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ANNUAL REPORT FOR MLS 150 & 151

WHITE RANGE GOLD MINE

NORTHERN TERRITORY

FOR THE YEAR ENDED 20th May 2015

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Tenement :	MLS 150 & 151 "**White Range Gold Mine**"
Map Sheets :	Alice Springs 1:250,000 (SF5314) Riddoch 1:100,000 (5851)

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1.0 INTRODUCTION

This Annual Report documents activities undertaken for the Year 2014 / 15 on MLS 150 and MLS 151.
MLS 151 is a bore field and pipeline easement to service a water supply for MLS 150.
MLS 150 is the White Range Gold Mine.

2.0 LOCATION and ACCESS

These Tenements are located just east of Arltunga in the Eastern MacDonnell Ranges, approximately 130km east of Alice Springs in the Northern Territory and covers portions of the Mt Riddoch (SF58-51), 1:100,000 map sheet (Fig. 2.1). The tenement lies within the Ambalindum Perpetual Pastoral Lease.

Access is via the all weather Ross Highway for approximately 80km to the Arltunga Tourist Drive turnoff. Arltunga is a further 33km on a well formed unsealed road to the Ruby Gap road turnoff. Approximately 10km down the Ruby Gap road there is a turnoff to the White Range Gold Mine which is approximately a further 10km.

3.0 TENURE

Table 1: MLS 150 & 151 Summary

MLS	Area: Hectares	Grant Date	Expiry Date
150	558	21st March 1989	20th March 2034
151	20	17th June 1996	16th June 2021

4.0 REGIONAL GEOLOGY

The carboniferous Alice Springs orogenic belt stretches along the entire northern margin of the Amadeus Basin, (*Wells et al. 1970, Korsch & Lindsay 1989*), and is characterized by Arunta basement metamorphics overthrusting basin sedimentary rocks, (*Forman & Shaw 1971, Rutland 1976*), and by decollement tectonics in the basin, (*Teyssier 1985, Stewart et al. 1990*). Three distinct, south-directed thrust and nappe complexes are preserved along this belt and are from west to east : the Ormiston Nappe Complex, (*Marjoribanks 1976*) ; the Blatherskite Nappe, (*Stewart 1967*) ; and the Arltunga Nappe Complex, (*Forman 1971*). The Arltunga Nappe Complex is the largest and best developed, extending E-W for a distance of 100 km.

Only the two basal members of the Amadeus Basin sedimentary sequence, (the Heavytree Quartzite and the overlying Bitter Springs Formation), are observed in the Arltunga Nappe Complex. The unconformable Heavytree Quartzite, which has an undeformed thickness of <1 km is commonly attached to the Arunta Basement allowing several superposed basement nappes to be recognized, (*Forman 1971*). At the southern front of the complex is the downward facing Giles Creek Synform, (*tete plongeante of Teyssier 1985*). Further north, retrogressed amphibolite basement gneisses are interleaved with the Heavytree Quartzite, (*at White Range for instance, Stewart 1971*), and locally forming a series of antiformal stacks (*at Ruby Gap & Amarata/Artnarpa Ranges, Collins & Teyssier 1989*). Overlying these structures, basement nappes of amphilobites and granulites were thrusted southward along retrogressd, anastomosing ductile shear zones, (*Forman 1971 ; Collins & Teyssier 1989*). Proterozoic fabrics are preserved in the internal zones of many of these basement nappes, (*Teyssier et al. 1989*).

The White Range area is one of the northernmost outcrops of Heavytree Quartzite in the internal (ductile) regions of the nappe complex. The White Range is located along the NE dipping western contact of a major basement nappe, (the Paradise Nappe), in a mirror image position to the NW dipping Ruby Gap structure. Transport of the Paradise Nappe probably increases across White Range to the east toward Ruby Gap. This lateral variation in bulk nappe displacement is necessary in order to explain the rapidly decreasing shortening recorded on cross-sections to the west (*Teyssier 1985*). We will see that this large scale boundary condition may have played a significant role in the deformation history of the White Range area.

4.1 GEOLOGY OF WHITE RANGE

Lithologies and Metamorphic Grade.

The White Range is composed almost entirely of the resistant Heavytree Quartzite with Bitter Springs Formation to the south and southeast of the range, and is structurally bounded above and below by retrogressd Arunta Basement, (*Stewart 1971*). At White Range, the Heavytree Quartzite is composed of a 3 m thick basal conglomerate unit, overlain by 150 to 300 m of blocky quartzite, and 100 m of platy quartzite, (*Forman 1971*). A discontinuous unit of impure quartzite and fine grained conglomerate occupies a continuous horizon within the blocky quartzite, about 50 m above the basal contact. The basal conglomerate unit of the Heavytree Quartzite is exposed mainly along the western and southwestern margin of the range; the middle, more massive units of the Heavytree Quartzite occupy most of the central and eastern portion of the range, the upper platy Heavytree Quartzite and Bitter Springs Formation is exposed only along the southeastern margin of the range.

The Arunta Basement to the west of the range is composed of fine grained felsic and mafic schist, with various amounts of fine grained augen gneiss, (*Mackie 1988*). In general, intense deformation precludes a clear recognition of the schist protolith ; however, the unconformable relationship with the Heavytree Quartzite basal conglomerate is preserved. The Paradise Nappe overlying the Heavytree Quartzite is mostly composed of granitic augen gneiss, variably crosscut by small leucocratic aplites and pegmatites, and amphibolite dykes. Locally along the northeast margin of the range, in the vicinity of the White Range gold mine, the augen gneiss is severely retrogressed to a schistose phyllonite.

Results of plagioclase-muscovite geothermometry, Ar-Ar data thermo chronology, (*Dunlap et al. 1990*), and petrographic analyses of retrogressed Arunta basement rocks suggest that most of the structures of the Arltunga Nappe Complex developed in greenschist to epidote-amphibolite grade conditions. The granitic gneiss on the eastern side of White Range is increasingly retrogressed and strained with proximity to the basement-quartzite contact, such that locally, within several meters of the roof thrust, the granitic gneiss is completely altered to a chloritic schist. Up to several hundred meters away from the thrust, the feldspars are altered to white mica, biotite is partially retrogressed to chlorite, and epidote-clinozoisite-zoisite are less abundant. Plagioclase-muscovite thermometry, (*cf. Green & Usdansky 1986*), on six basement rocks surrounding the White Range yields a temperature range of 280° - 409° C with three of the samples clustered at 330° C.

The broad lithological distribution at White Range is therefore relatively simple; the western side of the range is a sheared nonconformity, and the eastern side is a tectonic contact at the base of the Paradise Nappe. Metamorphic assemblages correspond to conditions prevailing at mid-crustal depth. The following sections investigate the geometry and the development of structures observed at White Range itself.

Foliation, Lineation and Shear Indicators.

A well developed S-C foliation observed on outcrop and in thin-section is characteristic of the Heavytree Quartzite. It is generally subparallel to bedding and is defined by muscovite folia wrapping around flattened quartz porphyroclasts. The mineral lineation in the quartzite invariably trends N-S and is defined by the elongation on mica grains and aggregates, and by the long axes of ellipsoidal quartz grains. The basal conglomerate contains N-S elongated clasts which define a stretching lineation and average 0.5 m in length. Lineation in the basement gneisses is also N-S trending and is defined by the long axes of mica grains, quartz ribbons and feldspar porphyroclasts.

Mesoscopic sense of shear indicators observed in the White Range area include S-C-C fabric relations, (*Berthe et al. 1979, Platt 1984*), boudinaged cobbles and veins (*Hanmer 1986, Goldstein 1988*), and o – porphyroclasts of quartz and feldspars (*Passchier & Simpson 1986*). Microscopic sense of shear indicators comprise mica fish, recrystallized quartz grain shapes and quartz crystallographic fabrics, (*Simpson & Schmidt 1983*). All of these criteria indicate a N over S sense of shear which is consistent with the overall regional southward vergence of the Alice Springs Orogen.

Ductile Thrust Faults – The White Range Duplex

Ductile faults, meters to tens of meters in thickness of concentrated deformation are present throughout much of White Range. Along the western margin of the range, where the basal conglomerate provides a continuous marker, the location, attitude and sense of movement on these faults, define them as thrusts. Quartz-tourmaline rich veins, both concordant and discordant to the foliation and bedding are commonly associated with the ductile thrust zones.

In general, thrusts strike E-W and dip shallowly to the north, however, segments of the thrust faults have been reoriented by later NE-SW trending folds. Eight ductile thrusts have been recognized within the Heavytree quartzite. These thrusts form a hinterland dipping duplex, (*Boyer & Elliot 1982*) with a well defined roof thrust of basement rocks overlying the Heavytree Quartzite to the north and the east. The floor thrust of the duplex is not as well defined and consists of a relatively thick zone of mylonitic schists and gneisses below the quartzite to the west and south. Sense of shear in all of these ductile faults is consistently N over S.

The amount of displacement on individual thrusts is a few hundred meters maximum as deduced from disruption of the basal conglomerate. On the other hand, a lower limit of N to S displacement across the roof thrust must be at least 5 km since the entire length of the duplex is overlain by mylonitic basement gneisses to the east. It follows that the ductile thrusts at White Range only partially accommodate the more substantial total displacement of the Paradise Nappe. This is consistent with the observation that this same nappe has recorded several tens of kilometers of southward displacement further east, above the Ruby Gap duplex, (*Collins & Teyssier 1989*). Nevertheless, considering its overall imbricate nature and well developed roof thrust, it is propose that the White Range structure be called a ductile duplex.

Folds

The importance of folding vs thrusting in the development of the Arltunga Nappe Complex has been the source of considerable discussion. Forman (1971) emphasized folding, while Yar Kahn (1972) and Hobbs et al. (1976, p411-414) pointed out the significance of the thrust-imbrication of thin sheets. At White Range, pebble conglomerates were found along the northern side overlying the blocky quartzite, and it was proposed that the whole Heavytree Quartzite could be overturned, (*Mackie 1988*). Our mapping has shown that these overturned conglomerate beds are part of a system of early, N trending Isoclinal folds which locally disturb the otherwise upright position of the Heavytree Quartzite.

These N-S trending tight folds of bedding and some quartz veins are more easily observed on the western side of the range. The axial planes are subparallel to the foliation and the fold axes are subparallel to the mineral lineation. These near-recumbent folds are centimeters to hundred(s) of meters in wavelength. Small tight folds are observed within the hinge zones and along the limbs, (i.e. parasitic folds), of the larger folds. These folds, especially on the west side of the range, appear to be cross-cut by the ductile thrusts.

In addition to the N-S folds, three E-W trending tight folds were observed in the field. In one case, an E-W hinge was traced around into a N-S hinge, defining a sheath fold geometry. In the other two cases, no such geometry was found. Centimeter scale, E-W trending, open to tight folds with north dipping axial planes are present locally, their vergence indicating a N over S sense of shear. Along the southern margin of the White Range, several large, open, upright folds with E-W trending hinges fold both bedding and foliation.

NE-SW trending open and kink folds are found throughout the range and affect all earlier structures, (foliation, lineation, ductile thrusts, isoclinal folds). Most of the axial planes of these open folds are steeply SE dipping, although they form a conjugate array. A broad antiform – synform – antiform upright fold sequence controls the outcrop pattern of the entire White Range with fold axes trending 014° to 027° N and plunging 19° N. Smaller scale folds in the Bitter Springs Formation to the S and SE of the range are oriented approximately 045°, 21° N. The fold axes of small kinks and crenulations are on average oriented 048°, 12° N. Associated with the later folds are NE-SW tracing brittle faults, conjugate joint sets, and an EW striking quartz vein system.

Finite Strain Analysis

Both Rƒ/ϕ and Fry analyses, (*Lisle 1985; Fry 1979*) of the porphyroclasts of 15 quartzite samples record apparent flattening to plane strain. Strain could be determined from samples even where recrystallized quartz composed 70-80% of the total quartz by volume due to the well-defined quartz grains outlines by muscovite folia, and to the preservation of the central part of porphyroclasts. The results of the two types of strain analyses are comparable, though the Rƒ/Φ in general documents slightly higher, more prolate strains. We interpret the minor differences to be related to measurement error and not to strain partitioning effects between clasts and recrystallized matrix. Beyond a certain “ magnitude “ of strain, the quartzite is almost entirely recrystallized and muscovite concentrations no longer clearly outline original grain boundaries. This suggests a correlation between strain and recrystallization within these rocks.

The axial ratios of the basal cobble conglomerate, (with quartzite clasts up to 1.5 m in length), were measured along foliation and joint planes at five localities. Based upon the harmonic mean of the axial ratios, the clasts record high, apparent plane strain to constructional strain. In general, strain increases from south to north, (localities A to E respectively), although strain is also dependent on the position of the measured localities relative to the ductile thrusts. Some clasts show incipient necking and boudinage features; others are folded along through-going shear bands. In the matrix of conglomerate B, quartz Porphyroclasts record lower strains.

Strain in the conglomerates is so large that the angle between clast long axis and foliation is not measurable. Therefore, pre-tectonic, (sedimentary), fabric could not be evaluated by the Rƒ/Φ technique. Despite this difficulty, the consistency in the shape of the strain ellipsoid, (plane strain to constriction), together with the general S to N increase in strain, (reflecting the regional trend), give some evidence to the pebble data. Finite strain derived from deformed quartz grains indicates that the Heavytree Quartzite is not as deformed within the central part of White Range. In fact, strain appears to be higher at the base, (in the conglomerate), and at the top, (beneath the roof thrust), of the quartzite and within the ductile thrust zones in the central part of White Range.

Microstructure

The development of microstructures in the quartzite is generally correlative with a position in individual thrust sheets. In the internal zones of the sheets, the quartzite is moderately deformed and recrystallized, while within the thrusts zones, (especially the roof thrust), the quartzite is increasingly strained and recrystallized. There is no observed correlation between amount of recrystallization and muscovite content in the quartzite.

Undeformed Heavytree Quartzite protolith contain quartz grains that are rounded and spheroidal, moderately well-sorted within individual beds, and almost entirely monocrystalline. Quartz overgrowths and white mica surround the detrital quartz grains. The weakest deformed quartzites in the White Range have over 50% by volume of the quartz recrystallized relative to total quartz. Quartz overgrowths are no longer observable and the quartz clasts are generally surrounded by a “matrix” of muscovite and recrystallized quartz. Most clasts are ellipsoidal, though some retain their original, nearly spherical shapes. Undulatory extinction, deformation bands and optical subgrains are moderately well developed in the porphyroclasts. While higher concentrations of muscovite still outline and define the original grains, preferential muscovite alignment also defines a foliation.

In more recrystallized quartzite samples, (e.g. 70-90% of quartz recrystallized, by volume), only fragments of internally deformed porphyroclasts remain. Long axes of the fragments lie approximately in the plane of foliation. Recrystallized quarts grains are elongate with long axes oriented approximately 10-30° to the muscovite foliation, consistent with a N over S shear. Muscovite folia define a pervasive S-C foliation through the rock. Muscovite is still heterogeneously distributed throughout the rock, mainly occurring in moderately narrow zones that frequently wrap around the remaining clast fragments. In some areas where the quartz is entirely recrystallized, the muscovite is homogeneously distributed.

Within several of the thrust zones, especially along the roof thrust, the quartzite is entirely recrystallized. The recrystallized grains are elongate in shape with long axes inclined approximately 20° to the muscovite foliation. This relationship is interpreted as a steady state foliation developed in a south-directed shear, (*Means 1981; Lister & Snoke 1984; Burg 1986*). Grains are elongate, meet at triple junctions and exhibit undulose extinction. Coplanar recrystallized muscovite grains are homogeneously distributed through the rock and define a mylonitic foliation. Shear bands are present in some of these samples.

Besides the microstructures discussed above, the quartzite contains: (1) microscopic pinch and swell / boudinage structures; (2) quartz veins; (3) open, isoclinal and kink folds; and (4) ubiquitous secondary fluid inclusion planes.

Quartz Crystallographic Fabrics

Quartz *c*-axis fabrics were measured for 12 samples from White Range. For 6 of the samples, separate fabrics for porphyroclasts and recrystallized grains were measured in the same thin-sections. In general, porphyroclasts *c*- axes are concentrated away from the foliation plane and define either single or double maxima, characteristic of flattening fabrics, (*Tullis et al. 1973; Price 1985*). A slight asymmetry in several porphyroclasts and recrystallized fabrics is consistent with N-over-S shear, (*Bouchez et al. 1983; Simpson & Schmid 1983*), although it is worth noting that most diagrams are quite symmetrical. The entire recrystallized sample 019 near the roof of the duplex clearly displays a cross-girdle fabric with a slight fabric asymmetry consistent with N-over-S shear. An increase in the amount of recrystallized quartz relative to total quartz weakly correlates with increased fabric intensity.

Kirschner & Teyssier (1990) have discussed the significance of the systematically different c-axis fabrics between porphyroclasts and recrystallized grains from the same thin-section. It was concluded that the strain evolved from apparent flattening to plane and constructional strain during the deformation history. In essence, the early stages of the deformation history would be preserved in the porphyroclast fabric, and the late stages would be more represented by the recrystallized fabric, assuming in part that the preferred orientation of cyclically recrystallized aggregates is more sensitive to changes in the deformation history, (*Lister & Hobbs 1980, Law et al. 1984*). The symmetry of recrystallized and porphyroclasts fabrics suggests that there was a component of coaxial deformation during fabric development

4.2 GEOLOGICAL STRUCTURE

The White Range area is part of the northern margin of the nappe complex where ductile and penetrative deformation developed after the early sliding progressively metamorphosed the basement to upper greenschist facies. This resulted in folding and produced homotactic and penetrative mesoscopic and microscopic structures and involved extensive cataclasis of feldspar and recrystallization of quartz.

The White Range antiform is of domal shape extending 5km in a north-south direction bearing 015° and with a maximum east-west extent of nearly 4km. The rocks exhibit north dipping foliation, a strong north plunging mineral lineation (often tourmaline) at 20° and are accompanied by the formation of reclined north-south folds with their axil planes parallel to the schistosity. The size and style of the folds is related to the lithology of the quartzite in which they occur. In the medium bedded blocky sandstone the folds range from 1m to 15m in amplitude and are tight to isoclinal in profile whereas in the laminated silt rich lithologies the folds are only a few centimeters in amplitude and are invariably isoclinal. They plunge north-northeast (015°) to east-northeast (060°) at about 10°. Field observations suggest that the foliation is parallel to the axial plane of the folds and this is in the direction of nappe development.

Associated with the recumbent folds where the limbs have been torn apart are numerous boudins and the noses form mullions. In the southern part of White Range, pinch and swell structures exist in quartz veins, beds have east-west trending axes and the lineations are folded by the early injection of siliceous solutions forming quartz veins.

After the main southward translation of the nappe, residual stresses caused the late east-west trending upright folds. These folded the foliation, lineation, recumbent folds and early quartz veins in the quartzite and their amplitude and style is again related to lithology. Folds in the more competent quartzite are open and concentric with amplitudes and wavelengths of several metres, whereas folds in the upper incompetent units are tight to isoclinal, concentric to disharmonic and range up to half a meter in amplitude. Some sulphide bearing siliceous solutions infilled the early gashes.

4.3 MINERALIZATION

The gold mineralization at White Range is a hydrothermal quartz lode type structurally emplaced during the waning phases of the tectono-thermal thrust nappe development of the Carboniferous Alice Springs Orogeny. This mineralization is found adjacent to an intense deformation zone of the Woolanga Lineament in the Weldon Tectonic Zone where heat and high water flow have retrogressed basement rocks to greenschist metamorphism and produced mesoscopic folds and penetrative structures in the Heavytree Quartzite. In this general area, alteration consists of silicification, chlorite, epidote and tourmaline and the chrome-bearing mica “fuchsite” is found.

The hydrothermal lodes are quartz-sulphide bodies that filled anticlinal tensions gashes, joints, fissures and favorable bedding planes within the Heavytree quartzite and basement rocks in the up-thrust zone of the nappe. Mining with machinery has shown that the quartzite has a surface silicified cap that protects poorly cemented quartzite beneath. The gold is contained in the pyrite or in limonite boxworks after pyrite near the surface where oxidation has taken place (*Hossfield 1937*).

Mineralogy is simple; the lodes are dominated by quartz. Pyrite and chalcopyrite form the principal sulphides with subordinate covellite, chalcocite and native silver being present in quartz as bunches, seams and veinlets. Native gold occurs mainly locked in the pyrite, ranging in size from 10 to 350mm and is liberated as the sulphides are oxidized thus leading to easy treatment by the amalgam method. Boxworks after pyrite up to 2 sq. cm are prominent and often show free gold. Limonite and hematite are often enriched with gold. The mode of silver occurrence is likely to be late stage veinlets of native silver.

At White Range there are two styles of mineralization, a high grade quartz-sulphide lode structure and a bulk low grade resource of stringer mineralization adjacent to shear zones.

Mineralization is hosted by quartz veins in late Proterozoic Heavytree Quartzite rocks which lie immediately below a large thrust contact with older Artnarpa complex schists and metatonalites. Although several smaller thrust faults are recognized within the Quartzite, mineralization at the mine site is confined to quartzite immediately beneath the exposed roof thrust contact between quartzite and metatonalite. Limited drilling indicates that mineralization also persists in quartzite beneath the metatonalite at depths exceeding 60m vertically.

Gold mineralization is contained in sulphidic hydrothermal quartz veins which are discordant to foliation. Vein geometry in cross section consists of individual steeply north dipping planar or sigmoidal veins that are en echelon arrayed in zones dipping south at 40 – 70° . Individual veins are centimeters to metres in width and metres to tens of metres in length. The mineable vein zones or vein arrays are meters to tens of meters in width, five to twenty meters in height and strike length. In plan view, vein arrays consist of anastomosing sets commonly intersecting to form parallelograms and less commonly to form pinnate geometries.

Typical oxidized ore is predominantly quarts vein rock in which pyrite has been replaced by limonite, some of which has been totally or partially leached out leaving fragile open latticework structures and solution cavities. Gold in oxidized ore is frequently visible as wiry and platy particles up to one millimeter in size and loosely attached to the latticework cavities. Below the zone of oxidation, gold ore is typically associated with coarse pyrite and less commonly with minor covellite and chalcopyrite. The average sulphide content is rarely greater than 10%.

Visual observations and detailed sampling have shown conclusively that the distribution of gold is erratic. Considerable gold is contained in patches of high to extremely high grade ore (30 – 300 g Au/t) with dimensions in the order of centimeters to decimeters in width. These high grade areas invariably correlate with high sulphide content in the primary zone and with a high proportion of latticeworks and fine grained limonitic material in the oxidized zone.

5.0 ORE RESERVES AND RESOURCES

At the commencement of mining by White Range Gold NL in 1989, the probable ore reserves were stated as :

850,000 tonnes @ 4.7 g Au/t *(M Rogers & Associates December 1989*)

Mining from 1989 to1991 was approximately 530,000 tonnes.
In November 1991, the remaining reserves were quoted as

Proved Ore Reserves :	160,000 tonnes
Measured Resource :	180,000 tonnes
Total Reserves and Resource	**340,000 tonnes**

Ore reserves and resources are based on drill intercepts with an average spacing of 7.5m on sections at 10m intervals. Approximately 65% of total drilling was open hole percussion and 35% reverse circulation percussion.

Samples were split at one metre intervals and open hole percussion samples were assayed for gold by acid digest on 40g charges with Atomic Absorption Spectrometry (AAS) determination. Reverse circulation samples were assayed by fire assay on 50g charges and economic grades are checked by acid digest on 35g charges with AAS determination. At various stages assays are repeated by splitting primary drill samples.

Open hole drill collars were surveyed and reverse circulation drill holes were surveyed at the collar and down the hole. Geology and assays were plotted on cross sections, ore lenses were rationalized and interpreted by plotting level plans using customized Surpac mining software. Criteria for the limits of ore lenses were 2 g Au/t cutoff over minimum 2m horizontal width and 10m strike length.

Ore volumes were computed from lens shapes on bench plans at 5m vertical intervals. Tonnage conversion is based on an average specific gravity of 2.5. Grade estimate of ore lenses on bench plans is based on the arithmetic mean of drill intercepts using a top cut of 15 g Au/t. Global pit grades are tonnage weighted on a bench by bench basis.

6 HISTORIC MINING (1886 to 1970)

Mining commenced in the Arltunga region around 1886 after the mistaken perception that Rubies had been discovered at Ruby Gap approximately 35km away causing a “Ruby Rush” of hopeful miners. When it was discovered that the Rubies were actually Garnet, attention was diverted to Quartz reefs around Arltunga and in particular White Range.
Mining occurred in the following areas of MLS 150 :

AMALGAMATED
BILLYCAN
BOULDER
CENTRAL
EXCELSIOR
EXCELSIOR EXTENDED
HOLLY OAK
LUCES
NORTH BLOCK
OVERSIGHT
SOUTH BLOCK
WEST BLOCK

7.0 PREVIOUS EXPLORATION (1985 to 1989)

Whilst most of the drilling undertaken from 1987 to 1989 concentrated on “Resource” drilling, exploration drilling was undertaken in the following regions which have not as yet been mined.

REGION	HOLES	METRES
Black Devil	15	648
Boulder	1	34
Central	11	404
Eastern Schist region	8	466
Excelsior South	8	343
Holly Oak	33	1095
North Block East	19	702
Oversight	13	468
South Block	30	1093
West of West Block	20	598

8.0 PREVIOUS MINING (1886 to 1992)

Mining at White Range, between 1886 and 1970 was by shaft mining on specific quartz veins.

Modern mining from 1989 to 1991 by White Range Gold NL was by open cut method undertaken on the side of a steeply sloping quartzite range some 200 metres in vertical height. Some 530,000 tonnes of ore was extracted from 5 open cut pits in the regions of :

EXCELSIOR
EXTENDED
LUCES
NORTH BLOCK
WEST BLOCK

9.0 PROPOSED EXPLORATION

To date, the boundaries of mineralization of the White Range deposit have not been established. The exploration potential of the White Range Mineral Lease has been reviewed by Independent consultants :

J Gilfillan Associates Pty Ltd (1991)
Dr Chris Giles (1991)
Dr David Kirschner & Dr Christian Teyssier (1991)

J Gilfillan's February 1991 assessment indicates a high likelihood of success in defining a resource in the order of a further 400,000 tonnes. The potential ore would be of similar grade and at a similar waste to ore stripping ratio to that previously mined. An additional 100,000 to 200,000 tonnes of resource potential beneath the barren metatonalite cover is also indicated, albeit at a slightly higher waste to ore stripping ratio.

Most of the potential 400,000 tonnes of additional resource is located within a one kilometer radius of the ROM Pad and is mineable by open cut. The main target areas are mapped but undrilled quartz veins in gullies between existing pits and in an area immediately west of the present open cuts.

With the aim of defining further ore resources at White Range, Dr Chris Giles was commissioned in August 1991 to assess and to plan a drilling program. Giles' report proposes a drilling program with good potential for the discovery of 200,000 tonnes of additional ore mainly from one area and at currently mined grades. Giles report was prepared following two site visits, inspection of targets in the field and a review of geological interpretations.

The main target areas are exposed quartz veins mineable by open cut methods and located within one kilometer of the ROM Pad.

Dr David Kirschner was a PhD student of Dr Christian Teyssier and later became Professor at St Louis University. In February 1991, Dr Kirschner provided a very detailed report, which forms part of Annual Report CR1993/027, titled "Deformation History of the White Range Duplex, Central Australia, with Implications for Fold Reorientation", with attached appendix 2 "Structural Geology Report".

Dr Christian Teyssier is a professor in the Department of Geology and Geophysics at the University of Minnesota and has undertaken several published geological studies and papers on Central Australia. We had Dr Teyssier visit the site in July 2014 together with Dr Donna Whitney, who is a metamorphic petrologist also at the University of Minnesota, to consult further in respect of our interest in further exploration for this site. They have introduced us to Tectonicist Professor Dr Patrice Rey from Sydney University who visited with us in August 2015 to discuss bringing some of his students to site to assist with mapping.

10.0 Activities 2014 / 2015

During the previous twelve months the site has been on care and maintenance. We have established some temporary accommodation to enable this.

All of the Athol Pine Trees that had sprung up in the tailings dam were removed.

As a result of the above average rain early in 2015, considerable damage was caused to the access road, this damage was repaired and the road was graded to maintain acceptable access to the site.

11.0 Proposed Activities 2015 / 2016

Continued control of any regrowth of the Athol Pine trees will be maintained along with adequate erosion control as advised by Low Ecological Services Pty Ltd.

All access tracks will be reopened for Four Wheel Drive access to enable adequate monitoring of the site and access to survey markers to assist with new mapping.

We are presently in the process of having Shandona Pty Ltd registered as an operator at this site. They have Low Ecological Services Pty Ltd preparing an MMP to cover the assets presently on this site and the planned work to be undertaken to access tracks.

Once approved, this MMP will then be amended to cover the installation of a small experimental processing plant they are planning to install during the last quarter of 2015 to undertake some processing of residual material within the ROM Pad area.

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Means
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J Gilfillan & Associates
Dr C Giles
W.J. Collins & C. Teyssier
Bouchez
Platt
Lisle
Law
Goldstein
Wells
Green & Usdansky
Simpson & Schmid
Boyer & Elliot
Yar Khann
Hobbs
Fry
Lister & Snoke
Tullis