ANNUAL REPORT

EL 8076

"PLENTY RIVER"

HARTS RANGE REGION, N.T.
NORtheast CORNER - ALICE SPRINGS [SF 53-14] 1:250,000
SOUTHEAST CORNER - ALCOOTA [SF 53-10] 1:250,000
SOUTHERN EDGE - HUCKITTA [SF 53-11] 1:250,000

TO N.T. D.M.E
FOR PERIOD TO 19/12/1997

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REPORT COMPILED BY:
CHAMBIGNE GARNET
30-12-97
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1 SUMMARY

Up until this reporting period Chambigne reported on its almost contiguous three Els (8076, 8384 & 8423), all of which located on the Plenty River, in one report. During this reporting period Chambigne applied for three mineral leases, one from within EL8076, one encompassing the entire river system within EL8384 and the third encompassing the entire river system within EL8423. Subsequent to the mineral lease applications, the areas applied for in the ELS were surrendered and in the case of EL8384 & EL8423, this necessitates annual and final reports, therefore this report only addresses EL8076.

The EL embodied in this report lies along the eastward-flowing Plenty River, just to the north of the Strangways and Harts Ranges, and is focused on alluvial garnet and to a lesser extent, other industrial minerals in the sands of the riverbed.

Substantial systematic sampling efforts were undertaken in previous reporting periods from the upper most reaches (19.5km) of the river and over 20.5km of the eastern portion of EL8076 commencing at the confluence with Entire Creek, moving east. The details of sampling sites, together with garnet size distributions from all these samples were presented in previous reports, along with preliminary minimum resource estimates.

Within the previous reporting period, a number of the sample separates were rechecked as a form of quality assurance, and found to match within counting error the figures reported. Utilising the grade figures previously presented, formal calculations were made to determine measured garnet resources arising from the previous sampling effort. The results yield 1.164 million tonnes within EL8076. This figure, added to those presented previously, yield a measured resource of 4.55 million tonnes of almandine rich garnet over the combination of the three EL’s.

From a statistical evaluation of existing detailed sampling and resource data, specifically of average garnet grades, river widths and sampling depths, a (conservative) inferred garnet resource in the remaining (unsampled) reaches of the Plenty River was calculated,
yielding in excess of 1.4 million tonnes. Thus, the combination of the 3 ELs contain a resource of 5.95 million tonnes of alluvial garnet, and comprise a world-class source of this commodity.

The figures contained within previous reporting periods, delineated with sufficient statistical confidence the likely resource distribution within the unsampled portion of the EL. It was decided to shift the emphasis of exploration away from further comprehensive detailed field work towards a better characterisation of potential garnet and heavy mineral products (required for marketing and sales contracts) and continuing metallurgical studies (required to optimise production).

As such, a program of in-fill, surface grab samples was initiated from within EL8076, collected for an indication of the concentrations of garnet between the known and measured sample sites, for an understanding of surface and near surface garnet concentrations as they relate to average concentrations over sample depth and for additional metallurgical consideration.

2 INTRODUCTION AND TENURE

The exploration licence, EL8076 comprising 148 graticular blocks of approximately 477km², was granted to Chambigne Resources Pty Ltd on the 20th of December, 1993.

74 blocks of EL8076 were relinquished in 1995, leaving 74 blocks (239km²), within this EL. On the 18-10-94, permission was sought from the N.T. Department of Mines and Energy to submit joint reports for the three ELs (8076, 8384 & 8423), as all share a similar geological framework, and all were taken up principally to explore for and exploit the garnetiferous sands of the Plenty River and its feeders; this was subsequently granted.
3 LOCATION AND ACCESS

EL8076 is centred on the eastwards flowing Plenty River, with the precise location of the graticular blocks as shown in Appendix page 2.

Access to the EL is via the Plenty Highway, which runs east from the Stuart Highway, roughly subparallel to the Plenty River, on its southern side. Numerous station roads and tracks run off the Plenty Highway, crossing the Plenty River, and in most places, rough and rarely used but quite navigable tracks run along parts of the banks of the River.

4 GEOLOGY OF EL8076

The EL lies in the flood plain of the Plenty River, with little in the way of massive outcrops; numerous smaller outcrops and rock bars, however, indicate that for the most part, the riverbed lies in the mid-Proterozoic metamorphic rocks of the Harts Range Group. To the west, some of the shallow feeders cut through deeply weathered and essentially undifferentiated Lower Triassic rocks, but these have no real significance in terms of the garnet genesis or resource volume.

Of the Harts Range Group rocks, the most significant are the Irindina Gneiss, and the Riddock Amphibolite; both are heterogeneous, and may carry from zero to 18 volume% garnet, though the average for the Gneiss is closer to 10%. From a consideration of the regional geology, petrology and topography, it is evident that the sources of most of the garnet in the river sands are the two rock units named previously. There appears to be little if any contribution to the river sands of grossular-andradite garnet from the rare calc-silicate rocks that are garnetiferous, or of almandine-rich garnets from the weakly garnetiferous lower grade schists to the north of the Plenty.
The geological-lithological distribution of rocks adjacent to the ELs can be seen on the Alice Springs, Alcoota, Illogwa Creek and Huckitta 1:250,000 Geological maps. For a better appreciation of the distribution of petrological types, refer to the Geology of the Strangways Range Region, the Arltunga-Harts Range Special, and the Quartz 1:100,000 geological maps.

It is of particular note, in relation to garnet grades, that there is little direct creek or river-fed input into the Plenty River from the north, at least along the section beginning at the western boundary of EL.8076. In fact, much of the alluvium from the high ground to the north of the Plenty is "captured" by the Bundey and Marshall Rivers and their tributaries. The Marshall runs subparallel to the Plenty; their sediment loads may mingle in the vicinity of Thring Bore during extreme flooding, but this is the exception rather than the rule.

Between the western and eastern limits of the EL, the sediment input to the Plenty from the south is exclusively derived from the rocks of the Harts Range Group. In particular, the immediate high ground west of the Harts Range Police Station, from 134 47' to 134 56', comprises mainly garnetiferous Irindina Gneiss and Riddock Amphibolite.

East of 134 56', the exposed high ground immediately south of the Plenty comprises the Brady Gneiss, which carries no appreciable garnet; colluvium from these rocks carried to the Plenty serves mainly to dilute garnet grades (via a surface sediment wash flowing north-east). Entire Creek, which empties into the Plenty at around 135 17' 40", however, is demonstrably garnetiferous (deriving this mineral within the Huckitta Dome, from large exposures of Irindina Gneiss; see the first annual report for EL.8829, 1996). This recharge is the last flux of garnet into the Plenty. As the river flows east, and begins to derive progressively more of its alluvial load from the southern (non-garnetiferous) flood plain, garnet grades will begin to drop eastwards, by dilution.

No purely geological mapping was carried out in any part of the EL in this reporting period. Written summaries of the regional geology of the areas encompassed by the EL is presented in the notes to accompany the Geology of the Strangways Range Region, and
the Aritunga-Harts Range Special 1:100,000 geological maps. There is no equivalent in
print for the Quartz Geological map, however the compilation notes appear as BMR
Record 23, 1982, [Shaw et al.]. The previous geological summary was compiled directly
from the above mentioned references, which are not presented here.

5 WORK PROGRAM TO 12/97

Previous reconnaissance over the entire length of the Plenty River contained within the
EL demonstrated that the Plenty was everywhere garnetiferous. Systematic sampling via
excavated holes carried out in reporting periods previous to this one has established garnet
size distributions and grades; detailed spreadsheets were included in previous reports.

To facilitate an understanding of continuing garnet concentration, of garnet grade
distributions, for an understanding of surface and near surface garnet concentrations as
they relate to average concentrations over sample depth and for additional metallurgical
consideration, a program of 21 in-fill, surface grab samples was initiated from within the
EL. These samples, numbered P40a to P61a inclusive were taken commencing at the
confluence with Entire Creek, and moving east. Note sample No. 42a was destroyed in
transit. The samples were taken at the approx. locations of the samples collected the
previous year (for comparative purposes), only this year at near surface. This particular
zone of the EL has been specifically targeted by Chambigne as:-

i) It is very close to the highway, ideally situated for a processing plant

ii) It is very large in terms of volume of ore

iii) It is a great distance from any dwellings or homesteads

iii) The ore is composed of the rich, although smaller grains of garnet of the
Riddoch Amphibolite, then it is re-charged by the rich and coarser grains of
the Irindina Gneiss via the Entire Creek, as well as being re-charged with
additional industrial minerals.
The samples were dispatched to the metallurgical laboratories, where they were initially screened to -850 microns. They were then concentrated using the RE-Roll technology in order to provide a magnetic concentrate (as opposed to the bromo-form sink/float magnetic/non-magnetic concentrate) to emulate proposed processing operations on site. This magnetic concentrate was subsequently screened into four additional size fractions (-850+600µ; -600+425µ; -425+180µ and -180µ), grain counted and thereafter subject to S.G. considerations to provide a wt%.

The representations of grade percentages within size distributions are included as Appendix page 3. A map of sample locations, name and numbers are included as Appendix page 4.

In order to better appreciate the garnet grade trends (along the river), it must be understood that the grade, at any one location, will vary across the river bed. This is simply a reflection of the fact that garnet has a density of around 4, whereas that of quartz, the most common mineral phase in the riverbed, is 2.65. Because of this, the flow regime along the bottom of the river will tend to concentrate garnet and other dense minerals in “channels” which meander back and forth across the riverbed, and which may be weakly to strongly defined (leading to relatively weak to strong local concentrations of garnet).

Because of the foregoing, the sampling methodology employed was to sample, at each site, at a random positions across the riverbed; the samples are not all collected at the centre of the river. This explains for instance, much of the seemingly erratic sample grade variation for some samples. Note however, that statistically, the average garnet grade for the samples is quite stationary; if the randomness is smoothed, there is no obvious trend of average garnet grade along the river between the sampling sites.

Another aspect of the (fairly uniform) garnet distribution is depicted in the plot of garnet contents in each ore block (of 0.5km length) along the length of the river. In the resource calculations, the amount of garnet is a function not just of average block grade, but of block volume, that is, the creek widths and sampling depths employed.
An average garnet grade is calculated for each block which tends to smooth the sample grade curve. Also the sampling depths are reasonably constant (with an average of 1.54m, and a standard deviation of 0.56m).

As a result of the foregoing, tonnage of garnet in each block is principally a function of the average creek (block) width.

The average grades and standard deviations of the river sections sampled in detail, and with an examination of the trends, the following observations and inferences may be made:

- While a declining garnet grade trend is indicated at the western end of EL8076, that actual grade values of samples are close to the average across the entire sampled section.

- The unsampled area of EL8076, opposite the high ground to the south comprising non-garnetiferous Brady Gneiss, may well exhibit dilution of grade, but this is likely to be, on average, of the same order as at the western end of EL8076

- The eastern sampled area of EL8076 has very similar grade characteristics to the sampled area to the west, but with lower (random or sampling) variation.

- To calculate an inferred resource tonnage in the unsampled reach of EL8076, an average inferred block garnet content was derived by subtracting the standard deviation from the average of each of the two sampled sections, and then multiplied by the length of unsampled riverbed. This yields a figure of 997,945 tonnes of garnet.

Earlier sampling depths were limited by excavation hole collapse; incidental data indicate that the real riverbed depth, especially in the east, may be as much or more than twice the sampled depth, and there is reason to believe that the extra depth will also be garnetiferous.
There should be a trend towards a widening of the riverbed going downstream (with resultant higher tonnages per block at constant garnet grade) - this in effect is offset by the probability of grade dilution in the unsampled section.

It became evident that the resource measurements and calculations finalised during previous reporting periods demonstrated that the amount of garnet contained in the Plenty riverbed, comprise a world-class garnet resource, of sufficient size to justify a large commercial operation.

It was decided that rather than embarking on further fieldwork to upgrade the inferred resources to measured resources in the unsampled reaches of the river, while the funding of the project was being organised, ongoing effort and funds would be better expended on garnet product quality characterisation and metallurgy, that is, exploring technologies for the recovery of garnet and other minerals existing in the resource as these factors will heavily influence sales and contracts, product recovery rates and project economics.

6 EXPENDITURE TO 12/97

As the result of the sampling and analysis of garnet, metallurgical considerations and specialist work by consultants apply equally across the three Els, costs incurred have been distributed across the Els pro rata, based on the individual percentages of the total area under licence. For EL8076 in this reporting period the expenditure incurred was:-

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7 PROPOSED WORK TO 12/98

Work to date within the three ELs has delineate a measured garnet resource of 4.55 million tonnes, and an inferred resource in excess of 1.4 million tonnes. The need to upgrade the inferred resource status is not pressing, and no systematic sampling of the type carried out to date is envisaged in the forthcoming reporting period.

As outlined earlier in this report, during this reporting period Chambigne applied for three mineral leases, one from within EL8076, one encompassing the entire river system within EL8384 and the third encompassing the entire river system within EL8423. At the time of writing this report Chambigne has lodged a fourth Mineral Lease Application (the second from within EL8076) and has subsequently dropped that same area from the EL.

As Chambigne moves towards production capability, it will be necessary to convert part or all of the balance of areas covered by the exploration licences to leases, though a time frame for this has not been determined.

In any case, Chambigne will continue characterisation of garnet and other heavy mineral products in the Plenty River, not so much for geological purposes but more for continuing metallurgical studies, for both proposed on-site and off-site (Alice Springs) processing and purification.

Parallel, in-house studies will continue on the conceptual optimisation and real-time testing of the proposed micronising plant (Darwin), and with the bringing on-line of other, very-low concentration minerals in the sands (principally zircon, and if it can be separated, low-iron muscovite).

Some of these studies will require additional sampling, and most field effort will be directed towards this aim. If it is in synergy with such sampling, several sample pits in the
unsampled reach of EL8076 may be excavated, the samples processed and tested, and used to upgrade the inferred category of this section of the Plenty to an indicated status.

8 PROPOSED EXPENDITURE TO 12/98

In light of the above, the following full-year minimum expenditure is estimated or proposed for EL8076, to 12/98:

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# CHAMBIGNE GARNET

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Appendix page 3