



**PASMINCO MINING ROSEBERY**

**SOCK CREEK EL 30/2000**

**ANNUAL REPORT  
FOR THE PERIOD ENDING 23<sup>rd</sup> JANUARY 2004**

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## 1. SUMMARY

This report details work undertaken on exploration licence 30/2000 Sock Creek (Bulgobac) during the third year of the licence. The principal exploration targets sought within the licence area are Hellyer- or Rosebery-type volcanogenic Pb-Zn-Cu-Ag-Au massive sulphide deposits.

Work completed during the reporting period has comprised:

- Cutting of 6.8 line km of new grid and surveying of this grid with DGPS.
- Partial leach soil sampling of the new grid (299 samples including standards and duplicates).
- Geological mapping of all grid cut since the granting of EL 30/2000.
- Review of previous exploration data.

No significant anomalies have been located by this work.

## 2. INTRODUCTION

This report details work undertaken on exploration licence 30/2000 Sock Creek (Bulgobac) [Figure 1], between 23 January 2003 and 23 January 2004, the third year of the licence.

The Sock Creek licence covers a portion of the Cambrian Mount Read Volcanics to the Southwest of the Que River and Hellyer Mines in Western Tasmania (Figure 2). The principal exploration targets sought within the licence area are Hellyer- or Rosebery-type volcanogenic Pb-Zn-Cu-Ag-Au massive sulphide deposits. Correlates (the Sock Creek Volcanics) of the Que-Hellyer Volcanics, which host the Que River and Hellyer mines, extend across the licence area. Access into the tenement is provided by forestry tracks extending west and then Southwest from the High Point on the Murchison Highway (A10). These tracks are currently open for 4WD vehicles to approximately 5392000mN, 385800mE (AGD66) after which access is by foot or motor bike-only. Access to the southern part of the tenement is via overgrown logging tracks and an old tramway extending northwest from the Murchison Highway near Animal Creek.

Exploration activities undertaken during this reporting period have focused on partial leach soil sampling and geological mapping over the Sock Creek sequence, interpreted to be time-equivalents of the Que-Hellyer Volcanics west of the Mt Charter Fault.

### 2.1 Attribution

The following personnel were responsible for the work carried out by Pasminco Rosebery Mine on the Sock Creek licence, EL 30/2000, area during the reporting period:

Senior Geologist:	Andrew McNeill – Pasminco Rosebery Mine.
Contract Geologist:	Roger Poltock - Poltock Geological Services.

### **3. LAND TENURE**

Sock Creek EL 30/2000, covering 14 sq. km, was granted to Pasminco Australia Limited on 23<sup>rd</sup> February 2001 for a period of 5 years (Figure 1). EL 30/2000 covers ground that fell vacant on the relinquishment of EL 37/89 (Pasminco) on 2<sup>nd</sup> September 2000. Land covered by EL30/2000 is all Crown Land designated as State/Multiple Use Forest and MDC (Forestry Commission) Informal Reserves, all of which are available for exploration under the Mineral Resources Development Act 1995.

### **4. GEOLOGY**

EL 30/2000 covers two main groups of the Cambrian Mt Read Volcanics - the Central Volcanic Complex (CVC), and correlates of the Dundas Group, including the Que-Hellyer Volcanics (Komyshan, 1986; Corbett and McNeill, 1986; Figure 2).

The CVC outcrop in the far South-eastern part of the EL and comprise rhyodacitic lavas and volcanoclastics. These rocks are called the Mt Block Volcanics.

The Dundas Group and correlates conformably overly the CVC on a gradational west facing and dipping contact, and are shown as Cycle 2 (Tyndall Group) rocks on Figure 2. The lower part of the Dundas Group comprises the Black Harry Beds and Animal Creek Greywacke; sediment dominated sequences that pass up into the Sock Creek Volcanics, a complex of shales, intrusive quartz-feldspar porphyries and dacitic to basaltic lavas with minor volcanoclastics. The sock creek Volcanics are geochemically distinct to the Que-Hellyer Volcanics, but, are considered to be their time equivalents south and west of the Mt Charter Fault. Overlying the Sock Creek Volcanics are equivalents of the Southwell Subgroup (felsic volcanoclastics and sediments).

The Palaeozoic rocks are unconformably overlain by Tertiary basalt, in the north of the tenement, and(or) Quaternary glacials, to the west and south.

Major structures on the EL include the N-S trending Mt Charter Fault, in the Northeast corner of the tenement. The regional magnetic and gravity data highlight the presence of several major, apparently deep-seated, unmapped or poorly mapped structures trending broadly E-W.

Two ?Cambrian zinc-dominated and gold/silver-poor sulphide occurrences are known on the EL. These are:

- 1) Sphalerite with lesser pyrite-galena-chalcopyrite in net-veins on the contact between quartz-feldspar porphyry and black shale at Sock Creek (best intersection of 1.7m @10% Zn, with a general tenor around 2-5% Zn over 5-10m.).
- 2) Weak disseminated sphalerite in black shale at Sock Creek South (best intersection of 1m @ 2.5% Zn).

No other sulphide occurrences of note are known anywhere on the EL.

## 5. PREVIOUS EXPLORATION

The area of EL 30/2000 Sock Creek has a long history of ‘modern’ exploration. From 1963 until 1989 the current tenement area was part of Comstaff’s EL 5/63. Exploration undertaken by Comstaff and JV partners Preussag (post-1977) and BHP (post-1985) is summarised in Table 1.

After the statutory relinquishment of EL 5/63, Pasminco were granted EL 37/89 Bulgobac Hill and commenced exploration in the area in 1990. Work undertaken by Pasminco between 1990 and 2000 is detailed in Table 2. Work completed by Pasminco since the granting of EL 30/2000 is summarised in Table 3.

Note that the north eastern part of EL 30/2000 overlaps with the western part of the High Point Prospect. However, the majority of this prospect is on vacant ground to the east and previous exploration will not be discussed in this report (see McNeill and Simpson (2000) for a summary).

**Table 1: Exploration on the area of EL 30/2000 prior to 1990**

Reporting Period	Work Completed
1970-1971 (Chisholm, 1971)	-80# stream sediment sampling on 150m intervals, minor soil sampling on access roads; weak anomalies located.
1971-1974	- costeaning on imperial grid; geological mapping, soil sampling – poorly documented and primary data not located.
1974-1976 (Keane and Orr, 1976)	- Diamond drilling on metric grid; 14 holes total for 2326m; intersected Sp-Gn-Cpy vein mineralisation; best intersection 1.7m@ 10.19% Zn in SK1
1975 (Butt et al., 1976)	- Area flown with INPUT airborne EM. No significant anomalies in the current licence area.
1977 (Hopwood, 1977)	- Drill core re-logged (SK1-6, 10 and 11), prospect geology reviewed and concluded that low potential for large tonnage deposit.
1978 (Orr, 1978)	- Reviewed previous work on the Sock Creek area and recommended further stream sediment and soil sampling and EM.
1979 (Hall, 1979a,b)	- Further review of Sock Creek prospect; concluded that mineralisation does not represent a major prospect and no further work was recommended.
1985-1986 (Anon, 1986)	- Bulk Cyanide leach and –80# stream sediment samples collected over licence area. No significant anomalies located.
1986-1987 (Anon, 1987)	- Cutting of grid for UTEM survey; Drill holes re-logged; summary drill logs and cross sections are presented.
1987-1988 (Anon, 1988)	- UTEM survey located Zone G – Sock Creek South; followed-up by a fixed loop SIROTEM and IP surveys and Drilling of DDH SCS1-3 (352m) intersecting weak Zn mineralisation (best: 1m @ 2.55% Zn). DHEM completed in SCS2 and 3.
1988-1989 (Wilde and Kerr, 1989)	- UTEM over the Southern extent of Sock Creek South; DDH SCS4 (201.4m) was drilled to test EM anomaly; DHEM completed.

**Table 2: Exploration on the area of EL 30/2000 after 1990**

<b>Reporting Period</b>	<b>Work Completed</b>
1990-91 (Lorrigan, 1991)	- Photogrammetry to produce accurate base maps, high resolution aeromagnetic survey, collection of physical properties data from existing drill core (SK1-12), Re-logging of Sock Creek South drill core and volcanological/lithogeochemical review of the prospect.
1991-92 (Purvis, 1992)	- Geological mapping, additional gravity data were collected. An Honours thesis entitled "Geology and mineralisation of the Sock Creek and High Point Areas, Western Tasmania" (Barwick, 1991) was completed.
1992-93 (Purvis, 1993)	- At Sock Creek Previous drilling, UTEM data and the Geology of the prospect were reviewed and new geological cross-sections compiled, infill gravity data was collected and a diamond drill hole (BHD4, 617m) completed as a deep test of the mineralised zone.
1993-94 (Purvis, 1994)	DHEM survey of BHD4 (Sock Creek); review of previous work indicated potential for low grade/ tonnage mineralisation at Sock Creek.
1994-95 (Purvis, 1995)	- Completion of analysis of stratigraphy & volcanic facies in western part of Que-Hellyer Basin, using lithogeochem & petrological data from 19 drill holes.
1995-96 (McGunnigle, 1996; Purvis, 1996)	- ML application (depth limited to 100m) over Sock Creek prospect by J.G. Purvis resulting in drilling of two holes (SC1 & SC2) with minor Pb -Zn intersections.
1996-97 (Basford and Murphy, 1997)	- Geological & geochemical data review. Minor grid cutting (4.4 line km) and soil sampling on northern section of licence as part of a program on EL 19/94.

**Table 3: Exploration on EL 30/2000**

<b>Reporting Period</b>	<b>Work Completed</b>
2001-02 (McNeill, 2002)	- Previous exploration data reviewed and digitally compiled; old DDH collars surveyed in AMG coordinates; 5 km line cutting completed at Sock Creek prospect for soil sampling program.
2002-03 (McNeill, 2003)	- 3 line km of grid were cut and this and the 5 km cut previously was partial leach soil sampled. Two anomalous zones, requiring some follow-up work, were located.

## 6. WORK COMPLETED 2003-2004 REPORTING PERIOD

Work completed during the third year of tenure focussed on partial leach soil sampling and geological mapping of the Sock Creek area.

### 6.1 Previous exploration

A review of data in the Pasmenco database indicated that the historical soil geochemical data from the Sock Creek area (presented in the last Annual Report) was mis-located. AMG coordinates were therefore transformed to match topography as accurately as possible (based on Comstaff plan TAS-2-1420). The corrected data is included as Appendix 1 (digital copy only).

### 6.2 Partial leach Soil Survey

#### Previous work

A review of the data presented in the last Annual Report (McNeill, 2003) indicated that there were analytical problems with SDS 4517, i.e., despite randomised sample numbers the Cu and Pb data produced three peaks when plotted in analytical sequence. This problem was approached by re-sampling and analysis of four of the problem samples. Results are shown in Table 4. It is obvious that the original results are much higher for Cu and Pb than the repeats, whereas the Zn results, although variable, are of a similar tenor. Amdel therefore re-analysed the first 88 samples from SDS 4517 for Cu, Pb and Zn (note that SDS 4517 included samples from Sock Creek and EL 14/98 Mt Sale). The 32 new results from EL 30/2000 are included as Appendix 2 and have been incorporated into the dataset, replacing the initial result, for interpretation. This exercise has highlighted the usefulness of randomised sample numbers in detecting analytical problems.

**Table 4: Comparison of Soil Sample results**

Site	Cu_ppm	SDS 4517/SDS 4537	
		Pb_ppm	Zn_ppm
6800N 2100E	21.3 / 0.5	19.9 / 0.95	1.7 / 2.8
6800N 2200E	9.6 / 0.3	9.9 / 0.9	3.3 / 4.3
7400N 2775E	9.7 / 1.0	11.5 / 1.3	3.3 / 6.2
7400N 3050E	5.1 / 1.3	15 / 2.7	1.7 / 5.27

## Current Year

Work on a planned partial leach soil survey of the Sock Creek Volcanics was progressed by cutting and surveying with DGPS 6.8 line km of grid and partial leach soil sampling this grid.

Randomised sample numbers were used in partial leach sampling to reduce the effect of analytical variations. The partial leach soil samples were collected at 25m intervals, at or near a grid peg, and involved digging a hole with a pick, removing the organic rich A-horizon and collecting approximately 500g of sample from the nominal B horizon. The samples were then placed in ziplock plastic bags and, once returned to the field office, the bags were stored open to prevent anaerobic reactions. When a batch of 200 samples was collected, the sample bags were sealed and the samples despatched to Amdel in South Australia for analysis by partial leach technique DL42. Elements determined were Ag, As, Au, Ba, Bi, Cd, Cu, Co, Mo, Ni, Pb, Ni, Y, Zn, Zr and the rare earth elements Ce, Eu, Gd, La and Sm. The pH of the leachate, after digestion, was also determined. Results are included as Appendices 2 and 3 and sample locations are shown on Plan 1.

Three duplicate and two standard samples were collected per 100 samples. The field duplicates were also analysed in duplicate to allow assessment of both the sample and laboratory variance. Additionally at each sample site a small amount of soil was collected and stored in a chip tray for reference and to allow soil colour to be recorded. Soil colour was assigned from a Munsell Colour chart with 19 colours and was then assigned to one of six colour groups.

The 292 samples (including duplicates) collected for this program were analysed as part of two batches (SDS 4535 and 4537).

No samples are obviously contaminated, however, 19 samples, 6.5% of the data set, have a low (pH<8.0) post-digest pH. At these 'low' pHs the speciation of reagents in DL42 may change and the resulting assays may be unreliable. These 33 samples would previously not have been considered in the analysis of the data set. However, Test work at Amdel indicated that decreasing the sample:liquid from 10:1 (method DL42) to 5:1 (method DL43) could buffer the solution to a higher, acceptable, final pH (for samples with a post-digest pH of >7.2) and not significantly affect the precision of the analysis. Accordingly all 19 samples, with low post-digest pH, were re-assayed with the new protocol with the result that all had post-digest pHs of >8.0. In the preliminary interpretation discussed below the low (pH 6.8-7.9) samples from the original dataset have had their assay results replaced by the re-assayed data.

Gridded images of the raw partial leach soil data are presented as Figures 3-10. Also shown on these figures are the boundaries of anomalous Pb C-Horizon total digest soil data collected by Comstaff. Several anomalies are evident:

- A Bi anomaly over Animal Creek Greywacke in the SE corner of the current grid.

- Two apparently Linear Pb, associated with As, Bi and Ag, anomalies north of the Collins Cross Fault. These appear to occur largely on shale/siltstone units suggesting the anomaly is related to variations in bedrock lithology (i.e., shales vs volcanics).
- A spot Cu and Pb high at the intersection of the Collins Cross Fault and the contact between dacite and Animal Creek Greywacke.
- Elevated Pb, Ag and As coincident with the 'C' horizon Pb anomaly at the Sock Creek Prospect.

Both Zn and Ba do not define any significant anomalies and have a 'spotty' distribution. No first order anomalies worthy of immediate follow-up are evident in the data, however, some total digest sampling may be warranted to determine if the linear Pb anomalies have a bedrock (lithological contrast) source.

### 6.3 Geological mapping

The entire grid cut in the first two years of EL 30/2000 and old grid lines extending to the north (onto EL 19/1994 Bulgobac River) were geologically mapped, by R. Poltock and A. McNeill, during the reporting period. Mapping was largely restricted to the cut lines and the streams and numerous logging tracks have not been mapped. Detailed interpretive geology in vicinity of the Sock Creek Prospect has been taken from Purvis (1993) and previous mapping by Barwick (1991), Komyshan (1986) and Corbett and Komyshan (1989) has been used to aid in interpretation and defining regional trends. Outcrop on the grid is poor averaging <10% and bedrock is locally obscured by fluvio-glacials. Outcrop geology is presented as Plan 2 and an interpretation is shown on Plan 3.

#### 6.3.1 Stratigraphy

Cambrian lithologies include the dacitic Sock Creek lavas, rhyolitic quartz feldspar porphyry intrusives (QFP), siltstone and micaceous - feldspathic wackes (Animal Creek Greywacke) and felsic volcanoclastic sandstones. Dolerite mapped by Barwick (1991) occurs as boulders in glacials and Tertiary basalt is restricted to the western margin of the grid.

The sequence is interpreted as west facing with shallow to moderate dips to the NW. Small wavelength folds have been described by Purvis (1993) in vicinity of the Sock Creek Fault.

#### *Cambrian*

From east to west the sequence includes:

- Dark grey siltstone and micaceous, feldspathic wackes (Eag). Siltstones are cleaved and thickly bedded; the latter is frequently difficult to see. Mn wad in streams appears to be associated with this lithology. These lithologies form the upper part of the Animal Creek Greywacke.

- Dacite lavas (Edi), Barwick's 1991 lithogeochemistry defines the lavas as mildly peralkaline intermediate – felsic, trachyte – comendites. Lavas are texturally variable and include amygdaloidal, fine-grained aphyric, perlitic and quartz feldspar porphyritic flows. Amygdales are elongate, aligned and filled with quartz and or chlorite. In the southern part of the mapped area the Dacite lavas include mixed unit (Exv) of lava breccia and quartz-feldspar-phyric epiclastics.
- Grey siltstone and sericitized quartz crystal rich volcanoclastic sandstone (Esh), this equates with Purvis's epiclastic unit between the dacites and QFP, the prospective horizon at Sock Creek Prospect.
- Rhyolitic quartz feldspar porphyry (Eqfp), Barwick (1991) described the porphyry as a typical late stage MRV calcalkaline rhyolite. Variably porphyritic with glassy – fine to medium grained crystalline groundmass. Interpreted as a sill emplaced within the basal section of a siltstone horizon i.e. the siltstone at Sock Creek Prospect may have been contiguous with that in Bulgobac River in the western part of the grid. However Purvis (1993) considered it extrusive based on peperitic contacts with siltstone in Sock Creek drill cores.
- Siltstone and crystal sandstone of Bulgobac River (Esh and Exv). Siltstones are not unlike those on the SE flank of the grid but are associated with feldspar > quartz crystal volcanoclastic sandstone rather than micaceous greywacke.

#### *Tertiary*

A remnant of a Tertiary basalt flow is located on the western end of 7000N. The basalt is fine grained to slightly plagioclase and olivine porphyritic.

#### *Quaternary*

A small area of gravel to boulder size glacials has been preserved between lines 7000N - 7200N / 2350E. The basal section is composed of mixed provenance, well rounded cobbles in clayey matrix and is exposed on the road at 386475E 5392,900N. 75m SE along this road cobble to ~5m boulder size deposits of granite, harnessed basic – intermediate rocks occur. The dolerite described by Barwick 1991 is part of the glacials. The source area for the glacials is a granite contact aureole with Cambrian age mafic – intermediate volcanics / intrusives, most likely on the eastern flank of the Meredith Granite

### **6.3.2 Structure**

All lithologies strike NE and dip NW at shallow to moderate dips, cleavage is moderately well developed with steep NE trend. At the Sock Creek Prospect Purvis (1993) has identified small wavelength, NE trending syncline / drag folds associated with the Sock Creek Fault. A prominent set of NW trending sub parallel faults between lines 6600 – 7000N equates with Barwick's X Fault / Collins Cross Fault (Purvis, 1993) and has been interpreted to represent a splay of the Mt Charter Fault (see Purvis, 1993 and Corbett and Komyshan, 1989). From current mapping the fault is sinistral with a horizontal displacement of ~400m,

further east Corbett and Komyshan (1989) interpreted it as a steep north dipping normal fault with significant but unspecified throw.

The Sock Creek fault is sub-parallel to stratigraphy and in the current mapping has only been identified as isolated occurrences of sheared volcanics and siltstone. Silicified and quartz veined siltstone at 7400N / 2150E and 7600N / 2075E may represent the northern continuation of the fault.

### **6.3.3 Mineralisation**

No significant mineralization has been noted in mapping but the following points of interest have been located;

- Quartz vein stockwork in dacite on lines 5800 – 6200N ~2700E.
- Trace pyrrhotite / arsenopyrite 7200N 2925E.
- Traces of pyrite in siltstones and greywacke.
- Leached limonitic quartzose float at 7200N 2385E.

The Sock Creek Prospect lies within the mapped grid but has very limited surface expression. Mineralization has been described by Purvis (1993) as vein style with sphalerite dominant and subordinate pyrite, galena and chalcopyrite. Veining is hosted within the quench brecciated QFP contact with black shales at the intersection of the Sock Creek and Collins Cross Faults. For a more detailed description of the mineralisation refer to Purvis (1993).

## **7. CONCLUSIONS & RECOMMENDATIONS**

A partial leach soil sampling program over the prospective Sock Creek Volcanics on EL 30/2000 Sock Creek was progressed during the reporting period with a further 6.8 line km of grid cutting and sampling completed. All of the grid cut to date on EL 30/2000 was also geologically mapped. No significant anomalous zones have been located by the survey to date and it is recommended that in the next 12 months:

- The grid be extended to the south to cover the entire strike length of the Sock Creek Volcanics on EL: 30/2000 (approximately 10.5 line km of cutting required).
- This grid be surveyed with GPS, soil sampled and geologically mapped.
- The linear Pb soil anomalies north of the Collins Cross Fault be followed-up by total digest soil sampling to confirm the source of the anomaly.
- Tracks and creeks in the northern part of the gridded area be mapped to improve the current geological interpretation. Additionally mapping traverses along the Bulgobac River and the north trending track at approximately 384500mE should be completed to determine the thickness of the Quartz-feldspar porphyry unit and whether any prospective units are present to the west.
- Previous UTEM and DHEM data be reviewed to assess its effectiveness and whether any targets have been missed.

## 8. EXPENDITURE

Total expenditure for all work undertaken by Pasminco Rosebery Mine within Sock Creek EL 30/2000, for the period ending 31/12/04 was **\$44,789**. A detailed expenditure statement is given below.

Computing	\$2,860
Drilling	\$0
Geochemical Assays	\$8,077
Geoscience Consultants	\$4,888
Land & Environment	\$452
Depreciation, Office, Sundry	\$247
Other Contractors	\$16,768
Personnel Costs	\$6,446
Stores & Supplies	\$321
Travel & Accommodation	\$0
Vehicles, Plant & Maintenance	\$660
Administration Fee 10%	\$4,070
<b>Total</b>	<b>\$44,789</b>

## 9. KEYWORDS & LOCALITY

### Keywords

SOCK CREEK, SOCK CREEK SOUTH, GEOCHEMISTRY, SOIL GEOCHEMISTRY, PARTIAL LEACH, ZINC, MAFIC, VOLCANICS, QUE-HELLYER VOLCANICS, MOUNT READ VOLCANICS, GEOLOGY

### Locality

1:250,000      BURNIE SK55-3  
1:100,000      SOPHIA 8014  
1:25,000        CHARTER 3839, BLOCK 3838

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