SILVER STANDARD AUSTRALIA PTY LTD

TECHNICAL REPORT
FOR THE BLUEY'S SILVER PROJECT, EL10228
ARLTUNGA
(July 01 – July 02)

WHITE RANGE MINERAL FIELD
NORTHERN TERRITORY

ALICE SPRINGS	SF 53-14
Fergusson Range	5850 - NW
Riddoch	5851 - SE

S. Carthew
Rocks Prospecting

July 2002

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SUMMARY

Thrust controlled precious metal and basemetal mineralisation

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At Bluey's Silver Prospect, an eleven (11) hole, four hundred and thirty three-metre (433m) drilling program, on six traverses drilled the outcropping Ag – Cu – Pb - Sb mineralisation and soil geochemical responses. At a 5-ppm Ag cut-off, the soils average 29 ppm Ag. Drilling has intersected mineralised stratabound dolarenite horizon and near vertical mineralised east – west structures feeding to this horizon. Assay results clearly recognise the mineralised zones with the maximum values being 500 ppm Ag, 1050 ppm As, 35ppm Cd, 195 ppm Co, 0.46% Cu, 3.95% Pb, 700 ppm Zn, and 1700ppm Sb. Mineralised zones of silver – copper – lead - antimony up to 15 metres wide are recognised.

INTRODUCTION

Imperial Granite and Minerals Pty Limited was granted the current project area as Exploration Licence (EL) 10228, from the 20th July 2001 for six years. Various mining companies have worked this property intermittently since the early 1980's and more recently by Silver Standard Australia Pty Ltd in joint venture with Imperial Granite and Minerals.

The area is considered prospective for precious metal and base metal mineralisation. Such mineralisation is hosted either along steeply dipping structures and/or thrusts and also in receptive carbonate rich sediments of the Proterozoic Adelaidean Billy Springs Formation. This style of mineralisation which occurs at the Bluey's Silver Prospect, is found at AMG reference 474430E, 7400308N.

This report provides the results of a literature review of past work and of a shallow Reverse Circulation (RC) drilling program undertaken to test the known silver – copper - lead soil geochemical responses and mineralised exposures.

PROPERTY, LOCATION, AND ACCESS

Exploration Licence (EL) 10228, is located in the Arltunga district of the 1:250,000 ALICE SPRINGS (SF53 - 14) and straddles the 1:100,000 Fergusson Range (5850) and Riddoch (5851) sheets.

The property consists of 17 blocks, totalling 53.5 square kilometres, is located within the White Range Mineral Province, in the eastern MacDonnell Ranges of the Northern Territory, approximately 120 kilometres east of Alice Springs

(Figure 1, Table 1). This tenement adjoins and is immediately south of the Alrtunga Historical Reserve (Figure 1).

Table 1: Tenement Details

Tenement Number	Area (Sq Km)	Date granted	Date expires	Rent	Expenditure per annum
EL 10228	**53.5**	**20/ 7 /2001**	**19/ 7 /2007**	**$170.00**	**$36,000.00**

A joint venture exists between the title holder Imperial Granite and Minerals and Silver Standard Australia, whereby Silver Standard Australia can earn a controlling interest in the license.

Vehicle access to Atnarpa Station by bitumen and graded tourist roads is excellent with accommodation and meals available at the nearby Alrtunga Bush Hotel or Ross River Tourist Resort. The Atnarpa Pastoral Lease for cattle is owned and operated by the Aboriginal controlled Central Lands Council, Alice Springs and managed from Limbla station.

TOPOGRAPHY AND VEGETATION

The topography of the property is comprised of a Tertiary aged laterite plateau being dissected and eroded. The Palaeoproterozoic aged schist and gneiss give rise to mulga scrub on undulating country whilst the Heavitree Quartzite is spinifex covered on the steep slopes and ridges. The eucalypt lined Paddys Hole Creek flows southward after intermittent rain, draining the centre of the licence.

Exposure of the weathered Archean lithologies and the Bitter Springs Formation is good with thin soil development, whilst skeletal soil development has occurred on the quartzite ridges. The area is semi-arid with unreliable sporadic summer rains.

ABORIGINAL SACRED SITES

An inspection of the registered sacred sites at the Aboriginal Areas Protection Authority, Alice Springs, and reveals that site 5851 – 013 is Arltunga Bore (4706007404900) on the Arltunga Historical Reserve, whilst none are recorded or are known of on the licence. Lack of surface potable waters would have restricted past aboriginal activities.

EXPLORATION ACTIVITIES

During the reporting period, an exploration program consisting of verification of tenement boundaries, the review of past work, the positions of geochemical targets, rock chip sampling and reverse circulation (RC) drilling was completed. The drilling of eleven holes for four hundred and thirty three metres (433m) was completed to test the surface silver - copper mineralisation at Bluey's Silver Prospect (474430E, 7400308N).

HISTORY OR PREVIOUS EXPLORATION

Past work undertaken on this licence application include:

1) **CR1983-005** EL 3316 Petrocarb / Peko Wallsend
Progress Report of exploration during 1983 on Exploration Licence 3316 (Ross River Area), Geopeko. December 1983.
Carthew, S. J.

This report presents the results of a 1:25,000 scale mapping and prospecting program for tungsten mineralisation when four locations of thrust controlled copper mineralisation was found. At Bluey's Silver Prospect, griding (still recognisable), -80# soil sampling, rock chip sampling and petrology (I.R. Pontifex) was undertaken. The soil program defined an exploration target, some 300 x 40m wide, and returned an average of 29 g/t Ag using a 5g/t Ag cut off. A silver – copper and a silver – lead mineral assemblage was noted in siliceous dolarenite and silt rich carbonates, and copper – silver mineralisation is hosted in the underlying siltstone along a sheared anticlinal axis.

The results of this work have been reassessed during Silver Standard Australia"s work and soil data are presented in Figure 2 and as various plans in Maps 3 and 4 of this report.

Selected rock chip grab samples assays up to 6,551 g/t Ag, 17.99% Cu, 0.8 g/t Au, 27.54 % Pb, and 0.25 %Zn.

Petrological studies by I. R. Pontifex identify native silver associated with quartz veinlets, supergene secondary copper minerals replacing probable tetrahedrite, pyrite and minor chalcopyrite. Native Silver also occurs as fine grains and as threads in very late stage supergene stringers cutting all components. In the lead rich sample, irregular patches of galena are enclosed in envelopes of cerussite and covellite.

2) Abstract- "The White Range Mineral Province" S. J. Carthew and J. R. Bruce 1985,
7th Geological Society Conference, Adelaide.

A summation of the attributes of the gold mineralisation at White Range, and the silver – copper mineralisation at Bluey's Silver Prospect.

3) **CR1986-0106** EL 3316 Petrocarb
Annual Report period 18-6-86 to 17-6-87

It was thought from the initial work, that the style of silver mineralisation was structurally emplaced stratabound ore related to zones of thrusting, and that near surface supergene forces had been important on concentrating surface mineralisation. A shallow air track drilling to 27m depths was undertaken along two grid lines (9900E and 9925E) to test the central portion of the silver soil anomaly. Best one metre assay results averaged 55ppm Ag, and 0.48% Cu. This drill rig did not always reach the target zone, or penetrate the prospective siliceous altered carbonate horizon producing inconclusive results.

4) **CR1987-0238** EL 3316 Petrocarb

Petrocarb extended the Geo-Peko grid to 10,650N along the baseline (10,000E) too more fully evaluate the Slate Bore Prospect with soil geochemistry (-80#, C – horizon, 25 metre stations, 50 metre line separation). Severely depleted base metal values were returned over the Tertiary silcrete.

5) **CR1988-0400** EL 3316 Petrocarb
Evaluation potential, Bluey's Silver Prospect EL 3316, Arltunga Area Temby, P.A.

The Bluey's Silver Prospect was considered to have some potential, particularly in areas of alluvial cover and duricrust.

6) **CR1988-0401** EL 3316 Petrocarb
Final report on work carried out on EL 3316
O'Connor, D.

The report summarises all previous exploration. The Bluey's Silver Prospect was found to consist of a concentration of irregular sulphide veins within carbonates of the Bitter Springs Formation.

7) **CR1989-0042** EL 4850 Carthew, Bruce and Endrass
Murrell, B.

The eastern area of the EL 4850 was flown with regional airborne geophysics. Aerial photography, stream sampling and prospecting was also undertaken. Analysis of the clay fraction of stream sediments indicated a multi-metal

anomaly near Bluey's Silver Prospect, and gold anomalies throughout the licence.

At Bluey's Silver Prospect, a costean across the main mineralised zone was undertaken exposing weathered shale and kunkar along the contact and a small window of schist within the dolomite.

8) **CR1989-0479** ELR 79, MCS94 Petrocarb Smolongor, S. and Temby, P.

The gossanous and brecciated quartz at Slate Bore Prospect occur in a variety of lithologies (quartzite, shale and carbonates) that are structurally controlled. Silcrete development is probably related to Tertiary or Mesozoic peneplanation and weathering. The character of the silcrete may be controlled in part by sulphide mineralisation associated with quartz veining. The general low level of metal response is attributed to extensive leach histories of the gossan and silcrete.

ROCK CHIP SAMPLING

Two campaigns of rock chip sampling were undertaken about the mineralised exposures and defined silver responses at Bluey's Silver Prospect. Results are shown on Map 1. Amdel Laboratories, Adelaide, assayed samples from both data sets. Data set one was assayed for silver, gold, copper lead, zinc and arsenic whilst data set two was assayed for these elements and bismuth, calcium, cadmium, cobalt, iron, magnesium, manganese, molybdenum, nickel and antimony.

REVERSE CIRCULATION DRILLING BLR001 – BLR011

Eleven (11) RC drill holes totalling 433m, were drilled to test the shallow, down dip extension of the mineralised outcrop and to test the near vertical east – west structures as being mineralised feeder systems to the stratabound mineralised horizons. JOHANNSEN DRILLING, of Port Lincoln, South Australia, using an EDSON 2000D scout drill, on an Isusu 4x4truck with a 600 CFM x 250psi compressor and supported by an Atlas Copco RV5 455 MD 950 CFM x 365psi compressor. Drilling was with a 9 cm face-sampling hammer, delivering the samples at one- metre intervals. These samples were speared to collect a 2 kilogram sample that was pulped and prepared at Amdel, Alice Springs and assayed in the Adelaide laboratory.

GEOCHEMISTRY

Drill samples were submitted to Amdel for assay by the IC2L method with check assays by the more accurate MET1 method. The two-kilogram drill chip sample was dried to a core temperature of 110° C, and milled in a LM5

pulveriser to 90% passing 106um. An analytical pulp of 250 gram was taken from the bulk and the residue retained.

Initially the drill samples were all assayed by the IC2L method using a sub-sample of up to 0.15gm of the analytical pulp is digested with aqua regia and then bulked to volume with water. The solution is presented to an ICPOES for the quantification of the chosen elements. Range is generally to 1% except Fe (30%), Ag (100ppm), and Cu (2%). For samples that assayed outside this range, more high-grade style dissolution with more appropriate measurement and standard by the MET1 method was chosen.

The MET1 analytical method by ICP employs a modified aqua-regia digest to dissolve the elements being assayed. Silver assays by this method are appropriate to 2000ppm Ag. Analytical ranges for the results are given in Table 2.

Table 2: Analytical Ranges

Element	Ag	Cu	Pb	Zn	As	Cd	Co	Sb
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
IC2L	2-250	5–3%	20–1%	5–1.5%	5-1.5%	5-500	10-5000	20-2000
MET1	2-2000	50-max	50-max	50-max	50-10%	10-1%	20-1%	50-1%

During the assay procedure checks put in place were reassaying one in twenty samples, with blanks and standards randomly placed through the sample suite.

REGIONAL GEOLOGY

The prospect is located within the Arltunga Nappe Complex, a group of basement-cored nappes formed during the Early Carboniferous Alice Springs Orogeny (300 –400 Ma). Basement rocks are the Arunta Block that consists of cratonised igneous, sedimentary and metamorphic rocks of Archean to Lower Proterozoic age intruded by Early Carpentarian granites. The Heavitree Quartzite and its equivalents were deposited unconformably over Arunta Block basement in intracratonic basins. Sedimentation continued with minor disconformity from the Adelaidean into the Upper Palaeozoic times, when the Alice Springs Orogeny deformed both basement and cover sequences. Widespread thrust faulting, isoclinal folding and nappe complexes were produced around the northern margins of the Amadeus Basin. Southward thrusting of basement blocks over the Adelaidean cover sequence developed late in the Orogeny. An extensive Tertiary silcrete-ferricrete peneplain is present throughout the region but is being actively eroded by an emergent landscape.

In the immediate area of the Bluey's Silver Prospect are exposures of the basement complex (amphibolite, gneiss, metadolerite), the Heavitree Quartzite (the basal unit of the Adelaidean sediments of the Amadeus Basin), pass upward into sandy carbonates and limestone of the conformably overlying Bitter Springs Formation. In places basement rocks are thrust onto the Bitter Springs Formation. Tertiary aged peneplanation has developed at two distinct levels, either at the top of the Heavitree Quartzite ridges or some fifty metres below with silcrete development.

At Bluey's Prospect, silver mineralisation is confined to dolomitic sediments of the Bitter Springs Formation. These sediments are complexly folded, predominantly along east-west oriented axis with less conspicuous north-south axis – four generations of folds have been described. A number of regional scale geologically mappable structures and lineaments are present; these proximal to the mineralisation are steep dipping northeast trending faults and a southeast trending fault. The style of mineralisation is considered to be Carboniferous epigenetic vein type precious metal mineralisation that is thrust controlled and in part found in dilational zones associated with a large ductile shear zone; the Cattle Highway Lineament. Retrogressive metamorphism is widespread within this part of the White Range Nappe that is part of the Arltunga Nappe Complex.

The prospect area comprises an ellipsoidal window of Bitter Springs Formation some 800 meters in diameter bound to the east, south and west by overthrust basement complex rocks, and to the north by an escarpment of Heavitree Quartzite.

PROSPECT GEOLOGY

The Bluey's silver mineralisation occurs in dolomite outcrops that are in part siliceous, which stand 2 to 3 meters above alluvial/colluvium flats in the south, and are bound to the west by a sharply incised, 2 to 4 meter deep northwest trending, gully. At the south end, where the gully enters onto the southern flats, dip and elevation to the east side of the gully confine the dolomite – moving north the combination of shallow dips, fold axis and elevation carry outcrop across the head of the gully to the west bank. This gives rise to the characteristic "S" shape of the mineralised unit in plan view (Maps 1 & 2). Behind the dolomite, to the north and east, the ground rises gently for a further +5 meters across outcrops of basement complex rocks to form a northeast trending ridge parallel to major regional structures. Very thin lenses of unaltered granite syenite intrude the altered and sheared basement rocks of amphibolite, dolerite and basalt.

In outcrop, un-mineralised dolomite is dominantly pale brownish to grey, massive to thick bedded, with some units containing numerous intraclasts. A black, fine grained to aphanitic, finely fractured and quartz-calcite veined, siliceous dolomite occurs throughout the outcrop range, apparently as an interbedded facies. The dolomite is underlain by a sequence of thin-bedded shale and ferruginous and dolomitic shale, and is overlain by thin-bedded

dolomite shale (very poor exposure, predominantly a kunkar zone). There is a marked rock competency contrast between the dolomite (massive and brittle) and it's enclosing siltstones and shales (fissile and ductile).

The dolomite host strikes predominantly to the northwest and dips are to the east ranging up to 30 degrees (Maps 1&2).

In the local area of the prospect the stratigraphic section is summarised in Table 3.

Table 3. Summary of Local Stratigraphy

Unit	*thickness*	*description*	*extent*
dolomite shale	>5 m, top sheared out	pale grey, fine grained, thins bedded (1-5 mm) and poorly exposed. Shallow dips, open fold pattern.	Confined between the *dolomite host* and the trace of the overthrust.
dolomite host	>6 m,	pale brownish to grey, massive to thick bedded, with some units containing numerous intraclasts. Minor black, fine grained to aphanitic, finely fractured and quartz-calcite veined siliceous dolomite. Shallow dips, open fold pattern.	200m of strike in discovery outcrop area; Peko mapped extensive outcrop to the west and southwest.
shale sequence	unknown	thin bedded shale and ferruginous and dolomitic shale. Either tightly folded along east-west axis or open folded and shallow dipping.	extensive area mapped, west of discovery outcrop tightly folded, elsewhere appears shallow dipping.

Antiformal folds and sheared folds in the underlying *shale sequence* are expressed in the *dolomite host* by localised steeper dips and an increasing intensity of sub-vertical shear joints which grade through to brecciation and quartz veining. The overlying *dolomite shale* does not appear to be tightly folded and apparently conforms to the dolomite.

The simplest example of the variation of fold/shear intensity with rock competency is through the area of samples 99/1 to 99/6. Narrow quartz veined shear in the underlying *shale sequence*, which is exposed in the bed of the gully (99/1), is expressed as a shear jointed offset in the overlying *dolomite host*. A larger more complex sheared and quartz veined antiformal fold in the *shale sequence* (99/2, 3) is expressed as shear jointing and alteration in the body of the overlying *dolomite host* with silicification and quartz veining extending laterally for a short distance across the upper contact (99/4, 5, 6).

A larger scale, more intensely mineralised, example is the mappable antiformal fold running east west approximately through airtrack holes BSA-7 and 9 towards the north end of the gully. In this area the base of the *dolomite*

host unit crops out on the east side of the gully about a meter above the bottom, and above the collar of BSA-9. This basal contact traces west across the face of the gully before running straight up slope to the west as dips become sub-vertical, past the collar of BSA-7 (on the north side) before tracing south then east (with less certainty as outcrop is poor) on the south side of BSA-7 and crops out in the slopes above the gully with shallow westerly (?) dips. Within this setting high-grade silver mineralisation is localised in sparsely quartz veined altered dolomites which extend along the basal contact of the unit (99/32) – drill holes BSA-7 and 9 which were collared along the antiformal axis but below the basal contact did not intersect significant silver mineralisation.

Bluey's Prospect was discovered during a regional exploration-mapping program being carried out by Peko and their prospect mapping was done within this context. Petrocarb reviewed the Peko data, developed a supergene model for the mineralisation and mapped the area to the immediate north in the context of this model. These data sets have been merged to provide an overview of the geological setting of the prospect – four structural domains have been recognised (Maps 1 & 2): -

A **southeast domain** comprises a broad anticlinal fold with northwest striking, shallow east dipping dolomite along the eastern margin which gets progressively steeper to the south. The core of the anticlinal fold is occupied by tightly east-west folded siltstone. The basement overthrust adjacent to the discovery outcrops forms the northeast edge of the domain. The boundary between the *southeast* and adjacent *western domain* is formed by a northeast trending structure, which is marked outcrops of massive jasper with coarse boxworks after carbonate and sulphate (?).

A **western domain** consists of northeast trending, shallow west dipping dolomite conformably underlain by siltstone. A silcrete/jasper surface is developed over the dolomite adjacent to the overthrust, which form it's northwestern edge.

A **northwest domain** consists of a series of overthrust slices of dolomite, siltstone and basement complex. A silcrete/jasper surface is developed over much of the dolomite. The domain is inferred from Peko mapping and was not walked out on the ground.

A **northeast domain** consistis of massive silcrete/jasper with prominent east west oriented zones of breccia and quartz-limonite veining. Strike of the underlying sequence is inferred to be to the northeast with shallow dips to both east and west.

At present silver mineralisation is known from the northeastern margin of the *southeast domain*. Traces of secondary copper have been found along the line of the structure, which separates the *southeast* and *western domain*s, and on a parallel structure at the southern edge of the northeast domain. Workings which some maps show located within or immediately adjacent to

the *northwest domain* are considered to be the Bluey's Silver Prospect, but misplaced.

RESULTS

ROCK CHIP SAMPLING

During this period two surface rock -chip sampling campaigns designated IJPB 01 – IJP 13, and 99-1 to 99-44 were undertaken. The results together with past results are tabled on Map 1. Assay values range from 0.5- 11,900 ppm Ag, 14- 13.15% Cu, 1- 3,620 ppm As, up to 40 ppm Bi, 0.7- 667 ppm Cd, and 2- 106 ppm Co.

MINERALISATION

A shallow dipping dolomitic unit (the dolomite host), which displays a wide range of primary and secondary textures and alteration, hosts the mineralisation at the discovery outcrops. In and adjacent to mineralisation the dolomite is characteristically a pinkish tinged pale grey colour with a fine-grained, saccharoid texture. Often the altered dolomite forms a fragment-supported breccia of angular clasts with few finer rock fragments and no matrix. Breccia fragment are commonly surrounded and cut by irregular white quartz veins. Fine drusy quartz occurs throughout, in the altered dolomite, in quartz veins and between fragments.

Several styles – and probably generations – of mineralisation are apparent in outcrop. Two generations of silver mineralisation is recognised from the petrological work of I. R. Pontifex. Most widespread is a fine (<1mm) black sulphide (?) occurring as dissemination's through altered dolomite and in association with fine, lensoidal, linear, quartz veinlets – this is the "background" mineralisation of un-veined, unaltered dolomite (samples 99/5, 6, 9) and is increasingly apparent in altered/veined dolomite (samples 99/10, 11, 17) through to high grade (samples 99/21 to 24, 32). In areas where strongly altered dolomite has been brecciated open druse is filled with galena (>10mm), often with an external rim of black, amorphous sulphide (samples 99/7, 13, 14, 19; IJPBO 1,2,3,4,5,9). In the outcrop of massively silicified altered and brecciated rock (dolomite) irregular veins of quartz and quartz-feldspar with knots and seams of black sulphide (1mm to 10mm) and secondary copper stains crosscut all fabrics (sample 99/18).

Each of the styles of mineralisation (Table 4) appears to be best developed in a particular setting and there is an apparent overprinting of styles with increasing disruption of the *host dolomite* by penetrative structures.

Table 4. Mineralisation Styles

	Description and comment	*Example*
style 1 - along and below the base of the dolomite – best developed over structural axis, penetrative fabric absent in *dolomite host*.	mineralisation as fine dissemination's and veinlets, alteration is not obvious or strong. Lateral continuity not known. Silver dominant.	99/2, 3 and the overlying 5,6 but best seen about 99/32 above the collar of BSA-9
style 2 - pervasively altered, variably brecciated and silicified dolomite – penetrative fabric not necessarily apparent in *dolomite host.*	mineralisation as fine dissemination's and veinlets in altered drusy dolomite and pervading the whole dolomite unit. Laterally continuous from top BSA-1 to bottom BSA-8, thence >26m. Silver dominant, possible lead component.	discovery outcrop area eg 99/21 to 24. Also in BSA-1 and adjacent 99/28,29,31
style 3 - sub vertical shear/breccia structures in the *dolomite host* – penetrative structures apparent.	coarse grained vugh and vein mineralisation in east west oriented zones through the dolomite – vertical attitude in outcrop face (99/12-15), trace out along outcrop (99/7,8). Width 1.8 to 10m, strike to 30m, vertical equal to *dolomite host* thickness, possibly >5m, Lead-silver or copper-silver dominant.	Discovery outcrop area at 99/12, 13,14,15 and 99/7,8 and 99/18, 19, and 20.

In the underlying *shale sequence* mineralisation similar to style 3 is present in an altered dolomite forming the sub-vertical limbs to a tight, east west oriented, sheared out antiformal fold which was tested by drill holes BAS-3 (vertical, on the antiformal axis, anomalous throughout, maximum 28 g/t Ag, 0.48% Cu) and RC drill hole BLR 9.

The two samples submitted for petrology by Peko were of high grade material from the discovery outcrops and are of style 3. There is a tenuous correspondence between the outcrop and petrographic descriptions – most surprising is the description of the rock matrix as being various metamorphic quartzose materials with little indication of a dolomitic precursor.

MINERALISATION MODEL

Observations suggest that mineralisation was deposited at favoured structural sites, during times of retrogressive metamorphism (eg sericite, epidote, chlorite and albite development) of the Alice Springs Orogeny. The most probable sequence of mineralising events is: -

- broad, open folding, probably along northeast oriented axis, with upward migration of fluids and Ag mineralisation deposited along the base of the *dolomite host* (style 1), probably associated with a thrust surface.

- tightening of the northeast oriented fold axis and the generation of penetrative fabrics into the *dolomite host* from the underlying *shale sequence*. Continued upward fluid migration deposited Ag mineralisation into the *dolomite host* (style 2) behind an advancing front of incipient fragmentation, alteration and quartz veining (99/4, 5).

- a change in the applied stress field to generate east west oriented sheared out antiformal structures in the *shale sequence* producing equivalent linear, penetrative structures in the host dolomite, predominantly by brittle failure. Deposition of disseminated and silicification and copper veining (style 3) followed vughy coarse-grained galena – the direction of fluid movement is not known.

While the known mineralisation is distributed along the trace of the basement overthrust shear the causal relationship is not well understood. It is possible that the folding and stage 1, 2 mineralisation is contemporaneous with the events, which produced the overthrusts.

Field indicators for styles 1 and 2 mineralisation are: -

- broad, northeast oriented, antiformal folds in the Bitter Springs Formation,

- The presence of dolomitic rocks with a moderate initial porosity and tendency to brittle failure. The *dolomite host* is the most obvious candidate but the Peko regional mapping indicates similar dolomitic units are present throughout the Bitter Springs Formation.

- alteration of dolomite - incipient bleaching with minor fragmentation and rotation, matrix level quartzose druse, and “fronts” of minor silicification with trace fine quartz veining.

- Imbricate thrust slices associated with silicification, mineralisation, (sericite- biotite- epidote) alteration and the development of brecciation and quartz veining.

Style 3 mineralisation is not confined to the dolomite host but is associated with east west oriented sheared out antiformal folds (eg IJPBO 10). On the basis of the existing mapping this style of folding is well developed in the southeastern domain and can be inferred in the *northern domain*.

While the Style 3 mineralisation is the most obvious in outcrop (eg IJPBO - 1,3,4,5 & 8; 99/7,13 &18) and has the highest total metal content it does not have a large tonnage potential if mineralisation is confined only to the presently recognised *dolomite host*. Styles 1 and 2 have the best tonnage potential, near “ore grade” total metal contents, and have the potential to form with reactive rocks throughout the section.

EXPLORATION POTENTIAL

Potential ore grade mineralisation is present in surface outcrop and shallow drill holes at two localities within the prospect –adjacent to the discovery outcrop and about drill hole BSA-1. On the basis of the sampling and mapping completed between the discovery outcrops and BSA-1: -

- host to the mineralisation is a shallow east dipping dolomite, which extends north-northwest below an overthrust basement contact.
- background values in the dolomite are 6.8 g/t silver.
- altered dolomite averages 26.3 g/t silver.
- brecciated and mineralised dolomite averages 680 g/t silver and comprises 10 to 20% of the altered material.
- the bulk average grade of altered and mineralised dolomite is between 91 and 157 g/t silver.

There is significant exploration potential away from the presently recognised positions. In assessing the potential of the area to contain significant mineralisation it is noted that :

- The alteration signature is not readily apparent in outcrop and the apparent stratigraphic/structural controls on mineralisation could be further developed for ongoing exploration.
- prospective stratigraphy and structures have been mapped but not adequately prospected or sampled for several hundred meters to the north and west.
- there has not been systematic exploration of the remainder of the licence, particularly in the Bitter Springs Formation for repetitions of this style of mineralisation.
- Similar rock type and structural setting have been mapped throughout the surrounding region but systematic exploration for repetitions of the Bluey's style of mineralisation has not been systematically conducted.

DISCOVERY OUTCROP

A bulldozer has been used by previous explorers at the discovery outcrops, presumably to expose high-grade mineralisation. Cuts have been made along the overthrust contact and along the southern outcrop/alluvium edge. The quality of the exposure achieved is not high - weathered shale and kunkar is exposed along the contact and a small window of schist within altered dolomite at the outcrop edge.

Three vertical air track drill holes, – hole diameter approximately 15 cm were drilled to 3m depth by prospector J. R. (Bluey) Bruce, in and about the area of the discovery outcrops. These holes were drilled: -

- on the overthrust contact. Cuttings indicate a shale/schist sequence without significant dolomite.

- at the southern edge of outcrop on the window of schist noted above. Cutting indicate a schist/shale sequence without significant dolomite,

- east of the discovery outcrop, presumably to test below the overthrust contact. Cutting were entirely amphibolite and schist.

On the basis of the plan extent of alteration and mineralisation as determined by observation and chip sampling, a more systematic drilling program would be required to test the true tonnage potential of the mineralised outcrop areas.

It is assumed that mineralisation is essentially confined to the dolomite host on the thrust contact. However, the area is characterised by several strong east-west vertical mineralised structures and if mineralisation persists down dip, or if other permissive dolomite units are present in the section, the tonnage potential increases significantly.

BSA-1 AREA

The potential of the BSA-1 area is founded on :-

- an intersection of 4 meters of dolomite in the top of hole BSA-1 which returned 55 g/t Ag,

- the sequence is shallow dipping and chip samples 99/28, 29 were collected from topographically below the collar of BSA-1. These samples returned 28.5 and 30 g/t Ag, which is comparable with the result, obtained in the drill hole.

- sample 99/31 was collected from above the collar of BSA-1 and returned 115g/t Ag.

- the base of the dolomite host drilled by BSA-1 is exposed in the gully 25 meters east of BSA-1 and sample 99/32-returned 170 g/t Ag.

- hole BSA-8 that was collared in basement 42 meters to the northeast of BSA-1 drilled through basement, the overthrust, unmineralised dolomite and terminated in dolomite returning 28 g/t Ag. The drill hole sequence can be walked out in surface section and the dolomite intersected at the bottom of BSA-8 is the top of the mineralised unit intersected in hole BSA-1.

Scree of altered and presumably mineralised dolomite extends for 20-30 meters to the northwest of BSA-1.

The tonnage potential increases significantly if: -

- mineralisation continues down dip past hole BSA-8
- if other dolomitic units with permissive characteristics are present in the section.

DRILLING RESULTS BLR1 – BLR 11

The drill logs and assay results for the Reverse Circulation drill holes BLR 1 – 11 are shown in Appendices 1 and 2, with site locations shown on Map 1.

Drill holes BLR 1 (10,000N) and 2 (10,025N) on section 10,000E, drilled to 52m and 49m, were designed to test the mineralised dolarenite outcrop and the thrust contact below the overriding basement.

BLR 1 intersected yellow brown massive dolarenite with variable vein quartz content up to 10% (0-5m) overlying fissile siltstones and shales with zones of vein quartz up to 4% content. In this hole, the dolarenite returned values to 16 ppm Ag, 115 ppm Cu and 150 ppm Pb over 1m intervals to depths of 5m. At 38m in a zone of vein quartz with trace galena, and disseminated pyrite, values of 14 ppm Ag, 130 ppm Cu, and 4,350ppm Pb were returned.

BLR 2 intersected the surface expression of the dolarenite with variable vein quartz, thrusted onto granite that is in turn thrusted onto siltstones and shales. BLR 2 intersected a fault zone with 30 – 60% vein quartz between 26 – 28m, below which are alternating bands of siltstone and limestone with variable vein quartz. At the bottom of the hole 1% disseminated pyrite occurs in grey black siltstone. Assay results reveal a zone of anomalous copper and lead values between 10 and 29m returning maximum values of 45ppm Ag, 195ppm As, 600ppm Cu and 5500ppm Pb.

Drill hole BLR 3 (10010N) was drilled to 43m, on section 10,025E was drilled to test the eastern margins of the mineralised carbonates and the thrusted contact between the basement granodiorite and the mineralised dolarenites. This hole collared in basement and intersected thrusted slices of dolarenite and basement granites with variable vein quartz content to 10% to 14m depth overlying siltstones and shales that contain widespread iron oxides on joints and disseminated and veinlets of pyrite at the bottom of the hole. Assay results recognise a lead rich zone between 3 to 6m with Pb values to700 ppm, overlying a Cu-Pb-Sb zone between 9 and 12m with best values to 12ppm Ag, 70ppm As, 390ppm Cu, 360ppm Pb, and 120ppm Sb.

On section 9975E, drill holes BRL 6 (9998N) and BRL 7 (10023N) each drilled to 40m tested the thrusted contact between basement and the mineralised dolarenites and the influence of the east-west anticlinal zone mapped in the siltstones. Drill hole BLR 6 intersected the siliceous dolarenite with variable vein quartz content up to 3% overlying fissile siltstones and shales. A thrust zone with 30% vein quartz exits at 12m depths. Hole BRL 7 was collared in basement granodiorites thrusted onto siliceous dolarenites and fissile siltstones and shales. At the lithological contacts variable quartz veining occurs. Assay results from BLR 6 are mineralised at the surface with values of 46 ppm Ag and 4800 ppm Pb; about the thrust zone 11 – 13m returning up to 33 ppm Ag, 230 ppm As, 200 ppm Cu 1550 ppm Pb, and 500ppm Sb. One of the most mineralised zones is recorded between 26 – 29m about a clay rich fault (?) zone in siltstones. This 3m zone averaged 121 ppm (max 340ppm) Ag, 146 ppm As, 1055 ppm Cu, 1.68% Pb, 550 ppm Sb and 286 ppm Zn. In BLR 7, assay results indicate zones of elevated values, the better being between 7 – 8m returning 33 ppm Ag, 600 ppm Cu, 2550 ppm Pb and 190 ppm Sb on the contact between siliceous dolarenites and shales, and between 24 – 25m in clay rich siltstones with 2% vein quartz assaying 500 ppm Ag, 550 ppm As, 750ppm Pb and 1700 ppm Sb.

Drill holes BLR 4 (9960N), BLR 5 (1010N) and BLR 8 (10050N) were drilled on section 9950E to 30, 40 and 20m depths. Drill hole BLR 4 tested a slither of northeast trending fault zone with brecciated carbonates with veinlets of malachite and silver mineralisation. Drill hole BLR 5 tested the sheared axial plane of an anticline in siltstones and shales beneath the thrust plane, whilst BLR 8 tested for carbonate - hosted mineralisation associated with the thrust. In BLR 4, anomalous Cu (Av 565 ppm), Pb (Av 1912 ppm), Sb (Av 370 ppm), and Zn (Av 138 ppm) values are recorded in carbonates to 4m depths. In drill hole BLR5, a 4m section between 11 and 15m averaged 38 ppm Ag, 383 ppm As, 278 ppm Cu, 770ppm Pb, and 587 ppm Sb in siltstones and shales with iron oxides on the joints and minor vein quartz. Hole BLR 8 records elevated and sporadic values throughout the with best values being 15 ppm Ag, 115 ppm As, 360 ppm Cu, 2400 ppm Pb, 230ppm Sb and 180 ppm Zn either on the dolarenite and siltstone contact between 3 – 4m or in fissile siltstones with 2% vein quartz at 8 – 9m depths.

Drill hole BLR 9, collared at 9935E and 10085N was drilled SW, oblique to section testing mineralised breccia and dolarenite. A 9m zone between 2 and 11m averaged 33 (max 150) ppm Ag, 1006 (max 4650) ppm Cu, 264 (max 900) ppm Pb and 255 (max 1100) ppm Sb shows the contact, the dolomitic siltstones and arenites and the underlying siltstones to be mineralised with widespread iron oxides and quartz veining. This intercept is down dip of the surface Ag-Cu mineralisation exposed in the gully and that intercepted in drill hole BSA- 1.

On section 9900E, were the fence of air track auger holes exist, one hole BLR 10 (10015N) was drilled test the central portion of the silver geochemistry soil anomaly (Maps 3 & 4), and for mineralisation on the anticlinal axial plane and down dip from the surface enrichments encountered in auger holes BSA 2 and 4. Hole BLR 10 encountered siltstones and shales that had variable

quartz veining and iron oxides throughout, and minor silica flooding and brecciation. Assay results returned zones of elevated values, the best per metre interval being 16 ppm Ag, 220 ppm As, 25 ppm Co, 900 ppm Cu, 1650 ppm Pb, 850 ppm Sb and 280 ppm Zn. This intercept is down dip from the near surface interception made in holes BSA 1 and 4.

Section 9875E was drilled at 1006N to test the anticlinal axis for mineralisation and the central portion of the silver geochemistry soil anomaly. This hole intersected dolomite and limestone in part with silica flooding and siltstones with variable quartz veining and iron oxides. Zones of elevated values were returned with the best being 20 ppm Ag, 145 ppm As, 85 ppm Co, 1650 ppm Cu, 1800ppm Pb, 450 ppm Sb and 390 ppm Zn.

CONCLUSIONS AND RECOMMENDATIONS

The soil geochemical anomaly and the discovery outcrop of silver -copper - lead – antimony is found in a complex nappe structure. This Carboniferous epigenetic mineralisation appears to be at least two phase where silver, copper, lead and antimony were deposited in brecciated carbonate rich rocks associated with thrust planes or along dilatant zones and tensional gashes associated with folds axis and faulting. This mineralisation was deposited late in the development of the White Range Nappe Complex during the wanning stages of the Alice Springs Orogeny. The effects of retrogressive greenschist metamorphism accompanied metal deposition.

The Bluey's Silver Prospect has been tested with an 11 hole RC drilling program. Despite encouraging intersections of siliceous dolarenites, in part silica flooded and brecciated, and widespread vein quartz, assay results for silver and base metals were not ore grade. However anomalous zones up to 9m width of silver and associated base metals are recognised.

Therefore it is recommended that an alternate exploration program consisting of a geophysical survey, additional geological mapping and compilation be undertaken to target additional drilling. The better opportunities to find economic mineralisation is along thrust planes that that have interacted with carbonate rich lithology's or along near vertical dilatational feeder zones eg shears or axial fold planes were ground preparation for incoming mineralised fluids is enhanced.

EXPENDITURE

The annual statutory expenditure for the licence is $36,000/year. Expenditure by Silver Standard Australia Pty Ltd has totalled $56,212.83 and this is summarised in Table 5.

Table 5. Expenditure by Silver Standard Australia Pty Ltd

	code	amount
Bank and Government Charges	6-2130	$130.00
Geology	6-0102	$14,780.54
Drafting	6-0109	$9.85
Labour and Expediting	6-0110	$750.00
Drilling	6-0125	$11,951.90
Assaying	6-0126	$5,815.70
Field costs	6-0129	$1,237.63
Field vehicles	6-0130	$1,496.00
Field Supplies and Equipment	6-0131	$140.57
Access Preparation	6-0136	$647.80
Drilling Supplies	6-0145	$872.96
Compensation/Option Payment	6-1139	$10,000.00
Telephone	6-2132	$80.00
Transport	6-0127	$2,965.77
Drafting	6-0109	$223.85
Overheads (10%)		$5,110.26
	Total	**$56,212.83**

SILVER STANDARD AUSTRALIA PTY LTD

TECHNICAL REPORT
FOR THE BLUEY'S SILVER PROJECT, EL10228
ARLTUNGA
(July 01 – July 02)

APPENDIX 1

RC DRILL LOGS FOR DRILLHOLES BLR 1 TO BLR 11

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APPENDIX 2

DRILLHOLE ASSAYS FOR DRILLHOLES BLR 1 TO BLR 11