WHITE DAM Au-Cu PROSPECT, CURNAMONA PROVINCE, SOUTH AUSTRALIA

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LOCATION

The White Dam prospect is approximately 31 km NE of Olary (Figure 1) at 32°06'S, 140°34'E; Olary 1:250 000 sheet (SI 54-02).

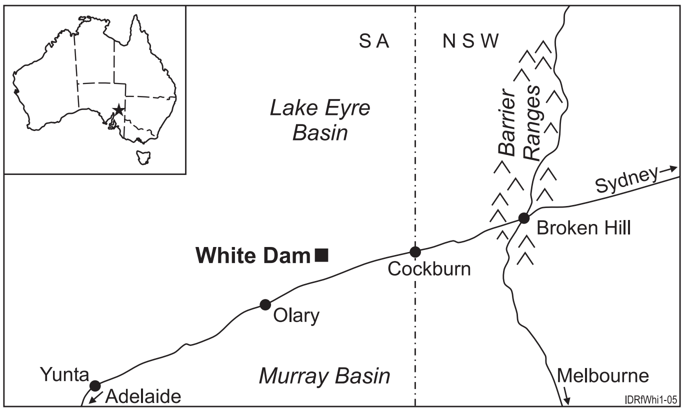

Figure 1. Location map.

DISCOVERY HISTORY

In 1989, following a regional airborne magnetic survey and a reconnaissance soil survey of parts of the regolith-dominated western margins of the Mundi Mundi Plains, Aberfoyle Resources found anomalous Au in soils in an area now known as White Dam. Soil sampling was on a 1 km-spaced grid and samples were collected preferentially from the bases of slopes (McGeough and Anderson, 1998). Subsequent 400 m-spaced grid sampling around White Dam gave locally anomalous Au (30-80 ppb; maximum 200 ppb). Poor correlation between the Au anomalies and an adjacent magnetic anomaly delayed follow-up exploration.

Under a joint venture between MIM, Aberfoyle Resources and Normandy Exploration, MIM began detailed exploration in 1994-5 at White Dam and other sites with anomalous Au in the soil, using a 100 m line spacing. The fine soil fraction (<180 µm) was collected in areas of subcrop or low outcrop on erosional rises; bulk soil samples (3 kg) were collected in depositional areas for bulk leach extractable Au (BLEG) analysis. Based on the results, 11 RC percussion holes and a number of HQ cores were drilled in 1996-97. Subsequent detailed drilling (over 130 RC holes and NQ diamond cores) at White Dam delineated substantial mineralization now estimated at 7.39 Mt at 1.09 g/t Au with an additional resource of 5.55 Mt at 1.12 g/t in the oxide zone. Other high Cu and Au soil anomalies were drilled but they lacked underlying mineralization. This was attributed, in part, to poor constraints on the regolith (McGeough and Anderson, 1998). Polymetals and EXCO Resources have done further drilling and excavated six costeans for metallurgical samples that have exposed the mineralization and regolith (Cooke, 2003).

PHYSICAL FEATURES AND ENVIRONMENT

White Dam lies within a subdued landscape with little exposed bedrock. The area lies within the upper Mingary Creek catchment, part of the Lake Eyre Basin that discharges into the Strzelecki Desert dune-field, S of Lake Frome. The climate is semi-arid, with and an annual average rainfall of <245 mm. Average minimum and maximum temperatures are 17-33ºC (January) and 4-15ºC (July). The land has been used for sheep grazing since the late 1800s.

The vegetation is mostly chenopod shrubland, dominated by bladder saltbush (*Atriplex vesicaria*), black bluebush (Maireana pyramidata) and some pearl bluebush (*Maireana sedifolia*). A few rosewood trees (*Alectrylon oleofolius*) occur near bedrock exposures and subcropping regolith carbonate accumulations. Belah (*Casuarina pauper*) occurs on some alluvial plains and fans.

GEOLOGICAL SETTING

The White Dam prospect lies within the Wiperaminga Subgroup of the Palaeoproterozoic Willyama Supergroup of the Curnamona Province. The Au-Cu mineralization is hosted by leucocratic banded gneiss and is limited by faults to the S and W. Bedrocks around White Dam are albitite with minor granitoids to the S and amphibolite and gneiss in the E.

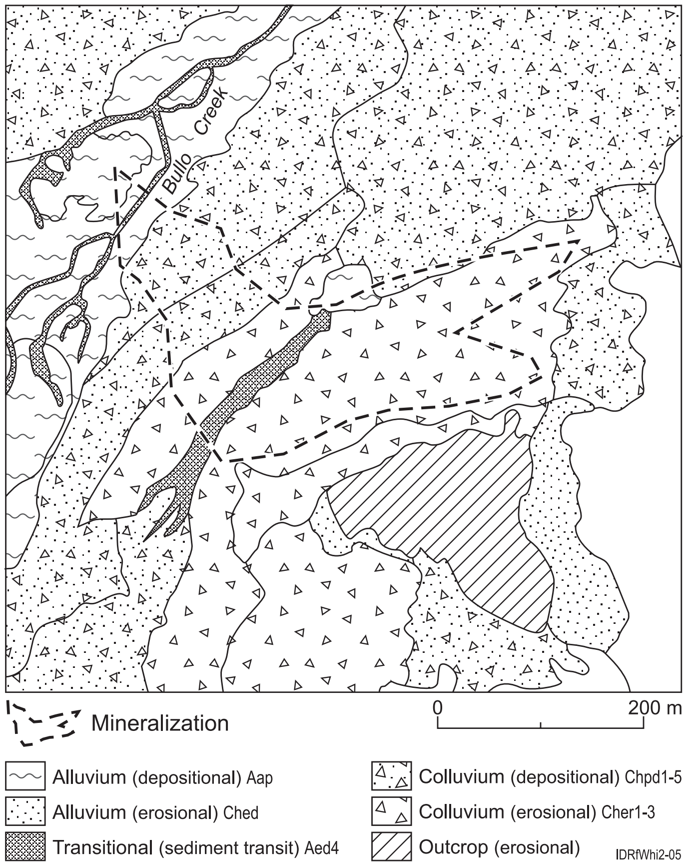

Figure 2. Detailed regolith-landform map with underlying mineralization.

REGOLITH

Alluvial and sheet-flow depositional plains and low rises extend across much of the area (Figure 2). Alluvial sediments occur along a creek channel and associated plains to the N. Although aeolian sediments are a component of most regolith materials, they do not form landforms of their own. Small exposures of weathered bedrock are flanked by mixed sheet-flow and aeolian sediments within low hills to the N and low erosional rises to the S (Brown *et al.,* 2003; Brown and Hill, 2003a, 2003b; Lau, 2005). Regolith materials include skeletal soils on saprock exposed in the S, up to 4 m of red-brown, quartz-rich alluvium in the NE, and quartzose and lithic, red-brown, colluvium on the remainder. Mixed aeolian and colluvial sediments, 1-10 cm thick, deposited since the onset of pastoral land use, are widespread across the area.

The alluvium and colluvium overlie kaolinitic saprolite. This is up to 50 m thick adjacent to a major N-trending fault W of the deposit, and shallows to the E. Multiple generations of regolith carbonates (calcrete) occur as powdery mottles and rhizomorphs in the alluvial and depositional plains flanking the creeks, and as nodular and fragmented hardpan carbonates within the thinner cover on the erosional rises to the S.

MINERALIZATION

Gold is hosted by biotite-rich selvedges and leucocratic bands and veins within the gneiss (Cordon, 1998; Cooke, 2003). The Au resource occurs within an extensive stockwork of veins of pyrite and chalcopyrite, which are the principal ore minerals in the sulphide zone. Compared to

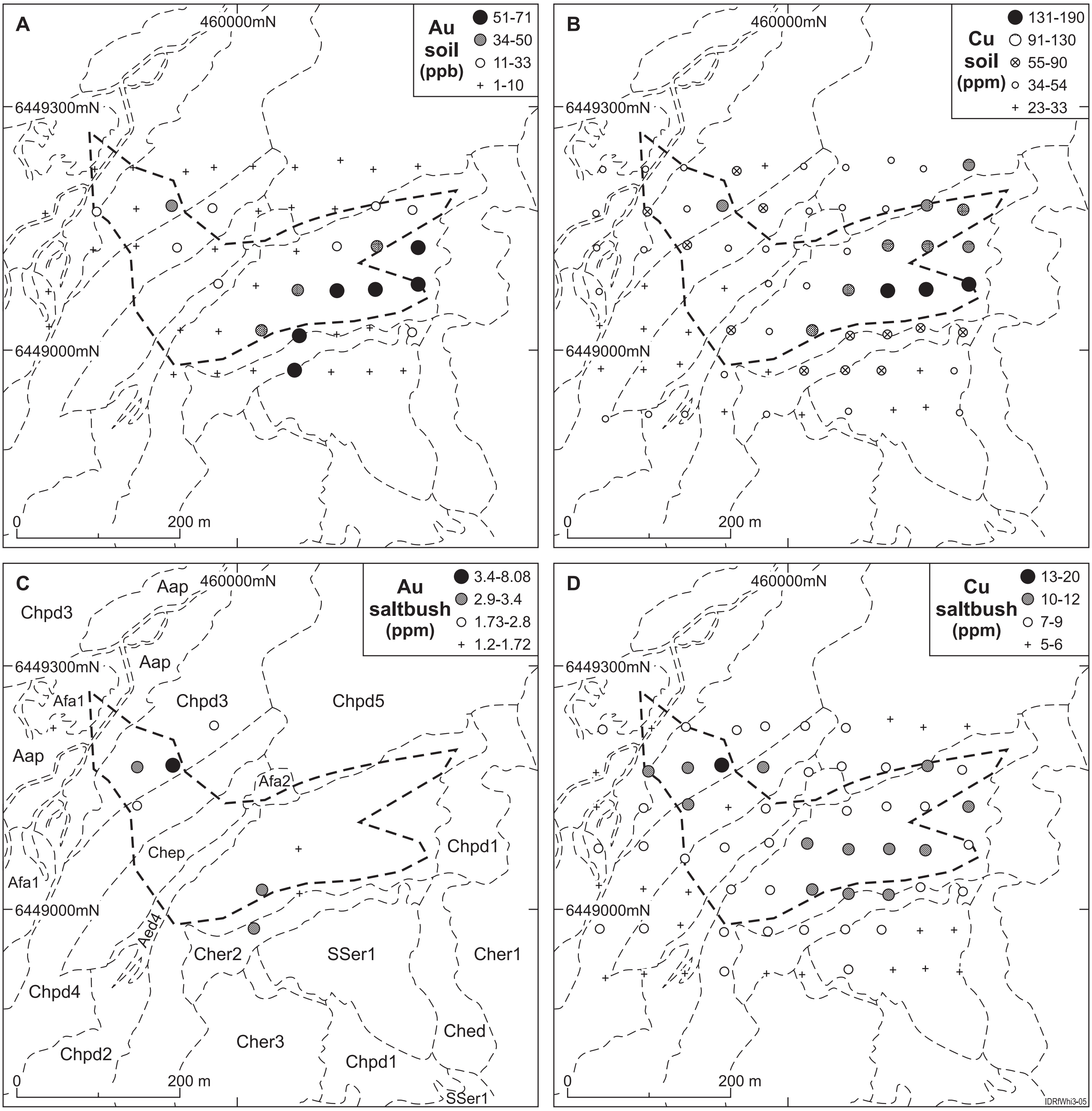

Figure 3. Soil geochemistry and biogeochemistry, White Dam, compared to regolith-landform units and mineralization (see Figure 2 for explanation). Gold (3A) and Cu (3B) in soil <75 Ìm soil fraction. Gold (3C) and Cu (3D) in bladder saltbush twigs.

other FeO-Au-Cu deposits, White Dam has relatively low Fe, hosted by biotite rather than magnetite or hematite, and does not show enhanced As, Ag, Ni, Cd, Sb or Pb abundances (Cordon, 1998). Sulphide minerals are oxidized to depths of up to 50 m, and within the oxide zone, Au has been remobilized and occurs in biotite lamellae. Minor native Cu, chalcocite and covellite occur where there is supergene enrichment.

REGOLITH EXPRESSION

Soil

The 1994-1995 soil surveys suggest that as little as 1 m of transported overburden was enough to conceal significant underlying bedrock mineralization. About two thirds of the mineralization is overlain by transported cover; only one sample showed relatively high Cu and Au through this cover. Instead, high Au in the soil is restricted to the sub-cropping, weakly mineralized 'tail' of the deposit (see Brown and Hill, 2003b).

Geochemical sampling by CRC LEME (Brown and Hill, 2003b) emphasised the importance of a consistent medium. The uppermost 20 mm of topsoil was sampled at 70 sites on a 50x50 m grid. At each site, litter, lithic debris and the top 10 mm were scraped away, and a 2.5 kg sample was taken with a plastic scoop. Sites visibly contaminated by drill spoil or down slope of drill sites were avoided. The <75 µm fractions was sieved from topsoil samples, based on our orientation survey (see also Skwarnecki *et al.,* 2001).

Gold and Cu results from the topsoil show a considerable improvement over the 1994-1995 soil sampling data; both elements highlight the effect of the subtle topography and regolith materials on the expression of mineralization (Figures 3A and B). Gold was detectable (>1 ppb) in 52 of the 70 topsoil samples, with relatively high concentrations over sub-cropping mineralization, including a high grade mineralized zone that is overlain by 4 m of transported cover (Figure 3A). On the topographically lower landforms to the SW of the mineralization, Au was below detection except for some samples along Bullo Creek and the adjacent alluvial fans and plains. However, there is detectable Au in all samples N and E of the mineralization. The lower abundances to the SW and detectable Au to the NE correlates with the predominantly

N to NE dispersion vectors mapped from litter dam orientations (Brown and Hill, 2003a; 2003b). Litter dams are surface collections of organic fragments (leaves, twigs and macropod droppings) dispersed and accumulated by sheet-flow. They have a convex down-slope form. Copper was detected in all 70 samples, with relatively high concentrations largely restricted to the area of sub-cropping mineralization. The results reflect dispersion down slope onto the large depositional plain to the NE. Distinctly lower Cu abundances in the SW, extending across the mineralization along the CHep and CHpd4 regolith landform units (Figures 3B and C), are similar to the distribution of Au.

Bladder saltbush

The Au and Cu contents of bladder saltbush twig samples highlight the significance of landforms when interpreting the biogeochemistry (Figures 3C and D). Gold was only detected in nine of the seventy samples assayed. Seven of these were from sites over or very close to the surface projection of the mineralization; four were from the S of the area, where the mineralization is buried by approximately 1 m of colluvium and three were located where high-grade mineralization is overlain by 4 m of colluvium. The remaining two samples were from an alluvial plain flanking Bullo Creek and another site 100 m NE of the high-grade mineralization on a depositional plain (CHpd3; Figure 3C), probably reflecting transported Au. The three detectable Au samples from over the high-grade mineralization indicate that, even where the transported regolith is at its maximum thickness, and provided there is sufficient Au, the plant can incorporate Au into its tissues. Copper was detected in all 70 samples of bladder saltbush (Figure 3D), and all anomalies overlie or are adjacent to the mineralization. The Cu abundances are lower to the SW of the mineralization, and over the mineralization on the erosional plain (CHep, Figures 3C and D) and depositional plain (CHpd4). This again agrees with the interpretation of materials being transported in a NE direction across the prospect, with unmineralized material being carried in from the SW. Copper also reflects the zone of high-grade mineralization through 4 m of transported cover.

ACKNOWLEDGEMENTS

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SAMPLE MEDIA – SUMMARY TABLE

Sample medium	Indicator elements	Analytical technique	Detection limit (ppm)	Median (ppm)	75th percentile (ppm)	Maximum (ppm)
Top soil (0-20 mm)	Au	GF-AAS	0.001	0.065	0.183	0.71
	Cu	ICP-OES	2	42	55	190
	Co	ICP-MS	0.2	12.5	13.5	17
Bladder saltbush twigs	Au	INAA	0.0001-0.0005	0.0209	0.024	0.081
	Cu	ICP-OES	1	7.5	9	20

ICP-OES for bladder saltbush followed acid digest of sample PLEASE STATE WHAT ACID/ACIDS??