Mineralogical Society of Western Australia Inc September 2012 Newsletter

Editorial

This meeting will be our Annual General Meeting. The most significant event this year was us hosting the Annual Seminar. I would personally like to thank the following people for their outstanding efforts in making the seminar a success (in order of event, not importance):- Sue Koepke for organising the speakers and arranging the visit to Lynus Corporation at Mt Weld, Ted Fowler for organising the micro mounters symposium, Susan Stocklmayer for organising the abstracts for the booklet, Stewart Cole and Deborah Barnes for printing and binding the booklet, Deborah Barnes for organising the dinner, Ted East for organising the field trip and Tom Bateman for helping him, Susan and Vernon Stocklmayer for organising the visit to the Core Library in Kalgoorlie and the barbeque which they put on. These people did many other tasks to help the seminar run smoothly. There were several other people who helped and whose help was much appreciated.

This will be my last newsletter for a while as I will be stepping down from the committee for 12 months to allow myself more time for travel and other activities. Please help the new newsletter editor by providing articles and other useful information to include in the newsletter. A number of other committee members also will not be restanding, so if you have an interest in joining the committee this would be a good time to do so.

Many thanks to those members supplying articles for this newsletter.

The policy that members may submit short adverts free of charge will remain.

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September Meeting

Wednesday 19th September 2012
Starting at 7:30 pm at the WA Lapidary Club rooms 31 Gladstone Road Rivervale (cnr of Newey St)
General Meeting
Annual General Meeting
Speaker: Melvyn J. Lintern , CESRE ,
Topic: "The gold and calcrete story 25 years on - what have we learnt?"
Visitors Welcome
A light supper is supplied after the meeting.

2012 Future Meetings and other Activity Dates

Please note these dates are the third Wednesday of the month.
Wednesday 17th October 2012 Annual Auction.
Wednesday 21st November 2012 Speaker: Peter Downes Topic: TBA
A Christmas function is being considered. Date to be advised if confirmed.
Wednesday 16th January 2013 Speaker: Ted East Topic: GPS & mapping
29th March to 2nd April Gemboree Murray Bridge SA
July 2013 Possible trip to Yinnietharra

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Report on Iain Stewart's Talk 30.07.12 by Ida Newton

On Monday night, 30th July I went to the advertised talk by English geologist and TV personality. Iain Stewart. His address was titled *How To Grow a Planet* and focused on raising the profile of Geology for the general public. I estimated over 300 people attended, the talk was lively and Iain an entertaining speaker.

He began by explaining how, when people ask "what do you do for work? and he replies "I'm a geologist" he is met with generally blank stares. The talk was mainly focused on how to raise awareness for the public of the concept of geology by using various mass media, particularly TV.

He drew an analogy with the success of David Attenborough and his focus on Biology / Botany, the use of Dinosaurs to interest people in the world of Palaentology, and explored various suggestions about TV presentations for Geological awareness. He touched briefly on his involvement with his TV series in England titled *How To Grow a Planet.*

Late in the talk he gave us an interesting example of how having an experiment in a public place could give people a gentle lesson on a subject without the schoolroom atmosphere. He showed us slides and explained an experiment he had been involved with, analyzing the reliance of humans on plants for oxygen supply. He was locked in an airtight glass chamber in a shopping centre for 48 hours with 200+ plants, and monitored remotely by the university students conducting the experiment. They measured the oxygen / carbon dioxide levels and watched for fluctuations from the normal ambient balance.

At first, the Oxygen levels dropped then recovered to almost ambient, retaining this level for the remainder of the time in the chamber. The visual display was very effective for raising public awareness in an informal educational way.

At the end of the talk, question time was very active with plenty of valid points raised by those attending.

JOINT MINERALOGICAL SOCIETIES OF AUSTRALASIA 35TH ANNUAL SEMINAR PERTH, WESTERN AUSTRALIA by John Bosworth

Reproduced from The Mineralogical Society of Victoria Newsletter No. 217 August 2012 with permission from John Bosworth.

The 35th Joint Societies Seminar was held on the weekend of 9/10 June 2012 at the Alexander Theatre in the State Library of Western Australia.

Stewart Cole, President of the Mineralogical Society of Western Australia introduced the Hon. Michael (Mike) Nahan MLA who gave a short speech on the importance of mining in the State before officially declaring the Seminar open. Mike Nathan was acting on behalf of the Hon. Norman Moore MLC, Minister for Mines and Petroleum, Fisheries and Electoral Affairs. Steve Dobos from the Mineralogical Society of Queensland then gave the keynote lecture "An Introduction to Rare Earth Minerals". This was a comprehensive and well illustrated discussion on the close similarities between most of the Rare Earth Elements (REE). Steve also discussed the pros and cons of whether scandium should be called a REE despite the ruling by the International Union of Pure and Applied Chemistry that it should be part of the group.

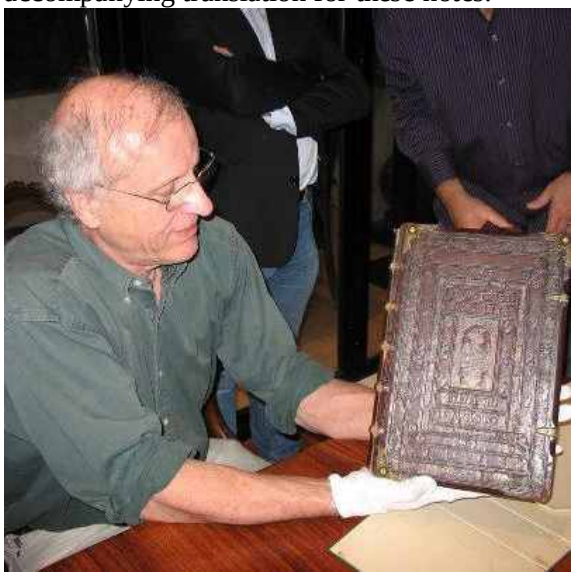
Topics presented to about 70 participants over the next two days covered several REE deposits in Australia, overseas and the REE in space together with a commercial look at the competing issues of supply and demand and the role China has to play with their large deposits. There were three talks on case histories in Western Australia, one of a general nature while the second was specific to the Mount Weld deposit.

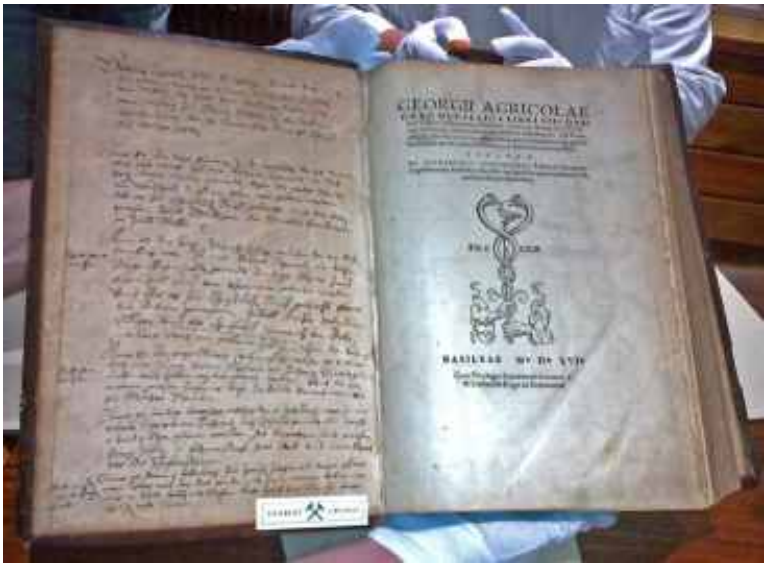
The full program of topics and speakers in order of presentation are listed below:

Speaker		**Topic**
Steve Dobos	Specialist Consultant and member of the Mineralogical Society of Queensland	An Introduction to Rare Earth Minerals
Angela Riganti	WA Geology Content Manager at the Geological Survey of Western Australia	Rare Earth deposits of Western Australia: from exploration to exploitation
Peter Downes	Curator of Minerals and Meteorites at the Western Australian Museum	Rare earth minerals of the Cummins Range Carbonatite Complex, Kimberley Region, WA
Theo Kloprogge (delivered by Steve Dobos)	Inorganic Program Researcher at Queensland University of Technology	REE Minerals in Scandinavia – a few snapshots from Sweden and Norway
Dudley Kingsnorth	Adjunct Professor at the Centre for Research in Energy and Minerals Economic at Curtin University, WA	The Rare Earths Industry: a delicate balancing act
David Vince	Retired from the mining explosives industry, member of The Mineralogical Society of Victoria	Rare Earths in China: Abundance, Conflict, Diversity and Collectors' opportunity
Margot Willing	Retired Analytical Chemist formerly with the CSIRO and member of the Gemmological Association of Australia	The significant role of REE's in man-made gemstones, natural gemstones, micro-minerals and rare collectable minerals
Peter Elliot	The Mineralogical Society of South Australia	The Paratoo mine
Brendan Shand	Chief Geologist, Lynas Corporation Limited	The Mt Weld Rare Earth Project
Marcus Sweetapple	Research Geoscientist with CSIRO Earth Science and Resource Engineering	Petrogenetic classification of rare earth enriched pegmatites, with reference to their REE mineralogy and Australian occurrences
Rod Martin	Furnace Engineer in the Container Glass Industry	Rare Earth Elements in New Zealand
Ralph Bottrill	Mineralogist/petrologist with Mineral Resources Tasmania and member of the Mineralogical	Rare Earth Rich Minerals and Rocks in Tasmania

	Society of Tasmania	
Trudi Kennedy	Post graduate researcher at the University of Western Australia	REEs in Meteorites from Chondrites to KREEPy Rocks
Dermot Henry	Manager of Natural Sciences, Museum Victoria and member of The Mineralogical Society of Victoria	Mining Museum collections for Rare Earth elements

During the luncheon breaks, Steve Sorrell was available to show some examples of his mineral paintings and discuss his technique in painting minerals and why he prefers to paint on black paper. Steve is not confined to painting minerals as he also showed some bird and dolphin works. At the Sunday luncheon break Margot Willing had a viewing of faceted rare earth minerals.
A Mineral Bazaar was held on Monday morning for participants who were still seeking more mineral exposure for the weekend.
A 10 day excursion left on Tuesday morning heading towards Kalgoorlie and then to parts north of this to Laverton and beyond. A visit to the Mt Weld Rare Earth deposit was also on the agenda. A report on this excursion will be available at a future date.
The social program was well organised with an event on each of the three nights. Friday night was a Cocktail Party hosted by Crystal Universe at their premises in Subiaco. This was a pleasant affair mingling amongst some excellent mineral specimens that were on display at the well organised display rooms. Saturday was the traditional Seminar dinner held at the Mecure Hotel in the Perth CBD. An auction was conducted by auctioneer Ralph Bottrill with assistance from Steve Sorrell which raised almost $3,000 for the host Society. The final event was named “The Penthouse Soiree” and was a fully catered event held at Mark Creasy’s penthouse overlooking Kings Park. Mark is Patron of the Mineralogical Society of Western Australia.
A highlight of the visit to Mark Creasy’s was the viewing of two copies of the classic publication DE RE METALLICA by Georgius Agricola, the first a copy of the 1912 translation by Herbert Clark Hoover, mining engineer and later President of the United States of America, and his wife Lou Henry Hoover. This copy was autographed by Herbert Hoover. The second was an original 1556 edition of the publication written in Latin complete with wood based leather bound cover and brass hinges. This copy originally belonged to the Agricola family and the inside front cover contained hand written notes made by the family. Unfortunately, there was no accompanying translation for these notes.





The host Society were able to gain sponsorship from several sources to assist in supporting the event which ensued that first class facilities and social events were available to attendees.

Preceding the Seminar was a Micromount Symposium held on Friday, 8 June at the Gemmological Association of Australia (WA) rooms in Cottesloe on the subject of “Western Australian Nickel Minerals”. About forty people were interested in attending the Symposium but numbers were restricted to about 25 due space limitations at the GAA rooms.

Ted Fowler was organiser and opened the day with a presentation on the 132 North mine at Widgiemooltha, other speakers included Judy Rowe from The Mineralogical Society of Victoria who gave two short talks and Russell Kanowski from the Mineralogical Society of Queensland who presented a talk on behalf of Theo Kloprogge who was unable to attend. The afternoon was spent viewing specimens, swapping, examining the 'giveaways' and having a good chat about things mineralogical. The event was declared a welcome addition to annual Seminars and the subsequent Joint Societies annual meeting recommended that future Seminar hosts include a similar event as part of the Seminar.

Society Notices

Calling for Expressions of interest

A trip to the Yinnietharra area has been suggested for July 2013.
This trip is likely to be between 10 and 16 days, and will involve bush camping with no facilities (you will need to take all water, fuel and food that you need). Four wheel drive is recommended.
Please let a committee member know by the night of the auction (17th October) if you are interested.

Volunteer required

We need a member as 'second in charge' of electronic equipment (laptop and projection equipment) at meetings, in case person in charge/custodian of equipment is unable to attend meeting. Please contact Stewart Cole if interested.

Co-ordinator and volunteers required for "Have a go Day 2012"

"Have a go Day 2012" This will be held at Burswood Park on Wednesday 14th November 2012 from 8.30am to 3.00pm. Setting up may start from 6 am.
This is an opportunity to get new members from the general public (mainly retirees) and tell others about our society. For further information see Sue Koepke or Barbara Donati.
If interested please contact a committee member by the night of the auction (17th October).

The Microscope

The microscope is now housed at 15 Colin Grove West Perth. Members wishing to use the microscope should contact Stewart Cole on ph 0414 904 169 to arrange a suitable time. This is a working office so please cause as little disruption as possible to those working there. Rules for using the microscope are that there must be at least 2 people there and one of them must have had training in its use. The microscope may be borrowed - see Stewart for conditions.

Committee Meeting

The next committee meeting will be held at 15 Colin Grove West Perth on Saturday 22nd September at 10:00 am (subject to change depending who is elected on to the committee).

Pinnacles Trip

Sandhill on the way to The Pinnacles

The Pinnacles

The Pinnacles

Lake Thetis

Lake Thetis

Lake Thetis

Echidna

Echidna

Core Lab - Kalgoorlie

Entrance to The Core Library

Orbicular Granite - Boogardie Station

Stacks of cores

viewing cores and other samples

Fergusonite

Yttrotantalite

Tanteuxenite

Wodginite

Crocoite – Comet Vale

Gold – as seen in the core

Spinifix texture

Tektites - Lake Yindarlgooda

Foyer of Core Lab

Dr Charlotte Hall gives us a talk

Dinner

Dinner

The Field Trip

Day 1 – meet Bakers Hill

at Bakers Hill

at Frasers Mine, Southern Cross

at Frasers Mine, Southern Cross

Day 3 Londonderry

Ralph inspects a cavity in the Western Quarry
At Londonderry

Core at Londonderry

Tourmaline in quartz, Londonderry

Tantalite

Day 5 Emus at Rowles Lagoon

Emus at Rowles Lagoon

Day 6 Gwallia mine

Sturt Pea at Gwallia Museum

Headframe at Mt Windara Nickel project
Viewed from Mount Windara lookout

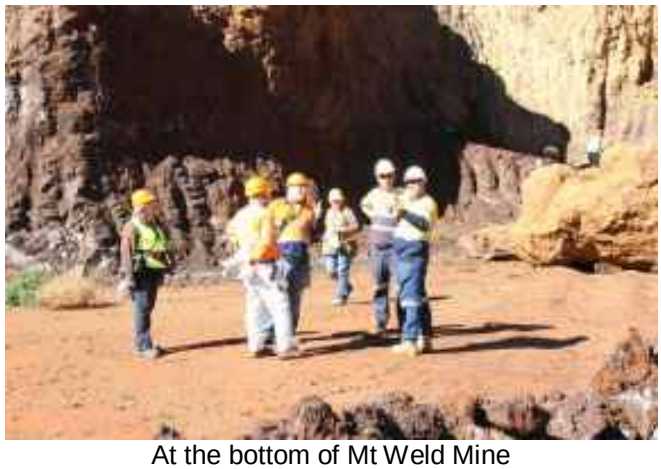
Day 7 On the way to Mt Weld

view across the open pit mine towards the 'bungle bungles' - at Mt Weld Rare Earths Project, Western Australia

At the top of Mt Weld Mine

Collecting specimens Mt Weld

At the bottom of Mt Weld Mine



At the bottom of Mt Weld Mine

Lunch at Mt Weld

Ore specimens (contains monazite)

Day 8 Wedge-tailed Eagle

waterholes, Yerilla Station

area to look for tektites - Boyce Creek

Kangaroo

Boyce Creek

owl

Campfire – Yerilla Station

The best tektites found this day

Tyre changing

open pit on Wonder Well mining lease, Riverina Station

Spinifix texture

Spinifix texture

Collecting specimens

Trimming specimen

Emerald in schist

small emerald

Laying out specimens for inspection

Ted East introduces Don North (lease holder)

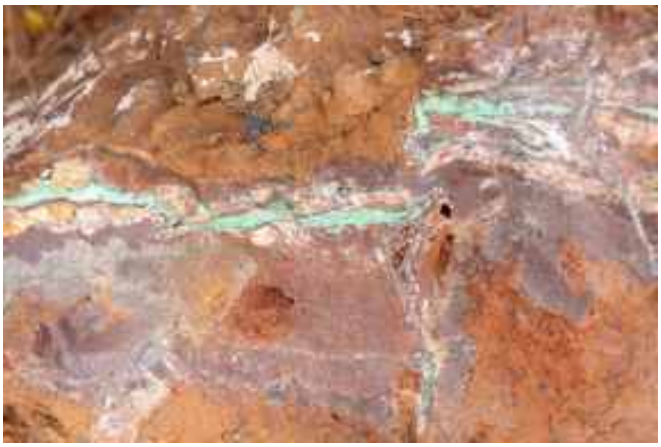
Emerald

Epidote

At end of Speech at Menzies

Liz, Ralph and Sue

Breaking rocks



Chrysoprase seam

nearby lakes

Magnesite

Ted, Liz and Tom

Sue Erickson's prize specimen

Final barbeque – Kalgoorlie

Final barbeque – Kalgoorlie

GEOLOGICAL FRAMEWORK DEGRUSSA PROJECT by Murray Thompson

4.1 REGIONAL GEOLOGY

The Project area is underlain by a Lower Proterozoic volcano-sedimentary basin sequence, previously known as the Glengarry Basin (Gee, 1987), and is located between two Archaean inliers, the Marymia and Goodin granite domes. This sequence has undergone a complex tectonic history. Recent revisions of the geology by Pirajno and Preston (1998) and Pirajno et al. (2004) led to the subdivision of the Lower Proterozoic sequence into four distinct basins: Yerrida, Bryah, Padbury and Earaheedy. Only the first three of these are present within the Doolgunna Project area.

The Yerrida, Bryah and Padbury Basins represent the exposed southern part of the 2.2-1.8Ga Capricorn Orogen, whose development was associated with oblique continental collision between the Pilbara and Yilgarn cratons. The three basins display distinctive stratigraphic, structural and metamorphic characteristics, are vertically juxtaposed and tend to be bound by major northeast-trending faults. One of these, the Jenkins Fault, is a major exploration target within the project area. A priority for exploration is the volcano-sedimentary rocks of the Yerrida, Bryah and Padbury basins.

4.2 DEGRUSSA COPPER–GOLD VHMS DEPOSIT

Introduction

The DeGrussa VHMS (volcanic-hosted massive sulphide) copper–gold deposit is located 900 kilometres north of Perth and 150 kilometres north of Meekatharra in the Peak Hill Mineral Field, on the Peak Hill 1:250 000 map sheet, SG 50-8. It lies on a major drainage divide between the Gascoyne River catchment and the Lake Gregory to Carnegie Lake salinas internal drainage. The deposit lies beneath a mantle of scree and sheet wash deposits on gentle slopes mantling an upland area of exposed bedrock and relic duricrust.

Regional geology

The DeGrussa copper–gold massive sulphide deposit is hosted within the Bryah Basin, one of a number of separate Palaeo-Proterozoic depositional basins in the eastern part of the Capricorn Orogen, which is a major tectonic unit that lies between the Archaean Pilbara Craton and the Yilgarn Craton. The Bryah Basin is a tectonic inlier of a fold belt of thick trough and shelf sediments and mafic volcanic rocks that underlies the southwest-trending Robinson Syncline of the Padbury Group sediments and iron formations, broadly centered between the Archaean Goodin and Marymia inliers. The Bryah Basin and the Padbury Basin that unconformably overlies it are situated along the northern margin of the Archaean Yilgarn Craton. The Bryah Basin is considered to be a back-arc basin of seafloor spreading and rifting. The Bryah Group is a succession of mafic rocks of mid-ocean ridge basalt to oceanic plateau affinity overlain by clastic and chemical sediments. The Geological Survey of Western Australia (GSWA) has divided the Bryah Group into four formations, two of which, the Karalundi Formation and the Narracoota Formation, underlie the Project area.

The age of the Bryah Group is poorly constrained between 2.0 Ga and 1.8 Ga. It is younger than 2.65 Ga and older than 1785 ±11 Ma (U-Pb zircon age), the age of the uncomformably overlying Mount Leake Formation.

The Bryah Basin has undergone two episodes of deformation. The 1.96 Ga Glenburgh Orogeny (D1) accreted the Narracoota oceanic plateau onto the Yilgarn Craton. Folding, faulting and shearing attributed to this orogeny have been largely overprinted by the 1.8 Ga Capricorn Orogeny (D2) that was the result of the oblique collision between the Pilbara and Yilgarn cratons. The present day configuration of folding and faulting is attributable to the D2 deformation event. During deformation the volcano-sedimentary succession was metamorphosed to greenschist facies.

Mineralisation

The copper–gold rich-massive sulphide lenses are VHMS-style based on the host rock package, mineralisation style, mineral composition and alteration.

The host rocks are submarine basalts, mafic volcaniclastic rocks and debris flows with sub-volcanic dolerite/gabbro sills of the De Grussa Formation.

Sulphide mineralisation consists of massive sulphide, semi-massive sulphide and stringer zone mineralisation. The transition from massive sulphide to an underlying stringer zone is not always present because of dolerite intrusion close to or at the base of the massive sulphide. Primary sulphide minerals present are pyrite, chalcopyrite, pyrrhotite, and sphalerite together with magnetite. The base of the massive sulphide is chalcopyrite rich with magnetite, passing upwards into iron sulphides with decreasing copper content and increasing zinc content higher up. Gold is associated with the chalcopyrite-rich zones and occurs as a high-silver electrum.

The oxide mineralisation is located vertically above Conductor 1 and DeGrussa. The grade and width of the oxide mineralisation is highest proximal to the main lenses and then forms enriched plumes that transgress lithological boundaries as the mineralisation disperses and dissipates. Close to the main lenses there is significant native copper and elevated gold. As the plumes disperse away from the ore zones the grade dissipates and mineralisation transitions through chrysocolla, cuprite, azurite and malachite.

Alteration associated with the massive sulphide is chlorite + sericite + quartz + pyrite which is typical for VHMS deposits. Stringers in the stringer zone are chalcopyrite rich.

The massive sulphide lenses are deformed and often exhibit a strong foliation. The harder pyrite and pyrrhotite tends to fracture, while the softer chalcopyrite and sphalerite are easily remobilized and recrystallised.

Beneath a hardpan cap there is about 80 metres of weathering over the sulphide lenses. Within the weathering profile is an upper, residual, gold-oxide zone overlying an oxide-copper zone. The oxide-copper zone contains the minerals malachite, chrysocolla, native copper and minor cuprite. A secondary supergene chalcocite blanket lies beneath the oxide-copper zone and immediately above fresh primary sulphides.

Four lenses of copper-rich massive sulphides have been discovered to date as shown in Figure 3. DeGrussa has a strike length of 180m, is some 20m thick on average and dips near vertically to the south. It has a vertical extent of 300m. Conductor 1 is interpreted to be stratigraphically below DeGrussa and dips at 75^{o} to the southwest. It has a strike length of 350m and a vertical depth of 400m. Conductor 4 is 200m to the east of both DeGrussa and Conductor 1, deeper and stratigraphically analogous to Conductor 1. It has a strike length of 320m, dips south-southeast and has an average thickness of 25m. Conductor 5 is approximately 80m east of Conductor 4 and has a 300m strike length, dips south-southwest and has an average thickness of 20m.

Oxide geometry is governed by weathering and is evident as flat-lying plumes ranging away from the primary mineralisation. Laterite-gold mineralisation is present as a flat-lying 2 to 5m sheet over top of the DeGrussa and Conductor 1 zones, dissipating in grade as it moves to the north of Conductor 1 (Figure 4).

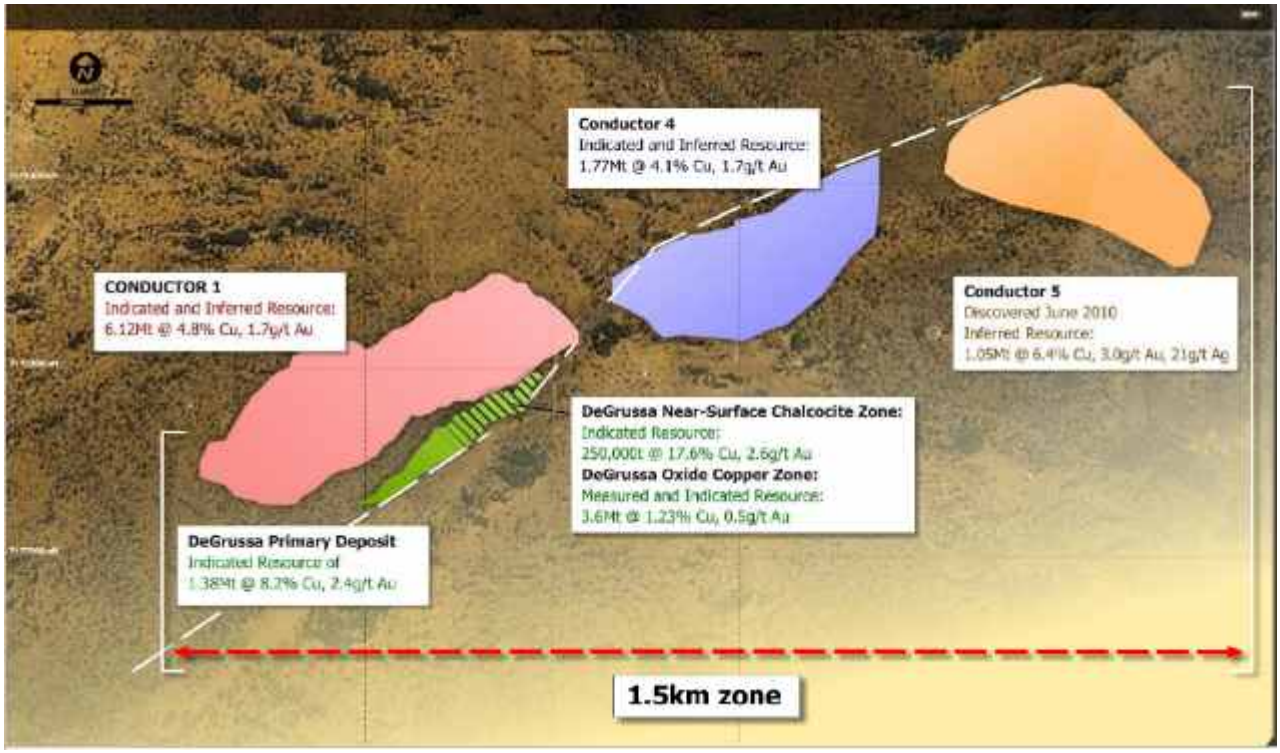


Figure : Plan view of DeGrussa, Conductor 1, Conductor 4 and Conductor 5 massive sulphide lodes

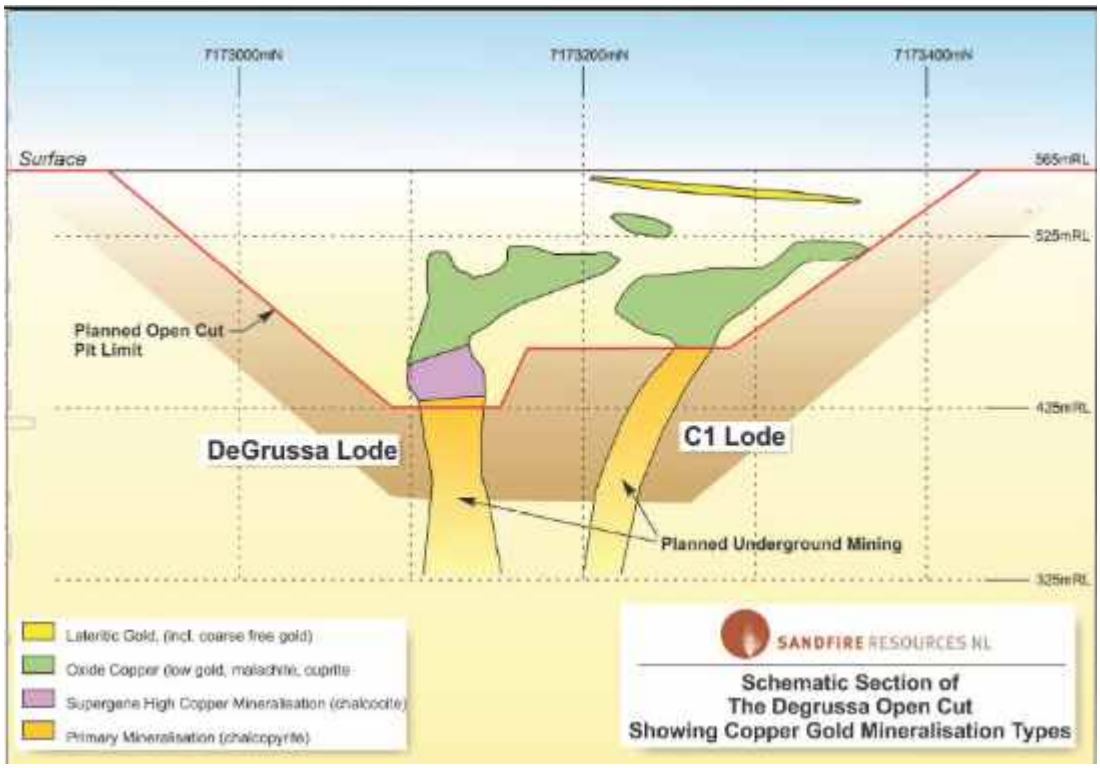
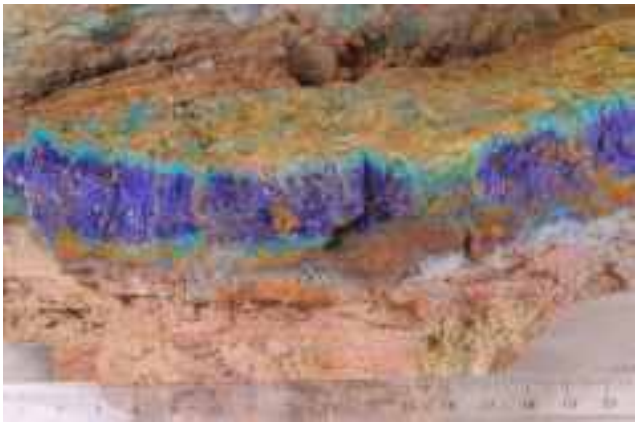


Figure : Schematic section of the DeGrussa Open Cut showing the lateritic gold, oxide-copper and chalcocite zones overlying the main Conductor 1 and DeGrussa sulphide lode

Photographs from DeGrussa by Murray Thompson

Copper ore



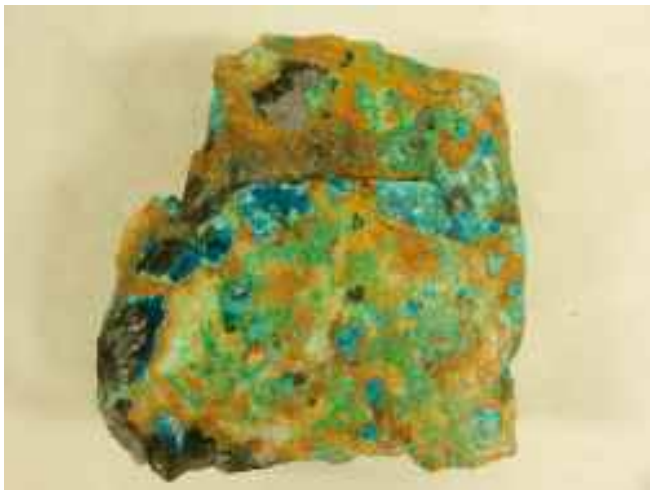
Azurite

Calcite intergrown with Malachite
View 4cm

Calcite on malachite on cuprite
matrix specimen 3 x 2 x2 cm

Chrysocolla and drusy quartz
Specimen 6 x 4 cm

Copper Nugget



Cuprite in weathered host

Native copper

Malachite sheaves to 2cm in matrix

Malachite sheaves, longest 9cm

New Members

Welcome to new members Mark Thompson, Peter Payne, and Peter Macintosh.

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Joint Mineralogical Societies of Australasia 36th Annual Seminar

The next Joint Mineralogical Societies of Australasia 36th Annual Seminar will be held in Sydney on 8th & 9th June 2013. The topic is "The Wonderful World of Minerals". Further details will be announced as they become available.
New Zealand will be hosting the seminar in October 2014

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Substance Harder than Diamond

In an article written by David Szondy on August 21, 2012 and stating the source as being Camegie Institution for Science Stanford University he stated that by starting with buckyballs (carbon-60) and mixing with m-xylene solvent and then subjecting this to a pressure of 600,00 atmospheres the buckyballs are crushed resulting in a structure which is a hybrid between crystalline and amorphous. This new material has been found to be harder than diamond.

Field Trips 2012

By arrangement members of the mineralogical society are able to go on field trips organized by the Western Australia Lapidary and Rockhunting Club inc.
If you are interested in attending these field trips please put your name on the notice board at the Lapidary and Rockhunting Club for the relevant field trip.
Please register with MINSOC Field Trip organizers prior to attending any of the following events, but only if you are a current (financial) MINSOCWA member to confirm event details.

THE WESTERN AUSTRALIAN LAPIDARY AND ROCKHUNTING CLUB INC. 31-35 Gladstone Road, Rivervale, 6103. Rivervale W.A.
PROPOSED 2012 ACTIVITIES & EVENTS
Sept 16th Toodyay for crystals
Sept 29th, 30th & Oct 1st Moora & Bindi for chert & anthophyllite
Nov 18th Club Auction
Further 2012 activities and events will be published during the year

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These committee positions are only until the AGM, where a number of these members will not be restanding, so we can expect to see some new faces on the new committee.

Committee Members	
Stewart Cole - President ph 0414 904 169	Ted East – Field Trip Officer
Sue Koepke - Secretary/Treasurer ph 0417 990 688	Allan Hart - Newsletter Editor
Susan Stocklmayer	
Vernon Stocklmayer	
Society e-mail addresses	
All correspondence (excluding the newsletter): minsocwa@hotmail.com	
Mineralogical Society WA Newsletter : minsocwa.newsletter@hotmail.com	
Website: www.minsocwa.org.au	