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GSAACT NEWSLETTER November 2022

Bi-monthly GSA ACT divisional meetings are held either in person, virtually or as a hybrid of both formats. For information on the next meetings, check this newsletter or the ACT Division website at <u>www.gsa.org.au</u>

Message from the Chair

Hi Everyone!

Welcome to the special edition of The Capital Geologist with highlights from our recent field trip out to Captain's Flat.

A massive thank you to **Richard Blewett** and **Alan Whitaker** who led us for the Captain's Flat Field Trip. Richard and Alan took the time to visit the region on several occasions and wrote the comprehensive field guide. It was so great to have Richard and Alan take us to the sites around Captain's Flat to explain the regional geology. Then after lunch at the RSL to the main mine site to discuss the mineralisation and the histo-



ry of the region. Thank you to Richard and Alan for sharing your passion and knowledge with the group, everyone really enjoyed the day. Photos from the individual sites we visited are on **pages 7 to 22**.

A big thank you to **Doug Finlayson** for organising the logistics of the day as well as lunch at the RSL. Lunch was a great way to learn more about the people on the trip, that included lots of non-members. Thank you to everyone who came on the day. If you would like to lead a field trip next year, please get in touch.

I would like to thank **Christo Marais Van Vuuren** for giving the September divisional talk about the Australian Stratigraphic Database and the importance of accurate stratigraphic definitions. Christo gave a wonderful presentation that was well attended despite it being a cold and raining night. For information on the November divisional meeting where we are lucky to have **Emeritus Professor Patrick De Dekker** presenting - please scroll to **page 5**.

It was fantastic to see so many people at the joint GSA-ASEG joint spring networking event. **Phill Wynne** the ASEG ACT president, and I were so happy to see members from both societies chatting and networking. We will be looking to hold there events again in the future. You can see some of the photos from the event on **page 3**.

As we have done for some years, we will be having an end of year picnic to celebrate 2022. All the details are on **page 4.** I hope that you are able to make it to Weston Park in early December.

Stay dry and I hope to see you at the divisional talk in November.

Verity Normington—Chair ACT Division

Next GSA ACT Divisional Meeting 2022

Tuesday 22 November 2022 More details on page 2

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Next GSA ACT Divisional Meeting Details

Tuesday 22 November 2022

Time: 5.30pm for a 6.00 pm start

Zoom link:

https://us06web.zoom.us/j/83243209689? pwd=ZEhKMk5wbGhnbk1DVE9NWIh5L0ZZUT09

Meeting ID: 832 4320 9689 Passcode: 680435

Venue: Harold Raggatt Theatre, Geoscience Australia, Cnr Hindmarsh Dr and Jerrabomberra Ave, Symonston

Speaker: Emeritus Professor Patrick De Dekker, Australian National University

Topic: Submarine canyons and slides in the central-west Otway Basin – their morphology, genesis, links to groundwater discharge and tsunamigenic potential

(see **page 5** for a summary of Professor De Dekkers' presentation and bio)

Virtual GESSS 2022 – Registrations open



Virtual GESSS will run from 15-16 November 2022 and will feature student presentations from all Earth Science fields. Virtual GESSS is proudly sponsored by Geoscience Australia, and is free to attend for all students, GA staff and GSA members.

Non-members can attend too for just \$10.

Registrations: <u>https://www.eventbrite.com.au/e/virtual-gesss-2022-</u> tickets-399253276297



Social Networking Event (14 Sept 2022) Geological Society of Australia, ACT Division & Australian Society of Exploration Geophysicists

On Wednesday 14 September approximately 15 members of the GSA or the ASEG, (some are members of both) gathered at Magoo's Cafe and Bar in Kingston. This was a wonderful opportunity for members of both societies old and new and some new friends that aren't yet members mingling and discussing new advances in science and hearing about adventures past.

The ACT leadership committees of both the GSA and the ASEG hope to make this a semiregular event to keep the conversation between the two societies going.

> Members of the GSA and ASEG and some new friends enjoying the conversation, food and drinks at Magoo's Cafe and Bar. *Photos: Phill Wynne and Bruce Goleby*



Australian Society of Exploration Geophysicists





SAVE THE

DATE



celebrate 2022 Friday 2 December from 5.30 pm

Weston Park Weston Park Rd, Yarralumla

We will be walking the short distance from the Prescott Lane carpark across the road from the Weston Park Mini Railway. Look for the GSA pull-up banners.

What to Bring: Picnic rug or chairs and tables and food and drink

Who: GSA-ACT division members, families and friends Cost: Free

This event is family friendly, and the park is accessible to all. We invite you to bring your whole family along to share in the fun. The event is also open to friends of GSA Members. Remember, when you are attending GSA events, you are expected to adhere to the GSA Code of Conduct.

Please RSVP by email to veritynormington@hotmail.com by 5pm, Wednesday 30th November with the number of people that will be attending.



Tuesday 22 September 2022 (GSA ACT Divisional Meeting)

Guest Speaker: Patrick de Dekker

Title: Submarine canyons and slides in the central-west Otway Basin – their morphology, genesis, links to groundwater discharge and tsunamigenic potential

Patrick is a graduate from Macquarie University with an MSc (Hons) in micropalaeontology, a PhD in zoology from Adelaide University and a DSc from the same institution awarded by the Dept. of Geology and Geophysics. After working on large Australian salt lakes and their records, he eventually returned to a second appointment at ANU in the original Dept. of Geology [now amalgamated with RSES] where he commenced working in marine geoscience to examine the Quaternary history of our oceans. This work was achieved in collaboration with a large number of students and postdocs associated with Patrick who made sure all these people received



training at sea on many of the cruises he led around Australia. Patrick has also investigated the geochemistry and microbiology of aeolian dust in Australia.

Patrick is now Emeritus Professor at ANU but continues publishing papers in peer-reviewed journals, one of which is to appear next year in the AJES on the canyons discussed in this talk.

Presentation Abstract: The morphology and development of several submarine canyons offshore southeast South Australia and western Victoria are described. The existence of three of those canyons had been foreshadowed by N. Boutakoff in 1963 who thought them to be linked to ancient courses of the Glenelg River. These canyons occur on the outer continental shelf where their heads are situated in depths shallower than 1000 m. Sinuous channels are visible within two of the canyon heads, indicating that water and sediment may still travel downslope and cause erosion, and thus are geologically recent.

The other characteristic feature of the area is the presence of numerous undersea slides. These occur at three specific depths and are coincident with stratigraphic horizons in which continental groundwater flows have been identified in adjacent exploratory oil and gas wells drilled into the continental shelf. Sapping of groundwater may likely have occurred during very wet periods inland.

We suggest that these undersea slides could be the first step in the formation of deepsea canyons that are not necessarily linked to ancient river courses. We also postulate that the 'sliding' of large piles of sediment down the continental slope have tsunamigenic potential and may have occurred during significant wet climate on land.





MAG22 – Modern Applications of Geophysics: ASEG Symposium November 9, 2022, Perth WA

Event website:

https://mirageoscience.com/aseg-mag-2022-symposium/

This symposium targets geologists and geophysicists and will cover a large range of case studies ranging from exploration and discovery to evaluation and production of mineral deposits.





Australian Society of Exploration Geophysicists



Modern Applications of Geophysics: Mineral Case Studies

Wednesday Nov 9, 2022 @ Fraser's Kings Park, Perth, WA

8:30 - 9:00	Registration		
9:00 - 9:10	Opening Address & Welcome		
	Session I - Exploration & Orebody Characterisation		
9:10 - 9:40	Integrated 3D modelling and associated machine learning targeting: the Jaguar Greenstone Belt example.	Gem Midgley	Mira Geoscience
9:40 - 10:10	Hardrock 3D Seismic Imaging of the Mawson Nickel prospect.	JJ Leong	Terra Resources
10:10 - 10:40	Application of underground DHEM at the historic Cassilis Gold Mine, Swifts Creek goldfield, eastern Victoria.	Nick Direen	MITRE Geophysics
	Morning Tea		
	Session II - Resource Evaluation and Production		
11:20 - 11:50	Geophysical mapping for mine planning.	Chris Wijns	First Quantum Minerals
11:50 - 12:20	Manganese and geophysics at Woodie Woodie.	Gemma King	Consolidated Minerals
12:20 - 12:50	Geophysically constrained resource definition of the Burracoppin Magnetite deposit.	Jim Austin	CSIRO
	Lunch		
	Session III - Exploration & Discovery		
14:10 - 14:40	Deep geophysical targeting for IOCG and shale-unconformity hosted Cu-Co-Ag deposits at Emmie Bluff in South Australia.	Jayson Meyers	Resource Potentials
14:40 - 15:10	The discovery of the Jericho ISCG deposit – following the breadcrumbs.	Andrew Thompson	Oz Minerals
	Afternoon Tea		
	Session IV - Geophysical Signatures		
15:50 - 16:20	Geophysics of the Prominent Hill IOCG Deposit.	John Hart	Rio Tinto
16:20 - 16:50	Havieron Gold-Copper Deposit: Discovery and Geophysical Characteristics.	Eric Battig	Newcrest
16:50 - 17:00	Closing address		

MAG22 – Modern Applications of Geophysics: Mineral Case Studies November 11, 2022, Perth WA

Event website:

https://www.aig.org.au/events/mag22-modern-applications-of-geophysics-mineral-case-studies/

A one-day symposium covering varying case studies, from exploration and discovery to evaluation and production of mineral deposits.

Acknowledgement of Country

"We acknowledge the traditional owners of the country where we work throughout Australia. We acknowledge Aboriginal and Torres Strait Islander people's continuing connection to land, sea, and community. We pay our respects to their elders past and present."



- November

CADITA

GSA (ACT) 2022—Captains Flat Field Trip

The purpose and expected outcome of this trip was the opportunity for members and friends of the Geological Society of Australia to get together in the field to examine the stratigraphy and structure of an historically important mining area in the Capital region.

Participants (28) were able to examine the late Ordovician to late Silurian (meta)sedimentary and volcanic rocks that are the setting of and host to the ~425 Ma Captains Flat Volcanic Associated Massive Sulphide (VAMS) Pb-Zn-Cu-Ag-Au deposit.

Members saw excellent examples of late Ordovician deep water (meta)sedimentary rocks, a range of volcanic facies of the Late Silurian Kohinoor Volcanics, including autobreccias, high-strain zones associated with mineralisation (S-C mylonites), meso- to macroscale folds, gossans and hydrothermal alteration as well as historical mining and railway infrastructure.



The next pages (pp 7—22) contain many photos taken during the field trip. Captions were kindly supplied by Alan Whitaker to ensure editorial correctness regarding the various geosites as well as by Verity Normington and the Editor.



Field trip participants were introduced to the geological history and landscape evolution of the Captain's flat region by field trip leaders Richard Blewett and Alan Whitaker. *Photos by Verity Normington*



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Stop 1a - Captains Flat Railway Station



Warbisco Shale, Late Ordovician - strongly cleaved, poorly laminated pyritic black shale - seen at the bottom of the cutting adjacent to the railway station.



Slag from the smelter - quite a bit was used as ballast for the railway line. The samples bear a clear resemblance to volcanic scoria. *Photos: Patricia Erfurt. Text: Alan Whitaker.*



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Stop 1a - Cutting adjacent to the Railway Station



Captains Flat Railway Station area. Outcrop of Warbisco shale south of the station, Warbisco Shale in the station Cutting, Bumballa Formation on the N-S road cutting east of the station. *Photo: Patricia Erfurt. Text: Alan Whitaker*



Warbisco Shale, Late Ordovician - strongly cleaved, poorly laminated pyritic black shale - seen at the bottom of the cutting. Surface weathering and oxidation has bleached the shale at the top of the cutting turning it a light grey colour. *Photo: Patricia Erfurt. Text: Alan Whitaker.*



Stop 1b - Captains Flat Road

Bumballa Formation (Obeb)



Richard Blewett explains the geology of a road cutting of the Bumballa Formation located close to the Captain's Flat railway station. *Photo: Judi. Text: Verity Normington.*



The cutting of the Bumballa Formation shows faults and folds disrupting the layering with extensive quartz veining visible. *Photo: Patricia Erfurt. Text: Alan Whitaker.*



Stop 1b - Captains Flat Road Bumballa Formation (Obeb)

Bumballa Formation road cutting near the old Captains Flat railway station.

Late Ordovician - well laminated silt/mudstone, isoclinally folded at the scale of a few meters and disrupted by minor faults. *Photos: Patricia Erfurt: Text: Alan Whitaker*



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Stop 2a - Molonglo River Bridge (west)

At each stop Richard Blewett and Alan Whitaker gave context to the rocks we were about to see. *Photos: Judi and Patricia Erfurt. Text: Verity Normington.*



E-W road cutting, south side, just over half way to the Molonglo River bridge. Kohinoor Volcanics - green-grey fine-grained quartz phyric (sparse phenocrysts to 1.5mm) dacite. *Photo and text: Alan Whitaker*.



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Stop 2b—Molonglo River Bridge (west)



Immediately west of the Molonglo River bridge - southside road cut Autobreccia - Kohinoor Volcanics - silicic quartz phyric (abundant phenocrysts to 3mm) autobreccia with abundant lozenge shaped boudins (clasts?) commonly between 10 and 25cm in length. *Photo and text: Alan Whitaker*

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Stop 2a - Molonglo River Bridge (west)

Rocks from the E-W section of road cuttings - Kohinoor Volcanics to Molonglo River Bridge and for about 25m past the bridge. Photos: Patricia Erfurt. Text: Alan Whitaker

Samples of fine-grained dacitic volcanic rocks from the Kohinoor Volcanics Formation.





Weathered volcanic rock samples from the Kohinoor Volcanics.





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Stop 2b—East of the Molonglo River Bridge



Tors of sericitically altered Kohinoor Volcanics immediately west of Captains Flat Formation. *Photo and text: Alan Whitaker*



Captains Flat Synclinal fold axis - Captains Flat Formation. Photo and text: Alan Whitaker



Weathered Kohinoor Volcanics —possibly ignimbrite/welded tuff. *Photo: Patricia Erfurt*



Stop 2b—East of the Molonglo River bridge



Captains Flat Formation - siltstone - steeply east dipping. Photo: Patricia Erfurt.



Captains Flat Formation further to the east - interbedded sandy siltstone and siltstone (graded beds - flysch?) with axial plane cleavage showing up in the finer grained upper sections of the beds. *Photo: Patricia Erfurt. Text: Alan Whitaker.*

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Stop 3a—Captains Flat Mine—Then and Now



Captains Flat mine entrance-85 years between the two images. Photos: Patricia Erfurt.





The image and the text below were reproduced from sign boards at the mine site by the editor.



The Koh-i-noor (owned by Lake George Mines Ltd) mine site in the 1960s. Remnants of the wood -lined drum filters can still be seen on the hill.

Major remedial works on this and other waste dumps were carried out in 1976 at a cost of approximately \$2.3 million. The dumps have been covered with impermeable clay and vegetation. These works were designed to remove the risk of sudden catastrophic failure of the dumps, such as occurred in 1939 and 1942 when tailings and slime dams collapsed.

Behind the old miners change rooms just north of the central shaft (west/right side up) is a section of intensely sheared Kohinoor Volcanics (*Shok-f*) with sericitically altered quartz phyric (abundant quartz phenocrysts to 4 mm) volcanics. *Photo: Alan Whitaker. Text: Richard Blewett* and Alan Whitaker—more exact details in the field guide.





"Getting to the point" of Captains Flat mine geology with Allison Britt, Richard Blewett and Shona Blewett. *Photo and text Steve Hill.*

Massive sulphides - mostly iron pyrite and galena.



Photos: Patricia Erfurt. Text: Alan Whitaker.





Track up to Central Shaft - track left foreground, bleached Elliott's Shale; right hand side of track, redbrown iron and silicica rich boxworks after sulphides (gossanous); farther up the hill, yellow altered and sheared Kohinoor Volcanics. *Photo and text Alan Whitaker—more exact details in the field guide.*



Sample of massive sulphide—mostly iron pyrite and galena from underground. *Photo: Patricia Erfurt. Text: Alan Whitaker.*



Iron and silica rich boxworks after massive sulphides—samples from Elliott's Shale within the Kohinoor Volcanics. *Photos: Patricia Erfurt. Text:*





Top of the hill—the ruins of the Central Shaft of the Lake George Mine at Captains Flat - the area around the ruins is covered in deeply altered rocks with the occasional piece of gossan. *Photo: Steve Hill.*





Looking down from the top pf the hill on the small mining town. *Photos: Patricia Erfurt.*

< Captains Flat Dam, a remnant of the old mining scheme from the early 1900s is the town's water supply system on -stream on the Molonglo River. Tailing dams next to the onstream dam, failed during the 1940s releasing highly contaminated water and sediments into the dam. Diversion pipes are now in place to minimise direct water run-off from the former mining areas into the raw water storage dam (https://www.nsw.gov.au/)



Jobs—Jobs—Jobs

Geoscience Australia is currently recruiting for multiple positions, closing <u>6 November</u>



Australian Government

Geoscience Australia

The skills and qualities Geoscience Australia are looking for:

- A tertiary qualification or equivalent industry experience in a field of geoscience.
- The ability to contribute your own expertise and identify opportunities to utilise the knowledge and experience of others to improve work processes, science interpretations and product delivery.
- The ability to work as a productive member of a team, supported by highly developed communication, collaboration and interpersonal skills.
- The capability to meet challenges, adapt to changing or uncertain circumstances, be proactive in rescheduling and rescoping work priorities, and maintain effective performance.
- A commitment to fostering a positive and inclusive culture in your team and workplace.

Salary \$75 000 - \$100 000

More details:

https://candidate.aurion.cloud/ga/production/ vacancies/2913619586109898~1/edit



AGE: Mid Silurian, 430 million years LOCATION: Central Canberra

ACT National Rock Garden





The National Rock Garden is heading across the road and will be located inside the National Arboretum. The relocation is planned to take place later this year.

Disclaimer:

Editor

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The Capital Geologist is published by the ACT Division of the Geological Society Australia to provide interesting information and updates for all members. While the editor is taking reasonable precautions with respect to the accuracy of any contributions, no warranties are made regarding material that is supplied to and published by the Capital Geologist. The Editor



From the Editor's Desk

Welcome to the October/November edition of the GSA ACT Division newsletter. As always, we invite suggestions for events, networking, lectures, and presentations as well as any ideas for field trips to interesting geosites in the ACT region.

Still waiting for spring to arrive—keep warm and dry—La Niña is starting to overstay her welcome.

The Editor

Contact: gsaactnews@gmail.com



Upcoming Earth Science Conferences



29 Nov – 1 Dec 2022 Massey University Palmerston North

Event website: https:// confer.eventsair.com/gsnz2021/

ICESSGM (International Conference on Engineering Seismology, Seismicity and Geophysical Methods) Sydney **2—3 December 2022 Event website:** tinyurl.com/27zfvmzg

ICPATA (International Conference on Paleoseismology, Active Tectonics and Archaeoseismology) Sydney **2—3 December 2022 Event website:** tinyurl.com/coh6ejsx



2 December 2022 Adelaide Convention Centre

Event website: saemc.com.au

ICEESDT (Environmental Engineering, Seismology & Dynamic Tectonics) Sydney 28—29 January 2023

Event website: tinyurl.com/2b5dwber



Brisbane 13—18 March 2023

Event website: https://2023.aegc.com.au

More Earth Science Conferences Worldwide – **Conference Index** https://conferenceindex.org/conferences/earth-science

More Geoscience Conferences in Australia for 2022/2023/2024 https://conferenceindex.org/conferences/geoscience/australia

The Capital Geologist

Monthly Newsletter of ACT Division Geological Society of Australia

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Let us know if you have something to share! Contact the Editor with news, geo-pics, competitions or events of interest for the ACT Division membership.