

REGIONAL PETROPHYSICS: EUCLA BASIN AND BASEMENT 2022–23

C Mortimore and B Bourne



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REGIONAL PETROPHYSICS: EUCLA BASIN AND BASEMENT 2022–23

C Mortimore* and B Bourne*

* Terra Petrophysics Pty Ltd, Unit 5/51 Forsyth Street, O'Connor Western Australia 6163

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About this publication

Terra Petrophysics Pty Ltd carried out petrophysical measurements under contract to the Geological Survey of Western Australia, funded by the Exploration Incentive Scheme.



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Acknowledgement of Country

We respectfully acknowledge Aboriginal peoples as the Traditional Custodians of this land on which we deliver our services to the communities throughout Western Australia. We acknowledge their enduring connection to the lands, waterways and communities and pay our respects to Elders past and present.

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Cover photograph: Down core petrophysical data shown in relation to crustal-scale density and velocity models

Introduction

The Geological Survey of Western Australia's (GSWA) regional petrophysics project provides high-quality petrophysical measurements to assist with the interpretation of geophysical data. The project commenced in 2020, in collaboration with Terra Petrophysics, and is funded by the Exploration Incentive Scheme (EIS). Petrophysical data were collected from EIS co-funded drillcore, company drillcore, and GSWA stratigraphic drillcore. All cores sampled for petrophysics have, or will have, HyLogger data and most have open-file company assay data available through the Mineral Exploration reports database (WAMEX).

Terra Petrophysics conducted petrophysical analyses on 484 samples from 10 diamond drillholes (Fig. 1, Table 1) drilled into basement beneath the Eucla Basin. In most cases, Cretaceous and Cenozoic Bight and Eucla Basin sedimentary rocks, overlying the basement rocks, were also collected. Where the sedimentary rocks were competent enough, they have also been submitted for petrophysical analysis.

Physical properties measured include:

- Induced Polarization (Chargeability) and Galvanic Resistivity
- Inductive Conductivity
- Magnetic Susceptibility
- Remanent Magnetization: the ratio of induced- to remanent-magnetization intensity of the sample (known as the Koenigsberger Ratio, Q), as well as an estimate of the total remanent vector (relative to drillhole)
- Dry Bulk Density
- Apparent Porosity
- P-wave Sonic Velocity
- Spectral Radiometrics.

GSWA provides a datasheet (with petrophysical measurements, lithological information and supplementary material), a photo of each sample, and a description of the methods. Terra also produces a report with an analysis of the data. All of these datasets, including the report are also available in [MAGIX](#).

GSWA drilled stratigraphic holes — Eucla Basement

In 2013 and 2014, GSWA drilled eight of the holes sampled for petrophysics in this Report. The location of these holes, prefixed in Table 1 as MAD or FOR, was targeted to investigate distinct geophysical domains interpreted in magnetic and gravity data, rather than specific geophysical targets. These targets provide information on a diverse array of basement rocks, from which background information could be obtained rather than potential mineralized intrusions.

GSWA has published two documents that provide important additional information on the Eucla Basement stratigraphic drilling. These documents are available on the department's eBookshop. They are:

- Record 2015/10 Eucla Basement stratigraphic drilling results release workshop: Extended abstracts *compiled by* CV Spaggiari and RH Smithies
- Report 204 Stratigraphic and co-funded drilling of the Eucla Basement – The Proterozoic geology beneath the Nullarbor Plain *by* CV Spaggiari, RH Smithies, CL Kirkland, MTD Wingate, RN England and Y Lu

Non-GSWA drillholes — WAMEX database

Drillhole HDDH002 was drilled by Teck Australia Pty Ltd December 2010 – January 2011. Open-file reports for this drilling are available from the department's WAMEX online database under [A90738](#) and [A91287](#).

Drillhole Hannah 1 was drilled in late 2007 by Buffalo Gold Limited. The drillhole report compiled as a statutory requirement is available in WAMEX, report number [A75850](#).

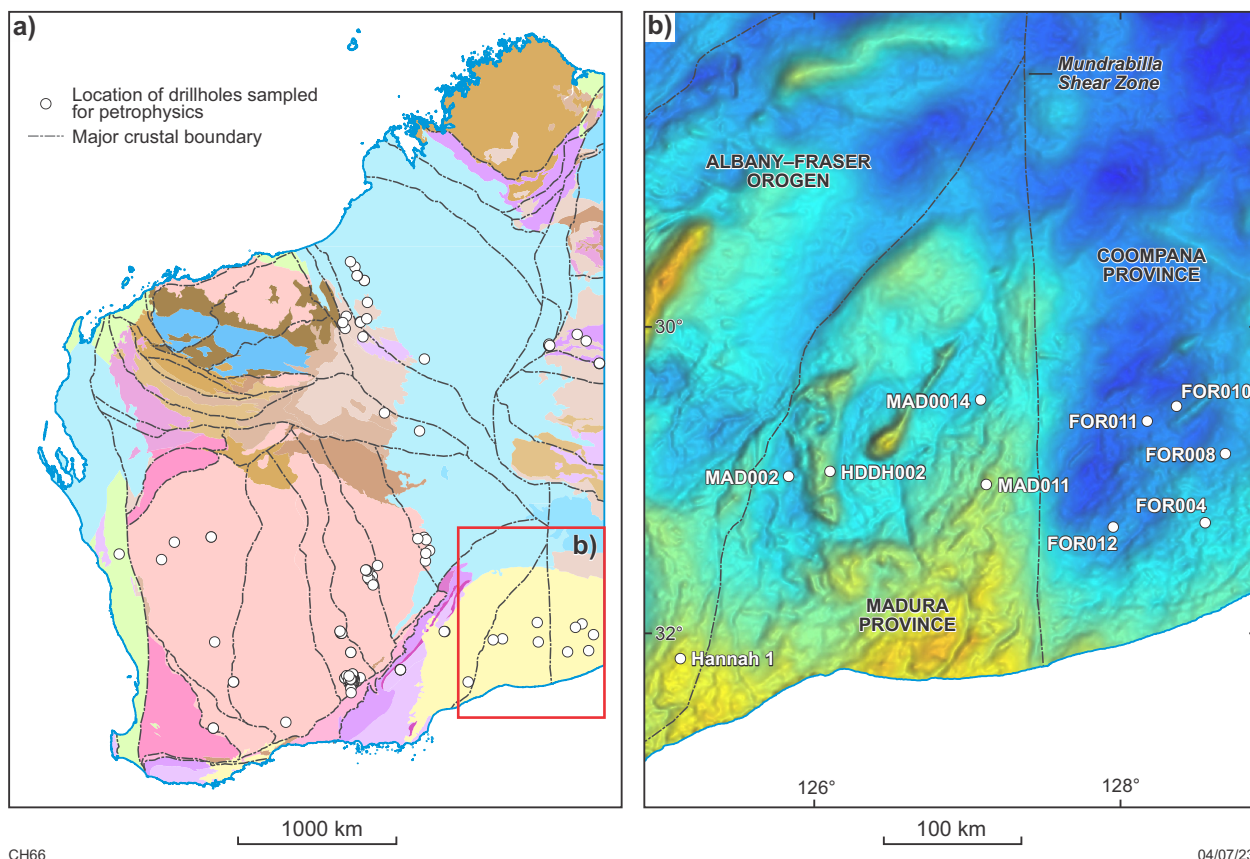


Figure 1. Drillcore locations sampled for petrophysics: a) statewide drillcores sampled since 2021, shown on tectonic units map (2021) with major crustal boundaries; b) location of 10 drillholes sampled for petrophysics (this Report) shown on 400 m gravity data (colour) draped with 1VD total magnetic intensity data (grey scale). The Madura Province is separated from the Coompana Province by the Mundrabilla Shear Zone

Table 1. Drillcore identification names/numbers and collar details sampled for petrophysics in this Report

Drillhole	Latitude	Longitude	Azimuth (degrees)	Dip (degrees)	Depth (m)	Number of petrophysical samples	Source of core
MAD002	-30.9757	125.8315	280	-80	591.60	51	EIS*
MAD011	-31.0300	127.1232	140	-75	641.15	42	EIS*
MAD014	-30.4786	127.0857	340	-80	459.50	26	EIS*
FOR004	-31.2801	128.5540	070	-80	570.40	35	EIS*
FOR008	-30.8290	128.6861	105	-75	585.45	64	EIS*
FOR010	-30.5186	128.3660	140	-80	527.80	70	EIS*
FOR011	-30.6172	128.1758	010	-80	500.10	58	EIS*
FOR012	-31.3007	127.9858	150	-75	510.6	29	EIS*
HDDH002	-30.9451	126.1035	315	-70	483.70	42	EIS*
HANNAH 1	-32.1657	125.1254	000	-90	654	67	Company – donated*

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TERRA PETROPHYSICS PTY. LTD.

(ABN 71 613 484 807)

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EUCLA BASIN REGIONAL

WESTERN AUSTRALIA

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1. GSWA – Charlotte Hall
2. Terra Petrophysics – Barry Bourne

Claire Mortimore
Geoscientist
May, 2023

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1. INTRODUCTION

Terra Petrophysics have performed petrophysical analysis of 484 core samples for GSWA from the Coompana (Forrest Zone) and Madura Provinces which are separated by the Mundrabilla Shear Zone. These samples have been provided by GSWA to develop an understanding of physical properties of rocks in the region and to assist with the interpretation of geophysical field data. Petrophysical analysis includes measurement of the following physical properties:

- Induced Polarisation (Chargeability) and Galvanic Resistivity
- Inductive Conductivity
- Magnetic Susceptibility
- Remanent Magnetisation; the ratio of induced- to remanent-magnetisation intensity of the sample (known as the Koenigsberger Ratio, Q), as well as an estimate of the total remanent vector (relative to drill hole).
- Dry Bulk Density
- Apparent Porosity
- P-wave Sonic Velocity
- Spectral Radiometrics

During analysis, Terra Petrophysics utilises standards and reference samples to ensure precision and accuracy.

2. PETROPHYSICS

2.1 Sample Preparation

Samples for physical property measurements should be carefully selected for quality and representation of geology and/or alteration. Terra recommends samples between the sizes of 10cm to 15cm. In this study all samples were of adequate size and quality. The size and shape of the sample need to be determined for most physical property measurements (e.g., geometric and core size correction factors). All samples and cores are returned to the client.

All samples are photographed and marked with Terra sample numbers. Samples for which magnetic remanence vector measurements are requested should be oriented in space. All samples should be accompanied by a project name, a brief description of each sample, requested physical property procedures and final disposal requirement for the samples.

Physical property determinations are non-destructive procedures; however, sample preparation requires the sample to have flat/square ends and sometimes requires them to be cut with a rock saw. In addition, samples are required to be submerged in water for 24 hours before being measured. Samples containing clays can absorb water and break. Extra caution is taken with these samples.

2.2 Inductive Conductivity

The inductive conductivity measurement is made in the frequency domain at 10,000 Hz via an external magnetic field inducing a small current in the sample. The measurement is most influenced by sample material at the receiver coil and within a 10 cm radius from the centre of the sample.

Inductive conductivity is calculated from the difference in amplitude between the sample and free air measurements. The limits of detectability are 0.1 S/m (maximum 100,000 S/m) and resulting data are presented in S/m. Several inductive conductivity measurements will be made and reported when the sample size permits.

2.3 Induced Polarization and Resistivity

The apparent resistivity and induced polarization (or chargeability) determinations are measured in time domain. The resistivity and chargeability values are measured by passing a constant current through the sample and then switching it on and off at 2 second intervals. While the current is flowing through the sample, the resistivity (ohm-m) is calculated. When the current is switched off, the voltage across the sample drops and a decay curve is measured. The induced polarization (mV/V) is calculated from this decay between 450-1100 milliseconds after turn off (Newmont Standard). Resistivity and induced polarization values are stacked and averaged a minimum of 10 times for one reading. Terra provide the average results for two readings (minimum).

Some samples (for example, silica rich samples) can be so resistive as to act dielectric. Electricity does not flow through the sample as if it were conductive, but charged particles are shifted minutely from their original position. When the current is removed the charged particles slowly (due to the high resistivity of the sample) relax to their original state. Therefore, samples are measured to be more chargeable than would be recognised by a field IP survey.

2.4 Wet/Dry Bulk Density and Porosity

The density determinations are calculated using Archimedes Principle. Dry bulk densities are determined by dry weight divided by the buoyancy determined volume of each sample. Porosities are calculated from water saturated weights, dry weights, and the buoyancy-determined volume. All sample are soaked for at least 24 hours after dry weights are measured.

The accuracy of the buoyancy technique of density measurement is 0.01 grams per cubic centimetre (g/cm³). The results of the laboratory density determinations are reported in grams per cubic centimetre. Density measurements can be made on grab samples or drill core. Very large or heavy samples (>1 kg) require coring or breaking prior to the density determination.

2.5 Magnetic Susceptibility and Remanence

Magnetic susceptibility is measured by using a magnetic susceptibility meter to apply an external magnetic field to the sample at an operating frequency of 8 kHz. Magnetic susceptibility is calculated from the frequency difference between the sample and free air measurements. The limits of detectability are approximately 1×10^{-7} SI units and resulting data is presented in SI ($\times 10^{-3}$) units. The measurement is most influenced by sample material at the receiver coil and within a 10 cm radius from the centre of the sample. Magnetic susceptibility measurements can be made on core, hand and surface samples.

For magnetic samples ($>5 \times 10^{-3}$ SI) the magnetic remanence can be measured. The measurement of remanence (J_r) in the field and the ratio of remanence to the induced magnetization ($J_{rem}/J_{ind} = Q$) has in the past been problematic. The induced magnetization can be estimated using the susceptibility (k , where $J_{ind} = kH$ and typically $H = 40\text{-}50 \text{ Am}^{-1}$) which can be measured using a handheld meter, but magnetic remanence is more difficult.

A recent development in field instrumentation uses a miniature fluxgate magnetometer and a pendulum arrangement in which a magnetic rock may be swung generating a transient signal at the fluxgate which is converted to a magnetic moment and magnetization.

2.6 Velocity

Terra Petrophysics can acquire P-wave velocity measurements on samples with a minimum length of 15 centimetres. Measurements are taken at 50,000 Hz. The velocity measurement range is between 1500-9999 m/s.

2.7 Spectral Radiometrics

Terra Petrophysics reports on the following radionuclides: Potassium (K-40) %, Uranium (U) ppm and Thorium (Th-232) ppm. The measurements are acquired using a 256 and 1024 channel spectrometer with a 3"x3" (21ci – 0.35L) Sodium-Iodide (NaI) gamma detector which is operated within the confines of a lead laboratory shield.

The minimum detection sensitivities of the instrument are 0.3% K, 0.9 ppm U, and 1.5 ppm Th; and the gamma ray sensitivity is (1MBq Cs-137 1 m) 386 cps.

3. RESULTS

A total of 484 samples have undergone petrophysical analysis, the results table of which is included as APPENDIX 1 – DATA TABLES. Each sample is assigned a Terra ID, and photographs of the samples are included as APPENDIX 2 – SAMPLE PHOTOS. Raw data files for the induced polarization and resistivity measurements are included in the datasheet. Cross plots of the various petrophysical data are given in Figure 2 to Figure 14. The data points are classified by Cu ppm, using cool to warm colours, and lithology, which is represented by shape (Figure 1). Symbol size is used to show the different provinces.

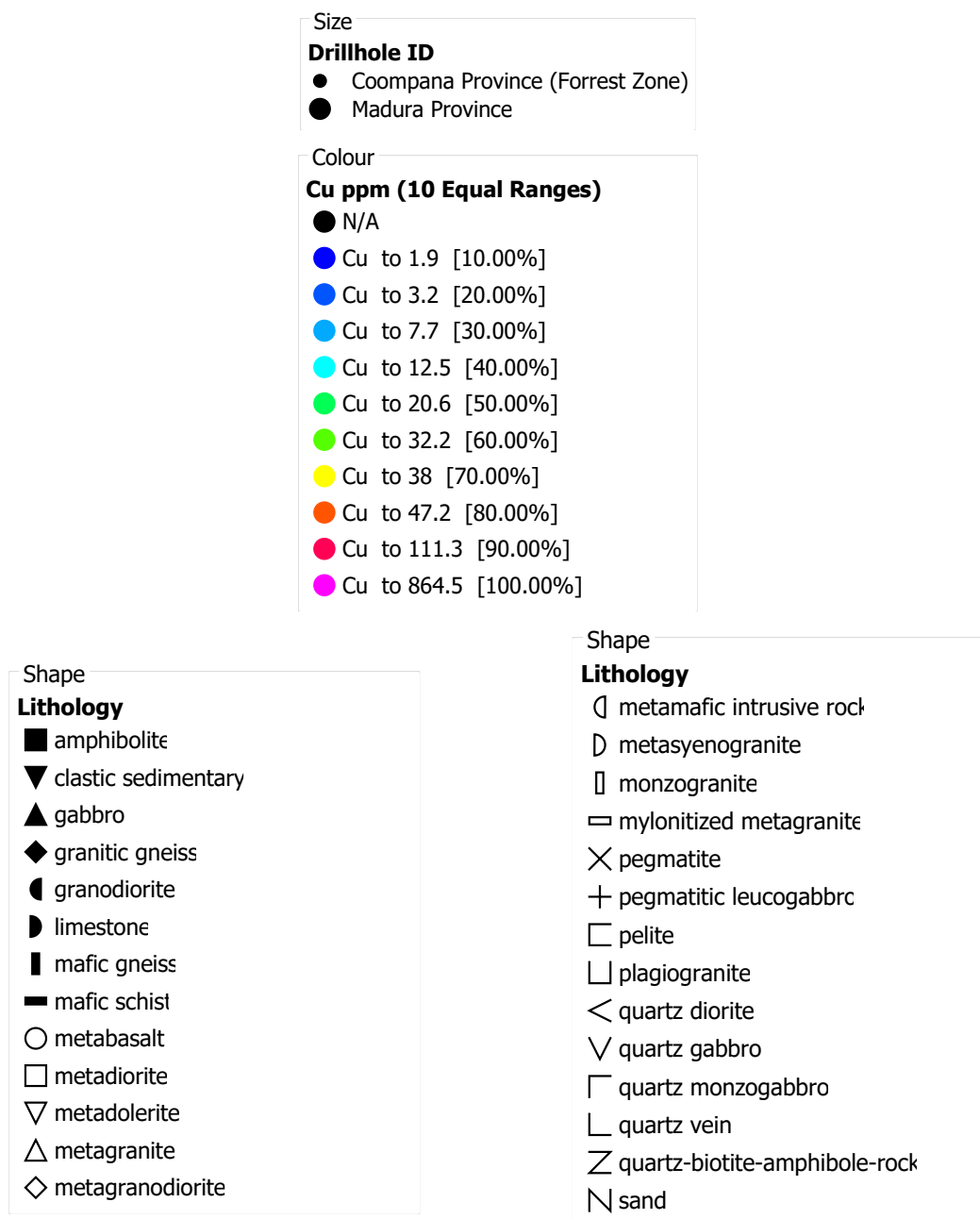


Figure 1. Legend corresponding to Figure 2, and Figure 5 to Figure 11.

A cross-plot of dry bulk density (DBD) and magnetic susceptibility data is given in Figure 2. Dry bulk density values range from 0.91 to 3.23 g/cm³ and magnetic susceptibility values range from 0.001 to 372.29 ($\times 10^{-3}$) SI. Extremely low DBD values (<1.3 g/cm³) are unique to weakly consolidated sands. Pelitic and clastic sedimentary rocks encompassing mudstones/ siltstones and sandstones/ conglomerates also show low and very low DBD values.

Sample 20TR0308 (mafic schist) shows the highest DBD value in the dataset.

An interesting circle shape is shown indicating three clusters of basement data which are circled in Figure 2.

- Samples with very high magnetic susceptibility values ($>100 \times 10^{-3}$) SI and DBD values between 2.75 and 3.08 g/cm³ are exclusive to the Madura Province and are shown in the plot with a red circle. Mafic gneisses, and quartz gabbros, quartz monzogabbros, quartz-biotite-amphibole rocks define the cluster.
- Samples with high magnetic susceptibility 1- 100 ($\times 10^{-3}$) SI are clustered into two groups by dry bulk density. The first group has an average DBD of ~ 2.65 g/cm³ and includes higher density Forrest Zone samples and lower density Madura province samples (circled in blue). Granodiorites, metagranites, metagranodiorites, metasyenogranites and some granitic gneisses define the group. The second ground group has an average DBD of ~ 3 g/cm³ (circled in black) is predominated by gabbros in drillhole HDDH002 and mafic schists of MAD002. Gabbros in this group correspond with comparatively high Cu values.
- Mafic schists and metabasalts show high DBD and a range of magnetic susceptibility values.

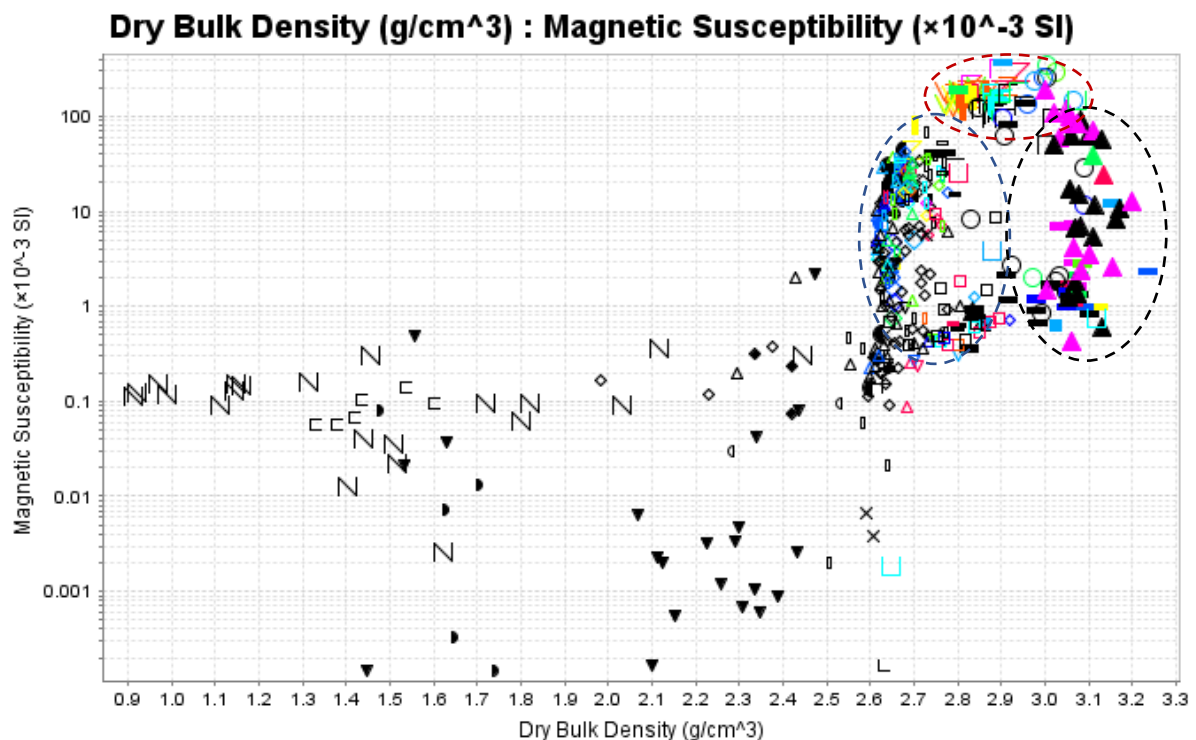


Figure 2. Cross-plot of dry bulk density against magnetic susceptibility data.

A method of estimating magnetic mineral content from magnetic susceptibility via a simple relationship was devised by Emerson (1997) and is shown in Figure 3. Sample 20TR2334 has a magnetic susceptibility of 0.372 SI, and correspondingly is estimated to contain approximately 10% magnetite; this is indicated by the dashed line on Figure 3.

Figure 4 shows ranges of density values for common rocks and minerals (Emerson, 1990). From this diagram, it can be noted this project shows a “very low to high” range of densities within the samples.

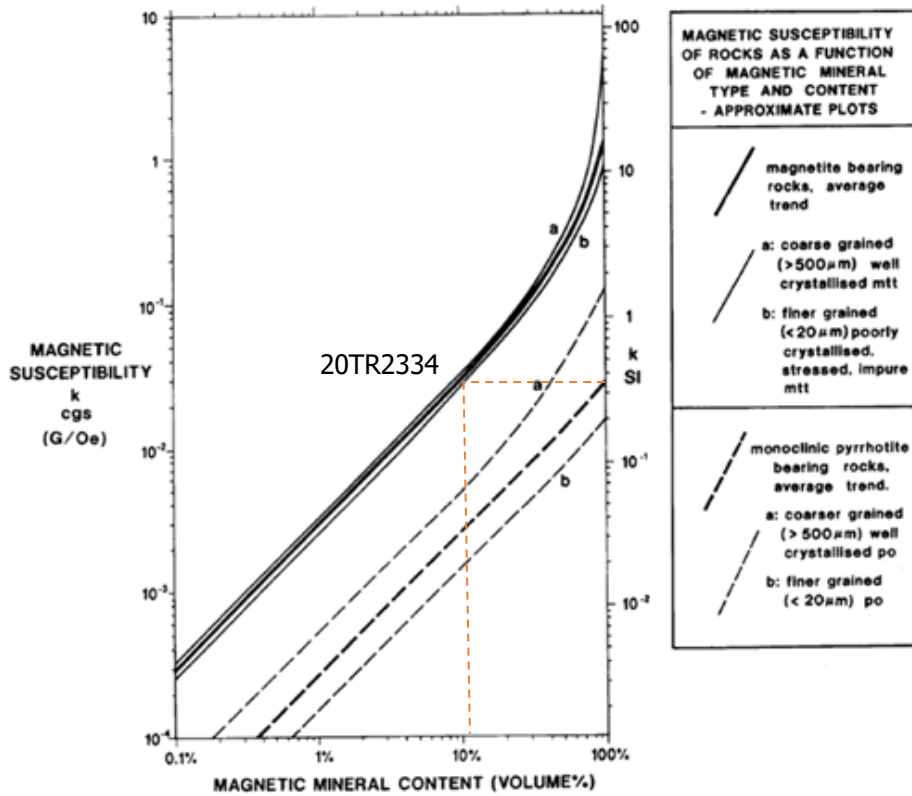


Figure 3. Theoretical magnetic mineral content (magnetite – solid lines; pyrrhotite – dashed lines) as a function of measured magnetic susceptibility (Emerson, 1997)

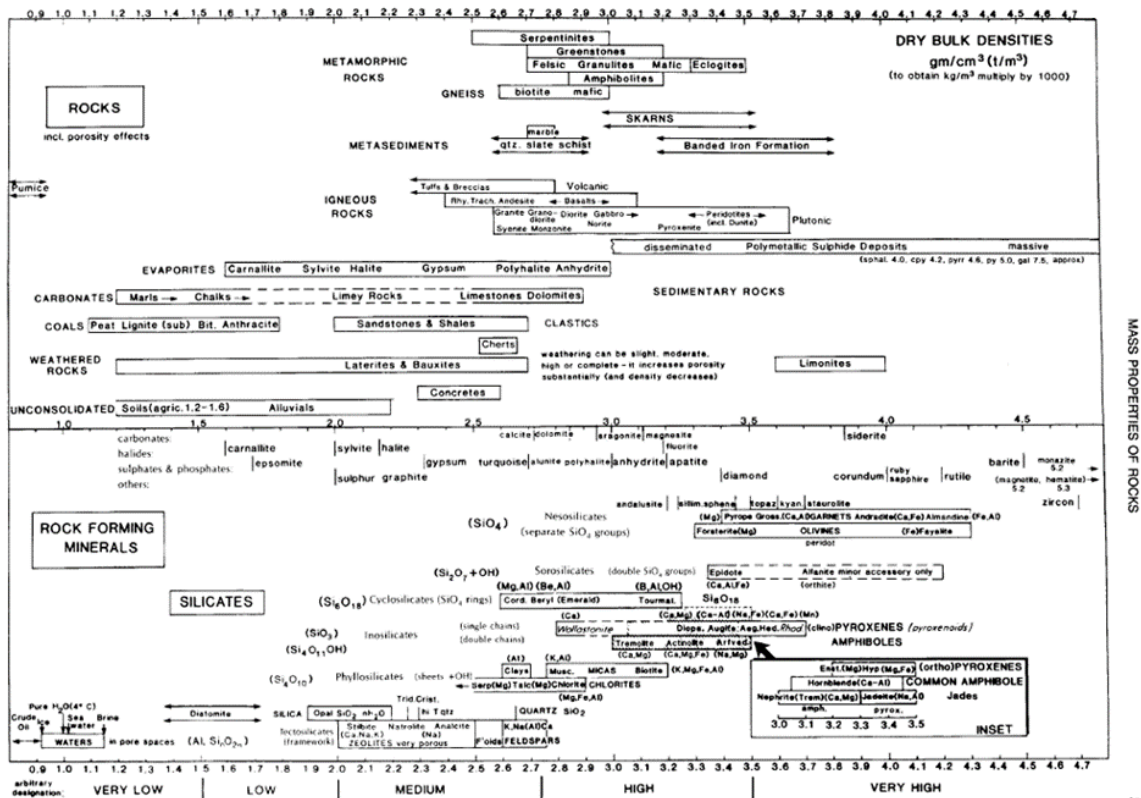
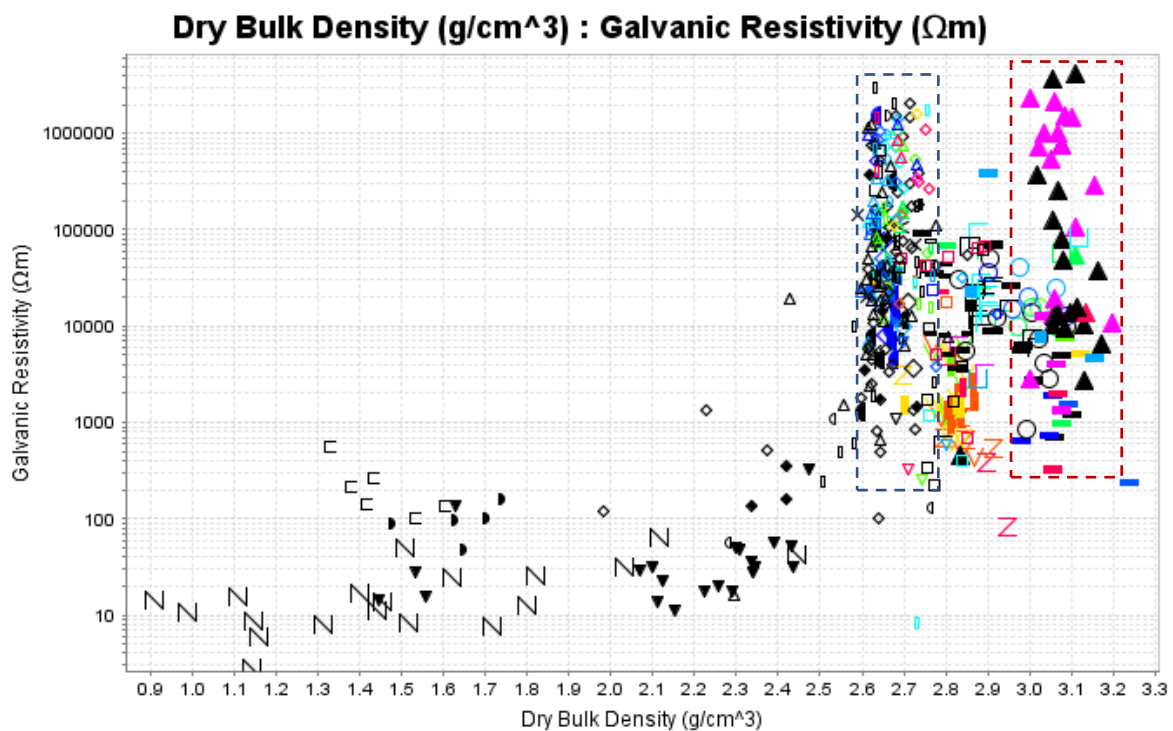


Figure 4. Dry bulk density ranges for common rock types (Emerson, 1990)

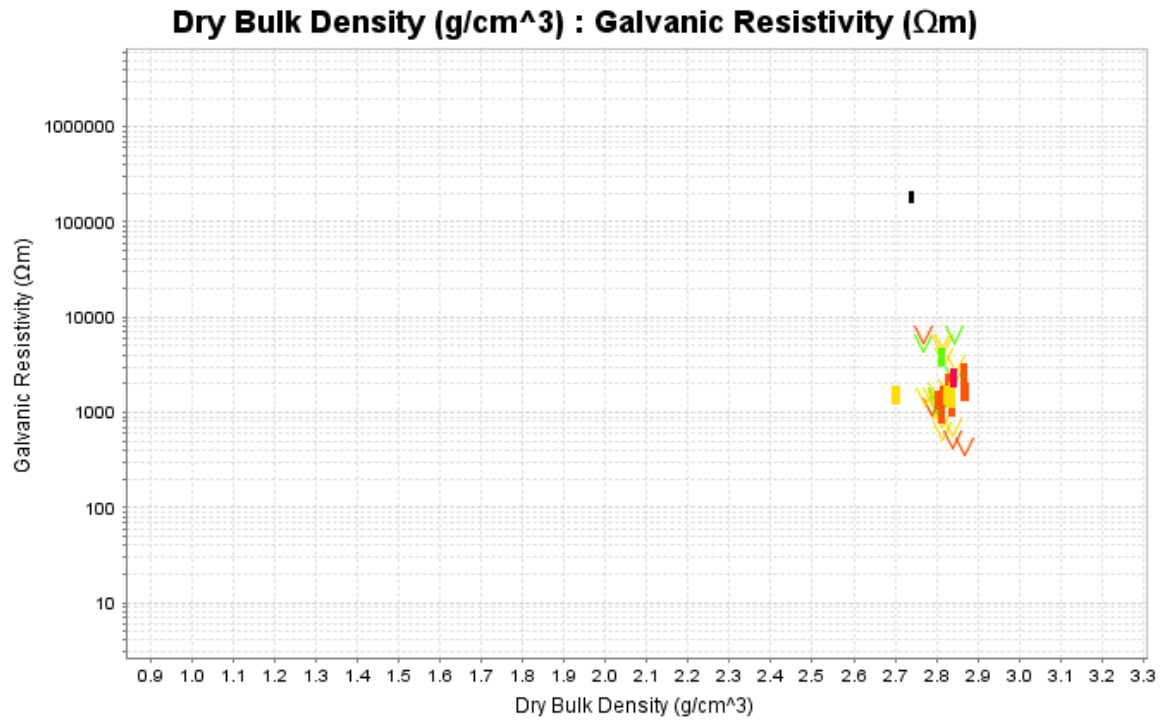
A cross-plot of dry bulk density and galvanic resistivity data is given in Figure 5a-b. Galvanic resistivity values range from 2.78 to >4,000,000 Ωm .

Two clusters of DBD data are seen in this plot and are shown with blue and red squares. Both clusters correspond to a wide range of resistivity values. The first data cluster shows DBD values of $\sim 2.65 \text{ g/cm}^3$ and is dominated by Coompana province. The second set of samples cluster at the 3.1 g/cm^3 DBD line and is mostly composed of Madura province gabbros. Additionally, quartz gabbros and mafic gneisses, shown in Figure 5b, show low galvanic resistivity ($\sim 1000 \text{ } \Omega\text{m}$) comparative to the two data clusters.

Sedimentary samples (clastic sediments, pelite, limestone and sand) show low DBD and correspond to low galvanic resistivity and show a weakly positive trend between the properties. This could be function of weathering and clay alteration.



a)



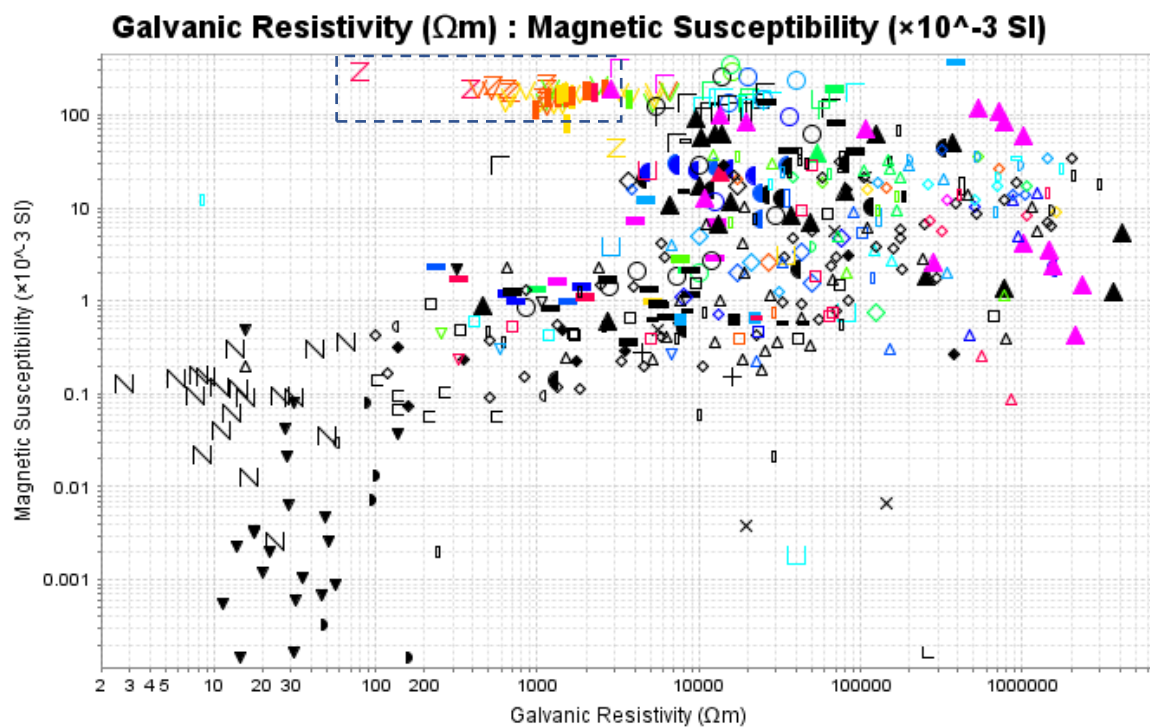
b)

Figure 5. Cross-plot of dry bulk density against galvanic resistivity data; a) shows all samples and b) shows mafic gneisses and quartz gabbros.

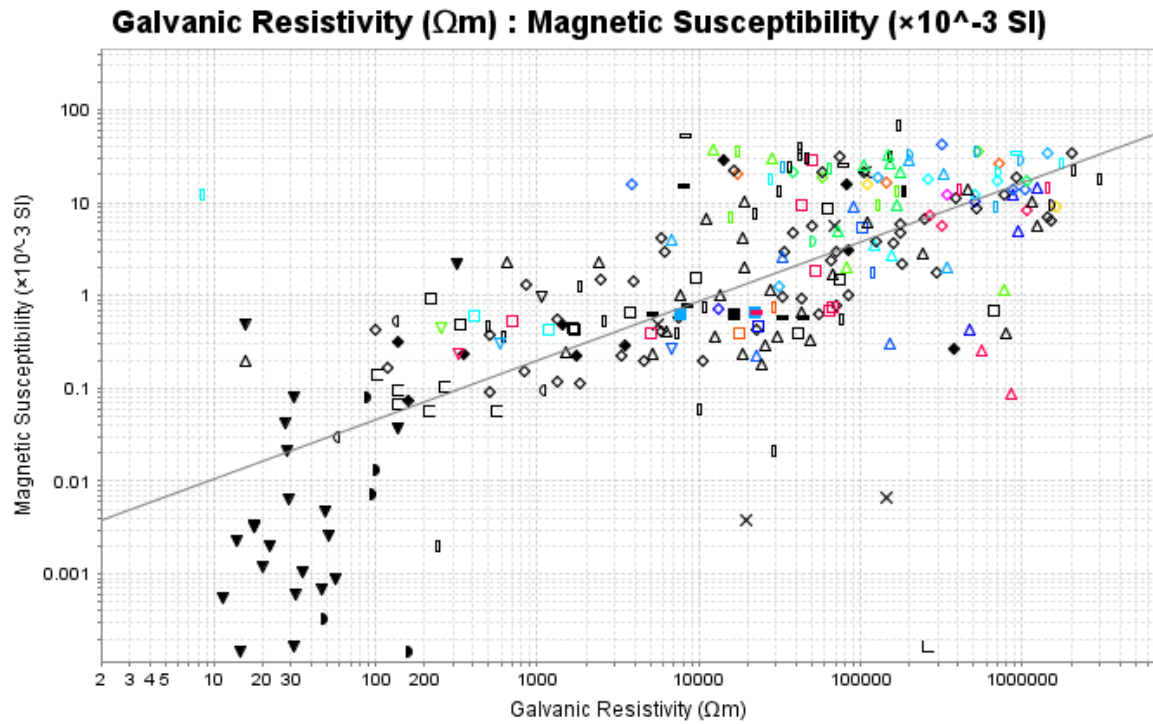
A cross-plot of galvanic resistivity and magnetic susceptibility and data is given in Figure 6.

A subset of high DBD samples show low galvanic resistivity and high magnetic susceptibility which could be indicative of sulphides. These samples also correspond with higher Cu values (yellow and red).

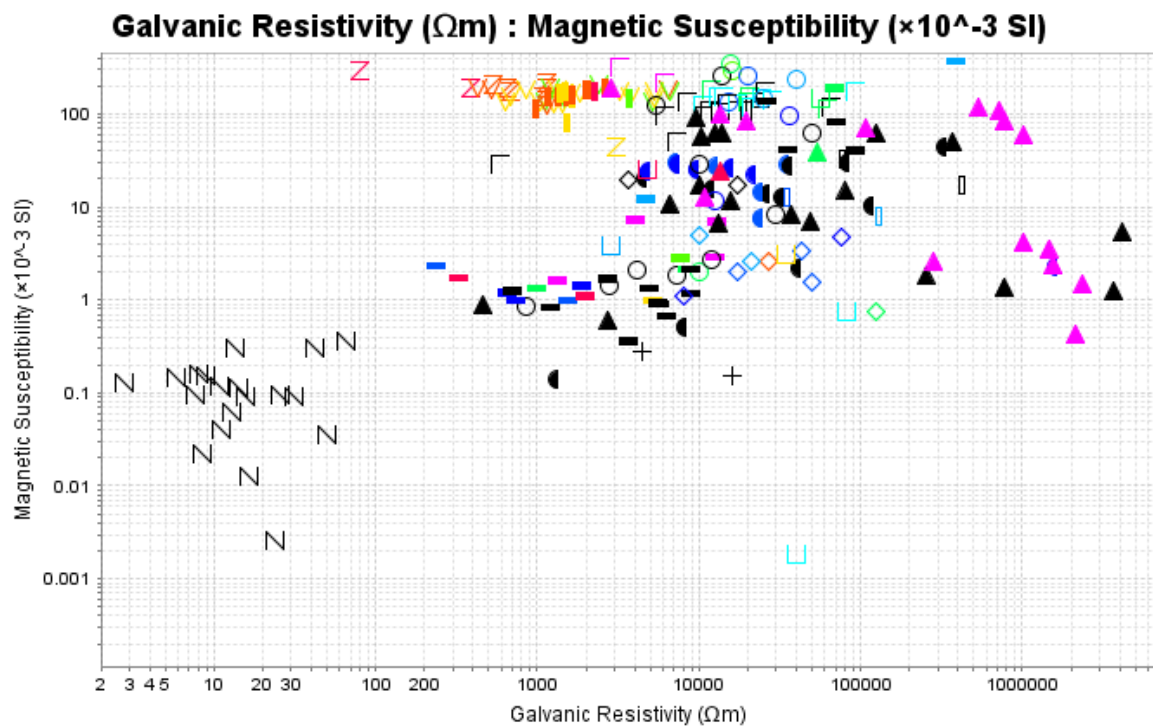
Coompana province samples show a linear relationship between the properties which is not as clearly exhibited by samples of the Madura province. This is shown with a trendline in Figure 6b. Only clastic sedimentary cover and pegmatites plot away from this trendline.



a)



b)



c)

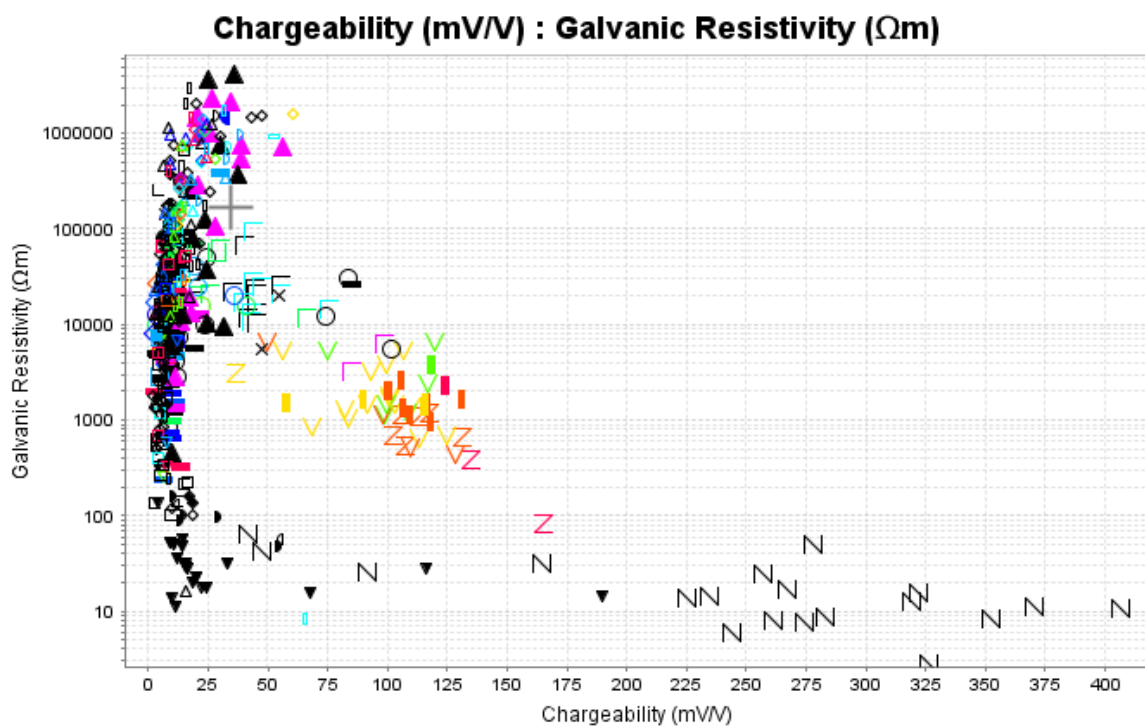
Figure 6. Cross-plot of magnetic susceptibility against resistivity; a) shows all samples, b) shows samples from the Coompana province only and c) shows Madura province samples only.

A cross-plot of chargeability and galvanic resistivity data is given in Figure 7.

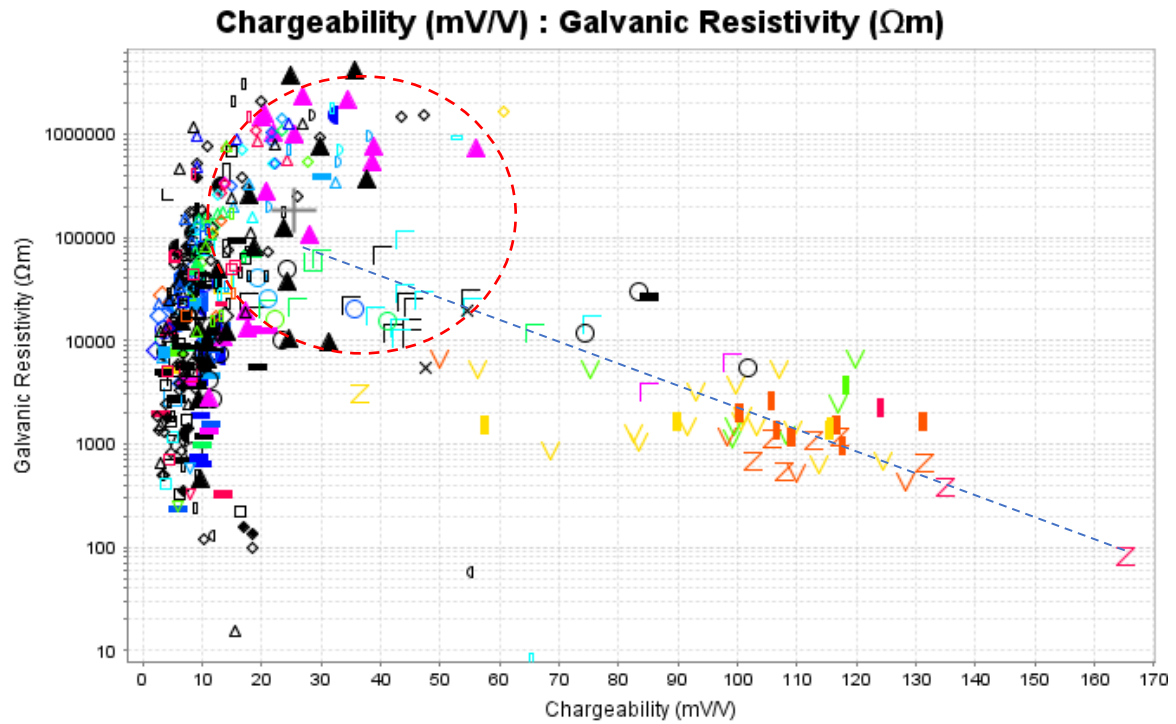
Chargeability values range between 2.24 and 406 mV/V. The mean values are shown with a grey cross and indicate an average value of 166 000 Ω m and 34mV/V; for galvanic resistivity and chargeability, respectively.

Most samples show moderately low chargeability values that correspond with a range of resistivities. The data deviates from the mean along the chargeability axis more so on the high end of resistivity values. The chargeability of some samples with extreme galvanic resistivity values may be exaggerated as a function of the dielectric effect (see Section 2.3). This is particularly true of silica rich samples.

Very high chargeability responses from non-sedimentary cover samples are restricted to samples from the Madura province with elevated Cu values. In the Madura province samples, there is a negative linear correlation between the properties which may reflect sulphide content. This is shown with a trendline in Figure 7b. Most Madura province gabbros show high Cu content and correspondingly high chargeability (10- 57 mV/V) and moderate- high galvanic resistivity values (2800- >2 000 000 Ω m). This is shown roughly with a red circle in Figure 7b.



a)



b)

Figure 7. Cross-plot of chargeability against resistivity; a) shows all data and b) shows crystalline basement samples with cover samples (clastic sediments, pelite, limestone and sand) removed.

A cross-plot of chargeability and magnetic susceptibility data is given in Figure 8.

Samples with higher Cu content (blue square) show high magnetic susceptibility and high chargeability. A subset of high magnetic susceptibility samples with elevated Cu, correspond to high chargeability values.

The greatest chargeability response is from cover samples which show low magnetic susceptibility values. High chargeability in these samples is likely a function of increased clay content.

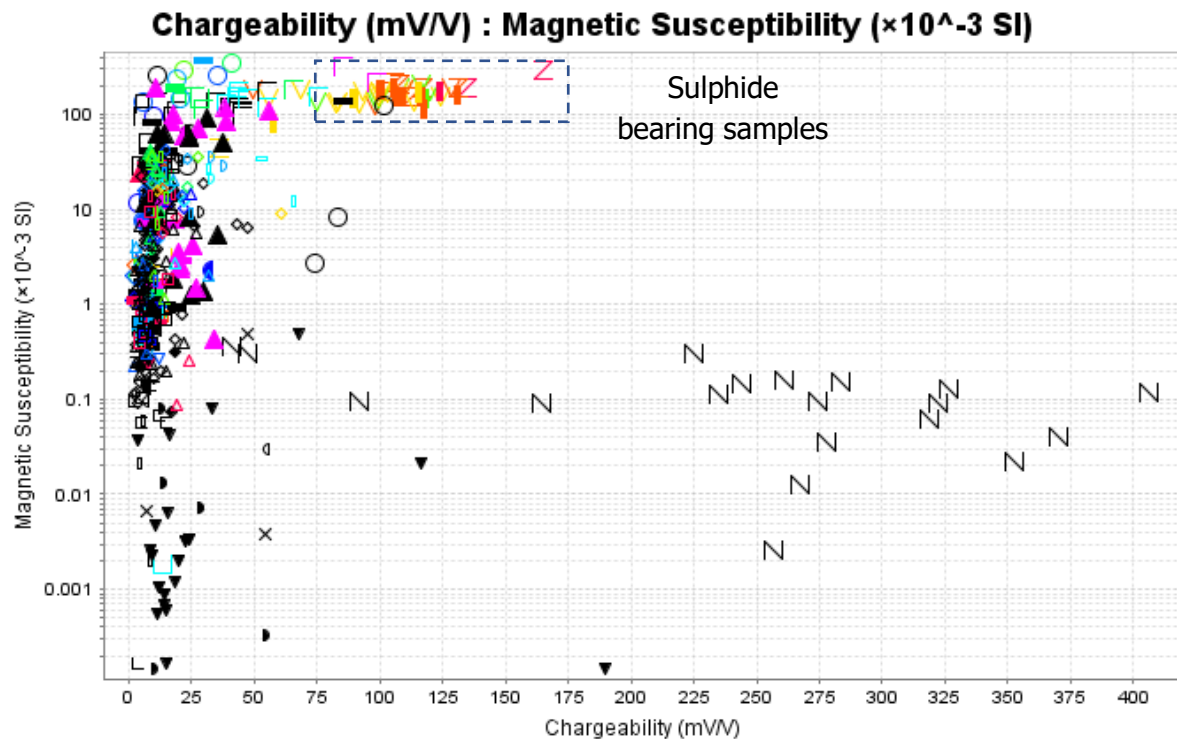


Figure 8. Cross-plot of chargeability against magnetic susceptibility.

A cross-plot of inductive conductivity and chargeability data is given in Figure 9. Only samples with a non-zero inductive conductivity value are included.

Chargeability of a material is dependent on 4 major factors: the degree of sulphide or metallic mineralisation, presence of clays, the pore-water salinity, and the overall tortuosity of the pore-space network within the rock. Both a high inductive conductivity and a high chargeability may be indicative of the presence of sulphides within the sample, although conductivity tends to better respond to massive (connected) sulphides, while chargeability responds better to disseminated (disconnected) sulphides.

Samples with a non-zero conductivity have values of <3.5 S/m which correspond to a range of chargeability values (2.30 to 370.10 mV/V). Much of the response can be attributed to weathering and alteration of cover samples.

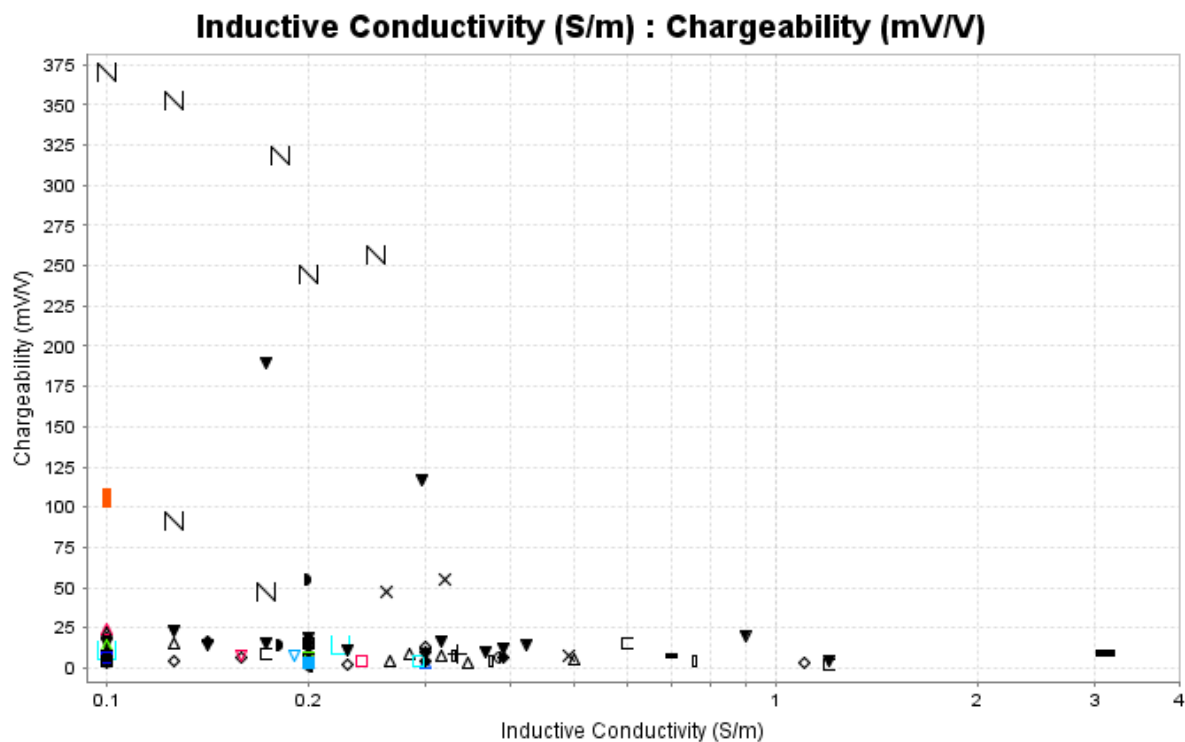
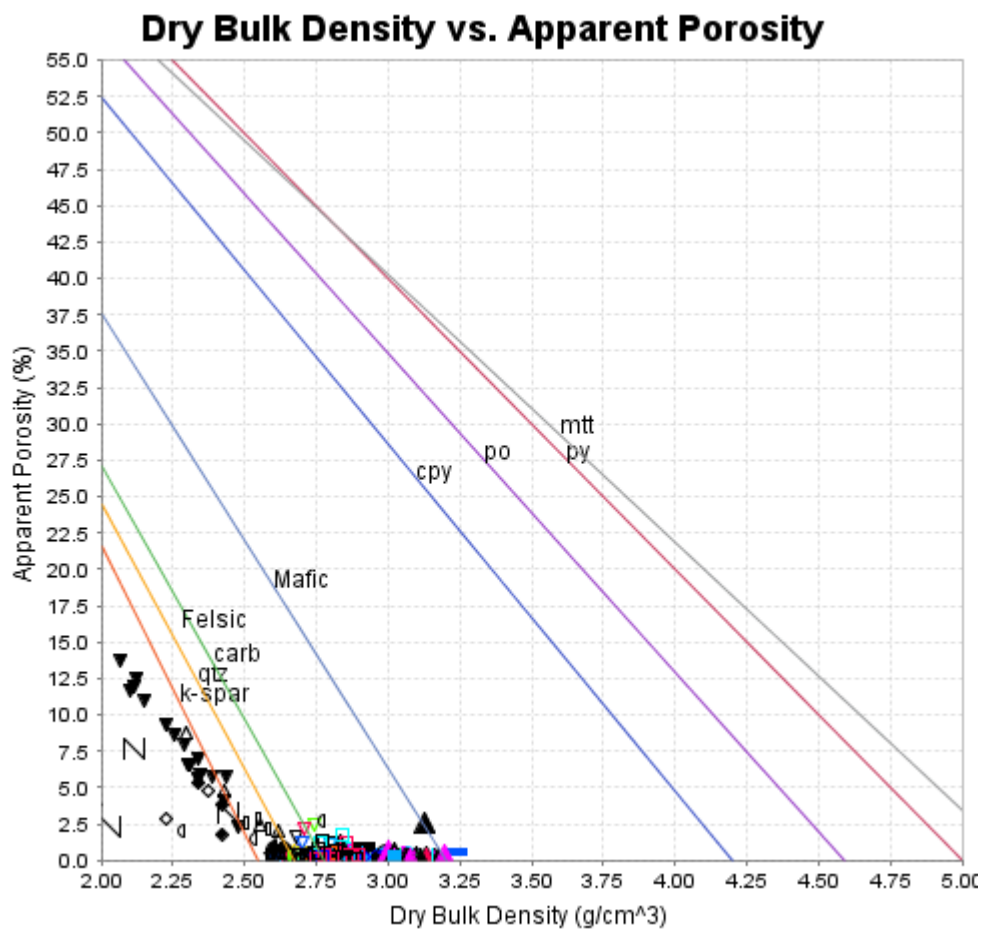


Figure 9. Cross-plot of inductive conductivity against chargeability.

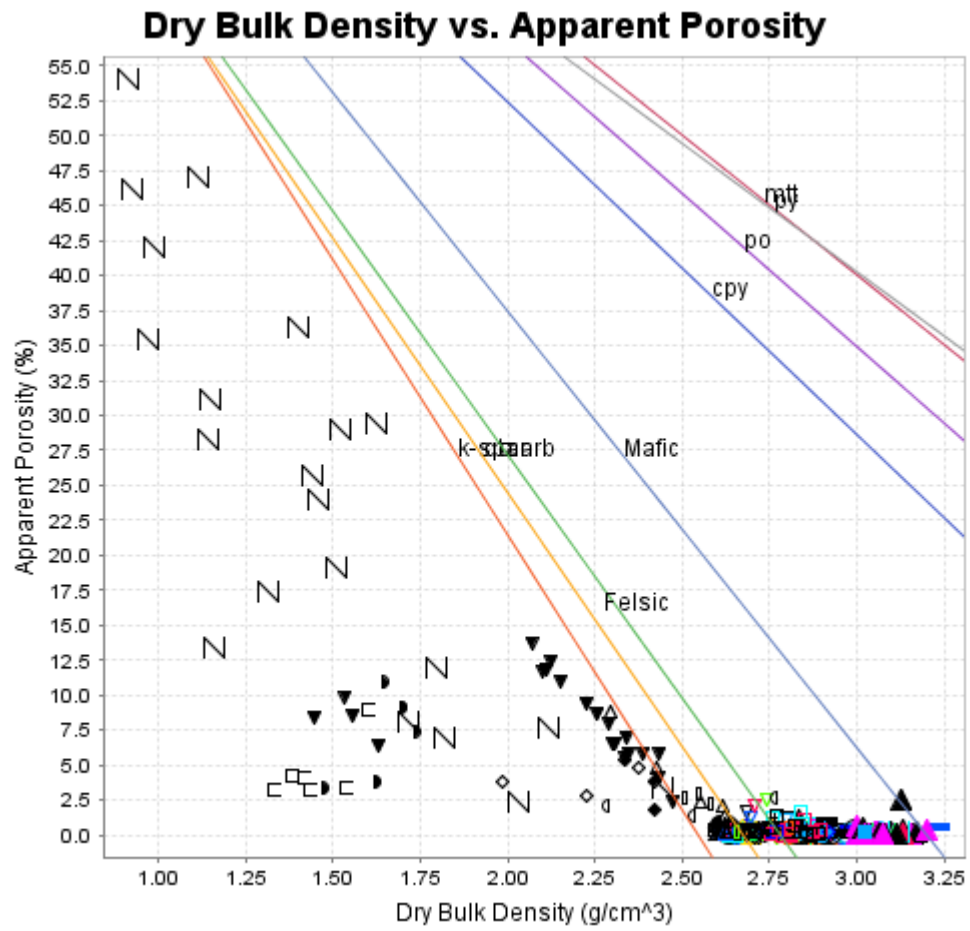
A cross-plot of dry bulk density and apparent porosity data against mineral trends (Emerson, 1997) is given in Figure 10.

Apparent porosity values for the project range up to 54% (Figure 10b). These extreme values are exclusive to cover weakly consolidated sands from the Hannah 1 drillhole. Other cover lithologies, such as clastic sediments, pelite and limestone, show porosity values <15%.

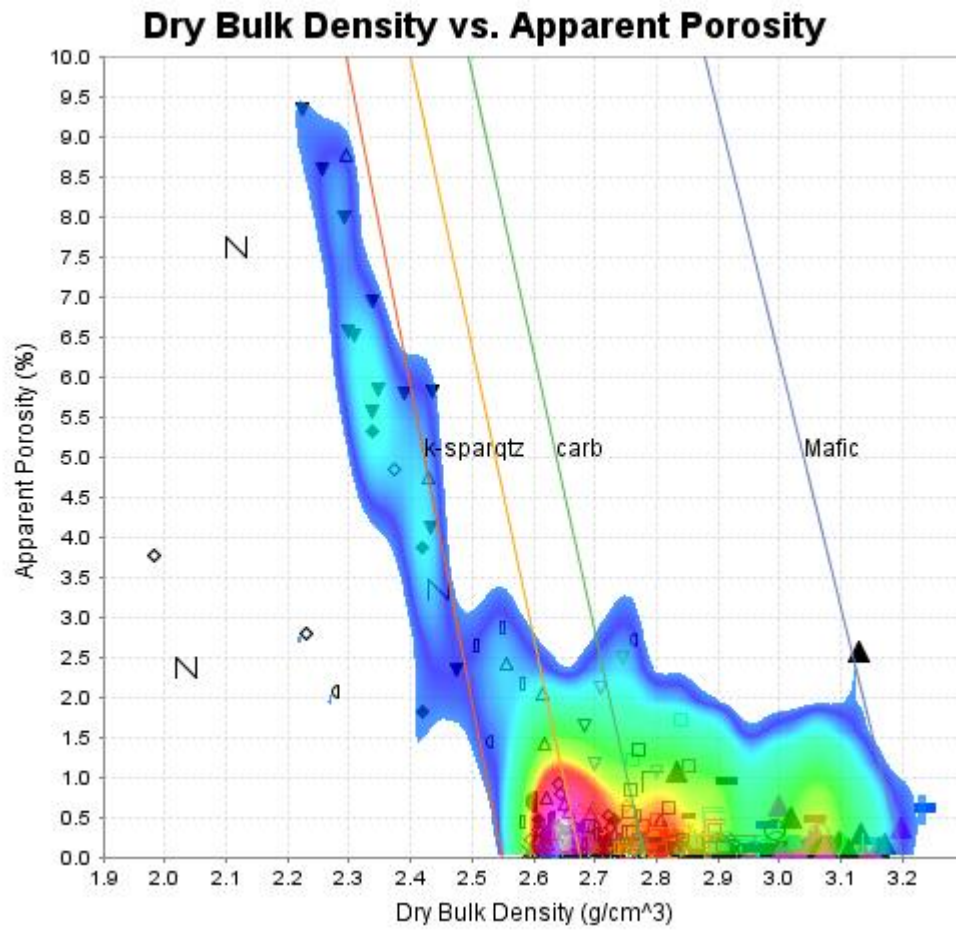
Most samples appear to be between the 'quartz' and 'mafic' mineral lines (Figure 10b) — though this may be reflective of alteration and weathering, rather than based purely on lithology. However, the significant cluster of samples plot around the 'quartz' mineral line and this is shown with a point density plot in Figure 10c.



a)



b)



c)

Figure 10. Cross-plot of dry bulk density against porosity; a) shows the full diagram, b) shows just the data range and c) shows samples of the crystalline basement only, overlain with a point density plot.

A cross-plot of dry bulk density and P-wave velocity data, with contours of acoustic impedance, is given in Figure 11. The separation between the contours represents the contrast required to produce a minimum reflection coefficient ($R=0.06$) detectable by the seismic reflection method. The more contours the data overlaps, the more likely the seismic reflection method is to map geological and/or lithological contrasts.

There is a high distribution of data (overlap of 8-9 contours) for this project and lithology groups fairly well in this plot. With consideration of cover affects, seismic reflection would be likely to detect differences in lithology.

P-wave velocity was unable to be measured on 64 samples due to insufficient sample length (<15 cm).

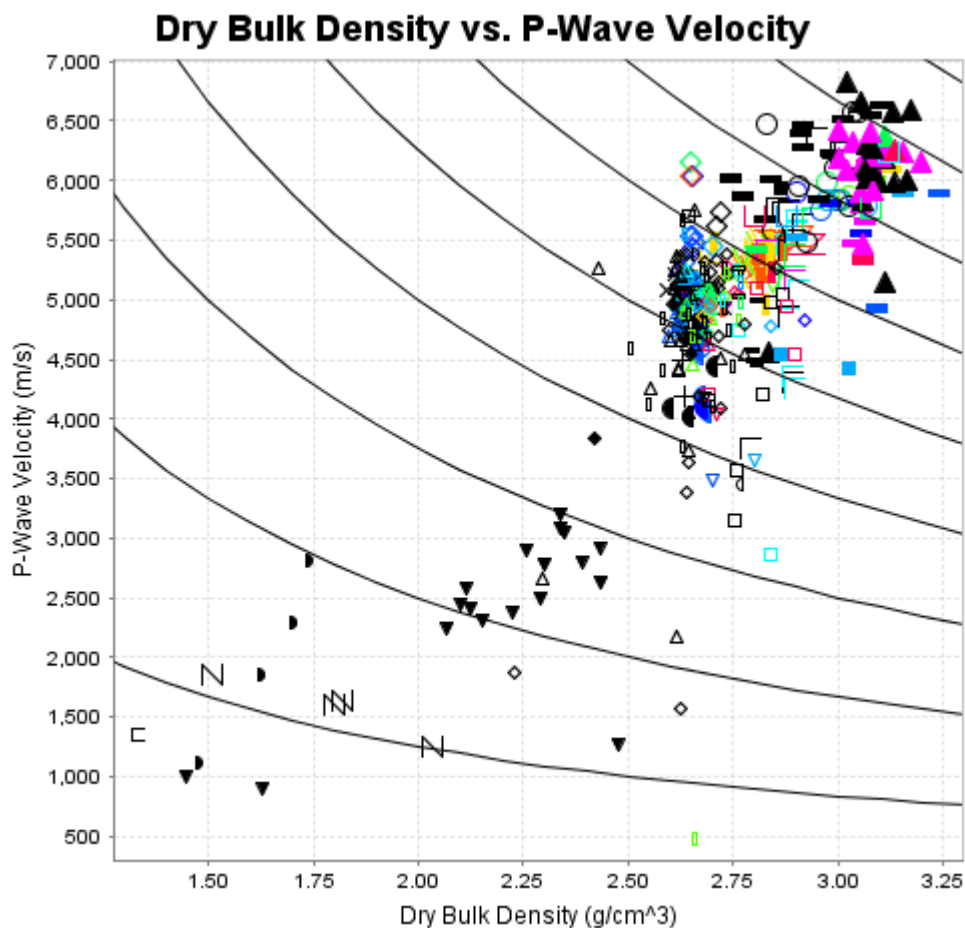
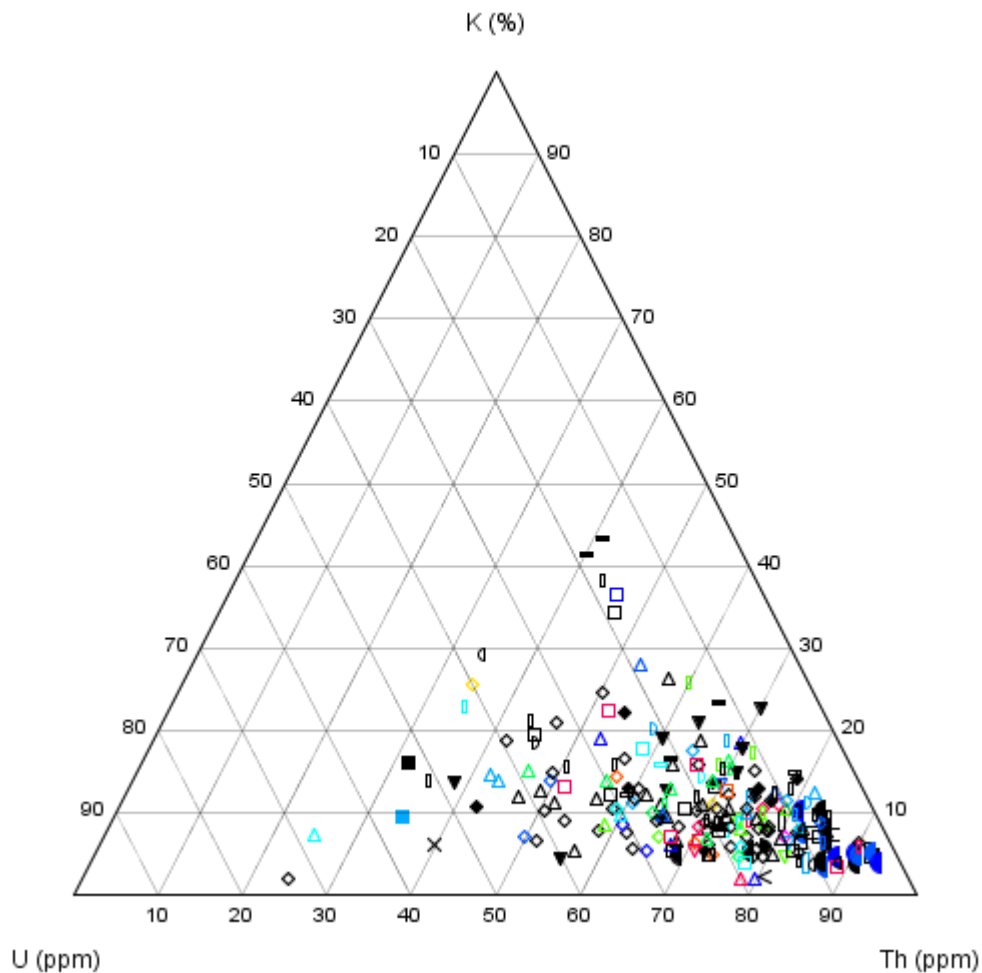


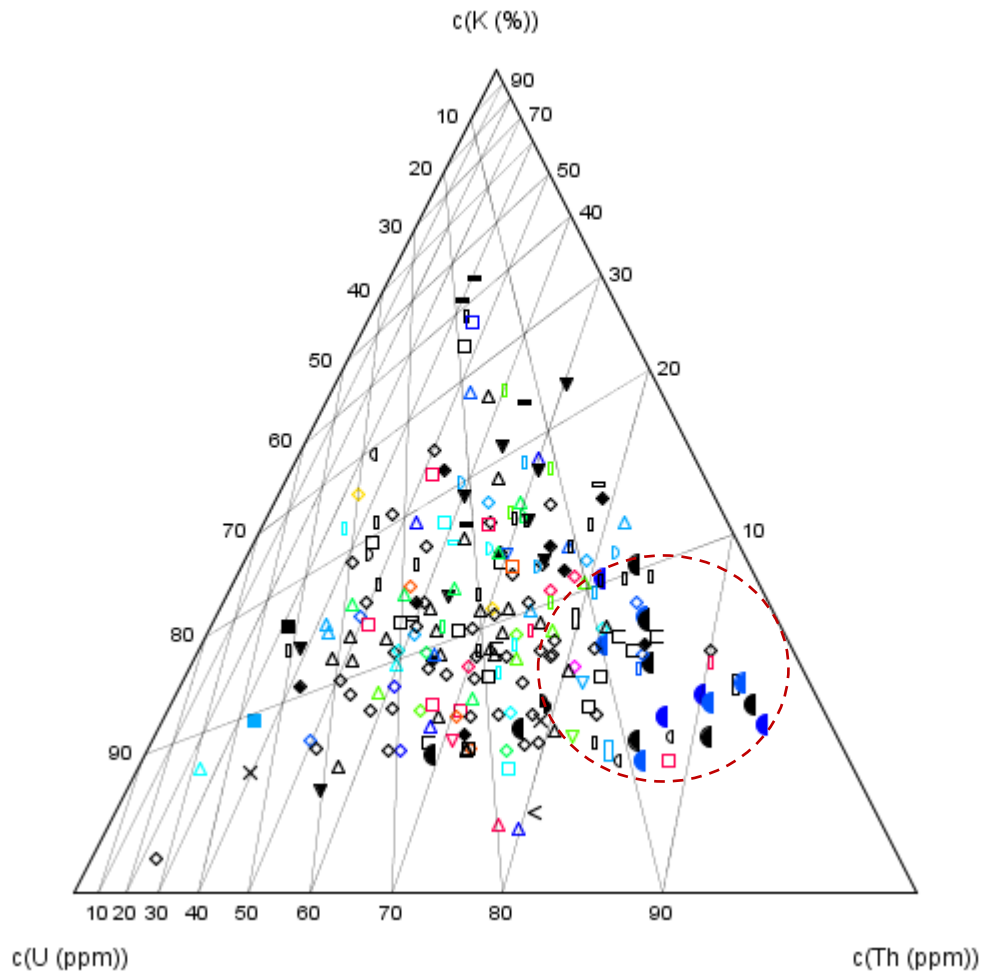
Figure 11. Cross-plot of dry bulk density against sonic (P-wave) velocity.

A ternary diagram of K, U and Th distributions is shown in Figure 12a- b. Spectral radiometric data is only given for select drillholes given the more recent implementation of this measurement. The median values are 4.47% K, 7.2ppm U and 26.2ppm Th. There is little variation across the provinces but the Madura province shows a higher Th median of 92.4ppm Th compared to 24ppm Th in the Coompana province.

Granodiorites from the Madura province are circled in red in Figure 12b and show higher Th content relative to U and K and other samples. Metagranites and metagranodiorites show a fairly even proportions of the three radioelements and pelites show low relative proportions of K%.



a)



b)

Figure 12. Ternary diagram of K%, U ppm and Th ppm; (a) shows a ternary plot and (b) shows a centred ternary plot.

The components of induced and remanent magnetism were measured for 225 samples. 142 samples are measured to be remanent-magnetisation dominant ($Q > 1$), with the remaining 83 samples being induced-magnetisation dominant ($Q < 1$).

A cross-plot of the intensity of the induced vs. remanent vectors (J_{ind} vs. J_{rem}) is given in Figure 13.

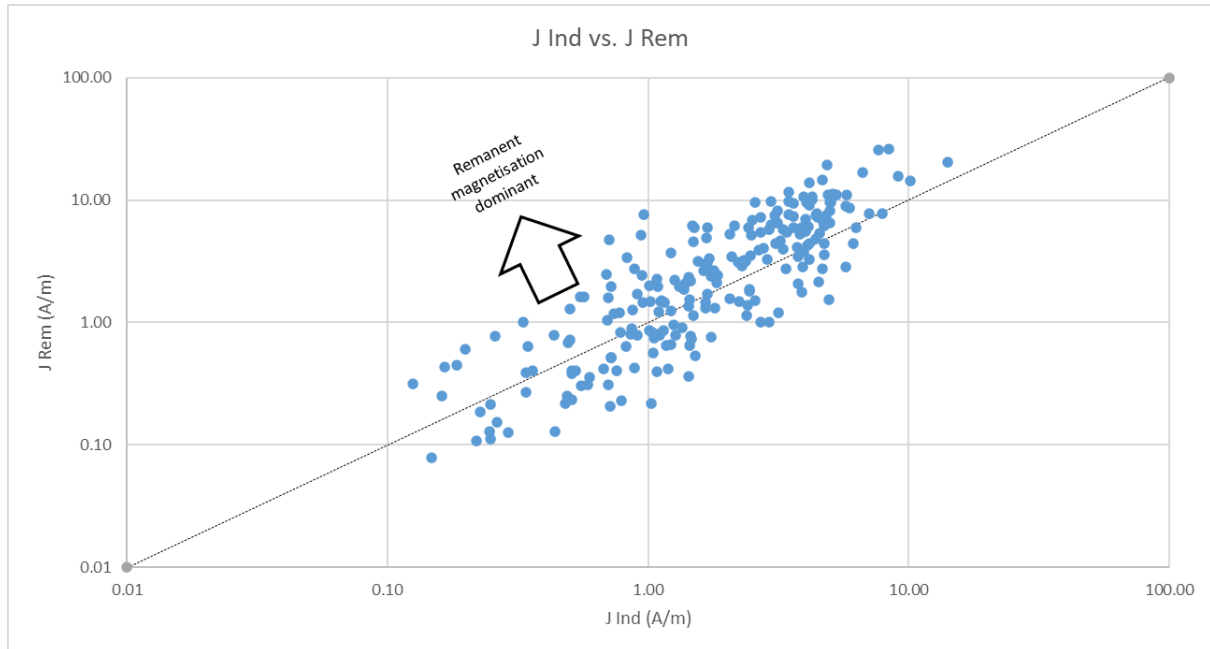


Figure 13. Cross-plot of intensity of J_{ind} versus J_{rem} . Samples above the trend line have Koenigsberger ratio (Q) greater than 1, indicating they are remanent-magnetisation dominant. Conversely, samples below the trend line have a Q value less than one, and are induced-magnetisation dominant.

A theoretical magnetic susceptibility value has been calculated from the J_{ind} vector intensity and is compared with the measured magnetic susceptibility via a cross-plot (Figure 14).

Most samples tend to show equivalence with greater deviation from the trendline almost exclusive to remanent magnetisation dominant samples. Variation between the two values is expected. Samples with higher orders of magnitude differences between measured magnetic susceptibility and the calculated value may be attributed to remanent dominance and the associated cancellation of induced magnetisation. This is particularly observed in remanent magnetisation dominant samples with high pyrrhotite content.

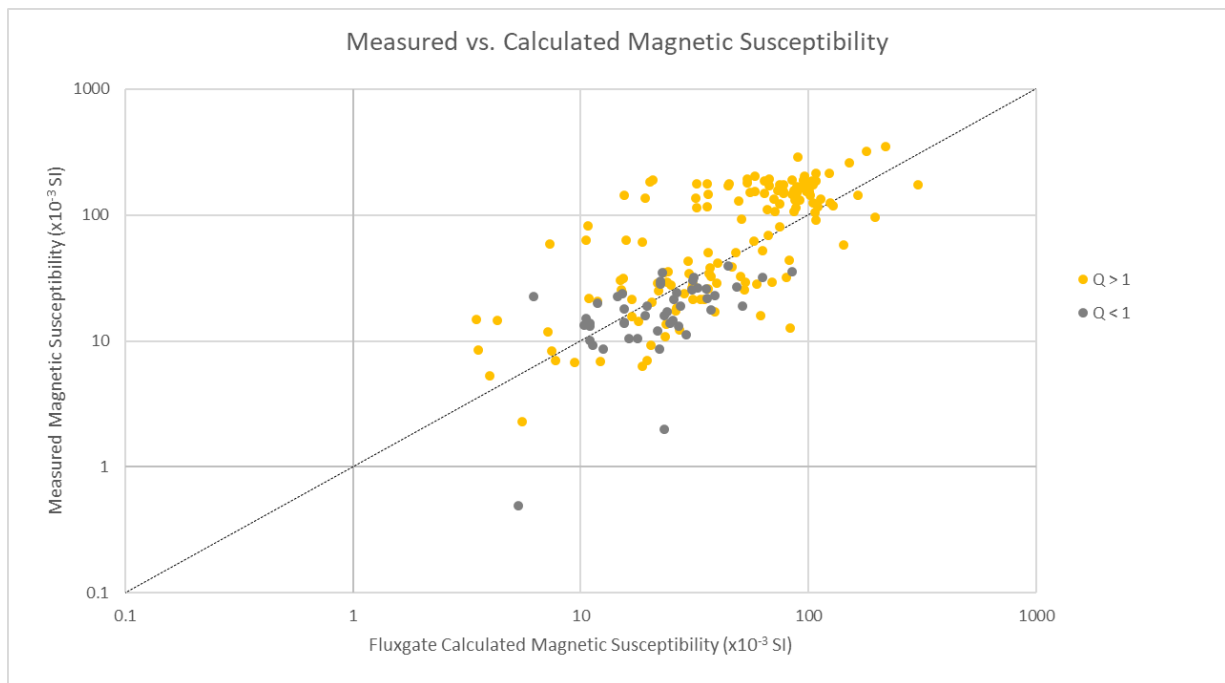


Figure 14. Logarithmic plot of magnetic susceptibility derived from fluxgate against measured magnetic susceptibility.

4. SUMMARY

A summary of statistics related to the petrophysical properties of samples from the Coompana and Madura provinces is given below;

1. Coompana province:

- Magnetic susceptibility ranges between 0.001 and $68 (\times 10^{-3})$ SI
- DBD ranges between 1.33 and 3.02 g/cm^3
- Galvanic resistivity ranges between 8.36 and $\sim 3\,000\,000 \text{ } \Omega\text{m}$
- Chargeability ranges between 2.3 and 189 mV/V
- Inductive conductivity ranges between 0.1 and 1.2 S/m
- Apparent porosity ranges between 0.01 and 13.7% and acoustic impedance ranges between 1285 and $16\,999 (\text{g/cm}^3) \cdot (\text{m/s})$
- Radioelement concentrations range between below detection to 10.88% K, 245ppm U and 140 ppm Th

2. Madura province:

- Magnetic susceptibility ranges between 0.001 and $372 (\times 10^{-3})$ SI
- DBD ranges between 0.91 and 3.23 g/cm^3
- Galvanic resistivity ranges between 2.78 and $\sim 4\,000\,000 \text{ } \Omega\text{m}$
- Chargeability ranges between 2.24 and 406 mV/V
- Inductive conductivity ranges between 0.1 and 3.11 S/m
- Apparent porosity ranges between 0.01 and 54% and acoustic impedance ranges between 2541 and $20\,901 (\text{g/cm}^3) \cdot (\text{m/s})$
- Radioelement concentrations range between below detection to 7.30% K, 19ppm U and 139ppm Th

5. REFERENCES

Emerson, D.W., 1990, Notes on Mass Properties of Rocks – Density, Porosity, Permeability. *Exploration Geophysics*, 21, 209-216

Emerson, D.W., and Yang, Y.P. 1997, Insights from laboratory mass property Cross-plots. *ASEG Preview*, 70, 10-14.

APPENDIX 1 – DATA TABLES

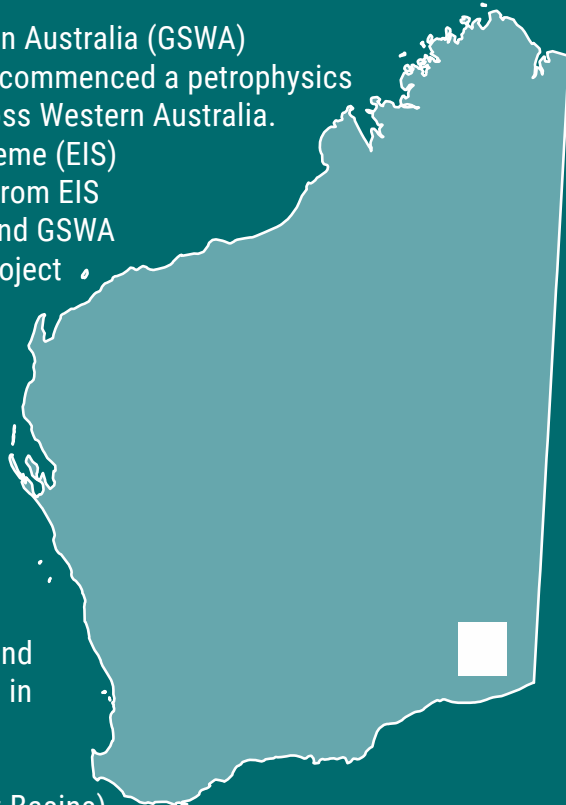
Please see attached document 'APPENDIX 1 – DATA TABLES'.

APPENDIX 2 – SAMPLE PHOTOS

Please see attached document 'APPENDIX 2 – SAMPLE PHOTOS'.

C Mortimore and B Bourne

In 2020, the Geological Survey of Western Australia (GSWA) in collaboration with Terra Petrophysics commenced a petrophysics project to sample diamond drillcore across Western Australia. Funded by the Exploration Incentive Scheme (EIS) petrophysical data have been collected from EIS co-funded drillcore, company drillcore, and GSWA stratigraphic drillcore. The aim of this project is to provide petrophysical datasets that can be used to assist with the planning and interpretation of geophysical data, including characterizing the physical property response of stratigraphic units, alteration and mineralization styles, and constraining geophysical models of the subsurface. This Report provides a dataset of petrophysical analyses on 484 samples from 10 diamond holes located across the Nullarbor Plain, in the far southeast of Western Australia. The drillholes penetrate Cenozoic sedimentary sequences (Eucla and Bight Basins) and basement rocks of the Paleoproterozoic to Mesoproterozoic Madura and Coompana Provinces.



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First Floor Counter
Department of Mines, Industry Regulation and Safety
100 Plain Street
EAST PERTH WESTERN AUSTRALIA 6004
Phone: +61 8 9222 3459 Email: publications@dmirs.wa.gov.au
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