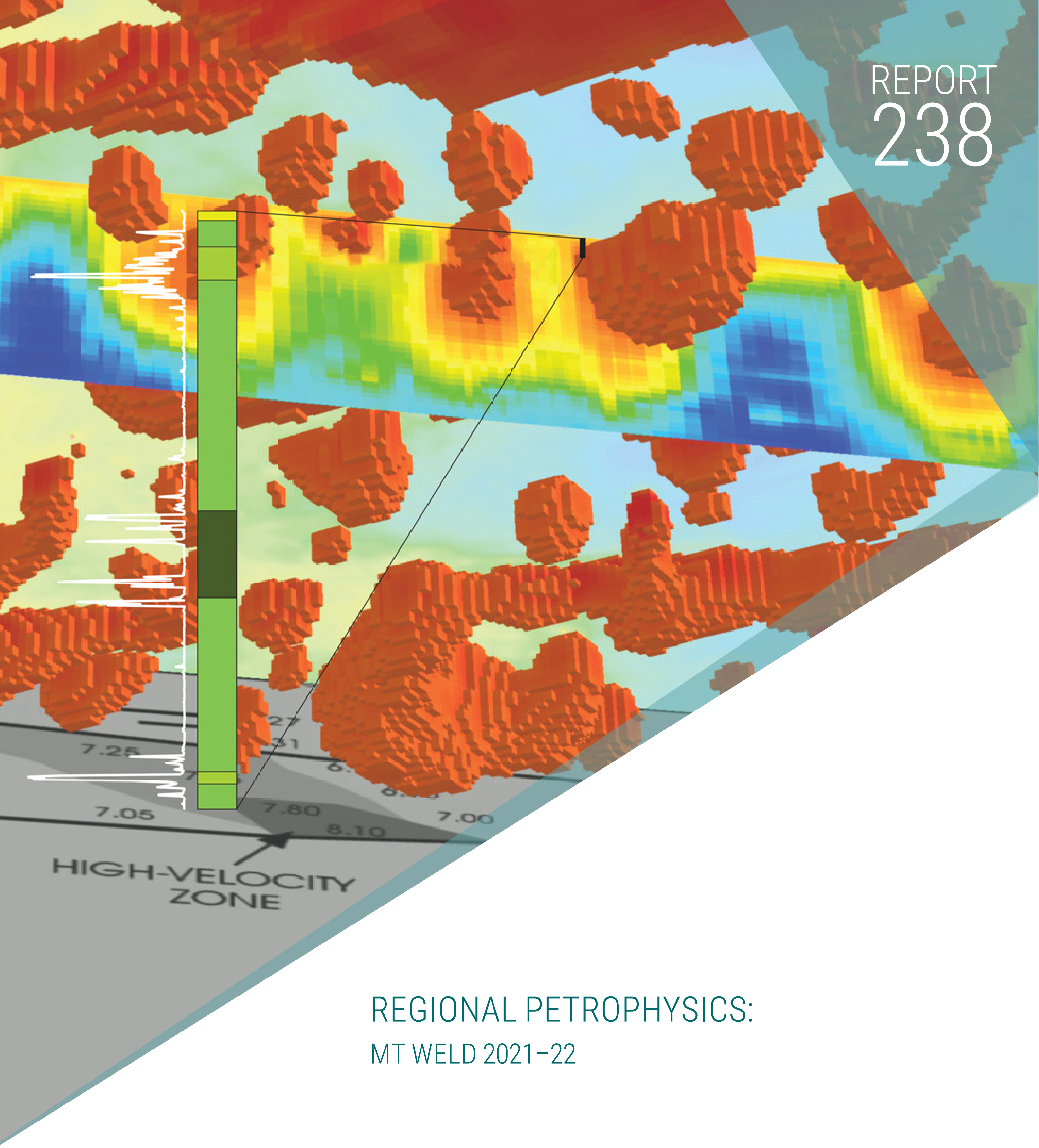

REPORT
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REGIONAL PETROPHYSICS:
MT WELD 2021–22

J Trunfull, B Bourne and C Mortimore

Government of **Western Australia**
Department of **Mines, Industry Regulation and Safety**

Geological Survey of Western Australia

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REPORT 238

REGIONAL PETROPHYSICS: MT WELD 2021–22

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Geological Survey of Western Australia

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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 a dataset of high-quality petrophysical measurements that assists 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 have been collected from EIS co-funded drillcore, company drillcore, and GSWA stratigraphic drillcore. All cores sampled for petrophysics have HyLogger data (or will have) and most have open-file company assay data, available from the Mineral Exploration reports database (WAMEX).

In 2021–22, a suite of eight petrophysical measurements were made on drillcore samples from the Paterson Orogen (n = 940), Mt Weld (n = 86), Fraser Zone in the Albany–Fraser Orogen (n = 370), Kalgoorlie Terrane (n = 337), southwest Yilgarn Craton (n = 174) and Eucla basement (n = 42). For all of these datasets, GSWA provides a datasheet (with petrophysical measurements, lithological information and supplementary material), a photo of each sample and a description of the methods. For the Paterson Orogen, Mt Weld and Fraser Zone datasets, Terra have also produced a report with an analysis of the data. All of these datasets, including the reports are also available in MAGIX.

The drillhole report compiled as a requirement for the co-funded drilling is available in WAMEX, report number A129908.

This Report contains the petrophysical data and Terra report produced for the Mt Weld 2021–22 drillcore samples (Figs 1, 2; Table 1).

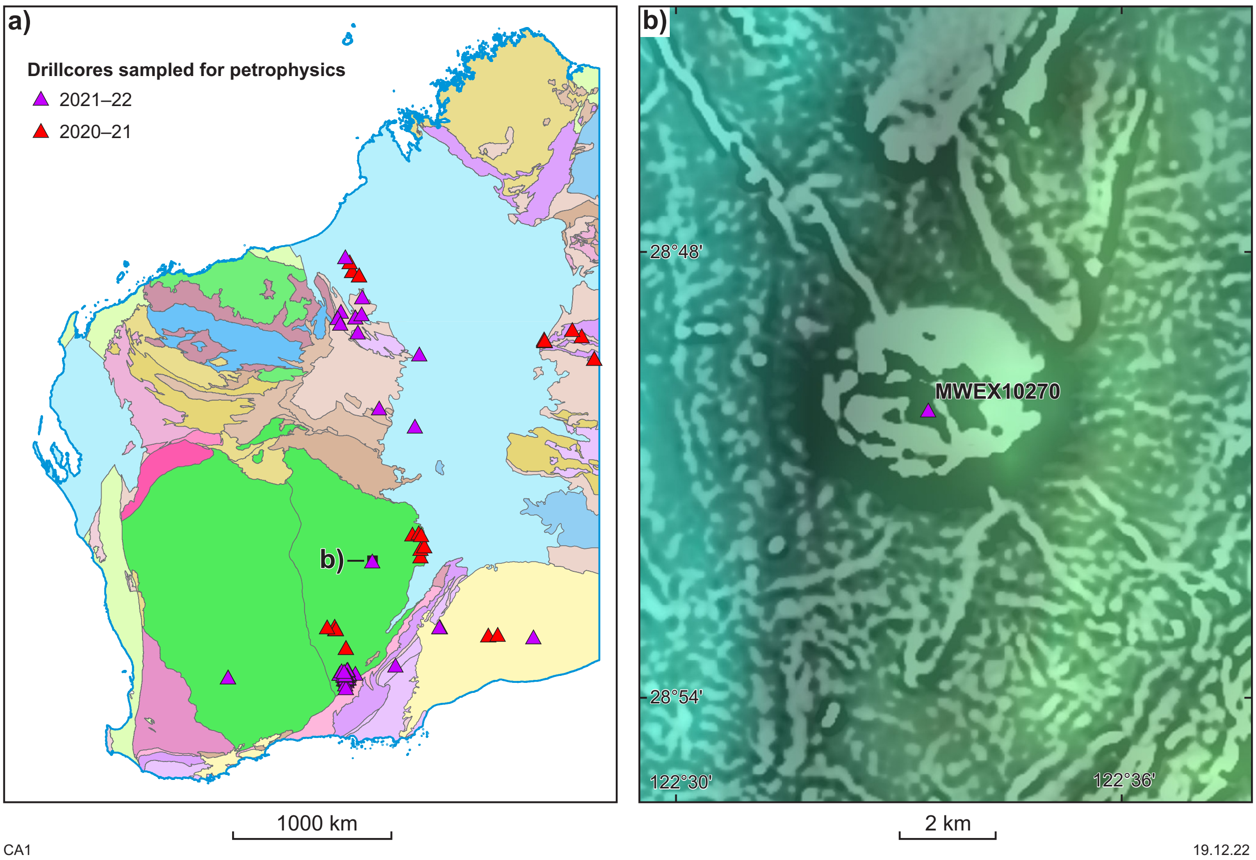

Figure 1. Drillcores sampled for petrophysics: a) statewide drillcores sampled from 2020–22, shown on tectonic units map (2021); b) Mt Weld drillcore shown on Bouguer gravity data (colour) draped with 1VD total magnetic intensity data (grey scale)

Table 1. Mt Weld drillcore sampled for petrophysics in 2021–22

Drillhole	*Datum*	*UTM Zone*	*Easting*	*Northing*	*Azimuth (degrees)*	*Dip (degrees)*	*Depth (m)*		*Source of core*
MWEX10270	GDA94	51	455829	6807118	270	−55	999.9	86	EIS

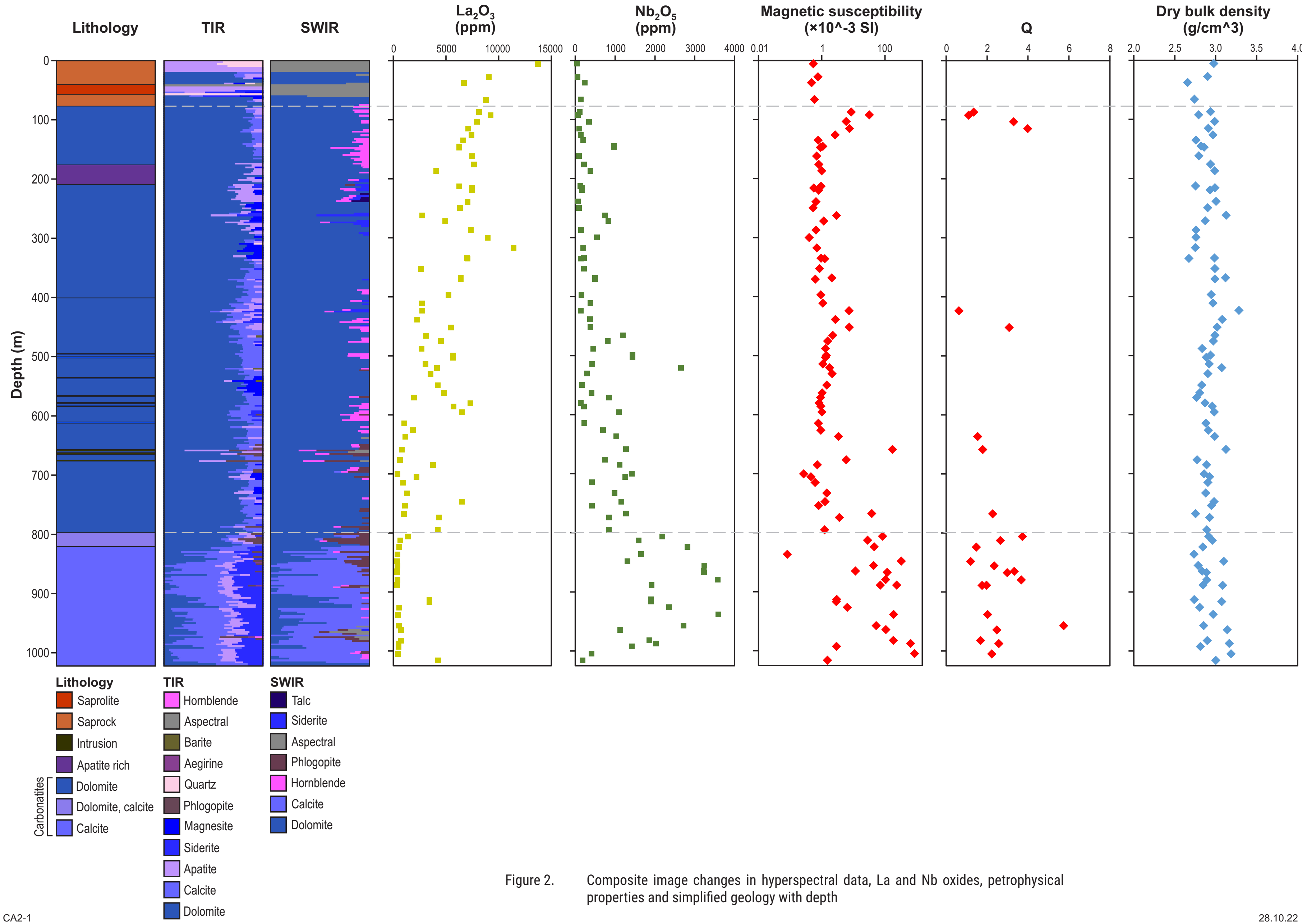

Figure 2. Composite image changes in hyperspectral data, La and Nb oxides, petrophysical properties and simplified geology with depth

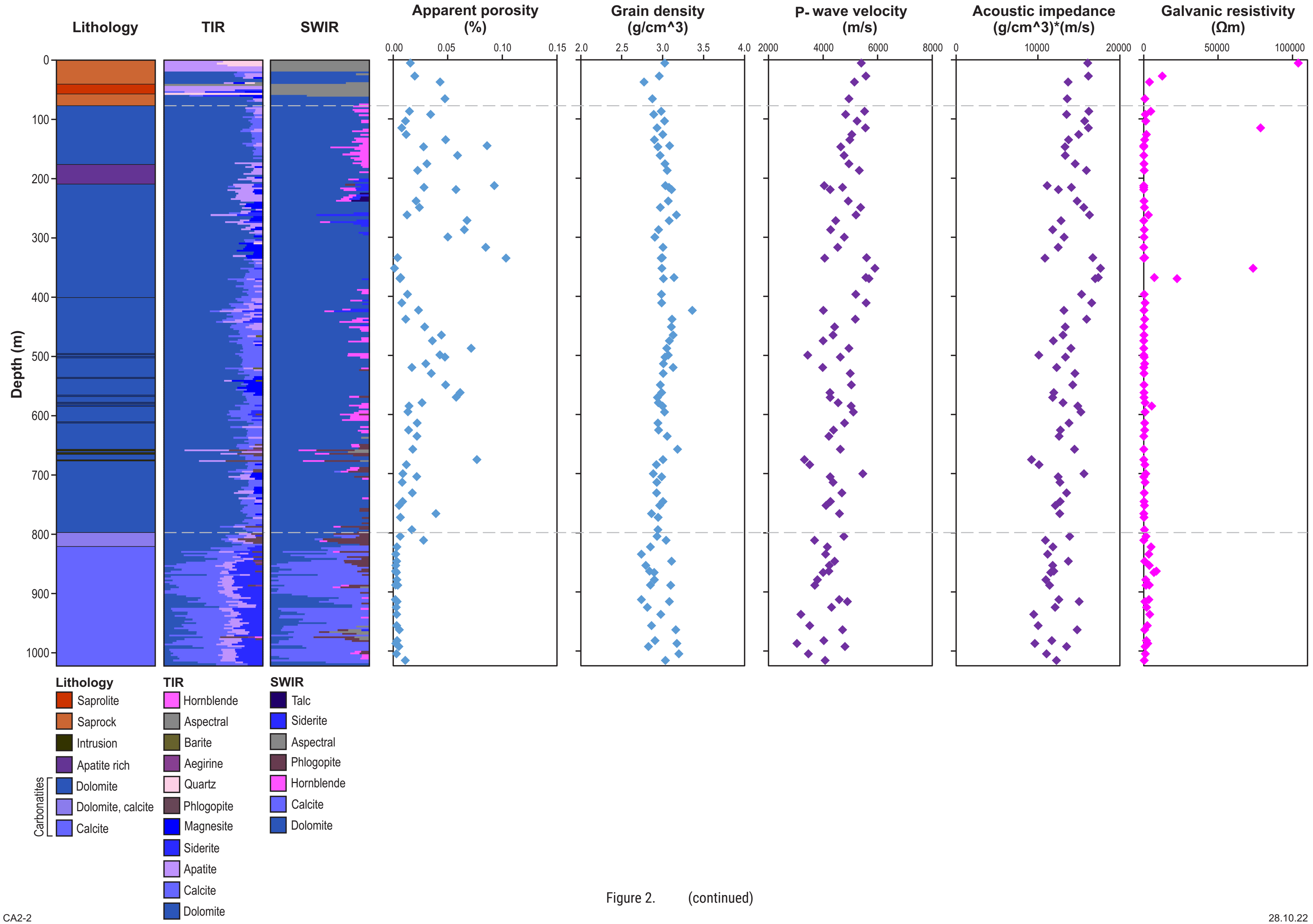

Figure 2. (continued)

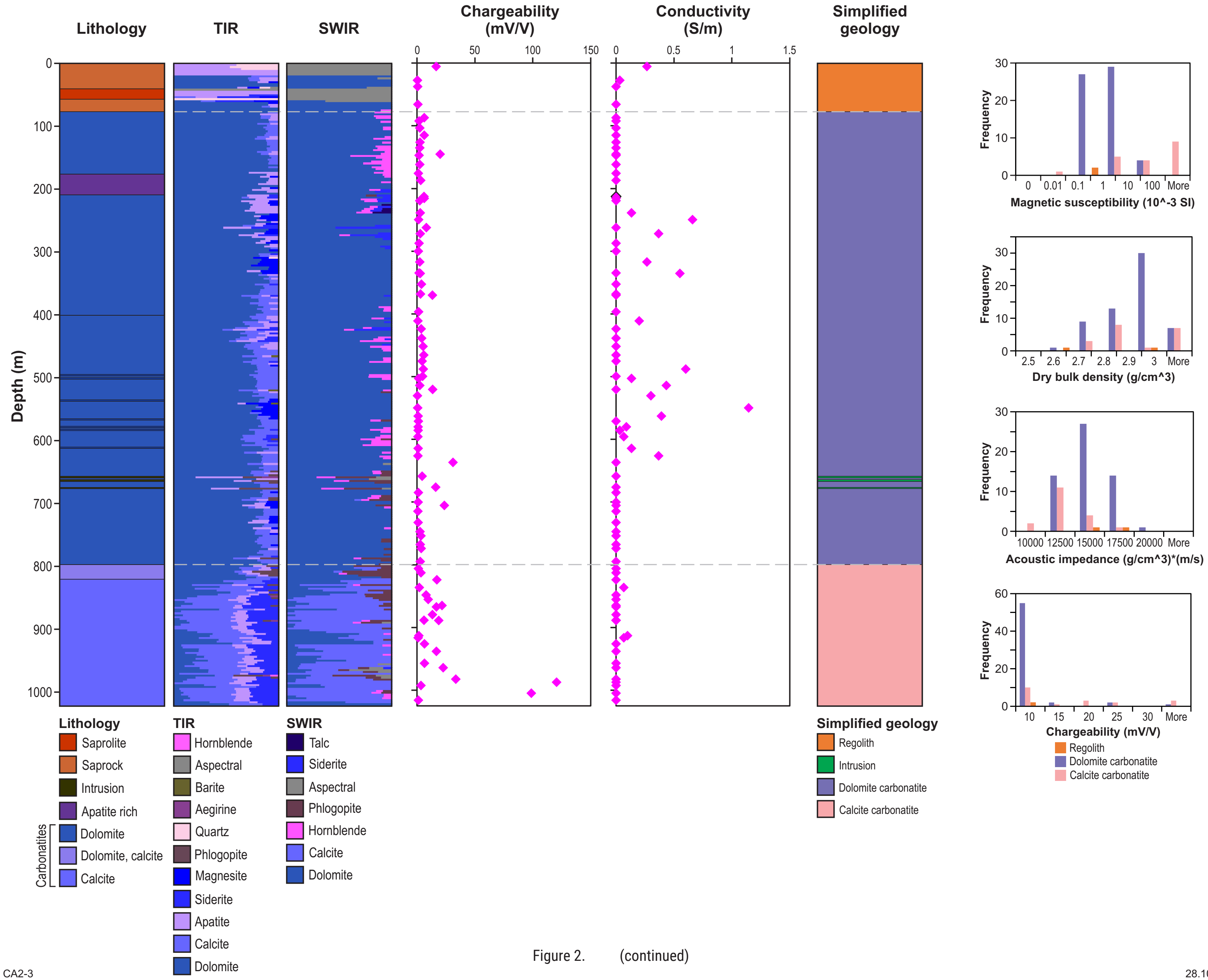

Figure 2. (continued)

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GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

MOUNT WELD PROJECT

LAVERTON, WESTERN AUSTRALIA

TECHNICAL REPORT NO. 21_041

GDA94 / MGA Zone 51

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Claire Mortimore
Geoscientist
May 2022

TERRA PETROPHYSICS

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1. INTRODUCTION

Terra Petrophysics have performed petrophysical analysis of 86 (drill core) rock samples for the Geological survey of Western Australia from their Mount Weld Project. These samples have been provided by GSWA in a joint initiative with Terra Petrophysics 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

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 provides 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/cm^3). 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 (×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 × 10^{-3} SI) the magnetic remanence can be measured. The measurement of remanence (Jr) 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 = 40-50 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.

3. RESULTS

A total of 86 samples have undergone petrophysical analysis, the results table for which is included as Appendix 1. Each sample is assigned a Terra ID and photographs of the samples have been included in Appendix 2. Raw data for the induced polarization and galvanic resistivity measurements are included in the attached spreadsheet. Various plots of petrophysical data are given in Figure 2 to Figure 15.

A legend corresponding to Figure 2 to Figure 13 is given in Figure 1. The data points are represented using three categories:

- Colour; which represents Nb_2O_5 content.
- Symbol size; which represents La_2O_3 content.
- Symbol shape, which represents lithology.

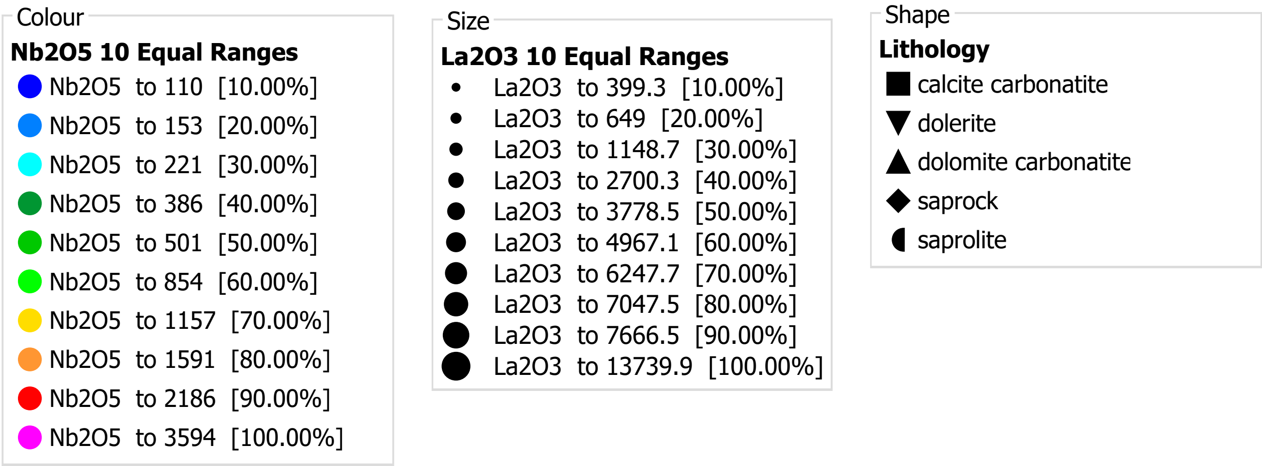


Figure 1. Legend corresponding to Figure 2 and Figure 5 to Figure 15

A cross-plot of magnetic susceptibility and dry bulk density (DBD) values is given in Figure 2. Magnetic susceptibility values in this dataset range from 0.082 to 863 (× 10^{-3}) SI, and DBD values range from 2.65 to 3.29 g/cm^3. Overall, there is a positive linear association between the variables (correlation coefficient r= 0.41). This could be a function of increasing magnetite and/or pyrrhotite content.

A summary of observations for the major lithology groups in Figure 2 is given below:

- There is a notable positive correlation between magnetic susceptibility and dry bulk density for calcite carbonatites (r= 0.71) which is shown in Figure 2 with a trendline. DBD values range between 2.7 and 3.2 g/cm^3. Magnetic susceptibility values in this group range between 0.08 and 862 (× 10^{-3} SI) but have an average of 150 × 10^{-3} SI. Calcite carbonatites are associated with lower La_2O_3 and higher Nb_2O_5.
- Dolomite carbonatites show magnetic susceptibility values ranging between 0.26 and 83.3 × 10^{-3} SI and dry bulk density ranges from 2.67 and up to 3.28 g/cm^3. Dolomite carbonatites are associated with comparatively lower Nb_2O_5 content and higher La_2O_3 content.
- Saprocks and saprolites show DBD values between 2.65 and 2.98 g/cm^3 and magnetic susceptibility values between 0.47 and 0.76 × 10^{-3} SI. La_2O_3 content is high in these samples (>70th percentile).

Emerson and Yang (1997) show that magnetic mineral content can be estimated from magnetic susceptibility by using a simple transform (Figure 3). Sample 22TR0440 (calcite carbonatite with minor magnetite and monazite) has the highest magnetic susceptibility of 863 × 10^{-3} SI and, from Figure 3, can be estimated to contain 20% magnetite.

Emerson (1990) has summarised DBD values for common lithologies (Figure 4), which is compared to the data collected in this project. Dry bulk density for this dataset is considered moderate-high. Sample 22TR0388 (dolomite carbonatite with trace monazite), has the highest DBD of 3.29 g/cm^3 and a corresponding magnetic susceptibility of 7.28 × 10^{-3} SI. This correlates with Nb_2O_5 and La_2O_3 concentrations of 141 ppm and 2732 ppm, respectively.

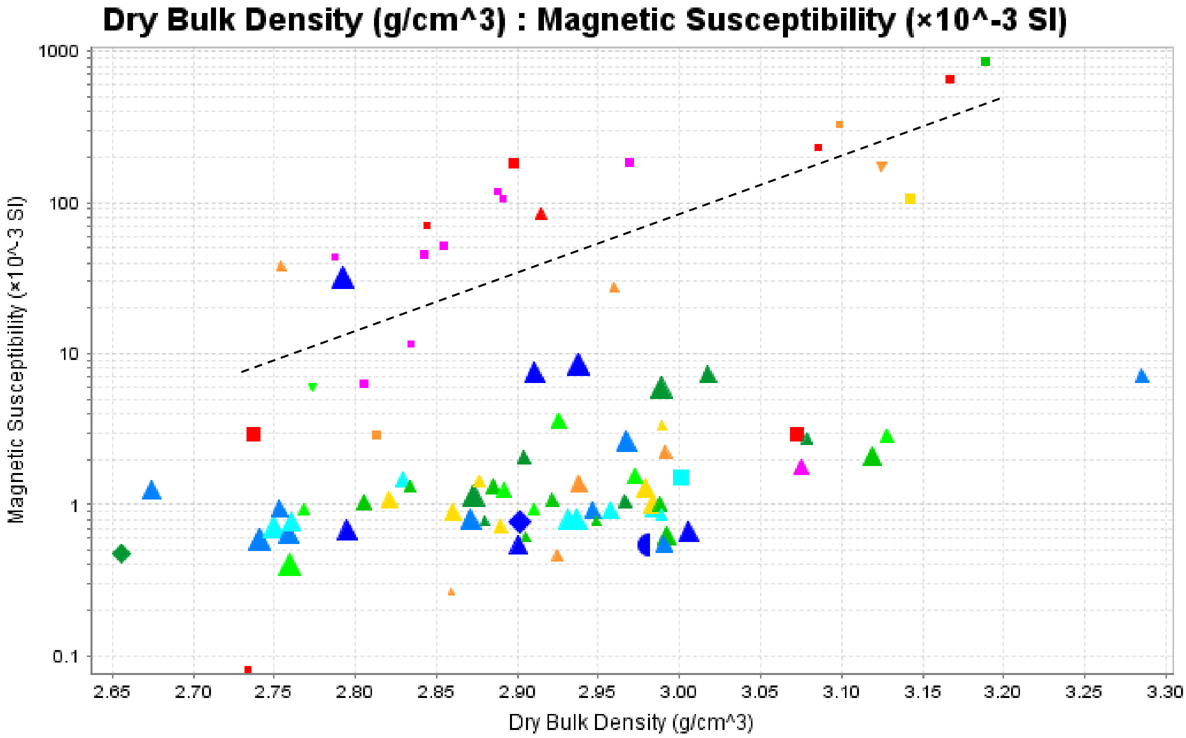


Figure 2. Cross-plot of dry bulk density against magnetic susceptibility.

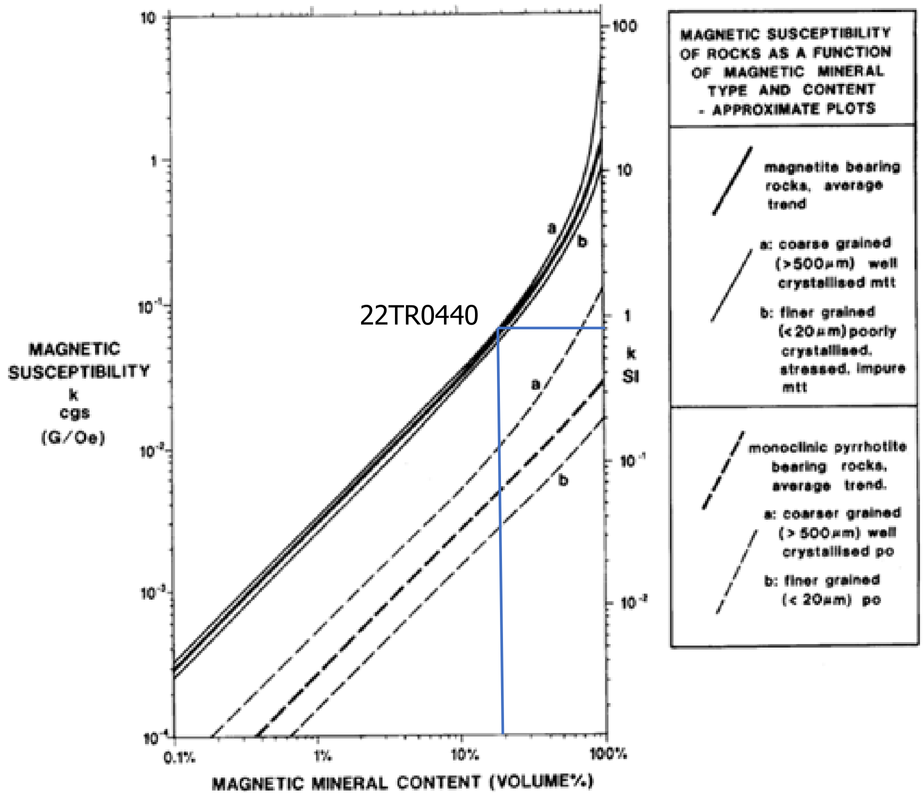


Figure 3. Theoretical magnetic mineral content (magnetite – solid lines; pyrrhotite – dashed lines) as a function of measured magnetic susceptibility (Emerson, 1997)

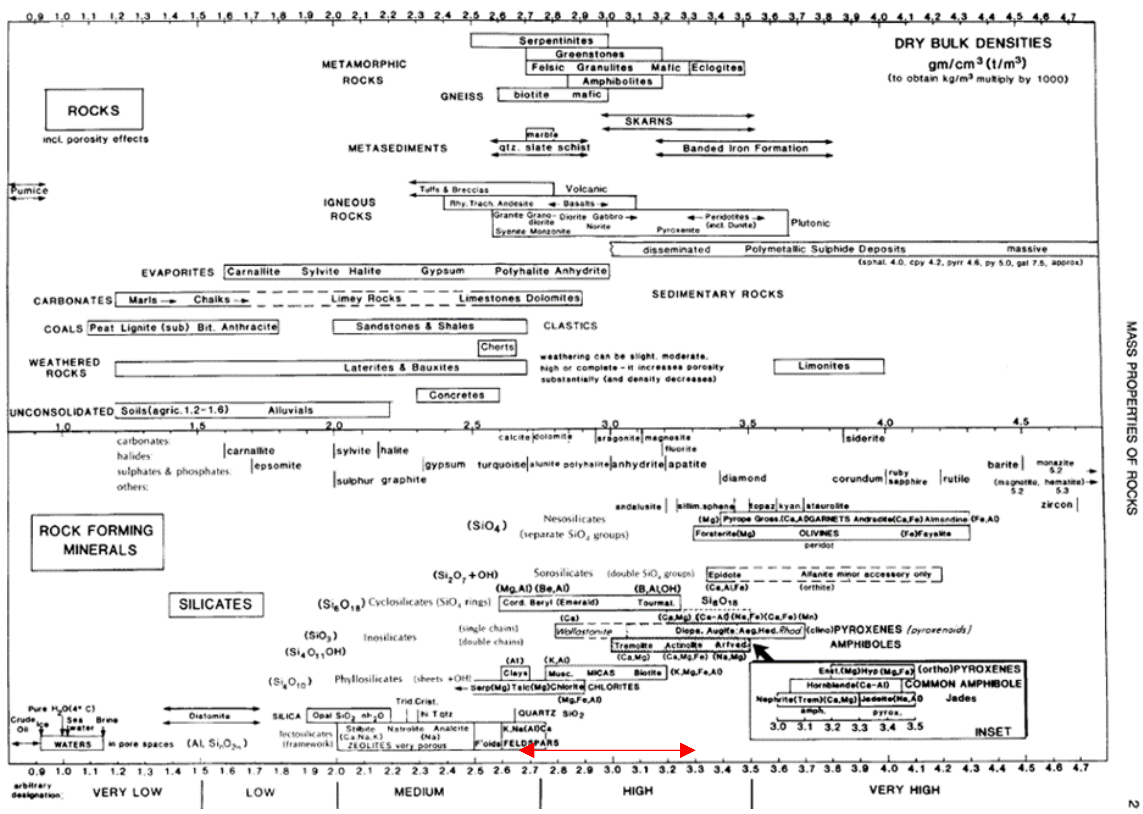


Figure 4. Dry bulk density ranges for common rock types (Emerson, 1990)

A cross-plot of galvanic resistivity data and dry bulk density data is given in Figure 5. Galvanic resistivity for this data set ranges from 12 and up to >100,000 Ωm.

Sample 22TR0358 (saprock) has the lowest DBD value of the dataset at 2.65 g/cm^3, which is likely a reflection of weathering. Sample 22TR0356 (goethite altered saprolite) has the highest galvanic resistivity value of 104, 000 Ωm. Although this sample is classified as saprolite, it does not appear to be extensively weathered.

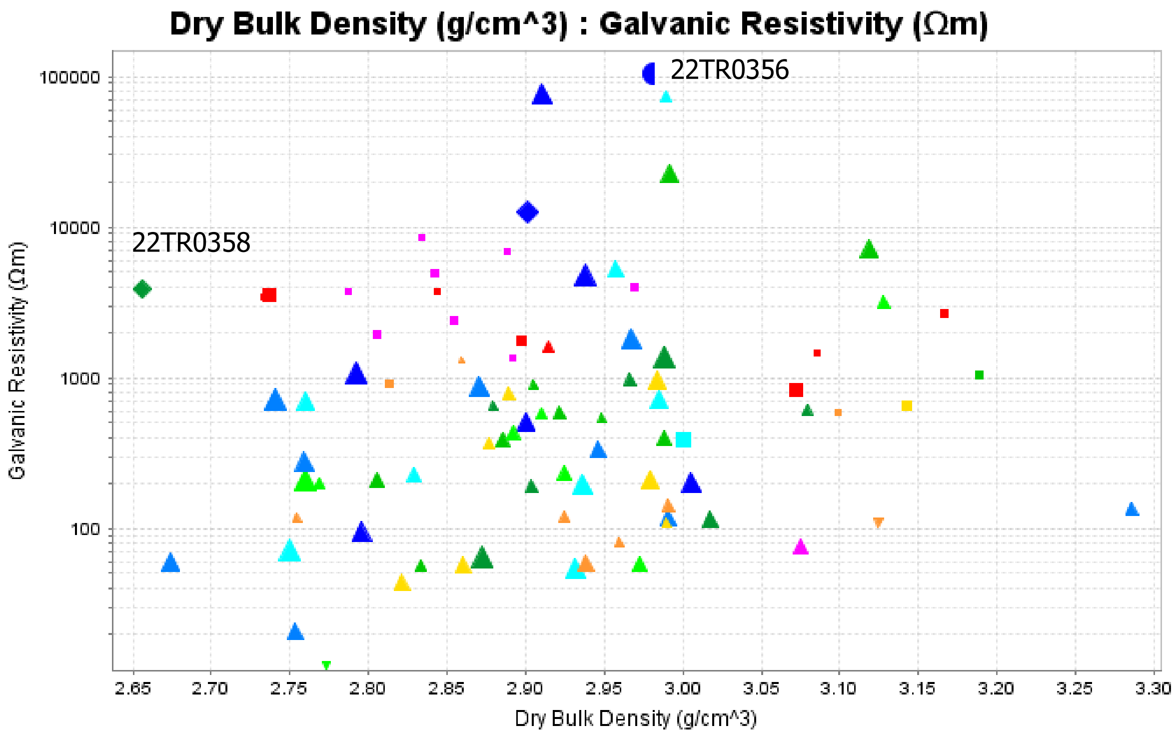


Figure 5. Cross-plot of dry bulk density against resistivity.

Magnetic susceptibility is plotted against galvanic resistivity in Figure 6, and magnetic susceptibility values for the dominant lithology groups are as follows:

- Calcite carbonatite: 0.08 to 862.97 ($\times10^{-3}$) SI.
- Dolomite carbonatite: 0.26 to 83.35 ($\times10^{-3}$) SI.
- Saprolite/ saprock: 0.47 to 0.76 ($\times10^{-3}$) SI.

Magnetic susceptibility corresponds with a wide range of galvanic resistivity values.

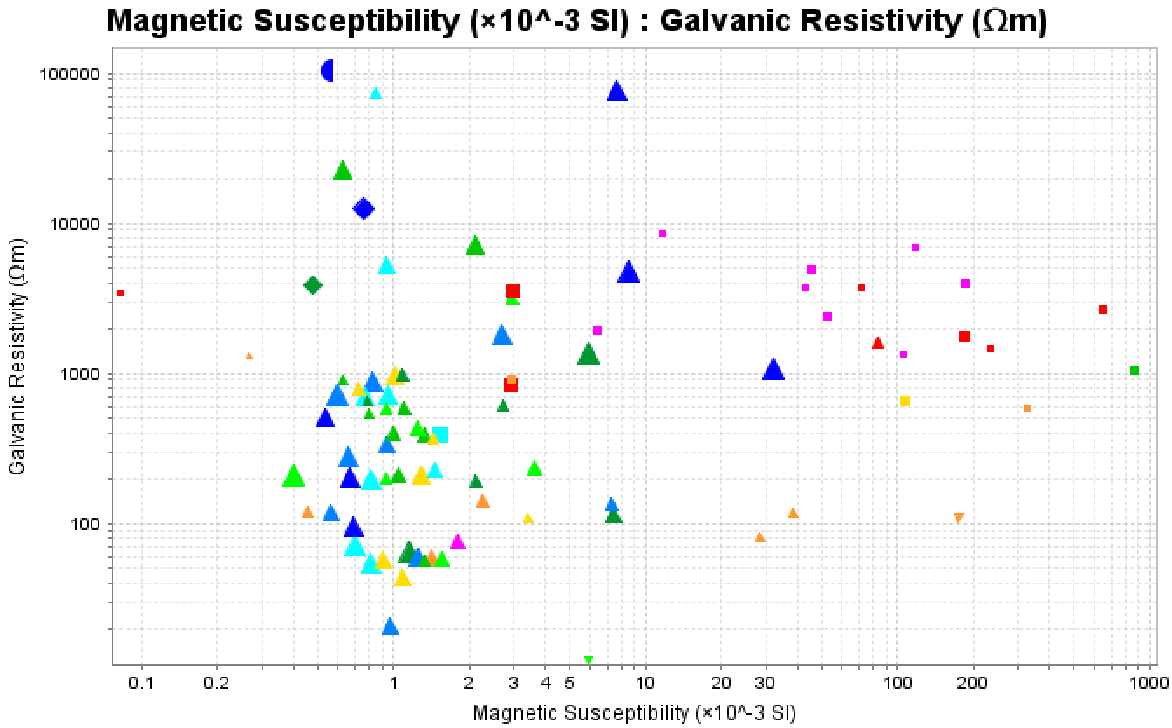


Figure 6. Cross-plot of magnetic susceptibility against resistivity.

Magnetic susceptibility values from drillhole MWEX10270 are plotted against depth in Figure 7. High magnetic susceptibility is associated with the calcite carbonatite group at depths >800m. Nb_2O_5 content tends to increase with depth, while La_2O_3 content decreases. This is shown well within the dolomite carbonatite group. A spike in magnetic susceptibility is apparent at ~655- 680m which corresponds to the dolerite intrusion.

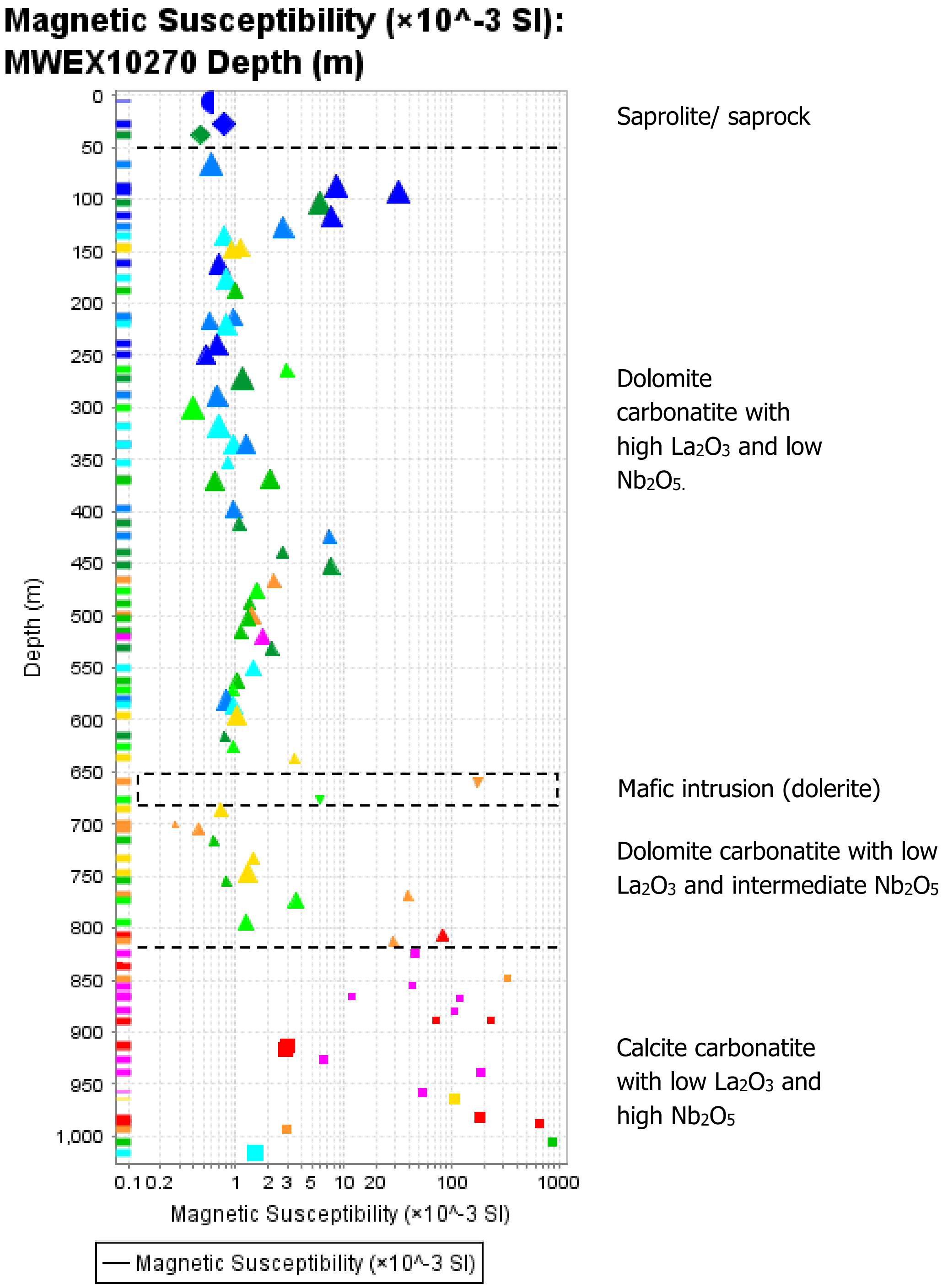
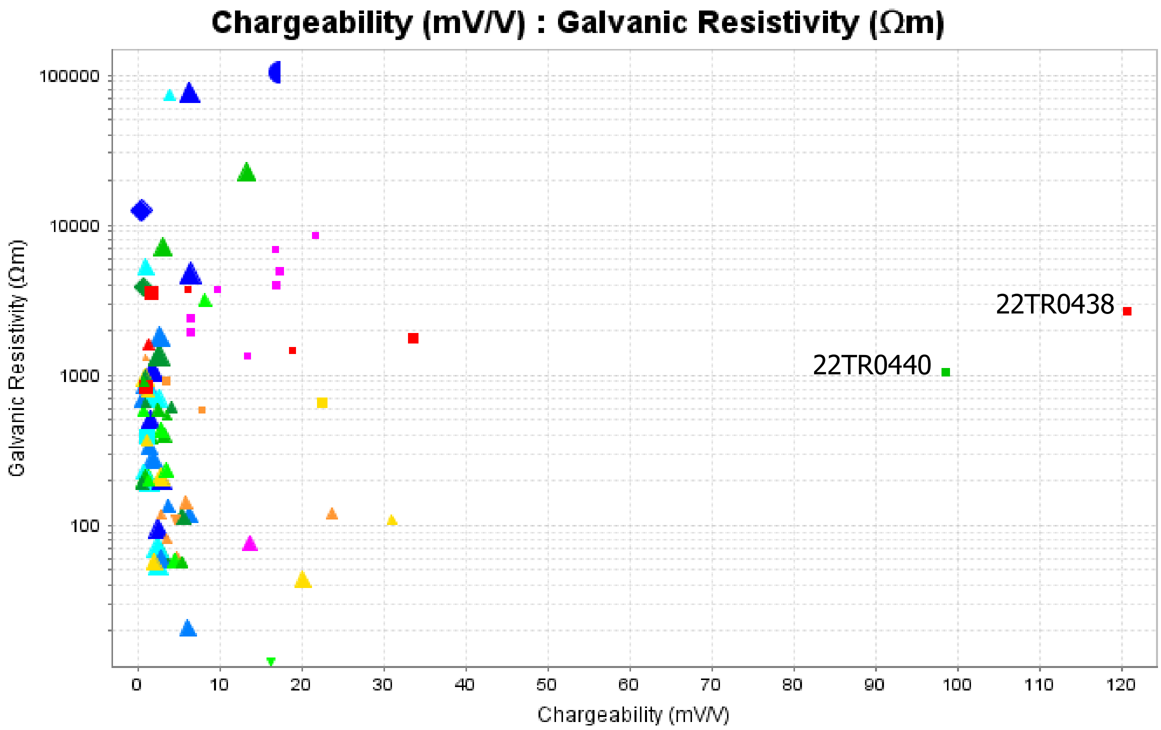


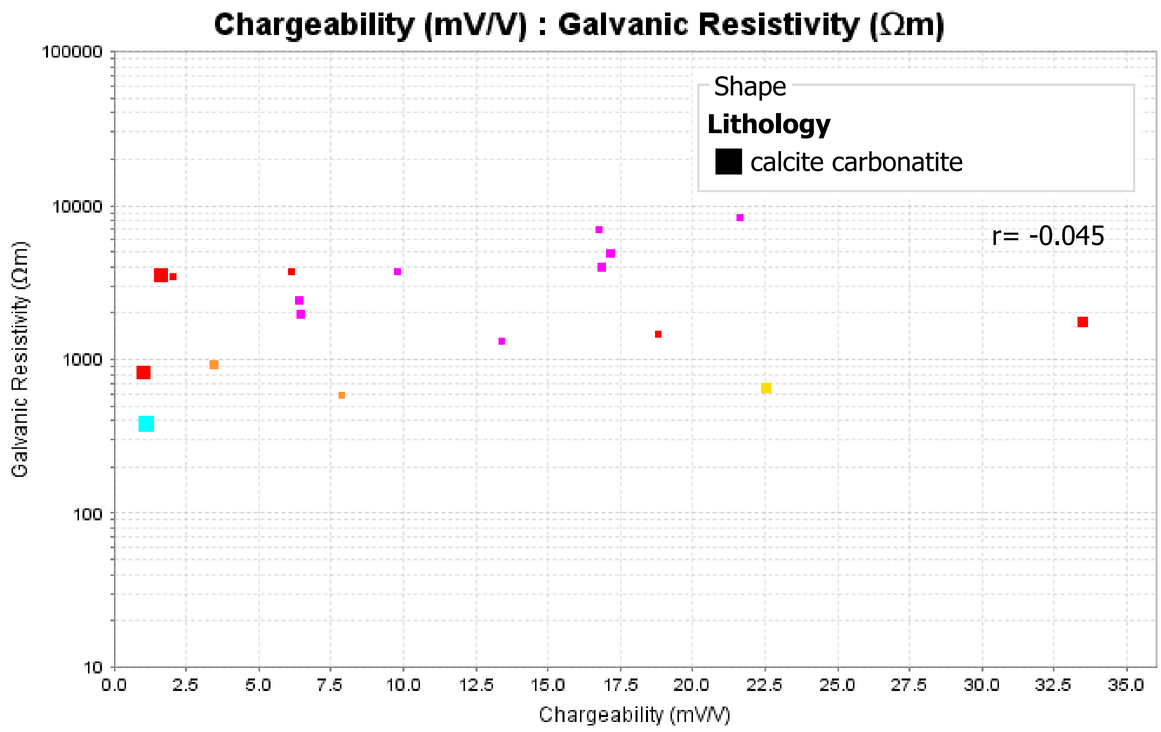
Figure 7. Magnetic susceptibility vs. depth for hole MWEX10270. The key on the left of the plot represents the downhole Nb_2O_5 content of each data point.

A cross-plot of chargeability against galvanic resistivity is shown in Figure 8. Chargeability values range from <1 to 120.6 mV/V. Some observations pertaining to the below plot are described below:

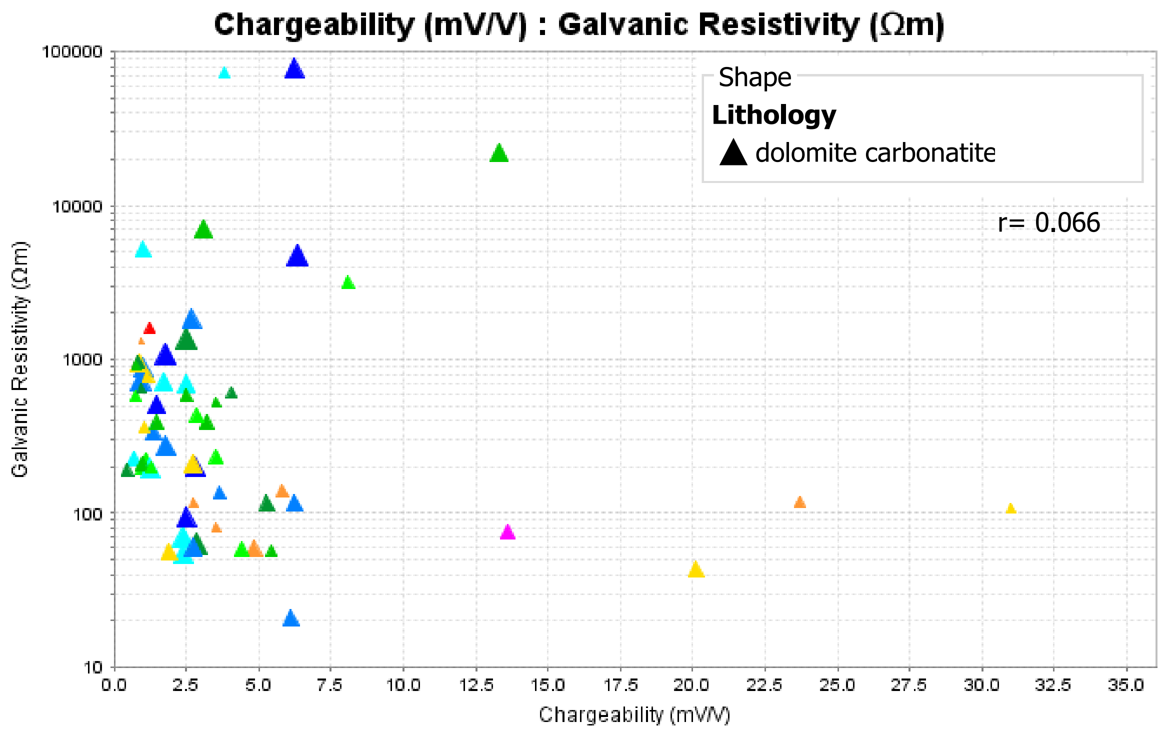
- Sample 22TR0438 (calcite carbonatite) has the highest chargeability value in the dataset which corresponds with a galvanic resistivity value of 2685 Ωm.
- Samples 22TR0440 and 22TR0438 both show high chargeability values and could be targeted by an IP survey when compared to the other samples measured. These samples correspond to Nb_2O_5 concentrations of 410 and 2024 ppm, and La_2O_3 concentrations of 484 and 491 ppm; respectively.
- No clear relationships between the properties are observed in the lithology groups (Figure 8b, Figure 8c).



(a)



(b)



(c)

Figure 8. Cross-plot of chargeability against resistivity; (a) shows all data, (b) shows only calcite carbonatite, and (c) shows only dolomite carbonatite. Two highly chargeable samples (22TR0440 and 22TR0438) have been omitted from the b and c plots.

Chargeability values are plotted against magnetic susceptibility values in Figure 9. There is a strong positive linear association between magnetic susceptibility values and chargeability values in this dataset (r = 0.87). Correlations between the properties are strong across all carbonatite groups.

Samples 22TR0440 and 22TR0438 stand out from other samples and could potentially be detected with IP. Sample 22TR0440 (calcite carbonatite with minor magnetite and monazite) has a chargeability value of 98.6 mV/V and a magnetic susceptibility of 862.97 $\times 10^{-3}$ SI. Sample 22TR0438 (calcite carbonatite with minor magnetite and trace monazite) has a magnetic susceptibility value of 647.45 $\times 10^{-3}$ SI and a chargeability of 120 mV/V. Both samples are taken from depths >985 m.

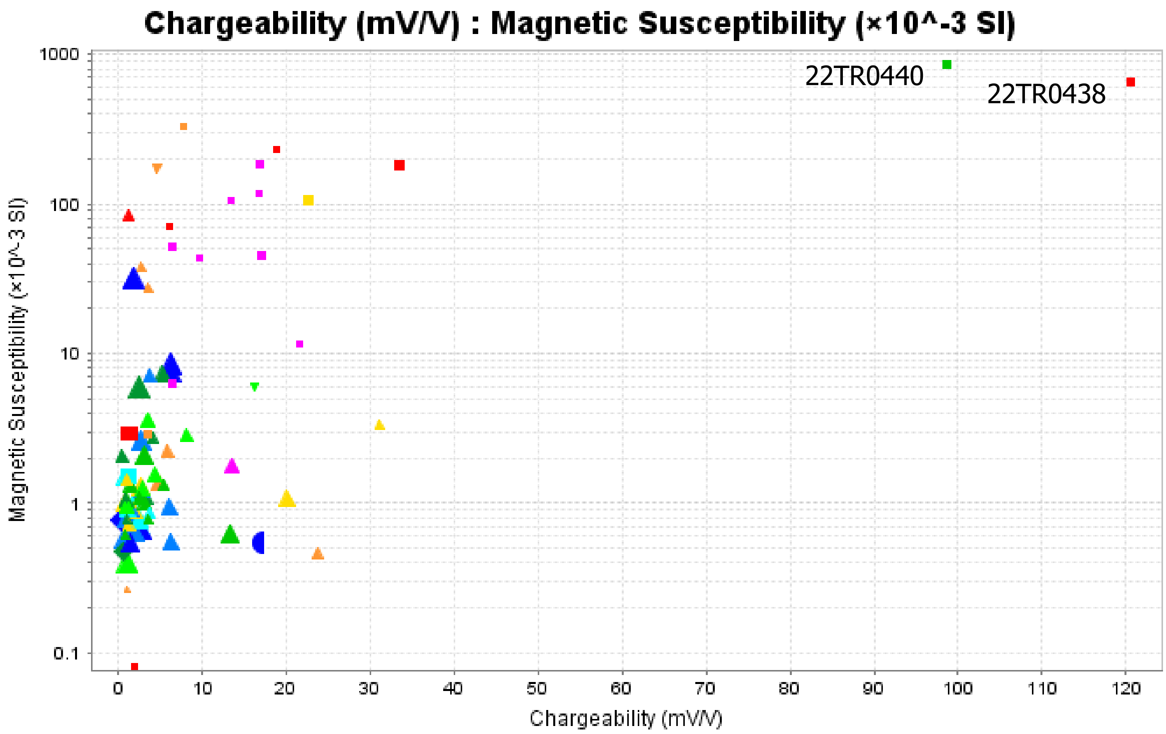


Figure 9. Cross-plot of chargeability against magnetic susceptibility.

A down hole plot of magnetic susceptibility and chargeability values for hole MWEX10270 is given in Figure 10. High chargeability and magnetic susceptibility values correspond with depths of >800m.

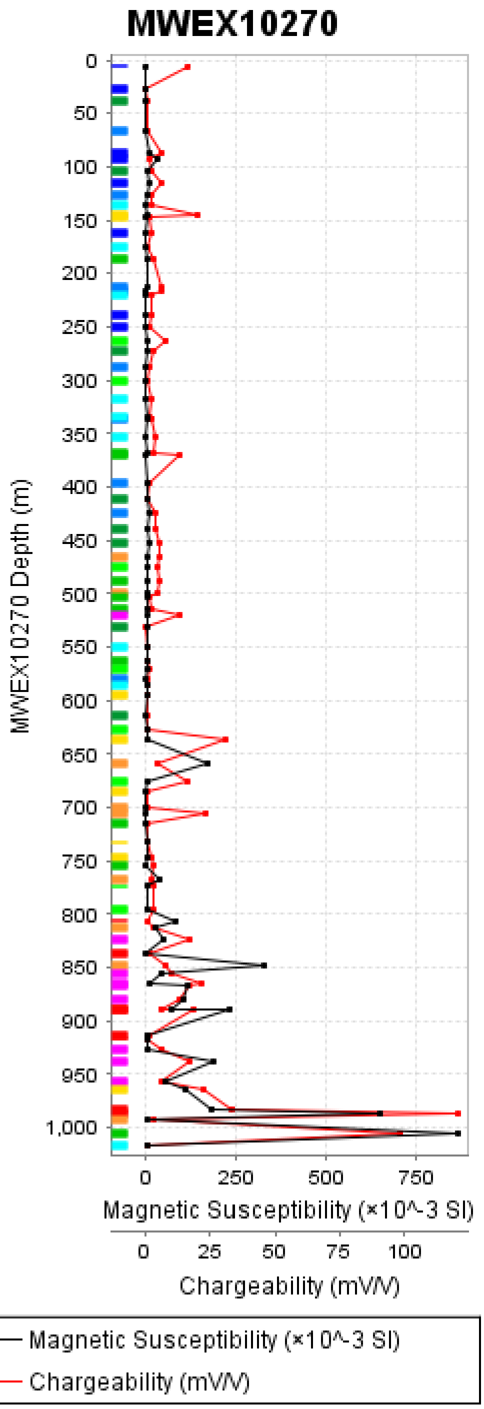


Figure 10. Downhole plot of chargeability against magnetic susceptibility values. The key on the left of the plot represents the downhole Nb_2O_5 content of each data point.

Inductive conductivity values are shown against chargeability values in Figure 11. Only samples with a non-zero conductivity value have been displayed on the plot. Inductive conductivity ranges from 0.03 to 1.14 S/m, for non-zero values.

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.

Overall, samples show a relatively low inductive conductivity value of <2 S/m. These correlate to low chargeability values (<6 mV/V). Sample 22TR0356 (saprolite) is exceptional with a corresponding chargeability of ~17 mV/V.

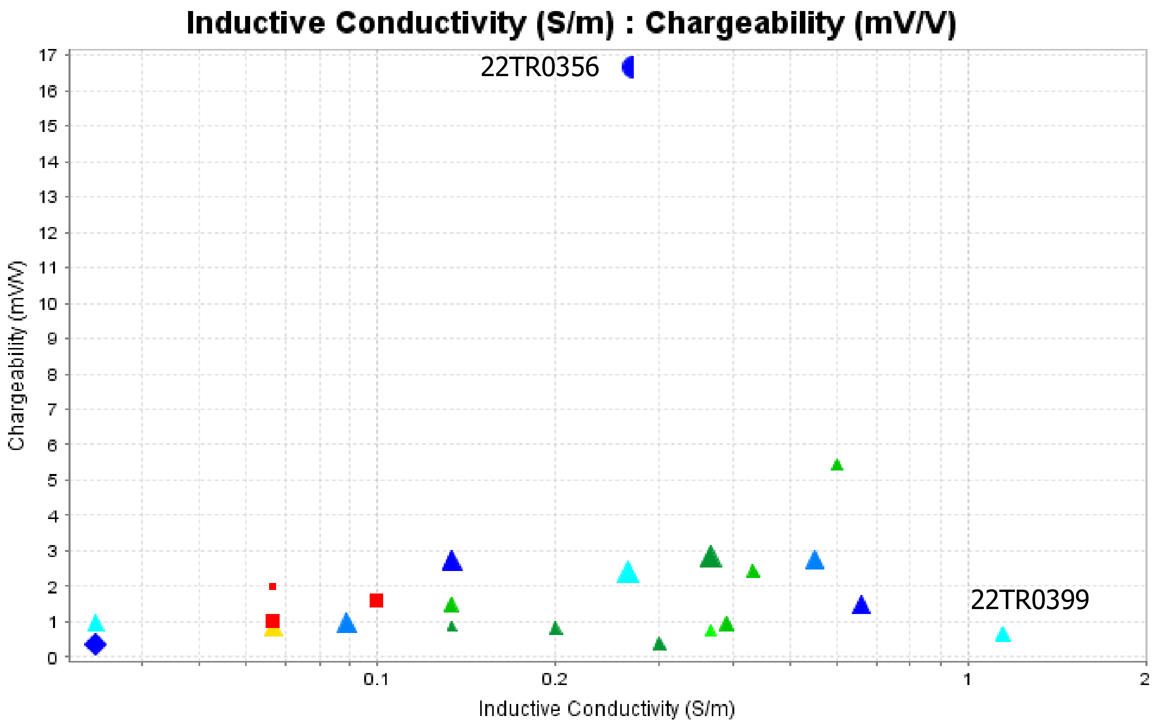


Figure 11. Cross-plot of inductive conductivity against chargeability.

Figure 12 plots the dry bulk density and apparent porosity of samples against known reference mineral trends (Emerson, 1997), which can be indicative of the type of rock being examined.

Apparent porosity for the whole project ranges from 0.12 to 10.34%; Porosity ranges for the dominant lithology groups are listed below:

- Calcite carbonatite: 0.2 to 1.12%.
- Dolomite carbonatite: 0.11 to 10.34%.

Most samples in this dataset plot between the carbonate and mafic lines, which may reflect alteration or accessory minerals within the carbonatite. Sample 22TR0423 plots on the carbonate line – this sample is a calcite carbonatite with almost no accessory minerals. Sample 22TR0388 (brecciated dolomite carbonatite) plots right of the mafic line with a dry bulk density of 3.28 g/cm^3 and an apparent porosity of 2.32%.

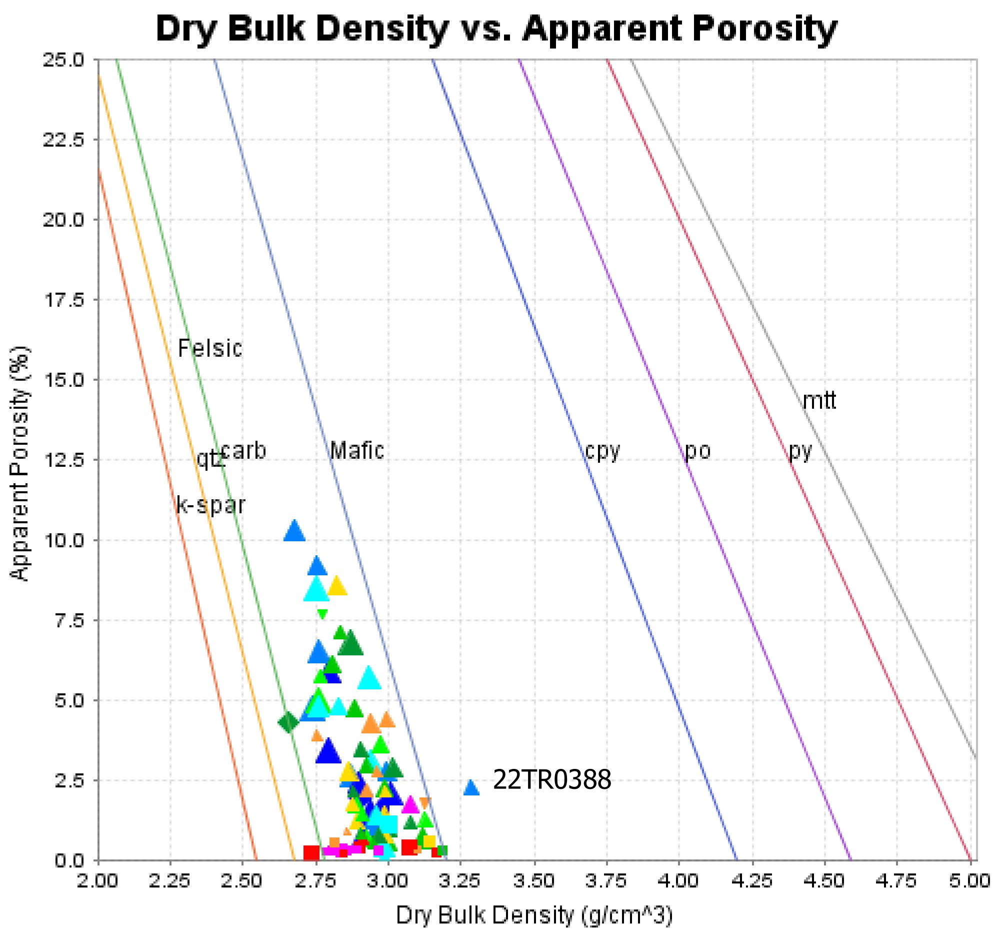


Figure 12. Cross-plot of dry bulk density against porosity.

Figure 13 displays dry bulk density against P-wave velocity. Solid black lines are contours of acoustic impedance with their separation representing 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. P-wave velocity was unable to be measured on 5 samples due to insufficient sample length (<15 cm). P-wave velocity ranges from 3040 to 5900 m/s.

Samples are spread over four contours, with differences noted between the lithology types. Seismic reflection may be able to map lithology groups in this area.

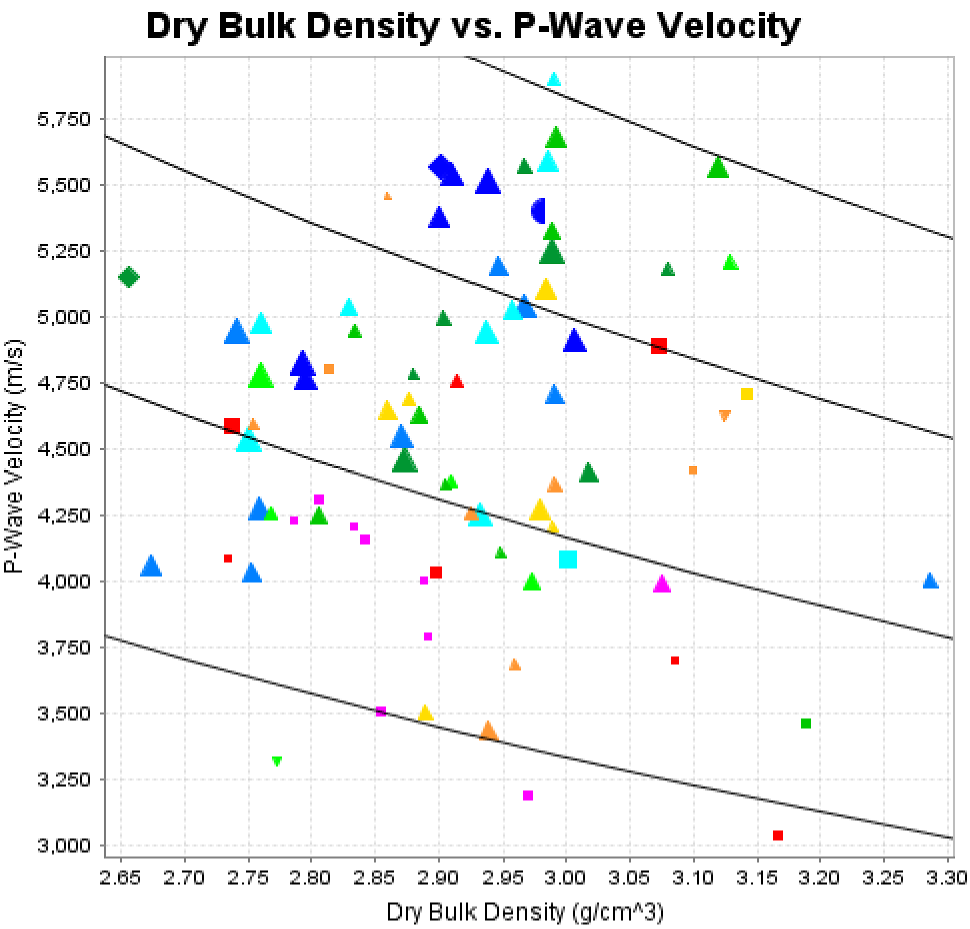


Figure 13. Cross-plot of dry bulk density against sonic (P-wave) velocity.

A plot of the intensity of the induced vs. remanent vectors (J_{ind} vs. J_{rem}) is shown in Figure 14.

Of the 25 samples measured for remanent magnetisation, 24 are remanent magnetisation dominant (Q>1). Sample 22TR0388 (dolomite carbonatite with minor amphibole) is induced magnetisation dominant (Q<1).

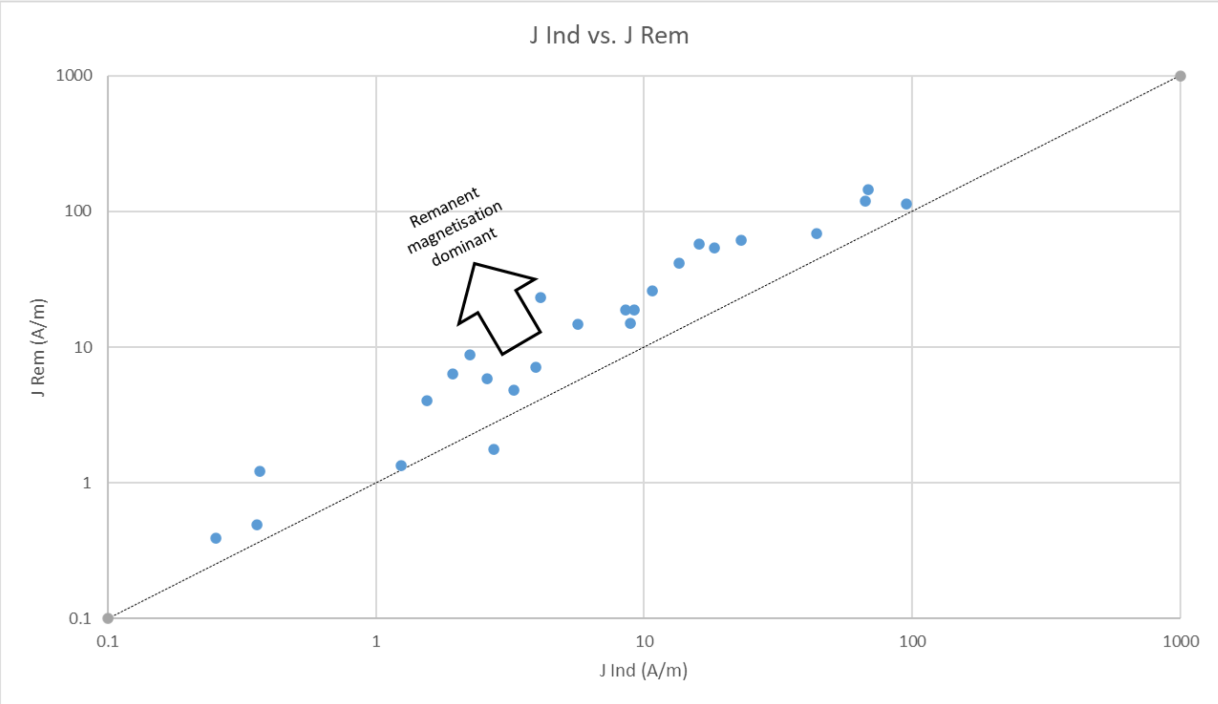


Figure 14. Cross-plot of intensity of J_{ind} versus J_{rem}. Samples above the trend line have Koenigsberger ratio (Q) greater than 1, indicating they are remanent-magnetisation dominant. Conversely, samples below the trend line have a Q value less than one, and are induced-magnetisation dominant.

A magnetic susceptibility value has been calculated from the fluxgate (remanent) measurements using the J_{ind} vector intensity, and compared with the measured magnetic susceptibility. A cross-plot of these two values is shown in Figure 15.

The values appear to correlate well; some variation is normally expected, especially in remanent-dominant (Q>1) samples where the remanent vector can interfere with the induced vector (by vector addition). This is particularly observed in samples with a high pyrrhotite content.

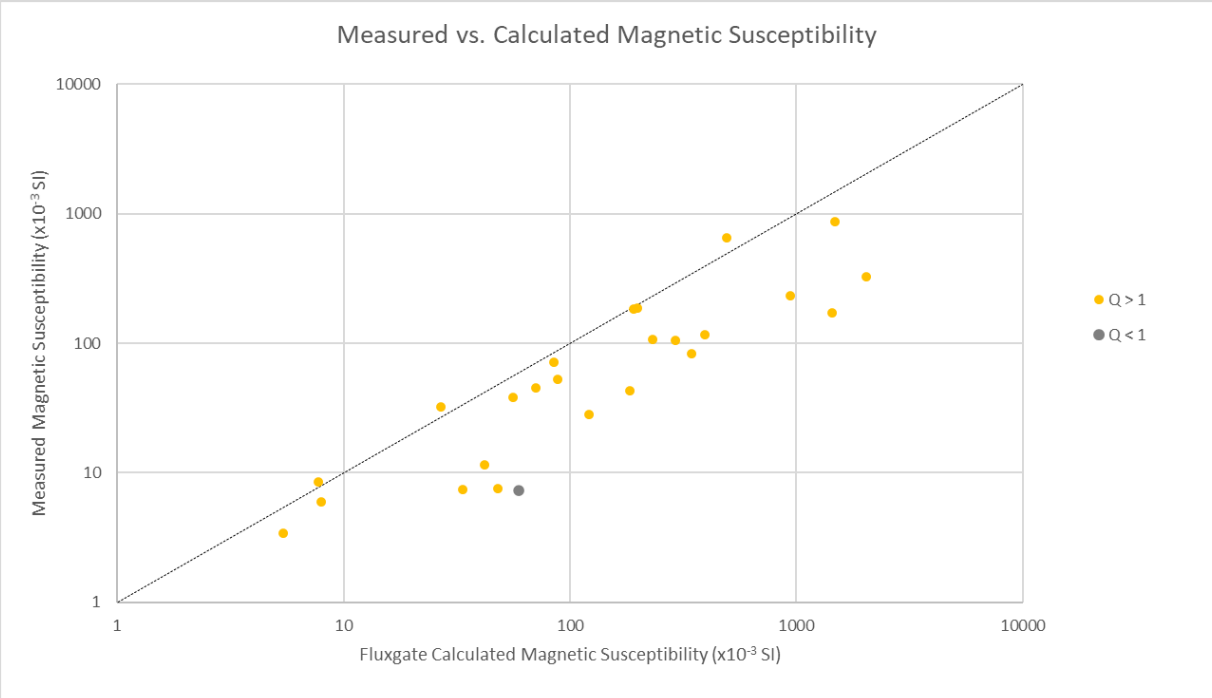


Figure 15. Logarithmic plot of magnetic susceptibility derived from fluxgate against measured magnetic susceptibility.

4. DISCUSSION

Terra Petrophysics has performed petrophysical analysis of 86 rock samples from Mt Weld, Western Australia. Petrophysical data has been integrated with geological logging and elemental assays to develop a better understanding and the potential implications of the physical properties of the data. A summary of the finding is given below:

- There is a positive correlation between magnetic susceptibility and dry bulk density values in this project (correlation coefficient r= 0.41) which could be a function of increasing magnetite and/or pyrrhotite content.
- Magnetic susceptibility data is grouped by lithology into dolomite carbonatites and calcite carbonatites.
- A wide range of galvanic resistivity values are observed across all groups with values ranging from 12 and up to >100,000 Ωm.
- There is a strong linear association between magnetic susceptibility and chargeability values in this project (r= 0.87). Chargeability and magnetic susceptibility anomalies are associated with calcite carbonatite samples and depths of >800m.
- Inductive conductivity values in this project are low (<2 S/m) and EM methods would not be an ideal tool for exploration in this area.
- Samples in this project plot between the carbonate and mafic lines, which may reflect alteration or accessory minerals within the carbonatites.
- A wide distribution of sonic velocity and dry bulk density values allows for a substantial range of acoustic impedance values. Seismic reflection may be capable of identifying lithological contacts in this area.
- The large majority of samples measured for magnetic remanence are remanent magnetisation dominant (Q>1). This should be considered in the interpretation of magnetic susceptibility data.

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

Sample Information					Lithology Information		Magnetic Properties		Mass Properties			Seismic Properties		Electrical Properties		
TR Sample ID	Client Sample ID	Drillhole ID	From	To	GSWA Lithology	Stratigraphic Unit	Magnetic Susceptibility	Koenigsberger Ratio (Q)	Dry Bulk Density	Apparent Porosity	Grain Density	P-Wave Velocity	Acoustic Impedance	Galvanic Resistivity	Chargeability	Inductive Conductivity
			(m)	(m)			(×10^-3 SI)		(g/cm^3)	(%)	(g/cm^3)	(m/s)	(g/cm^3)*(m/s)	(Ωm)	(mV/V)	(S/m)
22TR0356	258800	MWEX10270	5.52	5.67	saprolite	Mt Weld Carbonatite	0.540		2.98	1.58%	3.03	5400	16081.1	103863	16.7	0.3
22TR0357	258801	MWEX10270	27.55	27.70	saprock	Mt Weld Carbonatite	0.763		2.90	1.98%	2.96	5570	16160.3	12413	0.4	0.0
22TR0358	258802	MWEX10270	37.60	37.75	saprock	Mt Weld Carbonatite	0.476		2.66	4.30%	2.77	5150	13676.1	3860	0.6	0.0
22TR0359	258717	MWEX10270	66.05	66.20	dolomite carbonatite	Mt Weld Carbonatite	0.593		2.74	4.75%	2.88	4950	13565.6	722	0.9	0.0
22TR0360	258718	MWEX10270	87.10	87.25	dolomite carbonatite	Mt Weld Carbonatite	8.563	1.352	2.94	1.51%	2.98	5520	16216.4	4733	6.3	0.0
22TR0361	258719	MWEX10270	92.30	92.45	dolomite carbonatite	Mt Weld Carbonatite	32.130	1.096	2.79	3.44%	2.89	4830	13487.4	1082	1.8	0.0
22TR0362	258720	MWEX10270	103.45	103.60	dolomite carbonatite	Mt Weld Carbonatite	5.943	3.293	2.99	1.13%	3.02	5250	15689.3	1365	2.5	0.0
22TR0363	258721	MWEX10270	115.17	115.32	dolomite carbonatite	Mt Weld Carbonatite	7.588	3.980	2.91	0.79%	2.93	5550	16151.5	78556	6.2	0.0
22TR0364	258722	MWEX10270	126.20	126.35	dolomite carbonatite	Mt Weld Carbonatite	2.681		2.97	1.20%	3.00	5050	14980.9	1849	2.6	0.0
22TR0365	258723	MWEX10270	135.12	135.27	dolomite carbonatite	Mt Weld Carbonatite	0.770		2.76	4.80%	2.90	4980	13745.2	693	2.5	0.0
22TR0366	258724	MWEX10270	145.40	145.55	dolomite carbonatite	Mt Weld Carbonatite	1.085		2.82	8.61%	3.09	NA	NA	44	20.1	0.0
22TR0367	258725	MWEX10270	147.25	147.40	dolomite carbonatite	Mt Weld Carbonatite	0.905		2.86	2.80%	2.94	4650	13297.5	58	1.9	0.0
22TR0368	258726	MWEX10270	161.75	161.90	dolomite carbonatite	Mt Weld Carbonatite	0.688		2.79	5.90%	2.97	4770	13331.2	95	2.5	0.0
22TR0369	258727	MWEX10270	175.95	176.10	dolomite carbonatite	Mt Weld Carbonatite	0.809		2.94	3.09%	3.03	4950	14533.4	200	1.2	0.0
22TR0370	258728	MWEX10270	187.00	187.15	dolomite carbonatite	Mt Weld Carbonatite	0.997		2.99	2.25%	3.06	5330	15926.9	394	3.2	0.0
22TR0371	258729	MWEX10270	212.90	213.05	dolomite carbonatite	Mt Weld Carbonatite	0.962		2.75	9.27%	3.03	4040	11121.5	21	6.1	0.0
22TR0372	258730	MWEX10270	215.95	216.10	dolomite carbonatite	Mt Weld Carbonatite	0.563		2.99	2.83%	3.08	4710	14084.3	120	6.2	0.0
22TR0373	258731	MWEX10270	219.60	219.75	dolomite carbonatite	Mt Weld Carbonatite	0.803		2.93	5.76%	3.11	4260	12487.2	55	2.4	0.0
22TR0374	258732	MWEX10270	239.00	239.15	dolomite carbonatite	Mt Weld Carbonatite	0.664		3.01	2.10%	3.07	4920	14785.9	206	2.8	0.1
22TR0375	258733	MWEX10270	249.70	249.85	dolomite carbonatite	Mt Weld Carbonatite	0.535		2.90	2.41%	2.97	5380	15605.4	511	1.5	0.7
22TR0376	258734	MWEX10270	262.50	262.65	dolomite carbonatite	Mt Weld Carbonatite	2.916		3.13	1.27%	3.17	5210	16295.5	3220	8.1	0.0
22TR0377	258735	MWEX10270	271.95	272.10	dolomite carbonatite	Mt Weld Carbonatite	1.156		2.87	6.78%	3.08	4460	12812.2	64	2.8	0.4
22TR0378	258736	MWEX10270	287.30	287.45	dolomite carbonatite	Mt Weld Carbonatite	0.656		2.76	6.53%	2.95	4280	11807.7	278	1.8	0.0
22TR0379	258737	MWEX10270	299.90	300.05	dolomite carbonatite	Mt Weld Carbonatite	0.402		2.76	5.00%	2.90	4780	13190.5	210	1.1	0.0
22TR0380	258738	MWEX10270	317.35	317.50	dolomite carbonatite	Mt Weld Carbonatite	0.704		2.75	8.48%	3.00	4540	12484.7	71	2.4	0.3
22TR0381	258739	MWEX10270	335.63	335.78	dolomite carbonatite	Mt Weld Carbonatite	1.252		2.67	10.34%	2.98	4060	10857.1	60	2.8	0.6
22TR0382	258740	MWEX10270	352.67	352.82	dolomite carbonatite	Mt Weld Carbonatite	0.848		2.99	0.12%	2.99	5900	17636.9	73486	3.8	0.0
22TR0383	258741	MWEX10270	368.34	368.49	dolomite carbonatite	Mt Weld Carbonatite	2.107		3.12	0.70%	3.14	5570	17372.2	7106	3.1	0.0

Sample Information					Lithology Information		Magnetic Properties		Mass Properties			Seismic Properties		Electrical Properties		
TR Sample ID	Client Sample ID	Drillhole ID	From	To	GSWA Lithology	Stratigraphic Unit	Magnetic Susceptibility	Koenigsberger Ratio (Q)	Dry Bulk Density	Apparent Porosity	Grain Density	P-Wave Velocity	Acoustic Impedance	Galvanic Resistivity	Chargeability	Inductive Conductivity
			(m)	(m)			(×10^-3 SI)		(g/cm^3)	(%)	(g/cm^3)	(m/s)	(g/cm^3)*(m/s)	(Ωm)	(mV/V)	(S/m)
22TR0384	258742	MWEX102 70	370.30	370.45	dolomite carbonatite	Mt Weld Carbonatite	0.628		2.99	0.63%	3.01	5680	16993.3	22412	13.3	0.0
22TR0385	258743	MWEX102 70	334.85	335.00	dolomite carbonatite	Mt Weld Carbonatite	0.951		2.98	0.42%	3.00	5590	16684.8	713	1.7	0.0
22TR0386	258744	MWEX102 70	396.80	396.95	dolomite carbonatite	Mt Weld Carbonatite	0.938		2.95	1.32%	2.99	5200	15318.1	340	1.3	0.0
22TR0387	258745	MWEX102 70	411.10	411.25	dolomite carbonatite	Mt Weld Carbonatite	1.078		2.97	0.80%	2.99	5580	16552.0	982	0.8	0.2
22TR0388	258746	MWEX102 70	423.70	423.85	dolomite carbonatite	Mt Weld Carbonatite	7.286	0.624	3.29	2.32%	3.36	4010	13173.4	137	3.6	0.0
22TR0389	258747	MWEX102 70	438.75	438.90	dolomite carbonatite	Mt Weld Carbonatite	2.727		3.08	1.15%	3.11	5180	15949.0	607	4.1	0.0
22TR0390	258748	MWEX102 70	451.85	452.00	dolomite carbonatite	Mt Weld Carbonatite	7.395	3.079	3.02	2.90%	3.11	4420	13335.8	117	5.3	0.0
22TR0391	258749	MWEX102 70	465.65	465.80	dolomite carbonatite	Mt Weld Carbonatite	2.240		2.99	4.43%	3.13	4370	13069.2	142	5.8	0.0
22TR0392	258750	MWEX102 70	475.30	475.45	dolomite carbonatite	Mt Weld Carbonatite	1.553		2.97	3.60%	3.08	4000	11889.5	58	4.4	0.0
22TR0393	258751	MWEX102 70	488.10	488.25	dolomite carbonatite	Mt Weld Carbonatite	1.325		2.83	7.15%	3.05	4950	14026.0	57	5.5	0.6
22TR0394	258778	MWEX102 70	499.40	499.55	dolomite carbonatite	Mt Weld Carbonatite	1.408		2.94	4.28%	3.07	3440	10106.0	59	4.8	0.0
22TR0395	258752	MWEX102 70	502.95	503.10	dolomite carbonatite	Mt Weld Carbonatite	1.314		2.89	4.75%	3.03	4630	13358.3	388	1.5	0.1
22TR0396	258753	MWEX102 70	514.27	514.42	dolomite carbonatite	Mt Weld Carbonatite	1.090		2.92	2.99%	3.01	NA	NA	599	2.5	0.4
22TR0397	258779	MWEX102 70	520.40	520.55	dolomite carbonatite	Mt Weld Carbonatite	1.791		3.08	1.73%	3.13	3990	12270.0	75	13.6	0.0
22TR0398	258754	MWEX102 70	530.60	530.75	dolomite carbonatite	Mt Weld Carbonatite	2.113		2.90	3.50%	3.01	5000	14517.9	193	0.4	0.3
22TR0399	258755	MWEX102 70	549.95	550.10	dolomite carbonatite	Mt Weld Carbonatite	1.452		2.83	4.82%	2.97	5040	14258.7	226	0.7	1.1
22TR0400	258780	MWEX102 70	562.85	563.00	dolomite carbonatite	Mt Weld Carbonatite	1.040		2.81	6.15%	2.99	4250	11922.8	209	1.0	0.4
22TR0401	258756	MWEX102 70	571.00	571.15	dolomite carbonatite	Mt Weld Carbonatite	0.927		2.77	5.77%	2.94	4260	11793.8	201	1.3	0.0
22TR0402	258757	MWEX102 70	580.06	580.21	dolomite carbonatite	Mt Weld Carbonatite	0.820		2.87	2.66%	2.95	4550	13060.3	895	1.0	0.1
22TR0403	258758	MWEX102 70	585.85	586.00	dolomite carbonatite	Mt Weld Carbonatite	0.933		2.96	1.46%	3.00	5030	14874.3	5309	1.0	0.0
22TR0404	258759	MWEX102 70	595.63	595.78	dolomite carbonatite	Mt Weld Carbonatite	1.012		2.98	1.35%	3.02	5110	15245.7	949	0.8	0.1
22TR0405	258760	MWEX102 70	614.35	614.50	dolomite carbonatite	Mt Weld Carbonatite	0.785		2.88	2.20%	2.94	4790	13792.3	661	0.9	0.1
22TR0406	258761	MWEX102 70	626.30	626.45	dolomite carbonatite	Mt Weld Carbonatite	0.939		2.91	1.41%	2.95	4380	12746.6	584	0.7	0.4
22TR0407	258762	MWEX102 70	636.81	636.96	dolomite carbonatite	Mt Weld Carbonatite	3.403	1.539	2.99	2.20%	3.06	4210	12584.3	111	31.0	0.0
22TR0408	258763	MWEX102 70	658.70	658.85	dolerite	Mt Weld Carbonatite	172.726	1.792	3.12	1.80%	3.18	4630	14466.2	111	4.5	0.0
22TR0409	258764	MWEX102 70	676.35	676.50	dolerite	Mt Weld Carbonatite	5.963		2.77	7.68%	3.00	3320	9206.8	12	16.2	0.0
22TR0410	258765	MWEX102 70	684.95	685.10	dolomite carbonatite	Mt Weld Carbonatite	0.722		2.89	1.23%	2.92	3510	10140.3	789	1.1	0.0
22TR0411	258766	MWEX102 70	700.15	700.30	dolomite carbonatite	Mt Weld Carbonatite	0.267		2.86	0.90%	2.89	5460	15611.6	1322	0.9	0.0

Sample Information					Lithology Information		Magnetic Properties		Mass Properties			Seismic Properties		Electrical Properties		
TR Sample ID	Client Sample ID	Drillhole ID	From	To	GSWA Lithology	Stratigraphic Unit	Magnetic Susceptibility	Koenigsberger Ratio (Q)	Dry Bulk Density	Apparent Porosity	Grain Density	P-Wave Velocity	Acoustic Impedance	Galvanic Resistivity	Chargeability	Inductive Conductivity
			(m)	(m)			(×10^-3 SI)		(g/cm^3)	(%)	(g/cm^3)	(m/s)	(g/cm^3)*(m/s)	(Ωm)	(mV/V)	(S/m)
22TR0412	258767	MWEX10270	705.25	705.40	dolomite carbonatite	Mt Weld Carbonatite	0.458		2.92	2.17%	2.99	4260	12460.1	118	23.7	0.0
22TR0413	258768	MWEX10270	714.78	714.97	dolomite carbonatite	Mt Weld Carbonatite	0.623		2.91	0.83%	2.93	4370	12695.1	914	0.7	0.0
22TR0414	258769	MWEX10270	732.75	732.90	dolomite carbonatite	Mt Weld Carbonatite	1.440		2.88	1.76%	2.93	4690	13491.8	364	1.0	0.0
22TR0415	258770	MWEX10270	747.15	747.30	dolomite carbonatite	Mt Weld Carbonatite	1.276		2.98	0.88%	3.01	4270	12720.0	211	2.7	0.0
22TR0416	258771	MWEX10270	753.90	754.05	dolomite carbonatite	Mt Weld Carbonatite	0.795		2.95	0.55%	2.96	4110	12116.6	541	3.5	0.0
22TR0417	258772	MWEX10270	767.55	767.70	dolomite carbonatite	Mt Weld Carbonatite	38.367	2.275	2.75	3.92%	2.87	4600	12666.6	119	2.7	0.0
22TR0418	258773	MWEX10270	774.00	774.15	dolomite carbonatite	Mt Weld Carbonatite	3.626		2.93	0.68%	2.95	NA	NA	232	3.5	0.0
22TR0419	258774	MWEX10270	795.05	795.20	dolomite carbonatite	Mt Weld Carbonatite	1.235		2.89	1.72%	2.94	NA	NA	429	2.9	0.0
22TR0420	258775	MWEX10270	806.00	806.15	dolomite carbonatite	Mt Weld Carbonatite	83.349	3.721	2.91	0.65%	2.93	4760	13872.3	1601	1.3	0.0
22TR0421	258776	MWEX10270	812.75	812.90	dolomite carbonatite	Mt Weld Carbonatite	28.189	2.651	2.96	2.79%	3.04	3690	10919.5	83	3.5	0.0
22TR0422	258777	MWEX10270	823.90	824.05	calcite carbonatite	Mt Weld Carbonatite	45.578	1.476	2.84	0.35%	2.85	4160	11823.0	4884	17.2	0.0
22TR0423	258781	MWEX10270	836.45	836.60	calcite carbonatite	Mt Weld Carbonatite	0.082		2.73	0.26%	2.74	4090	11181.6	3475	2.0	0.1
22TR0424	258782	MWEX10270	848.15	848.30	calcite carbonatite	Mt Weld Carbonatite	327.167	1.198	3.10	0.34%	3.11	4420	13696.8	583	7.9	0.0
22TR0425	258783	MWEX10270	855.50	855.65	calcite carbonatite	Mt Weld Carbonatite	43.126	2.351	2.79	0.26%	2.79	4230	11788.3	3707	9.8	0.0
22TR0426	258784	MWEX10270	865.00	865.15	calcite carbonatite	Mt Weld Carbonatite	11.594	3.332	2.83	0.24%	2.84	4210	11931.2	8431	21.6	0.0
22TR0427	258785	MWEX10270	867.20	867.35	calcite carbonatite	Mt Weld Carbonatite	116.784	2.981	2.89	0.31%	2.90	4000	11552.0	6921	16.7	0.0
22TR0428	258786	MWEX10270	879.45	879.60	calcite carbonatite	Mt Weld Carbonatite	105.542	3.668	2.89	0.34%	2.90	3790	10958.5	1331	13.4	0.0
22TR0429	258787	MWEX10270	888.85	889.00	calcite carbonatite	Mt Weld Carbonatite	232.559	1.761	3.09	0.43%	3.10	3700	11416.4	1472	18.8	0.0
22TR0430	258788	MWEX10270	888.55	888.70	calcite carbonatite	Mt Weld Carbonatite	71.134	1.975	2.84	0.24%	2.85	NA	NA	3679	6.1	0.0
22TR0431	258789	MWEX10270	913.00	913.15	calcite carbonatite	Mt Weld Carbonatite	2.964		2.74	0.21%	2.74	4590	12562.1	3491	1.6	0.1
22TR0432	258790	MWEX10270	916.60	916.75	calcite carbonatite	Mt Weld Carbonatite	2.896		3.07	0.38%	3.08	4890	15025.5	830	1.0	0.1
22TR0433	258791	MWEX10270	926.30	926.45	calcite carbonatite	Mt Weld Carbonatite	6.389		2.81	0.29%	2.81	4310	12092.6	1955	6.5	0.0
22TR0434	258792	MWEX10270	938.25	938.40	calcite carbonatite	Mt Weld Carbonatite	185.772	2.030	2.97	0.33%	2.98	3190	9471.3	4023	16.9	0.0
22TR0435	258793	MWEX10270	957.20	957.35	calcite carbonatite	Mt Weld Carbonatite	52.294	5.743	2.85	0.33%	2.86	3510	10018.5	2414	6.4	0.0
22TR0436	258794	MWEX10270	964.20	964.35	calcite carbonatite	Mt Weld Carbonatite	107.004	2.477	3.14	0.58%	3.16	4710	14799.1	654	22.5	0.0
22TR0437	258795	MWEX10270	982.35	982.50	calcite carbonatite	Mt Weld Carbonatite	183.460	1.682	2.90	0.38%	2.91	4030	11677.5	1764	33.5	0.0
22TR0438	258796	MWEX10270	987.45	987.60	calcite carbonatite	Mt Weld Carbonatite	647.453	2.579	3.17	0.25%	3.17	3040	9627.4	2686	120.6	0.0
22TR0439	258797	MWEX10270	992.60	992.75	calcite carbonatite	Mt Weld Carbonatite	2.920		2.81	0.52%	2.83	4800	13503.6	916	3.5	0.0

Sample Information					Lithology Information		Magnetic Properties		Mass Properties			Seismic Properties		Electrical Properties		
TR Sample ID	Client Sample ID	Drillhole ID	From	To	GSWA Lithology	Stratigraphic Unit	Magnetic Susceptibility	Koenigsberger Ratio (Q)	Dry Bulk Density	Apparent Porosity	Grain Density	P-Wave Velocity	Acoustic Impedance	Galvanic Resistivity	Chargeability	Inductive Conductivity
			(m)	(m)			(×10^-3 SI)		(g/cm^3)	(%)	(g/cm^3)	(m/s)	(g/cm^3)*(m/s)	(Ωm)	(mV/V)	(S/m)
22TR0440	258798	MWEX10270	1004.92	1005.07	calcite carbonatite	Mt Weld Carbonatite	862.972	2.228	3.19	0.31%	3.20	3460	11031.9	1036	98.6	0.0
22TR0441	258799	MWEX10270	1016.04	1016.19	calcite carbonatite	Mt Weld Carbonatite	1.521		3.00	1.12%	3.04	4080	12243.5	383	1.1	0.0

APPENDIX 2 – SAMPLE PHOTOS

GEOLOGICAL SURVEY OF WESTERN AUSTRALIA

MOUNT WELD PROJECT

LAVERTON, WESTERN AUSTRALIA

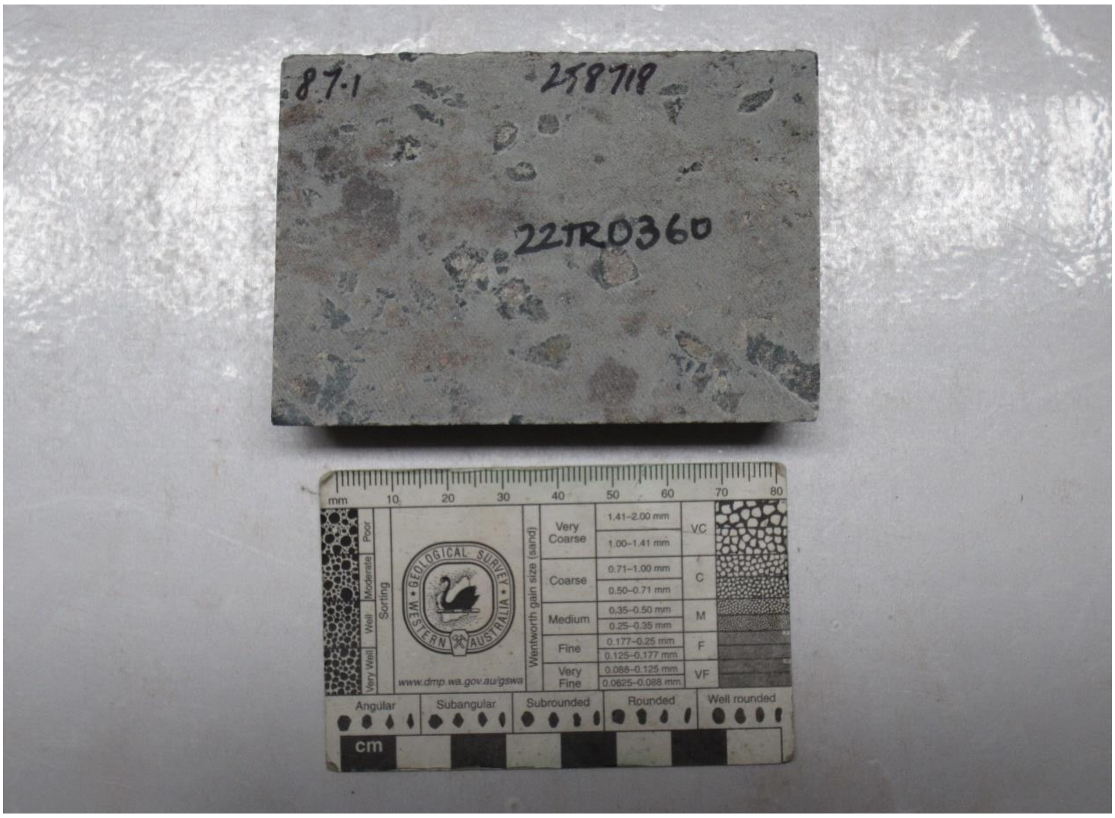
TECHNICAL REPORT NO. 21_041

Terra ID: 22TR0356 Client ID: 258800 Drillhole ID: MWEX10270 5.52m- 5.67m

Terra ID: 22TR0357 Client ID: 258801 Drillhole ID: MWEX10270 27.55m- 27.70m

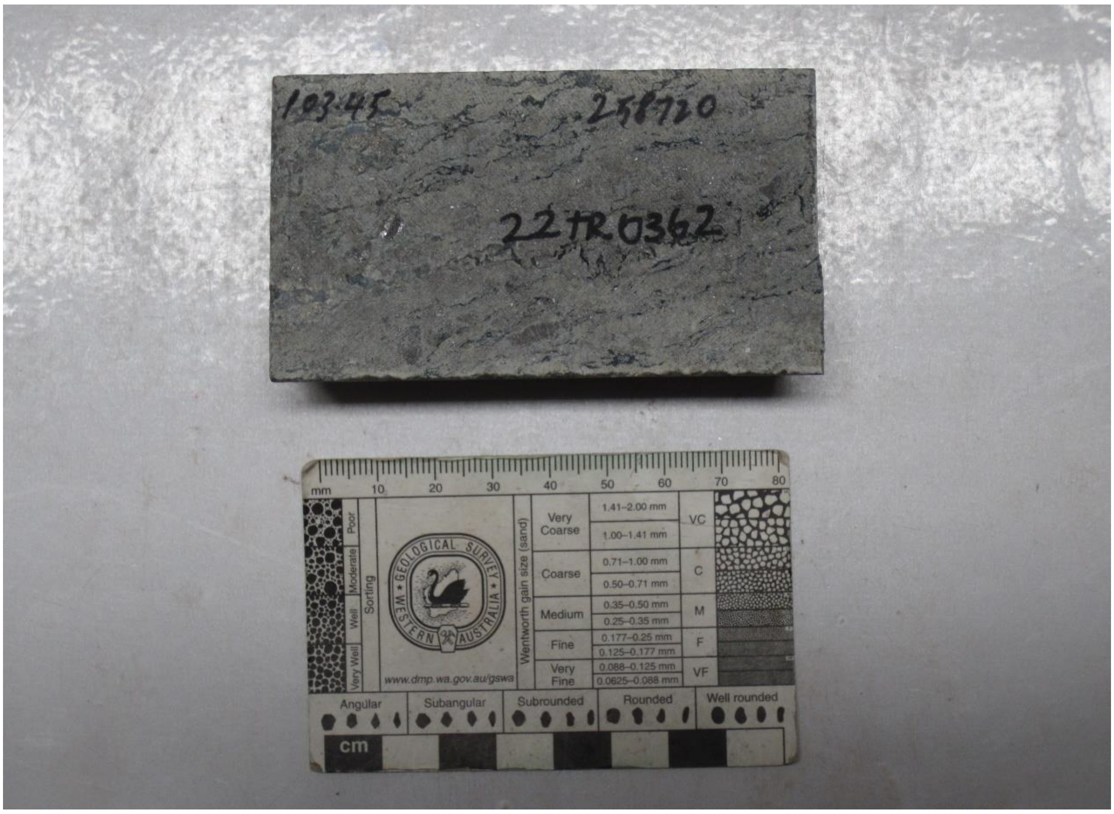
Terra ID: 22TR0358 Client ID: 258802 Drillhole ID: MWEX10270 37.60m- 37.75m

Terra ID: 22TR0359 Client ID: 258717 Drillhole ID: MWEX10270 66.05m- 66.20m



Terra ID: 22TR0360 Client ID: 258718 Drillhole ID: MWEX10270 87.10m- 87.25m

Terra ID: 22TR0361 Client ID: 258719 Drillhole ID: MWEX10270 92.30m- 92.45m



Terra ID: 22TR0362 Client ID: 258720 Drillhole ID: MWEX10270 103.45m- 103.60m

Terra ID: 22TR0363 Client ID: 258721 Drillhole ID: MWEX10270 115.17m- 115.32m

Terra ID: 22TR0364 Client ID: 258722 Drillhole ID: MWEX10270 126.20m- 126.35m

Terra ID: 22TR0365 Client ID: 258723 Drillhole ID: MWEX10270 135.12m- 135.27m

Terra ID: 22TR0366 Client ID: 258724 Drillhole ID: MWEX10270 145.40m- 145.55m

Terra ID: 22TR0367 Client ID: 258725 Drillhole ID: MWEX10270 147.25m- 147.40m

Terra ID: 22TR0368 Client ID: 258726 Drillhole ID: MWEX10270 161.75m- 161.90m

Terra ID: 22TR0369 Client ID: 258727 Drillhole ID: MWEX10270 175.95m- 176.10m

Terra ID: 22TR0370 Client ID: 258728 Drillhole ID: MWEX10270 187.00m- 187.15m

Terra ID: 22TR0371 Client ID: 258729 Drillhole ID: MWEX10270 212.90m- 213.05m

Terra ID: 22TR0372 Client ID: 258730 Drillhole ID: MWEX10270 215.95m- 216.10m

Terra ID: 22TR0373 Client ID: 258731 Drillhole ID: MWEX10270 219.60m- 219.75m

Terra ID: 22TR0374 Client ID: 258732 Drillhole ID: MWEX10270 239.00m- 239.15m

Terra ID: 22TR0375 Client ID: 258733 Drillhole ID: MWEX10270 249.70m- 249.85m

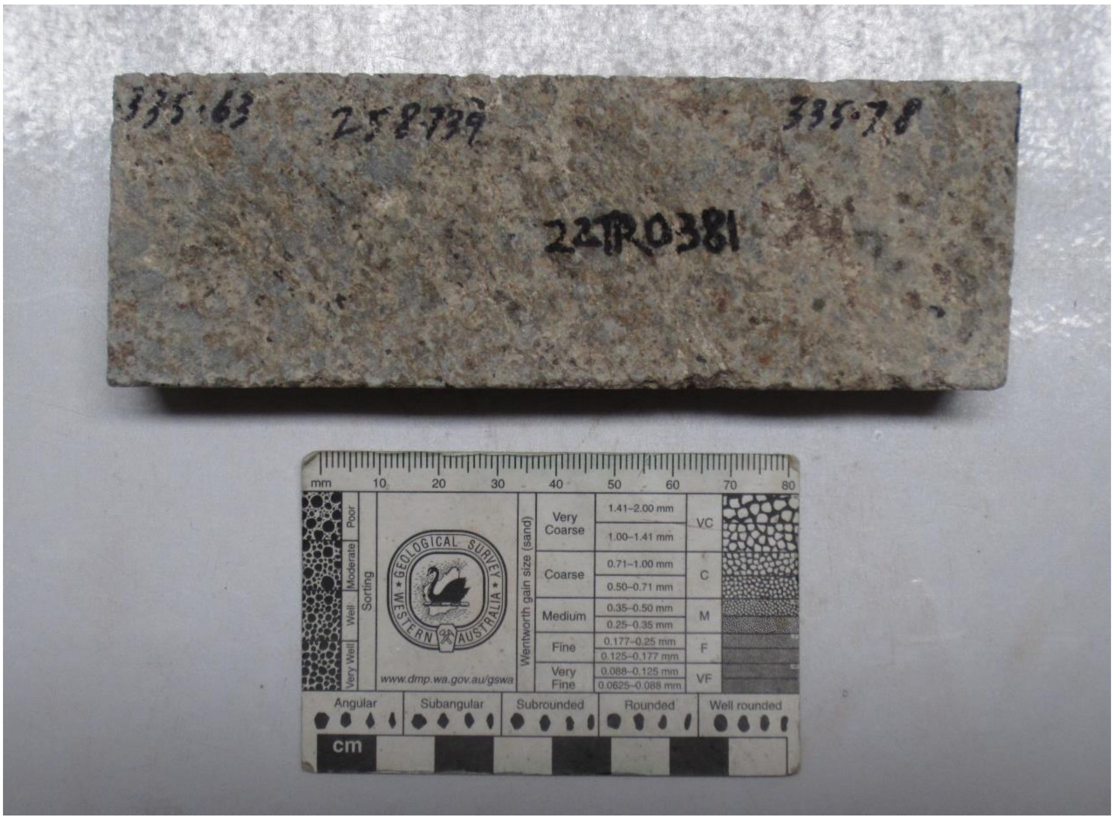
Terra ID: 22TR0376 Client ID: 258734 Drillhole ID: MWEX10270 262.50m- 262.65m

Terra ID: 22TR0377 Client ID: 258735 Drillhole ID: MWEX10270 271.95m- 272.10m

Terra ID: 22TR0378 Client ID: 258736 Drillhole ID: MWEX10270 287.30m- 287.45m

Terra ID: 22TR0379 Client ID: 258737 Drillhole ID: MWEX10270 299.90m- 300.05m

Terra ID: 22TR0380 Client ID: 258738 Drillhole ID: MWEX10270 317.35m- 317.50m



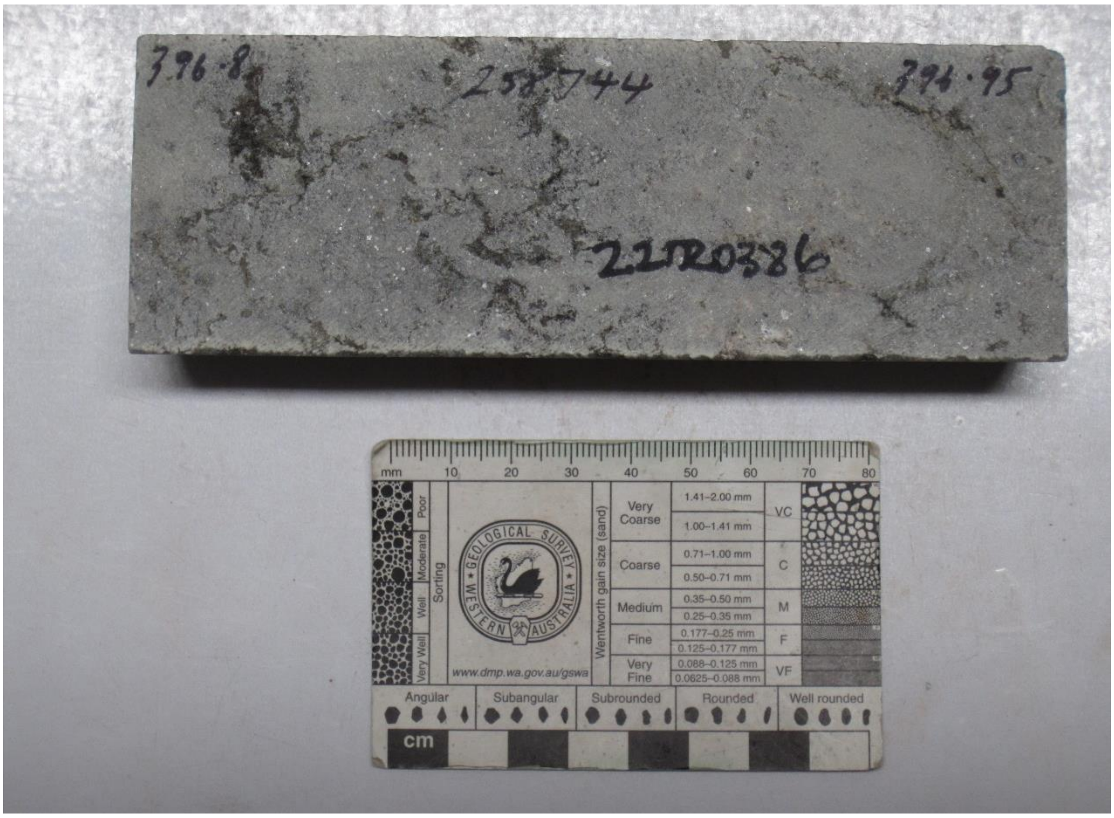
Terra ID: 22TR0381 Client ID: 258739 Drillhole ID: MWEX10270 335.63m- 335.78m

Terra ID: 22TR0382 Client ID: 258740 Drillhole ID: MWEX10270 352.67m- 352.82m

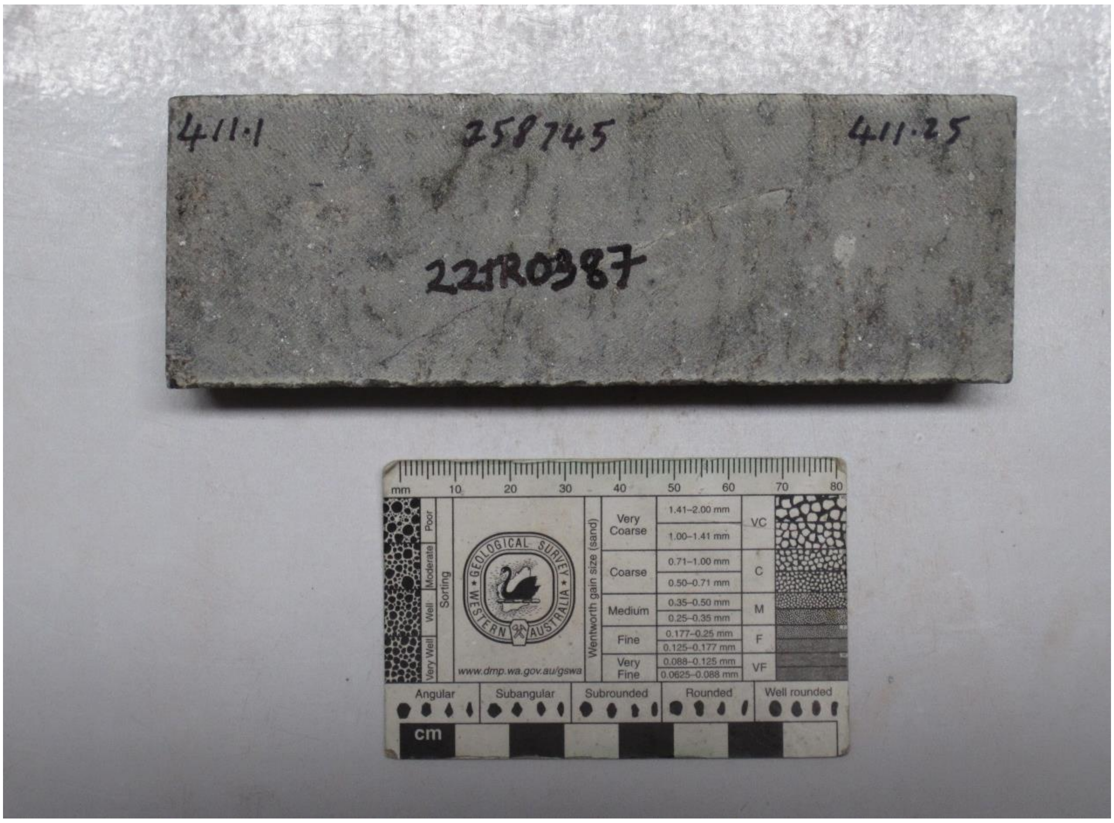
Terra ID: 22TR0383 Client ID: 258741 Drillhole ID: MWEX10270 368.34m- 368.49m

Terra ID: 22TR0384 Client ID: 258742 Drillhole ID: MWEX10270 370.30m- 370.45m

Terra ID: 22TR0385 Client ID: 258743 Drillhole ID: MWEX10270 334.85m- 335.00m



Terra ID: 22TR0386 Client ID: 258744 Drillhole ID: MWEX10270 396.80m- 396.95m



Terra ID: 22TR0387 Client ID: 258745 Drillhole ID: MWEX10270 411.10m- 411.25m

Terra ID: 22TR0388 Client ID: 258746 Drillhole ID: MWEX10270 423.70m- 423.85m

Terra ID: 22TR0389 Client ID: 258747 Drillhole ID: MWEX10270 438.75m- 438.90m

Terra ID: 22TR0390 Client ID: 258748 Drillhole ID: MWEX10270 451.85m- 452.00m

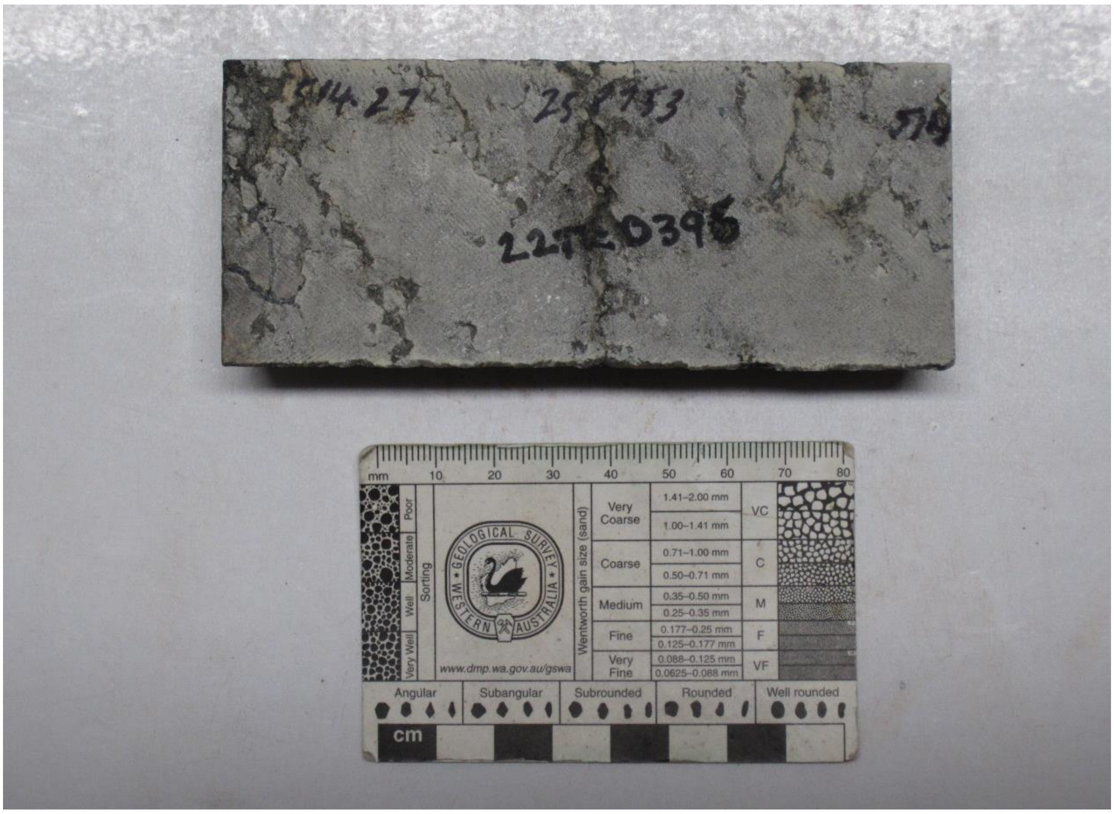
Terra ID: 22TR0391 Client ID: 258749 Drillhole ID: MWEX10270 465.65m- 465.80m

Terra ID: 22TR0392 Client ID: 258750 Drillhole ID: MWEX10270 475.30m- 475.45m

Terra ID: 22TR0393 Client ID: 258751 Drillhole ID: MWEX10270 488.10m- 488.25m

Terra ID: 22TR0394 Client ID: 258778 Drillhole ID: MWEX10270 499.40m- 499.55m

Terra ID: 22TR0395 Client ID: 258752 Drillhole ID: MWEX10270 502.95m- 503.10m

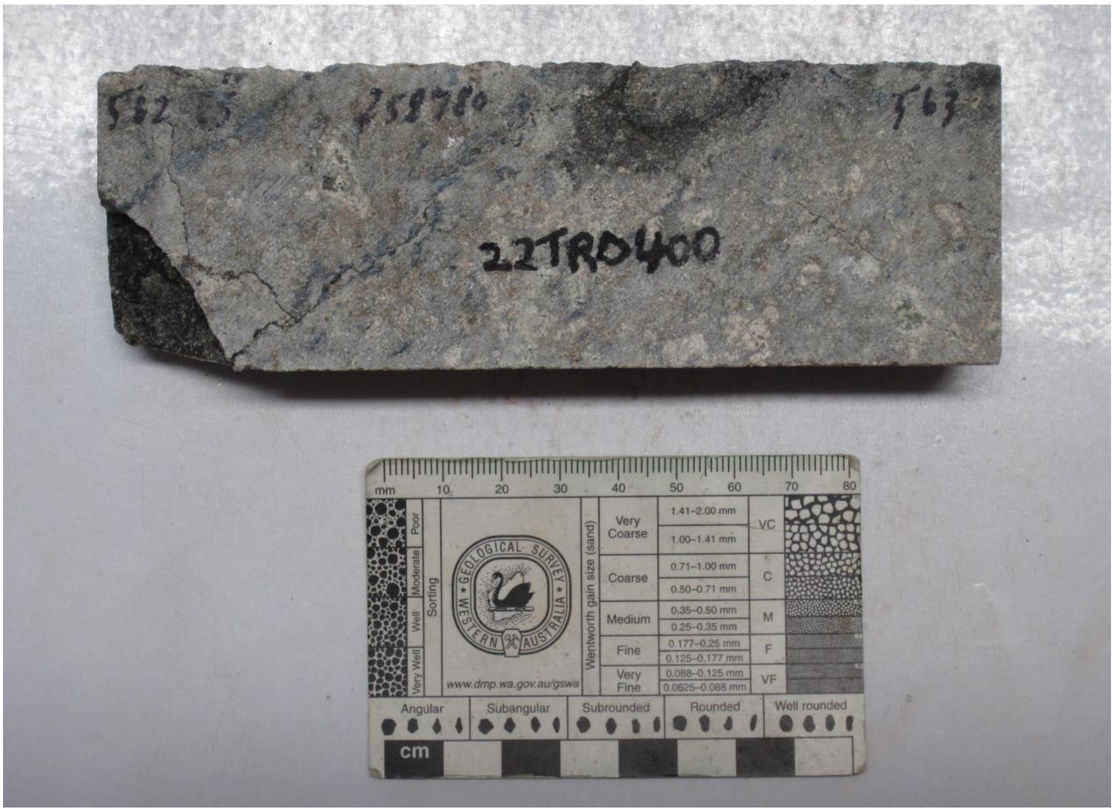


Terra ID: 22TR0396 Client ID: 258753 Drillhole ID: MWEX10270 514.27m- 514.42m

Terra ID: 22TR0397 Client ID: 258779 Drillhole ID: MWEX10270 520.40m- 520.55m

Terra ID: 22TR0398 Client ID: 258754 Drillhole ID: MWEX10270 530.60m- 530.75m

Terra ID: 22TR0399 Client ID: 258755 Drillhole ID: MWEX10270 549.95m- 550.10m

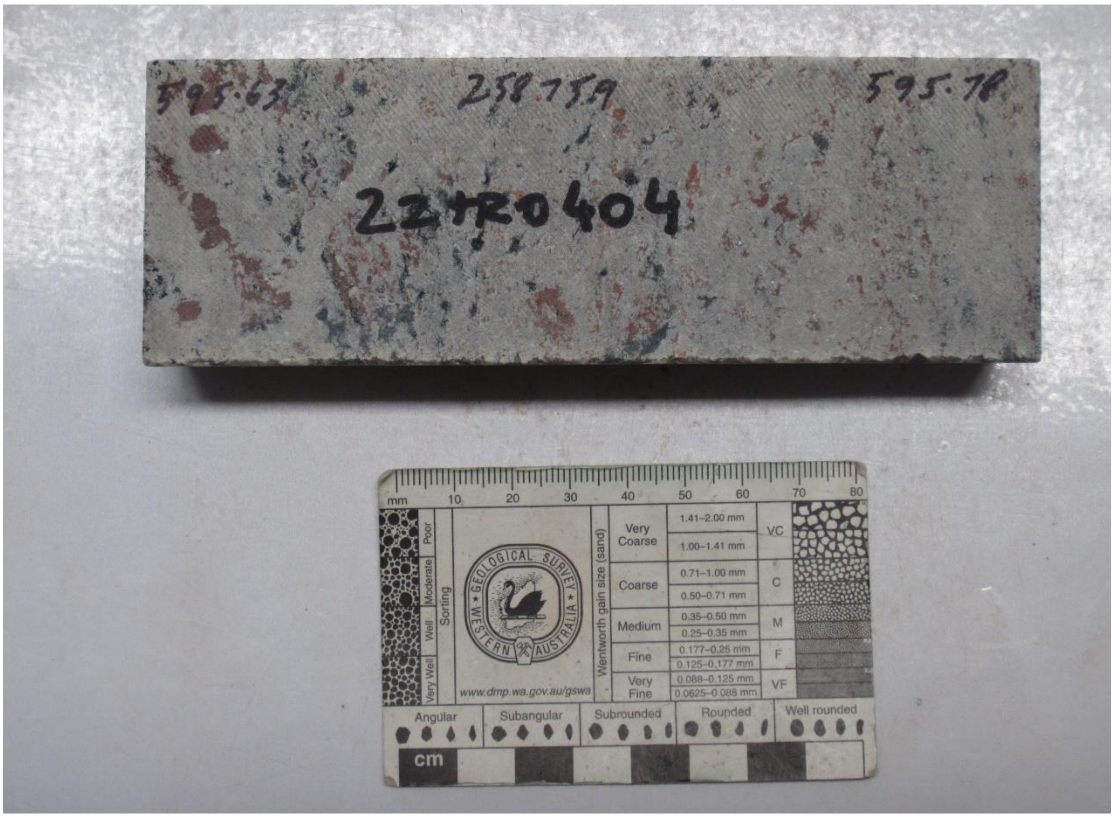


Terra ID: 22TR0400 Client ID: 258780 Drillhole ID: MWEX10270 562.85m- 563.00m

Terra ID: 22TR0401 Client ID: 258756 Drillhole ID: MWEX10270 571.00m- 571.15m

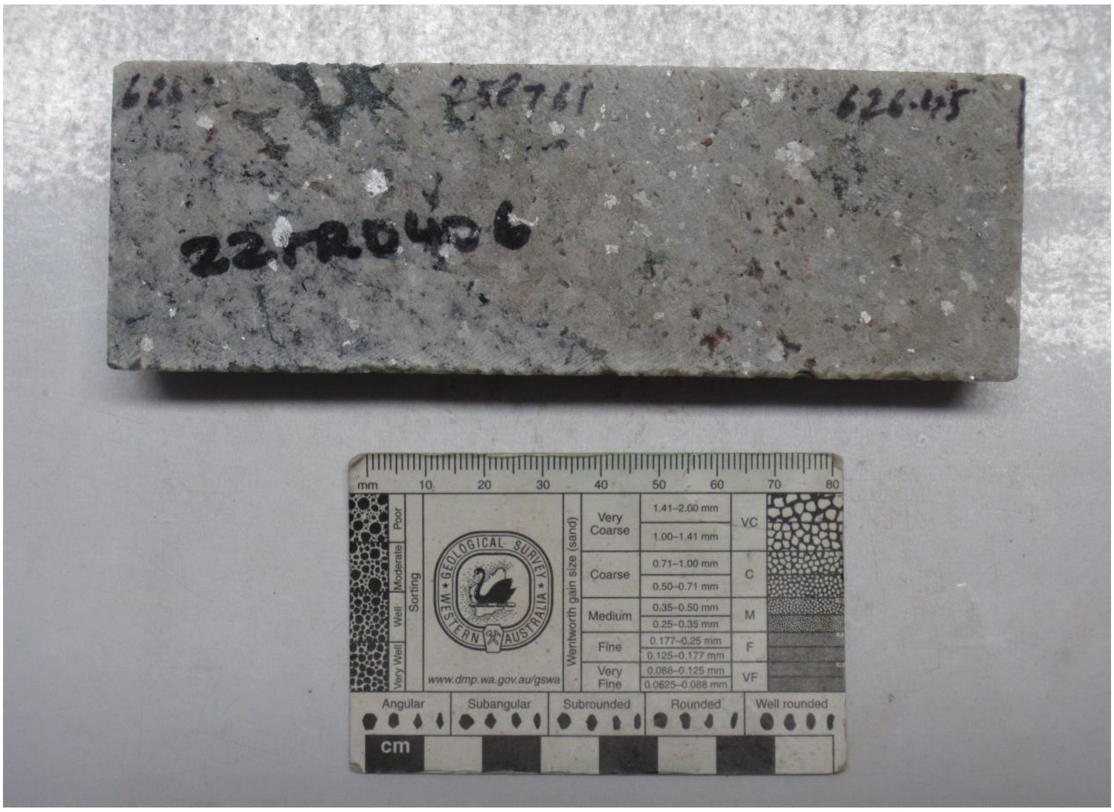
Terra ID: 22TR0402 Client ID: 258757 Drillhole ID: MWEX10270 580.06m- 580.21m

Terra ID: 22TR0403 Client ID: 258758 Drillhole ID: MWEX10270 585.85m- 586.00m



Terra ID: 22TR0404 Client ID: 258759 Drillhole ID: MWEX10270 595.63m- 595.78m

Terra ID: 22TR0405 Client ID: 258760 Drillhole ID: MWEX10270 614.35m- 614.50m

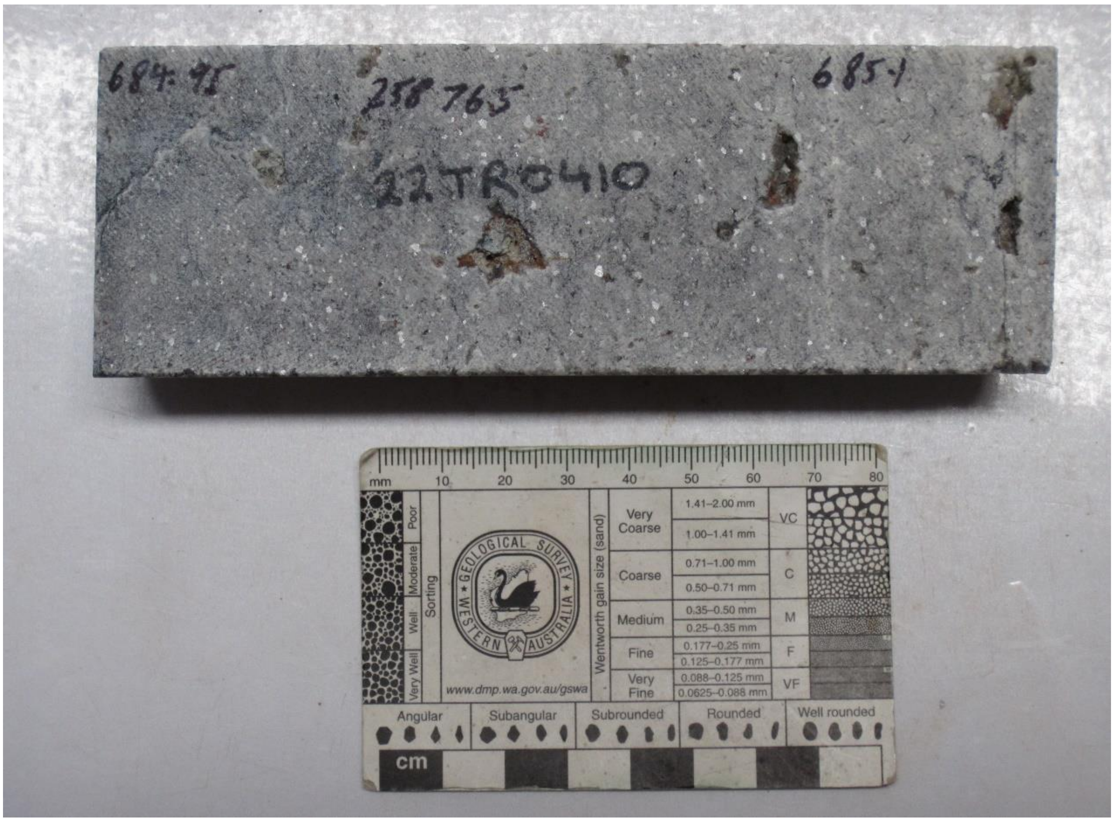


Terra ID: 22TR0406 Client ID: 258761 Drillhole ID: MWEX10270 626.30m- 626.45m

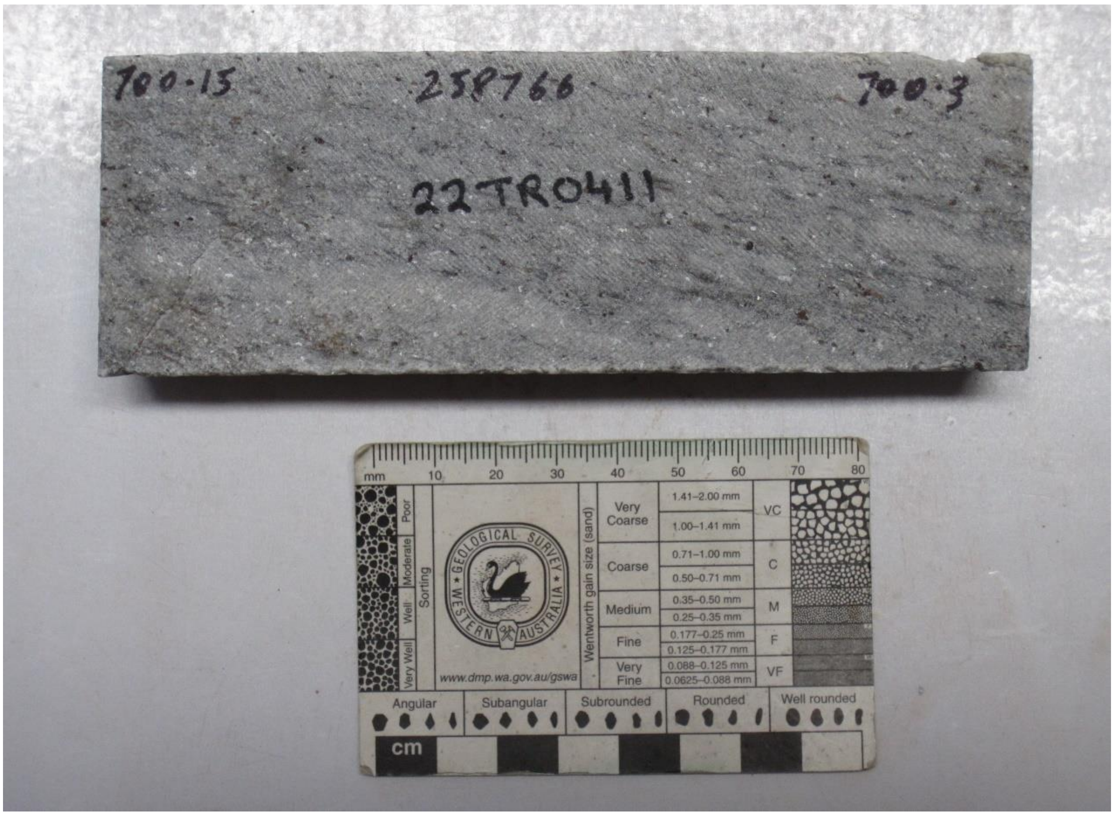
Terra ID: 22TR0407 Client ID: 258762 Drillhole ID: MWEX10270 636.81m- 636.96m

Terra ID: 22TR0408 Client ID: 258763 Drillhole ID: MWEX10270 658.70m- 658.85m

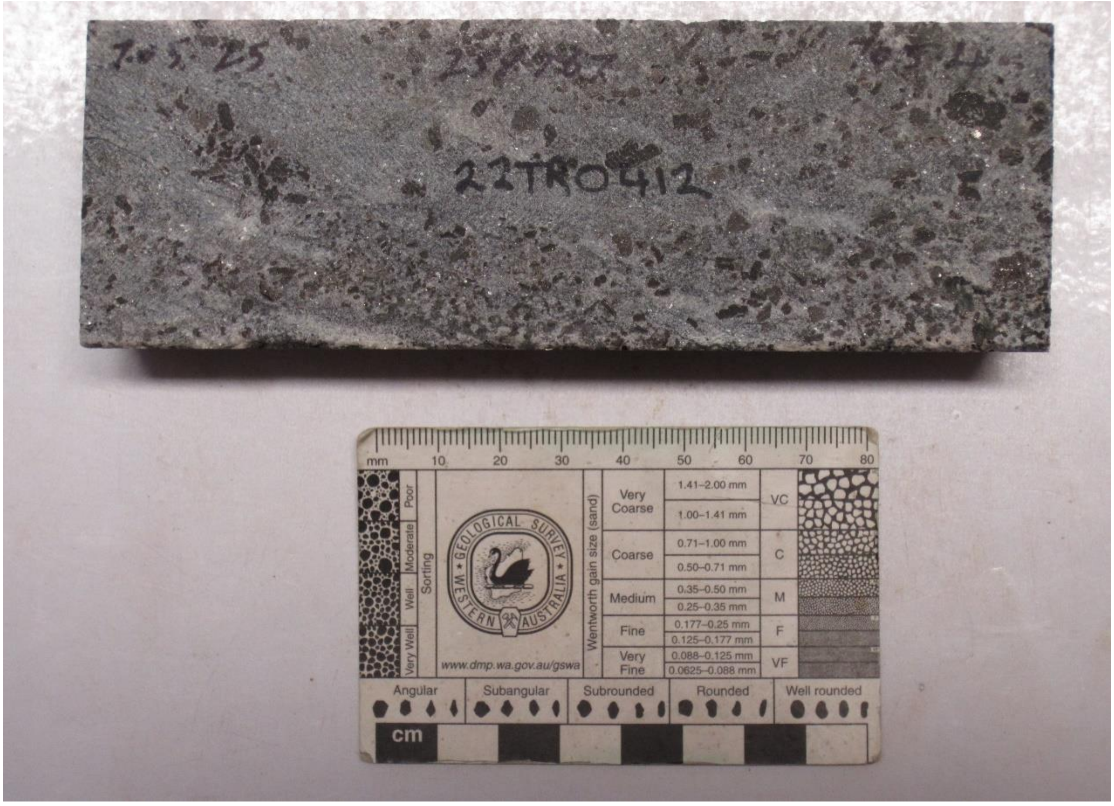
Terra ID: 22TR0409 Client ID: 258764 Drillhole ID: MWEX10270 676.35m- 676.50m



Terra ID: 22TR0410 Client ID: 258765 Drillhole ID: MWEX10270 684.95m- 685.10m

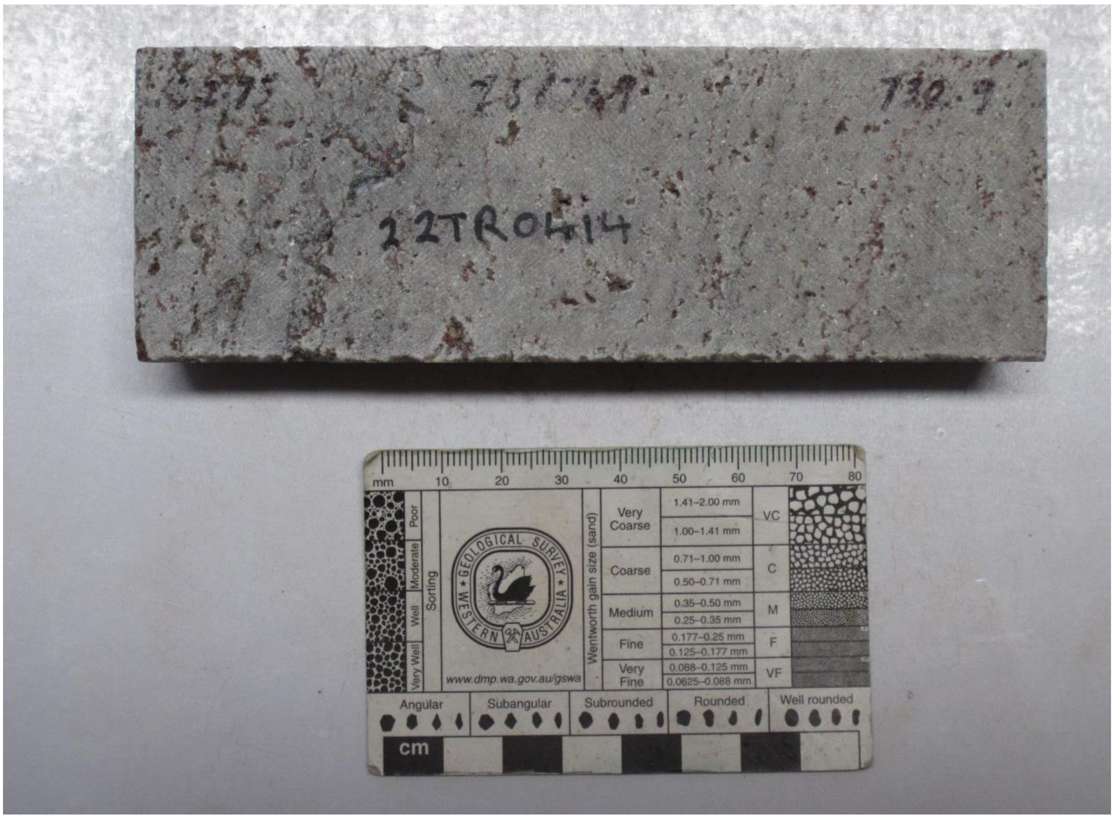


Terra ID: 22TR0411 Client ID: 258766 Drillhole ID: MWEX10270 700.15m- 700.30m



Terra ID: 22TR0412 Client ID: 258767 Drillhole ID: MWEX10270 705.25m- 705.40m

Terra ID: 22TR0413 Client ID: 258768 Drillhole ID: MWEX10270 714.78m- 714.97m



Terra ID: 22TR0414 Client ID: 258769 Drillhole ID: MWEX10270 732.75m- 732.90m

Terra ID: 22TR0415 Client ID: 258770 Drillhole ID: MWEX10270 747.15m- 747.30m

Terra ID: 22TR0416 Client ID: 258771 Drillhole ID: MWEX10270 753.90m- 754.05m

Terra ID: 22TR0417 Client ID: 258772 Drillhole ID: MWEX10270 767.55m- 767.70m

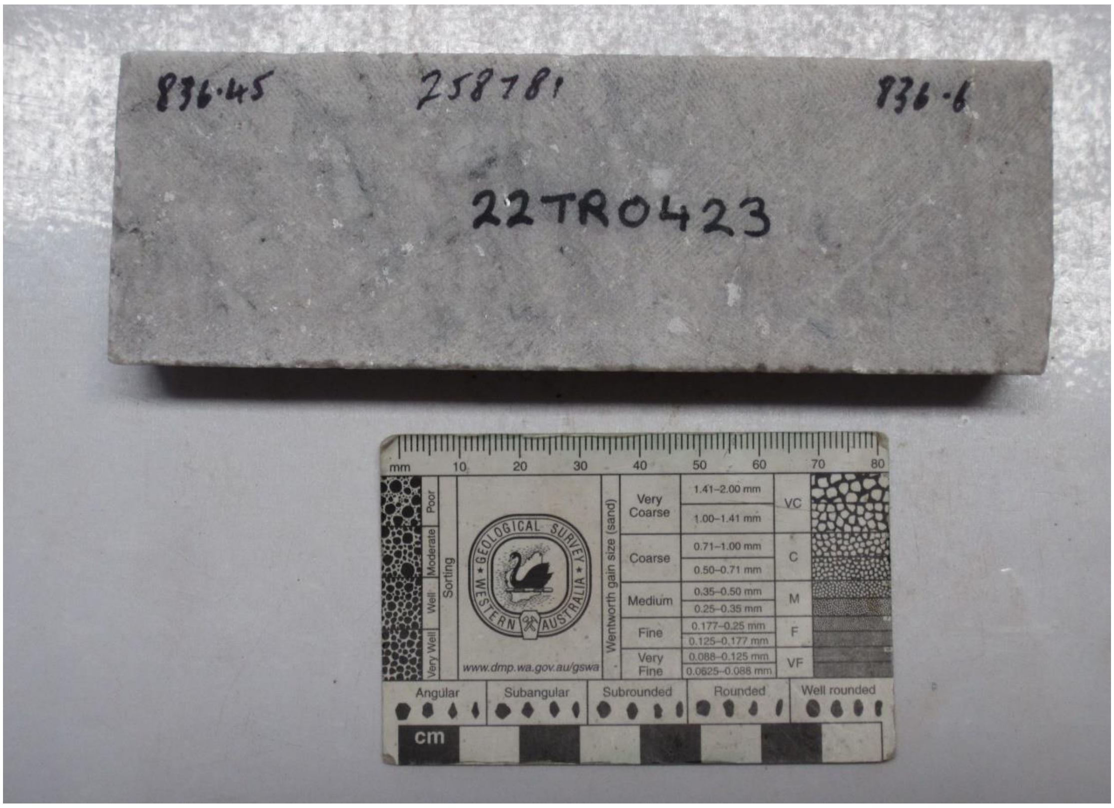
Terra ID: 22TR0418 Client ID: 258773 Drillhole ID: MWEX10270 774.00m- 774.15m

Terra ID: 22TR0419 Client ID: 258774 Drillhole ID: MWEX10270 795.05m- 795.20m

Terra ID: 22TR0420 Client ID: 258775 Drillhole ID: MWEX10270 806.00m- 806.15m

Terra ID: 22TR0421 Client ID: 258776 Drillhole ID: MWEX10270 812.75m- 812.90m

Terra ID: 22TR0422 Client ID: 258777 Drillhole ID: MWEX10270 823.90m- 824.05m



Terra ID: 22TR0423 Client ID: 258781 Drillhole ID: MWEX10270 836.45m- 836.60m

Terra ID: 22TR0424 Client ID: 258782 Drillhole ID: MWEX10270 848.15m- 848.30m

Terra ID: 22TR0425 Client ID: 258783 Drillhole ID: MWEX10270 855.50m- 855.65m

Terra ID: 22TR0426 Client ID: 258784 Drillhole ID: MWEX10270 865.00m- 865.15m

Terra ID: 22TR0427 Client ID: 258785 Drillhole ID: MWEX10270 867.20m- 867.35m

Terra ID: 22TR0428 Client ID: 258786 Drillhole ID: MWEX10270 879.45m- 879.60m

Terra ID: 22TR0429 Client ID: 258787 Drillhole ID: MWEX10270 888.85m- 889.00m

Terra ID: 22TR0430 Client ID: 258788 Drillhole ID: MWEX10270 888.55m- 888.70m

Terra ID: 22TR0431 Client ID: 258789 Drillhole ID: MWEX10270 913.00m- 913.15m

Terra ID: 22TR0432 Client ID: 258790 Drillhole ID: MWEX10270 916.60m- 916.75m

Terra ID: 22TR0433 Client ID: 258791 Drillhole ID: MWEX10270 926.30m- 926.45m

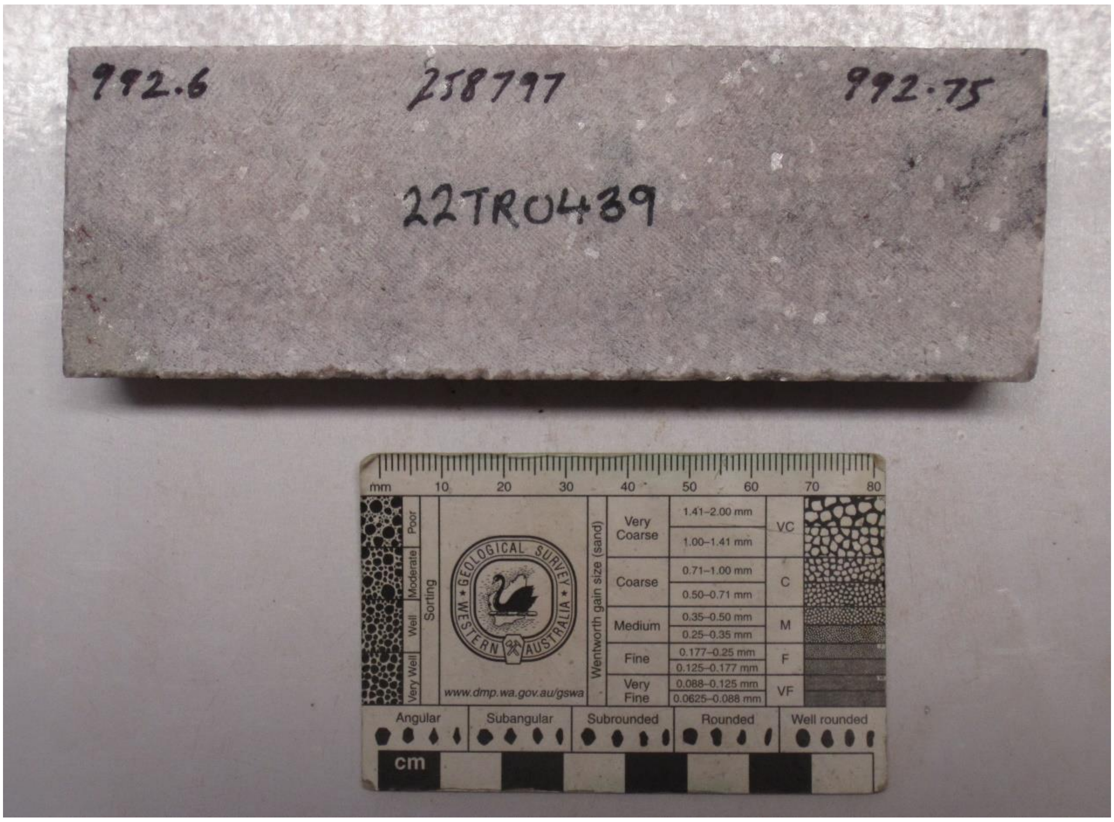
Terra ID: 22TR0434 Client ID: 258792 Drillhole ID: MWEX10270 938.25m- 938.40m

Terra ID: 22TR0435 Client ID: 258793 Drillhole ID: MWEX10270 957.20m- 957.35m

Terra ID: 22TR0436 Client ID: 258794 Drillhole ID: MWEX10270 964.20m- 964.35m

Terra ID: 22TR0437 Client ID: 258795 Drillhole ID: MWEX10270 982.35m- 982.50m

Terra ID: 22TR0438 Client ID: 258796 Drillhole ID: MWEX10270 987.45m- 987.60m



Terra ID: 22TR0439 Client ID: 258797 Drillhole ID: MWEX10270 992.60m- 992.75m

Terra ID: 22TR0440 Client ID: 258798 Drillhole ID: MWEX10270 1004.92m- 1005.07m

Terra ID: 22TR0441 Client ID: 258799 Drillhole ID: MWEX10270 1016.04m- 1016.19m

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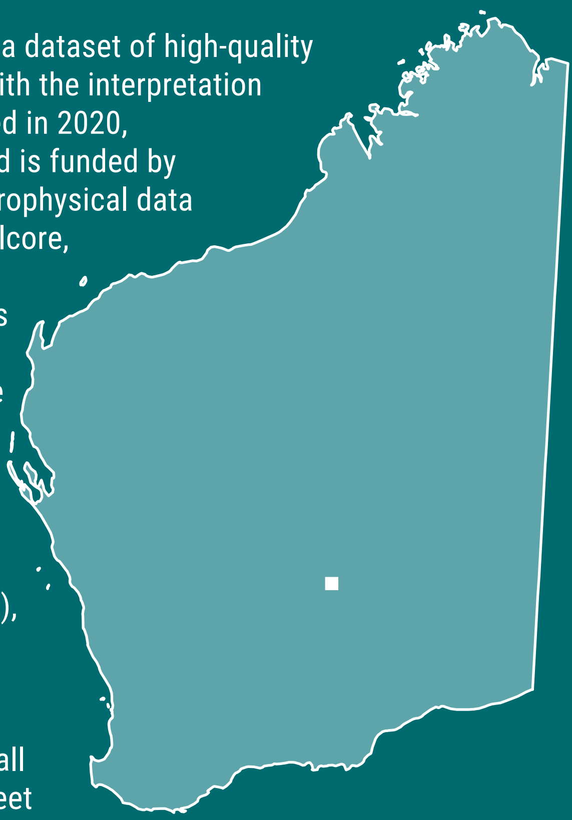
REGIONAL PETROPHYSICS: MT WELD 2021–22

J Trunfull, B Bourne and C Mortimore

This regional petrophysics project provides a dataset of high-quality petrophysical measurements that assists 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 have been collected from EIS co-funded drillcore, company drillcore, and GSWA stratigraphic drillcore. All cores sampled for petrophysics have HyLogger data (or will have) and most have open-file company assay data, available from the Mineral Exploration reports database (WAMEX).

In 2021–22, a suite of eight petrophysical measurements were made on drillcore samples from the Paterson Orogen (n = 940), Mt Weld (n = 86), Fraser Zone in the Albany-Fraser Orogen (n = 370), Kalgoorlie Terrane (n = 337), southwest Yilgarn Craton (n = 174) and Eucla basement (n = 42). For all of these datasets, GSWA provides a datasheet (with petrophysical measurements, lithological information and supplementary material), a photo of each sample and a description of the methods. For the Paterson Orogen, Mt Weld and Fraser Zone datasets, Terra have also produced a report with an analysis of the data. All of these datasets, including the reports are also available in MAGIX.



Further details of geoscience products are available from:

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