Report

Hume Coal JORC Resource Statement

Company	Hume Coal
Site	Hume (A349)
Date	Original - September 2014 Update for MLA April 2016
Doc No	HUM1652-181

palaris

Report To	Hume Coal
Project No.	HUM1652
Doc No.	HUM1652-181

Document History	Name	Date	Version
Authors	Brad Willis Ben Fitzsimmons Rod Doyle	September 2014	V1
Peer Review By	John Bamberry	September 2014	V1
Draft Issued To	Rod Doyle		
Final Review By	John Bamberry	October 2014	V2
Final Issued To	Rod Doyle	October 2014	V3
Updated for MLA	Brad Willis	April 2016	V4
Final Review By	Rod Doyle	April 2016	V5

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- efficiency considerations
- variations in cost elements
- market conditions and global demand
- industry development
- regulatory and policy changes

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1 Statement of Resources

Hume Coal Pty Ltd commissioned Palaris Australia Pty Ltd (Palaris) to provide an estimate of resources for the Hume Coal underground coal project. The Hume Coal project is located within coal title Authorisation 349 (A349) located 6 km west of Moss Vale in the Southern Highlands of NSW.

Resources and reserves reported herein comply with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code) 2012 Edition.

This document provides a statement of the Coal Resources which are currently the subject of plans for mining by underground mining methods, and is supported by a complete JORC Compliant resource report.

The Hume Coal project is a planned underground mine, with a Pre-Feasibility Study completed. The mining methods to be used are *first workings* a combination of bord and pillar.

1.1 Resources

Coal resources have been estimated for the Wongawilli seam as of September, 2014 and are based on a geological database (Geobank) maintained by Hume Coal and a geological model built in Minex software which was a joint collaboration between Hume Coal and Palaris. A total of 245 boreholes have been used to create the geological model.

The Hume Coal resource estimates are potentially underground mineable resources, which have been estimated for two working sections in the Wongawilli Seam:-

- Parting Band Section (PBS), consisting of plies G, H and I
- Alternate Working Section (AWS), consisting of plies E, F, G, H and I (i.e. encompassing the PBS)

The Wongawilli seam consists of up to 10 coal plies labelled WWA to WWJ in descending stratigraphic order. Plies available are typically determined by the overlying unconformable Hawkesbury Sandstone, which erodes the upper coal plies.

The upper coal plies (A, B, C and D) have not been included on the basis that they are typically poorer quality and would not be mined in either of the working sections considered. Similarly, the underlying American Creek and Tongarra seams are not planned to be mined and are excluded from the estimate.

Wongawilli seam working section resources for A349 are summarised in **Error! Reference source ot found.** below. The PBS resources consist of the G, H and I plies of the Wongawilli seam and totals 219.12 Mt, of which 35.24 Mt is Measured, 98.56 Mt is Indicated and 85.32 Mt is Inferred. With inclusion of the overlying E and F plies contained within the AWS adds an additional 103 Mt, of which 17.67 Mt is Measured, 48.74 Mt is Indicated and 36.6 Mt is Inferred.

The total estimate for the AWS section is 322 Mt, based on a minimum working section thickness of 1.5 metres and using air-dried RD values.

Table 1.1 A349 Wongawilli Seam Underground Resources (September 2014)

Tenure	Coal Plies	Working Section	Thickness (m)	Measured (Mt)	Indicated (Mt)	Inferred (Mt)	Total (Mt)
A349	E and F Plies	(upper AWS)	0.95	17.67	48.74	36.60	103.01
A349	G, H and I Plies	PBS	2.25	35.24	98.56	85.32	219.12
A349	TOTAL	(AWS)	3.20	52.91	147.30	121.91	322.12

Subsets of the A349 Wongawilli seam working section resources are contained in the proposed areas within the MLA1 and MLA2. The original resources (above) have now been summarised below in Table 1.2 below, with the new resource estimate of these two MLA areas totalling 188.6 Mt.

Coal resources within MLA1 are estimated at 91.64 Mt within the PBS working section and 50.3 Mt within the upper E and F plies combining to give a total of 141.94 Mt;. Coal resources within MLA2 are estimated at 33.19 Mt within the PBS working section and 13.47 Mt within the upper E and F plies combining to give a total of 46.66 Mt;.

The total estimate for the AWS section within MLA1 and MLA2 is 188.6 Mt, based on a minimum working section thickness of 1.5 metres and using air-dried RD values.

Table 1.2 MLA1 / 2 WWSM Underground Resources (September 2014 – Update April 2016)

MLA Area	Coal Plies	Working Section	Thickness (m)	Measured (Mt)	Indicated (Mt)	Inferred (Mt)	Total (Mt)
MLA1	E and F Plies	(upper AWS)	1.20	14.08	30.18	6.05	50.30
MLA1	G, H and I Plies	PBS	2.38	26.48	53.83	11.33	91.64
MLA1	**E to I**	**(AWS)**	**3.58**	**40.56**	**84.01**	**17.38**	**141.94**
MLA2	E and F Plies	(upper AWS)	0.87	3.15	10.18	0.14	13.47
MLA2	G, H and I Plies	PBS	2.34	7.73	25.16	0.30	33.19
MLA2	**E to I**	**(AWS)**	**3.21**	**10.89**	**35.34**	**0.44**	**46.66**
MLA1&2	**GRAND TOTAL**	**(AWS)**		**51.45**	**119.34**	**17.81**	**188.60**

Note for the sake of transparency the purpose of this update is to provide information to support the submission of Mining Lease Applications over portion of the Authorisation 349, those areas are referred to as MLA1 & MLA2. An additional application MLA3 will also be submitted, but this is a surface lease to assist with the construction of mining related infrastructure and is outside of A349. As such the MLA3 area was not subject to the earlier Resource Assessment.

This update of the 2014 JORC report (April 2016), has had some minor additions that allow the Resources within A349 existing to be broken down into their respective areas of MLA1 and MLA2 (see Figure A.5). These additions include Table 1.2, which provides the subset of resources for MLA1 & MLA2, as well as Figure A.2 which also highlights the respective MLA areas.

1.2 JORC Competency Declaration

This resource estimate is based on information compiled and modelled by Mr Brad Willis and Mr Ben Fitzsimmons. Both are Members of the Australasian Institute of Mining and Metallurgy (#205328 & #304604 respectively). Mr Willis is Principal Geologist at Palaris and Mr Fitzsimmons is a Project Geologist at Hume Coal. The estimate work was undertaken under the supervision of Mr Rod Doyle, Exploration Manager at Hume Coal (AusIMM #102049). All persons mentioned have sufficient experience relevant to the style of mineralisation and type of deposit under consideration. Mr Doyle has the experience and qualifications relevant to qualify as the Competent Person, as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Doyle has over 30 years' experience in exploration and mining of coal deposits. Mr Doyle consents to the inclusion of this Resource Estimate in reports disclosed by the Company in the form in which it appears.

Competent Person(s)	
Mr Rod Doyle Member AusIMM (#102049) Exploration Manager Hume Coal Project	*Signature*  *September 2014*
Competent Person(s)	
Mr Rod Doyle Member AusIMM (#102049) Exploration Manager Hume Coal Project	*Signature*  *April 2016*

2 Overview

2.1 Raw Coal Quality

Raw coal quality data for the resources in the PBS working section are presented in Table 2.1.

Table 2.1 PBS Resources and Raw Coal Quality[1]

Working Section	Resource Class	Resources (Mt)	Thick' (m)	Ash % (ad)	IM % (ad)	VM % (ad)	CSN	RD g/cc (ad)	SE MJ/kg (ad)	TS % (ad)
PBS	Measured	35.24*	2.45	25.2	1.8	28.2	4.6	1.47	24.87	0.56
PBS	Indicated	98.56*	2.27	25.9	1.8	27.7	4.3	1.48	23.18	0.53
PBS	Inferred	85.32*	2.14	28.2	1.6	26.7	3.1	1.50	22.93	0.45

* PBS working section resources shown are not exclusive to AWS resources (AWS encompasses the PBS working section)

Raw coal quality data for the resources in the AWS working section are presented in Table 2.2.

Table 2.2 AWS Resources and Raw Coal Quality

Working Section	Resource Class	Resources (Mt)	Thick' (m)	Ash % (ad)	IM % (ad)	VM % (ad)	CSN	RD g/cc (ad)	SE MJ/kg (ad)	TS % (ad)
AWS	Measured	52.91	3.60	27.4	1.8	27.9	4.2	1.49	23.98	0.55
AWS	Indicated	147.30	3.26	27.8	1.7	27.5	3.8	1.50	22.46	0.53
AWS	Inferred	121.91	2.95	29.0	1.6	26.8	2.4	1.51	21.91	0.50

2.2 Product Quality

Product quality by resource classification of the PBS working section is presented in Table 2.3.

Table 2.3 PBS Resources and Indicative Product Qualities

Working Section	Resource Class	Resources (Mt)	Thick' (m)	Primary Yield %	Primary Yield Ash % (ad)	Primary CSN	Secondary Yield %	Secondary Ash % (ad)
PBS	Measured	35.24	2.45	49.48	10.6	7.3	32.83	23.5
PBS	Indicated	98.56	2.27	49.93	10.3	7.2	30.92	23.4
PBS	Inferred	85.32	2.14	41.37	10	6	27.69	22.1

Product quality by resource classification of the PBS working section is presented in Table 2.4.

[1] IM: inherent moisture, VM: volatile matter, CSN: Crucible Swelling Number; RD: relative density; SE: gross specific energy; TS: total sulphur

Table 2.4 AWS Resources and Indicative Product Qualities

Working Section	Resource Class	Resources (Mt)	Thick' (m)	Primary Yield %	Primary Yield Ash % (ad)	Primary CSN	Secondary Yield %	Secondary Ash % (ad)
AWS	Measured	52.91	3.6	44.45	10.6	7.3	31.96	23.9
AWS	Indicated	147.30	3.26	44.59	10.4	7.1	32.97	22.9
AWS	Inferred	121.91	2.95	43.38	10.3	6.3	25.46	22.1

2.3 Limits and Constraints

Table 2.5 lists the constraints used in this resource estimate. The minimum working section thickness is based on local experience in the Southern Coalfield.

Table 2.5 Limits and Constraints

Resource Limit Parameter	Limit Used
Minimum Working Section Thickness	1.5 m
Upper Limiting Surface	Base of Hawkesbury Sandstone
Depth of Cover Limit	None applied, depth of cover is typically less than 200m
Quality / Grade Cut-offs	None used – all coal within working sections will be beneficiated
Relative Density	Air Dried RD has been used
Surface Constraints	No surface constraints have been used to limit resources

2.4 Confidence and Validation of Estimation

Mining in the Southern Coalfield and the Southern Highlands has been on-going for the best part of a century. Knowledge and understanding of the Illawarra Coal Measures is at a very high level. With that background the level of understanding of the coal within Authorisation 349 has improved significantly since Hume Coal took over ownership.

Drilling has effectively doubled the Points of Observation (POO) and a very large majority of boreholes not used for modelling are historic boreholes. More recent POO are of greater confidence particularly with regard to survey control. This improved understanding of the area has led to a greater confidence in geological structures and washouts as well in the nature and behaviour of the Wongawilli Seam. This in turn has raised the confidence levels in the resource estimate. On average across the entire licence area there are approximately 4 holes drilled per square kilometre (367 holes – 89km^2).

The previous resource estimate did not have any resources identified as Measured Status. This improvement in resource definition highlights the improvement in confidence.

With the input of Palaris during the modelling and reviewing POO this has effectively acted as an external audit process of the internal Hume Coal processes.

2.5 Comparison with Previous Estimates

A comparison of this resource estimate is provided in Table 2.6.

Table 2.6 Comparison with previous estimate

Cockatoo Coal Summary Data - Grand Totals - 25/11/2011					
Coal Plies	**Working Section**	**Measured Mt**	**Indicated Mt**	**Inferred Mt**	**Total**
Data includes ABCD & J.					
EF	Upper WW	0	80.5	112.0	192.5
GHI	PBS	0	124.4	129.0	253.4
Combined	AWS+ABCD+J	0	204.9	241.0	445.9
Cockatoo Coal Summary Data (Like for Like with Hume Coal Data)					
Coal Plies	**Working Section**	**Measured Mt**	**Indicated Mt**	**Inferred Mt**	**Total**
Data doesn't include ABCD or J.					
EF	Upper AWS	0	66.4	63.0	129.4
GHI	PBS	0	124.4	121.0	245.4
Combined	AWS	0	190.8	184.0	374.8
Hume Coal Summary Data - 30/09/2014					
Coal Plies	**Working Section**	**Measured Mt**	**Indicated Mt**	**Inferred Mt**	**Total**
EF	Upper AWS	17.7	48.7	36.6	103.0
GHI	PBS	35.2	98.6	85.3	219.1
Combined	AWS	52.9	147.3	121.9	322.1

The most significant difference between the 2011 estimate and the 2014 estimate is the plies that have been omitted from the estimates in the recent results. This in effect reduces the Cockatoo Coal result of 445.9Mt to a level of 374.8Mt on a like for like basis. A difference of some 71.1Mt.

The difference between the revised Cockatoo Coal (like for like basis) and the Hume Coal estimate is a total of 52.7Mt. The main reason which accounts for the lower tonnage estimates in Hume Coal's assessment is, the inclusion of recent boreholes coupled with the exclusion of several historic boreholes and piezometers (92). This has led to a better, more refined interpretation of the geological model. Areas of exclusion associated with interpreted intrusions and washouts are significantly greater than previous models which would also account for tonnage differences.

In addition the use of Relative Density values has undergone different determinations. Cockatoo Coal developed a regression analysis which was applied to the data. Due to the increased number of drilling, Hume Coal employed a different estimate using RD (air dried basis). Hume Coal used existing laboratory data for RD (recent and old) and generated grids for the various plies which would have resulted in differences between the two estimates.

Different radii of influences were used between the two estimates which would have impacted on tonnages attributed to the different categories but not necessarily the tonnages themselves. Some areas within A349 are now identified as not having coal defined as resources.

3 JORC Table 1

3.1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• The target coal seam is sub-surface. No outcrops have been sampled. All coal collected for testing has been via drilling methods e.g. NQ, HQ triple tube coring methods or LD (200)mm. Coring techniques ensured very good representative coring of the target core seam. Several drilling campaigns have taken place over 45 years under the direction of various companies. There are some 164 'historic holes' across the area of interest (1956 – 1986) and an additional 146 recent holes drilled post 2011.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• Blade bits and hammers were used to construct open holes (sections) and core barrels are used to recover coal core to established industry standards. Core orientation has been trialled in the past, but not undertaken recently. Geophysical logs use verticality to ensure that holes are drilled vertically.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• Industry standard techniques are used for sampling. In open holes representative chip samples were taken and logged and every metre is photographed, while core was obtained by NQ, HQ and 4C (100mm) diameter coring techniques – generally using triple tube operations. • Professional drilling companies are used to ensure high recovery standards, they typically attain 100% core recovery. Geophysical logs are used to assist define any lost core. • Geologists are used to log the cuttings and the core and take photographs of both. • Sampling is fully representative and there is no bias for loss or gain.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc)*	• All holes are geologically and more recently geotechnically logged. All logs are both qualitative and quantitative, defining the nature of material present and the amount of core drilled versus recovery. Typically the proposed working sections are fully cored.

Criteria	JORC Code explanation	Commentary
	photography. • *The total length and percentage of the relevant intersections logged.*	• All the recent HU series holes have been geophysically logged with a suite of tools being used. Geophysical logs are analysed extensively and used to confirm and correct geological logs. All holes are planned to be drilled vertically and geophysical logs measure the verticality of the bores. • Core photography is undertaken on all cored holes. Over 300 holes have been drilled and cored sections for each is identified in the accompanying formal report.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• All recovered coal core (including roof and floor dilution samples) is sampled and placed into labelled bags to ensure proper chain of custody. It is then transported to the laboratory for testing purposes. • The laboratory used are NATA registered and follow strict Australian and ISO Standards to ensure appropriate representative sampling and sizing is undertaken. Samples have previously been riffled and rotary split to ensure masses are available for the different stages of work required as well as to maintain reserves for any checks required. • Procedures in the laboratory ensure that the samples tested are representative and that bias is not introduced. Accuracy of data is at a high standard and checked internally and audited externally.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.*	• Various laboratories have been undertaking analysis over time. Currently, the sample selection is undertaken in-house at Hume Coal and reviewed by external coal quality consultants who have also developed the procedures for testing. ISO & Australian Standards are used for all laboratory testing. They use systematic QA/QC procedures for all work. Results are reviewed both by the laboratory and in-house to ensure the accuracy of the data. The laboratory has been inspected by Hume Coal personnel and found to satisfy the highest standards for testing purposes. • Geophysical logging has been undertaken by professional companies for all of the recent Hume Coal holes. Prior to this of all the historic holes drilled only 13 holes had geophysical logs undertaken. Typically, Weatherford slimline suite of tools are utilised for all geophysical requirements.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• Little use of pilot or twin holes (if any) has been undertaken at A349. The recent environmental conditions limit the flexibility to conduct twin holes or redrills. All holes are geophysically logged and verification of seam details is made using geophysics. Assessments of coal intersections are undertaken by both Hume geologists and reviewed internally by alternate geologists. Geophysical logs confirm the presence and details of the target Wongawilli seam and its various plies as well as all the strata from the base of the hole to the surface. • Core photography also provides evidence of samples taken.

Criteria	JORC Code explanation	Commentary
		• Sample sheets are developed in-house, reviewed by the laboratory and on occasions audited externally. • Drilling data is recorded on field sheets and transcribed to the data base. All data is audited and checked against the existing data base of information. Any data outside the usual ranges is reviewed and resolved. Any laboratory data is reviewed, validated and if necessary the anomaly is taken up with the laboratory for checks.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• All recent boreholes are set out using GPS technology and then formally surveyed by external professional contract surveyors. Any significant variation between the two measurements is investigated. The holes are located with a high degree of precision in three dimensions. Work is undertaken to Australian Standards. • Survey practice used during the drilling of historic holes is understood to be undertaken to standards used at the time. In general they are regarded to have a high degree of confidence. However several historic holes have been ignored during modelling due to concerns regarding survey confidence. Access to properties to confirm survey data has not been forthcoming and was considered to cause more consternation with the local community than it was worth. Because the drilling extends back for more than 50 years a new review of this excluded data set will need to be undertaken prior to reusing this data. A list of all holes used and not used is outlined in the formal report with reasoning set out for exclusion parameters.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• Bores have been nominally spaced at 500m or 1000m depending on availability to properties. Some infilling of this grid has been undertaken where access permits. Historic holes are also overlain with this spacing. On average there are statistically less than 4 boreholes per square kilometre (89km2). However this varies significantly and there are some areas of square kilometre size that only have 1 hole or less. While the maximum frequency per square kilometre would be approximately 12 drill sites per square kilometre. • Ongoing exploration will continue to see the spacing reduced and the confidence levels improved. Particularly in areas where there are currently low frequencies.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• All holes are planned to be drilled vertically to minimise any bias in obtaining information and core. Verticality surveys are also undertaken with geophysics. Dips of the seam are not excessive and near horizontal which also assists in minimising any bias. • Confidence in geological structure is comparatively low at this time. A review of structure has been undertaken for this study. Few holes have been specifically drilled to target structure. Nevertheless there are a significant amount of drill

Criteria	JORC Code explanation	Commentary
		holes that have encountered geological structures, including both faulting and igneous intrusions. Of the 337 holes drilled approximately 15% of the holes have intersected structural features.
Sample security	• *The measures taken to ensure sample security.*	• Once the core is recovered the coal samples are identified and described during geological logging. They are then placed in plastic bags with descriptive tags placed inside the bag and labelled outside the bag. Samples are returned to a core shed and stored in a freezer until ready for transport to the lab. • Transportation of samples is recorded and a chain of custody document is provided. Any delay in transportation is investigated. The laboratory provide acknowledgement of receipt. The laboratory has strict procedures to follow for acceptance of samples and recording there delivery and processing steps.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Data integrity of all data; geological, survey, geophysical and laboratory information is reviewed before importing into Hume's data base system. An external coal quality audit of data was undertaken in 2012 and also in 2014.

3.2 Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• The Hume Coal Project is exploring for coal on an Exploration Licence Authority - A349. It is operated by Hume Coal Pty Limited which is a 100% owned by the Korean Company POSCO. • Exploration activities are progressing under the belief that a Mining Lease will be approved. However there is a local opposition group that have caused delay to the exploration activities.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• The area has had exploration activities being undertaken for in excess of 50 years. Some 164 holes have been drilled prior to POSCO taking an interest in the area. Since then some 173 holes have been drilled in the area. • Austen and Butta, Bellambi Coal, Shell & Anglo American have all undertaken exploration in and around the A349 tenement. • Aeromagnetic surveys have been taken on the tenement. Earlier generations of information have contributed to an overall understanding generated for this recent resource review.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The geology of the tenement is well understood and lies within the Sydney Basin along its south western margin. Coal seams are well known members of the Permian Illawarra Coal Measures. Shales of the Wianamatta Group outcrop as the upper strata in the area. The Hawkesbury Sandstone Unit underlies the Wianamatta Group and directly overlies the Wongawilli Sandstone. There has been significant erosion of sediments from both the Illawarra Coal Measures and the Narrabeen Group. The area is also significantly impacted by igneous intrusions.

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *hole length.*
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the*
		• Relevant drill hole information is provided in the formal summary report for this resource review. The summary report provides commentary on survey data for layout and pick up and also on geophysical logs e.g. deviation tools and depth checks.
		• This information is considered commercially in-confidence information and is not presented in summary here in Table 1.

Criteria	JORC Code explanation	Commentary
	Competent Person should clearly explain why this is the case.	
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• No weighting has been attributed to any results used in reporting these resources. For the Wongawilli Seam a seam thickness minimum cut-off of 1.50m has been used. Any resources less than 1.50m have been ignored. No coal above the E ply has been included in this the latest coal resources assessment.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	• The vertical bores and near horizontal seams give high confidence in seam thickness measurements such that intercept lengths are considered to be equal to seam thickness.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• The formal report has diagrams covering all suggested requirements. This information is considered commercially in-confidence information and is not presented in summary here in Table 1.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• Reporting identifies Inferred, Indicated and Measured status of resources. The table presented compares two alternate mining heights. A minimum coal thickness of 1.50m is used as a cut-off. The Average combined (coking & thermal) yield for the Wongawilli seam is nominally 80%. No weighting has been attributed to sampling or testing during laboratory processing.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• Gas data has been collected at various bores throughout the tenement at various depths and in various seams. Gas is very low content (Avg. <0.3m3/t) and what is present is Carbon Dioxide (nom 97%). • Aeromag and surface magnetometer work has been conducted. In addition, two areas of 2D seismic surveying have been undertaken.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Ongoing magnetic work is planned for several properties. An additional 25 holes all planned to core the target seam will be conducted.

3.3 Estimation and Reporting of Mineral Resources

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	• Data recorded in the field is logged using field sheets and then checked on entry into the Hume Coal data base. This software is designed to ensure data accuracy before being accepted into the database. Data validation and checks are undertaken both internally and by external consultants. The database integrity is robust.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• Mr Doyle is the Competent Person and is employed full time by Hume Coal as their Exploration Manager. He is based at Moss Vale and has visited the Exploration Licence site on numerous occasions in the last 12 months. He has also worked in this part of the Sydney Basin for in excess of 22 years. And had several years of underground experience in and around the Wongawilli Seam in various mines of the Southern Coalfield.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• Geological interpretation of seam continuity is at a high level of confidence. The nature of geological structures is currently at a lower level of confidence. However, a recent study has pulled together a significant and detailed interpretation of possible structures. This structure figure together with interpretation details is included in the formal resource report. The mine plan design is flexible and if alternate structures proved to be present this is considered to have low impacts compared to the existing current interpretations. The effect of geology has impacted the resource definition. Washouts of the Wongawilli seam to the south west has impacted on seam thickness. In places this erosional activity has made inroads into areas of good seam thickness. There may be some additional losses due to unknown erosional activity, but these are not considered to be significant. It is considered that this could lead to reduction of resource estimates by up to 5%. However any potential is not expected to have any impacts on current planned mine plans.
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• The Wongawilli seam resources work has defined a major mining domain across the entire tenement covering about 89km2. The one major constraint is associated with seam thickness and anything less than 1.5m has been excluded from the resource base. Thickness range from 1.50m (minimum) to 4.70m. For the PBS working section (GHI) the average thickness is 2.18m and the maximum is 3.39m. For the AWS (alternate working section - EFGHI) the average thickness is 3.08m and the maximum is 4.70m. Depths ranging from outcrop in the north-west to 200m in the north-east and the south-east.
Estimation and	• *The nature and appropriateness of the estimation technique(s) applied and key*	• Modelling has been undertaken using Dassault Systems' Minex software under the guidance of a professional consultant from Palaris with Hume Coal operators

Criteria	JORC Code explanation	Commentary
modelling techniques	*assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.* • *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	undertaking the work. Hume Coal have been fully trained in the use of the software. • Resources are based on working sections of the Wongawilli seam, which are created using scripts (Minex borehole SQLs) to create the PBS and AWS intervals • The working section grids have been cut by Topography and Base of Hawkesbury Sandstone surfaces • Structure grids have been limited by masks representing the interpreted location and extent of volcanic dykes and plugs, which have been interpreted from boreholes, seismic, gravity and magnetic data • Resource classification polygons have been created around points of observation for structure and points of observation for coal quality, although almost all boreholes drilled are partly cored with coal quality data used • Distance between PoO's for Measured resource class is 0 – 400m, Indicated is 400 – 1,000 and Inferred is 1,000 - 3,000 m.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• For moisture levels for this resource assessment air dried levels were used. It is recognised that this is not the preferred criteria. But time demands meant that the in-situ densities were not able to be determined. In this instance with the low level of moisture associated with the bituminous nature of the coal it was not felt that the difference would be significant. Following the completion of the formal resource report a revision of the tonnes will be undertaken to compare results.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• A minimum seam thickness cut off for the Wongawilli seam is 1.50m. This is considered the minimum likely thickness to be mined by underground methods. • Raw coal ash is not deemed to be a cut-off parameter. Washability of the ROM coal will ensure that yields will provide both Coking Coal and Thermal products averaging about 80%. • High ash coal plies of the Wongawilli seam (A, B, C and D), the American Creek and Tongarra seams have been excluded
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the*	• The target seam is considered suitable for high productivity underground operations.

Criteria	JORC Code explanation	Commentary
	basis of the mining assumptions made.	
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• Product from the target seam will have a significant proportion that will provide metallurgical coking coal.
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• No environmental factors or assumptions have been made with respect to the resource
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• No assumptions have been made regarding bulk density.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• The Australian Guidelines for Estimating and Reporting of Inventory Coal, Coal Resources and Coal Reserves has been adhered to in defining resource categories. The JORC Code has been reviewed and followed for the use of this resource determination.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• Informal audits have been undertaken by Hume Coal and Palaris.
Discussion of relative accuracy/	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical*	• Based on the data available the degree of accuracy of this statement is high. The process for calculation has used; Standards, Guidelines and the JORC Code along with best practise where available to define the resource estimates

Criteria	JORC Code explanation	Commentary
confidence	*procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	provided.

Appendix A Plans

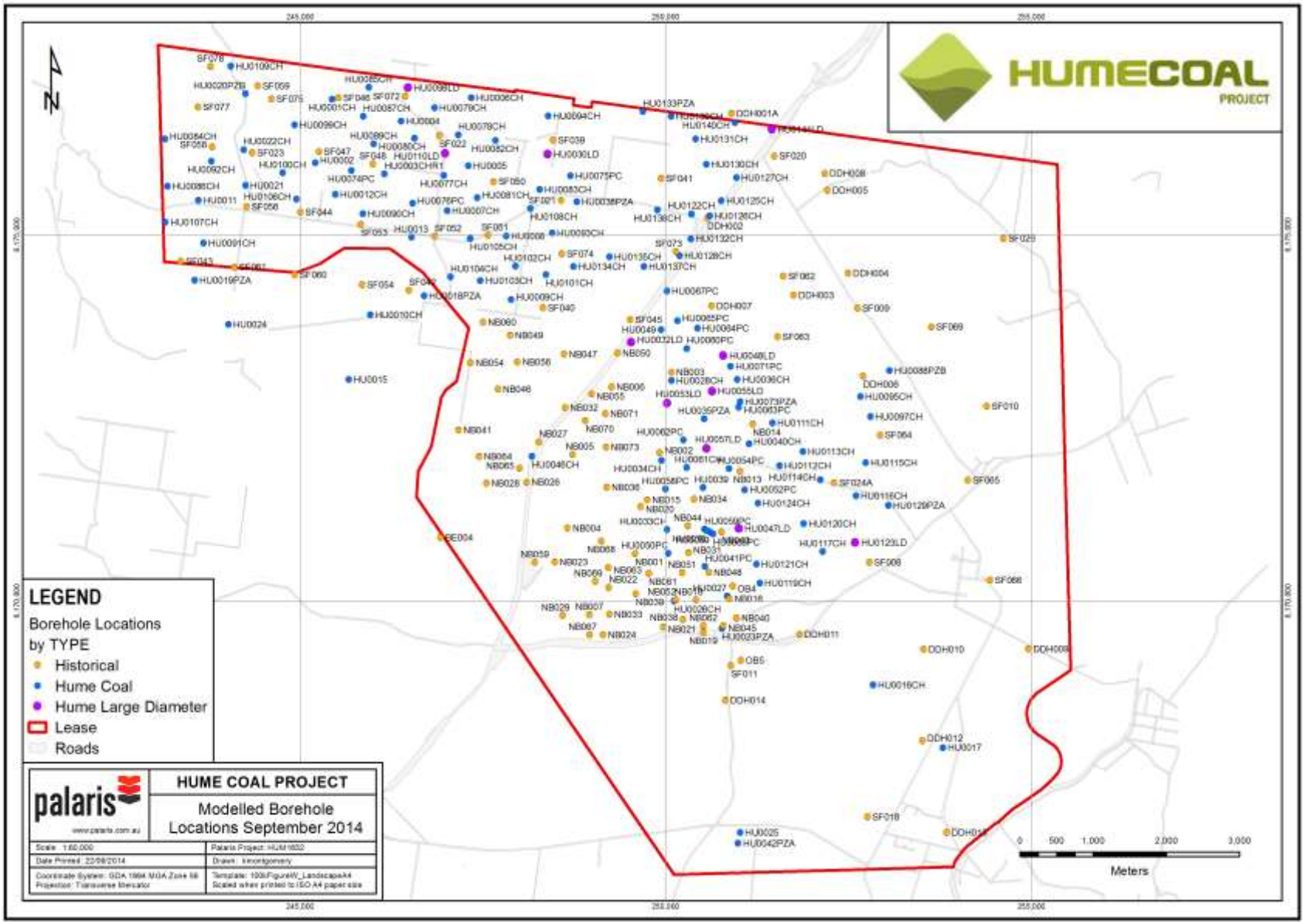


Figure A.1 Borehole plan

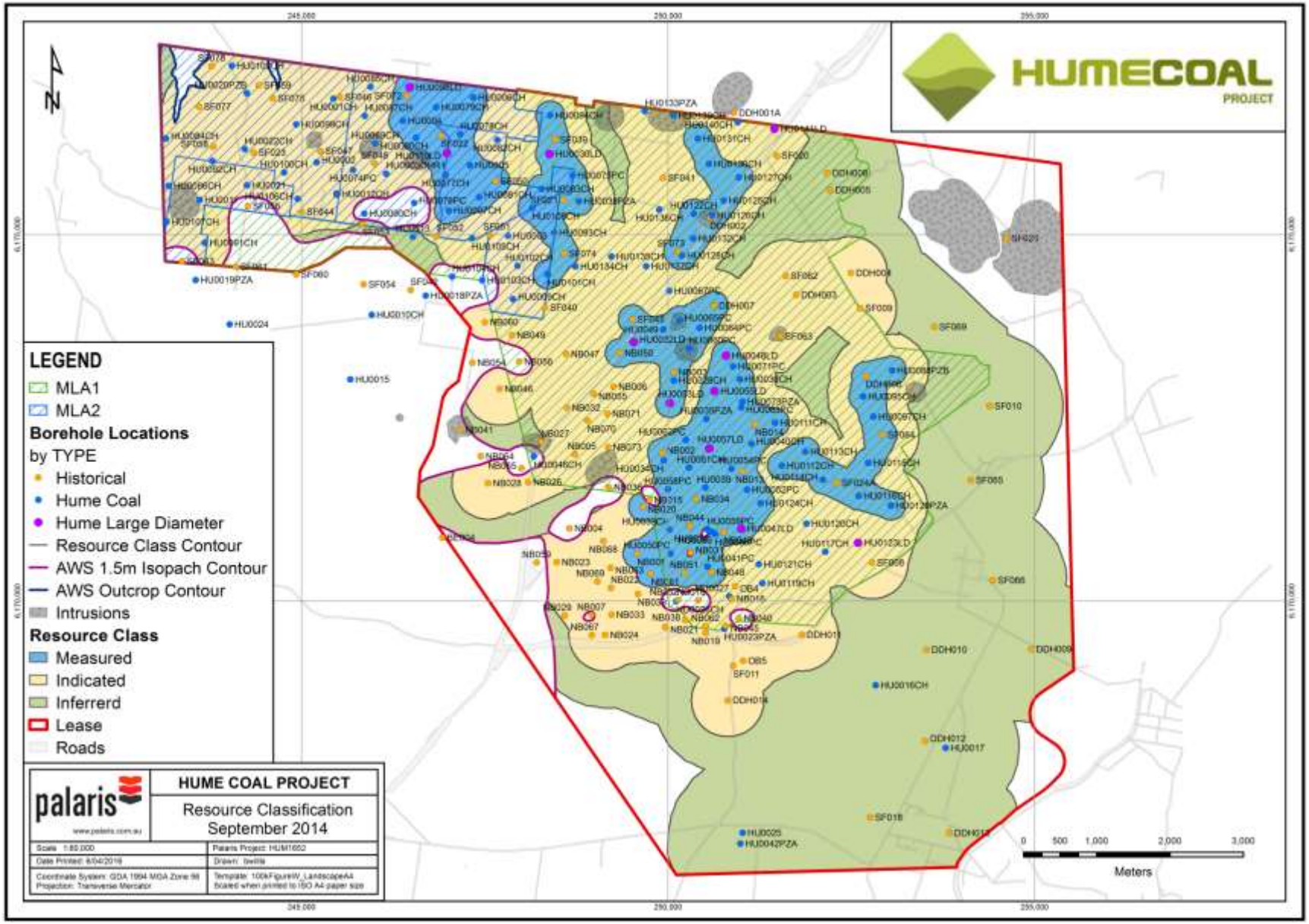


Figure A.2 Resource classification

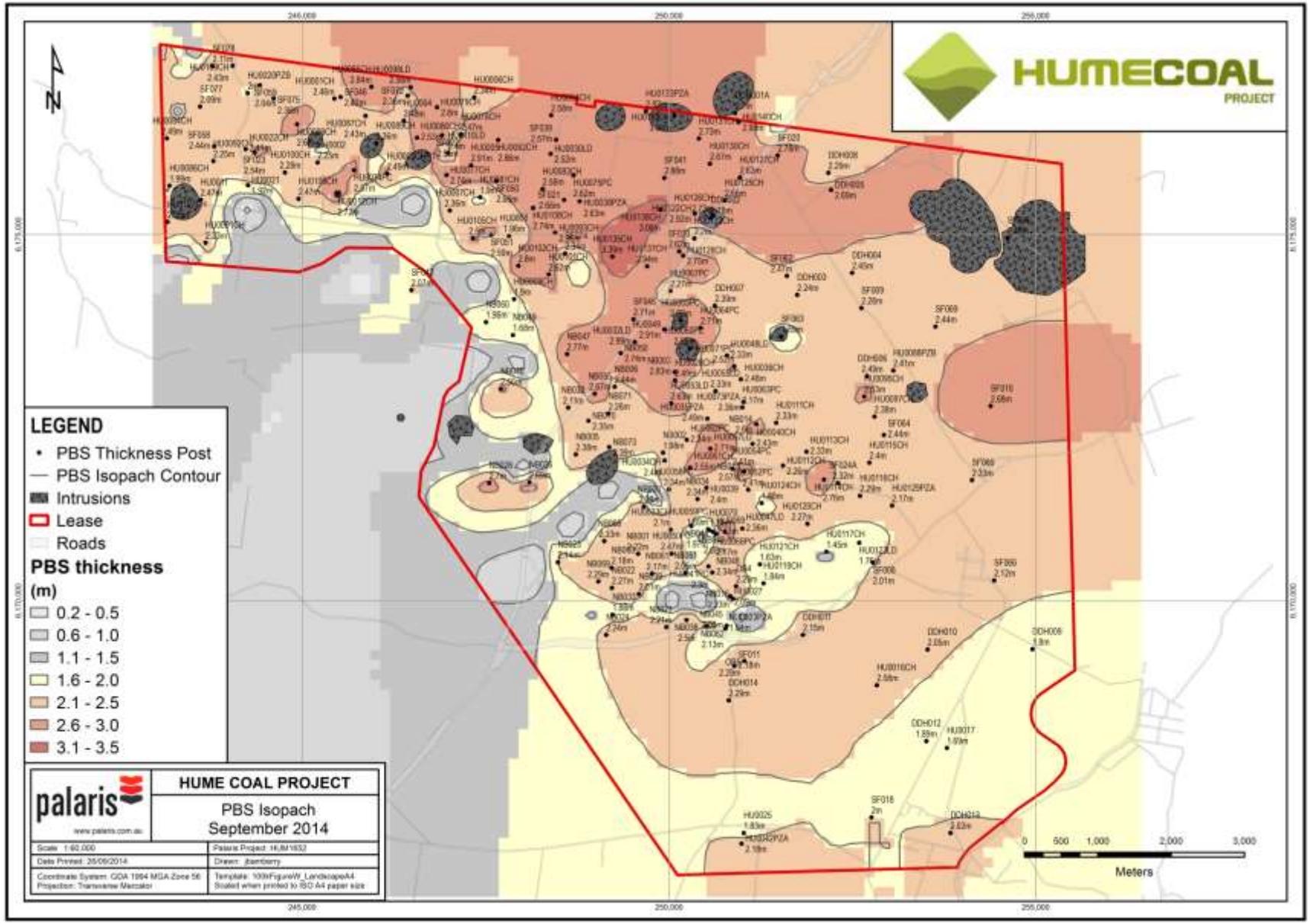


Figure A.3 Isopach map of the PBS

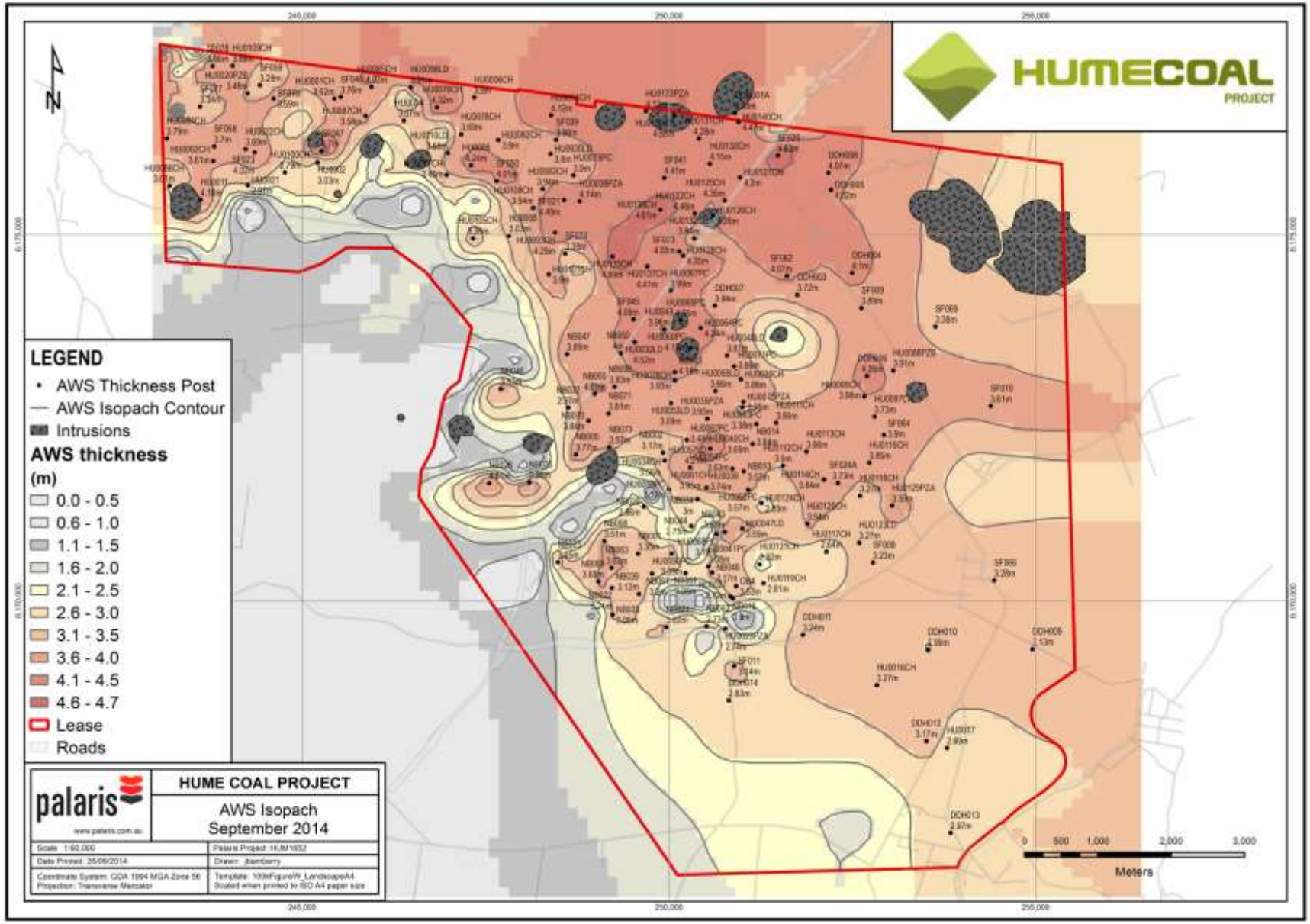
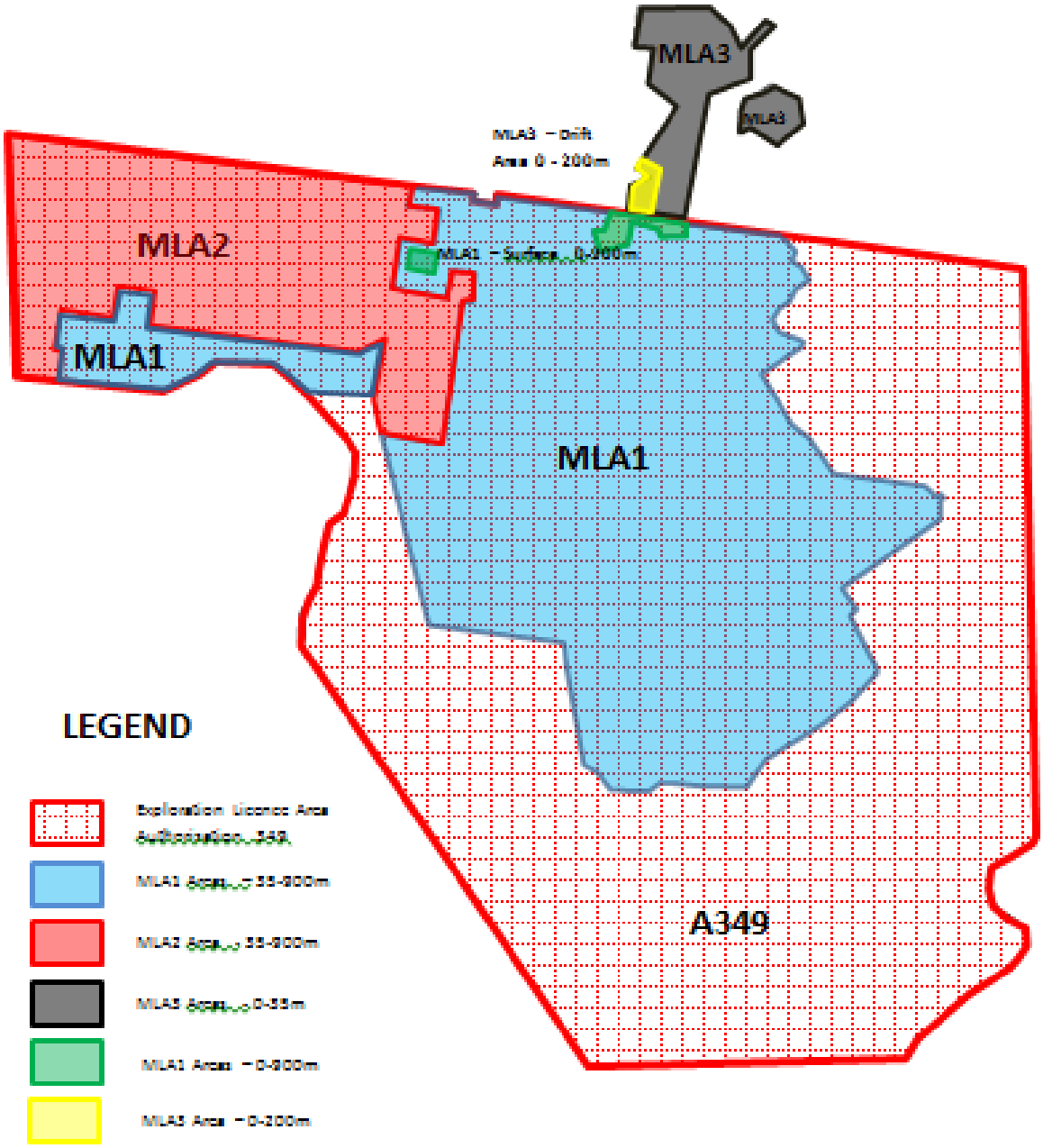


Figure A.4 Isopach map of the AWS



OVERVIEW SKETCHES OF MINING LEASE APPLICATION AREAS.

Figure A.5 Highlighting the Extent of MLA1, MLA2, MLA3 & A349.