Increase to Rio Tinto Coal Australia Mineral Resources and Ore Reserves

3 March 2016

Included in Rio Tinto's annual Mineral Resources and Ore Reserves update, released to the market today as part of its 2015 Annual Report, are increases in Rio Tinto Coal Australia's Mineral Resources and Ore Reserves in New South Wales and Queensland, Australia.

The updated Ore Reserves and Mineral Resources are reported in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 (JORC Code) and Australian Securities Exchange (ASX) Listing Rules. As such, the reported increases relating to six Rio Tinto Coal Australia sites require the additional supporting information set out in this release and its appendices.

A full update of Ore Reserves and Mineral Resources is provided in the 2015 Annual Report.

Total coal Ore Reserves for all deposits have increased by 397 million tonnes (Mt), from 2,106 Mt to 2,504 Mt.   Increases in Ore Reserves include:

•   Hunter Valley Operations (HVO) Ore Reserves increased by 309 Mt, from 581 Mt to 890 Mt.
•   Hail Creek Ore Reserves increased by 127 Mt, from 126 Mt to 253 Mt.

Total Mineral Resources exclusive of Ore Reserves have increased by 1,376 Mt, from 5,429 Mt to 6,805 Mt. These increases to Mineral Resources include:

•   HVO Mineral Resources increased by 458 Mt, from 1,373 Mt to 1,831 Mt.
•   Warkworth Mineral Resources increased by 138 Mt, from 475 Mt to 613 Mt.
•   Hail Creek Mineral Resources increased by 419 Mt, from 172 Mt to 591 Mt.
•   Kestrel and Kestrel West Mineral Resources increased by 164 Mt, from 142 Mt to 306 Mt.
•   Winchester South Mineral Resources increased by 164 Mt, from 192 Mt to 356 Mt.

Mt Robert contains a maiden Mineral Resource estimate of 31 Mt.

The upgrades have resulted from a programme of orebody knowledge and strategic mine planning optimisation undertaken at Rio Tinto Coal Australia. They are based on a rigorous examination of all Rio Tinto Coal Australia leases that included:

•   Consolidating and analysing a large volume of new and legacy geology data sets for all sites.
•   Reinterpreting and standardising all of the New South Wales and Queensland geology models, employing an expanded range of available data sets.
•   Updating the strategic mine planning processes and tools used to estimate Ore Reserves.
•   Adopting more efficient Mineral Resource estimation methods.

These increases in Ore Reserves and Mineral Resources reflect a continuation of the work announced in 2014.

All Minerals Resources and Ore Reserves are quoted on a 100% basis. Rio Tinto's interest as at 31 December 2015 is listed in the tables on pages 2 and 3. On 30 September 2015 Rio Tinto announced a restructure of Coal & Allied which included changes in Rio Tinto's interests in Hunter Valley Operations and Warkworth. The restructure completed on 3 February 2016.

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Table 1 – Ore Reserves

COAL (c)	Type of mine (a)	Coal type (b)	Reserves Proved millions of tonnes	Reserves Probable at end 2015 millions of tonnes	Marketable reserves Proved millions of tonnes	Marketable reserves Probable at end 2015 millions of tonnes	Marketable reserves Total **2015** millions **of tonnes**	Marketable reserves Total 2014 millions of tonnes	Marketable coal quality Calorific value MJ/kg (d)	Marketable coal quality Sulphur content % (d)	Avg. % yield to give marketable reserves	Rio Tinto share Interest %	Rio Tinto share Marketable reserves millions of tonnes
Reserves at operating mines													
Hail Creek (e)	O/C	SC + MC	82	171	63	103	**165**	85	**25.74**	0.35	65	82.0	**136**
Hunter Valley Operations (f)	O/C	SC + MC	684	206	484	144	**629**	404	**27.50**	0.54	71	80.0	**503**
Kestrel Coal	U/G	MC	31	95	27	79	**106**	110	**31.60**	0.59	84	80.0	**85**
Warkworth (g)	O/C	SC + MC	178	153	116	100	**217**	226	**29.82**	0.45	65	44.5	**96**

Notes
(a) Type of mine: O/P = open pit, O/C = open cut, U/G = underground, D/O = dredging operation.
(b) Coal type: SC: steam/thermal coal, MC: metallurgical/coking coal.
(c) For coal, the yield factors shown reflect the impact of further processing, where necessary, to provide marketable coal.
(d) Coals have been analysed on an "air dried" moisture basis in accordance with Australian Standards and gross calorific value and sulphur content are reported here on that basis. Marketable
Reserves tonnages are reported on a product moisture basis.
(e) The completion of technical and economic studies has resulted in an increase in the Hail Creek Reserves tonnes. This work included the development of a new life of mine design and schedule.
(f) A re-optimisation of the Hunter Valley Operations Resource was undertaken during 2015, following completion of an updated Resource model. This work included the development of a new life
of mine design and schedule and resulted in an increase in the Hunter Valley Operations Reserves tonnes.
(g) Following the Planning and Assessment Commission determination which approved the Mt Thorley Warkworth continuation projects, the current Warkworth mine design and Reserves were confirmed on 30
November 2015.

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Table 2 – Mineral Resources

COAL (c)	Likely mining method (a)	Coal type (b)	Coal resources at end 2015			Total resources 2015 compared with 2014				
			Measured	Indicated	Inferred	2015	2014			Rio Tinto
			millions of tonnes	millions of tonnes	millions of tonnes	millions of tonnes	millions of tonnes			interest %
Hail Creek (d) (e)	O/C + U/G	SC + MC	103	440	48	591	172			82.0
Hunter Valley Operations (d) (f)	O/C + U/G	SC + MC	348	571	912	1,831	1,373			80.0
Kestrel Coal (d) (g)	U/G	SC + MC	1.2	205	100	306	142			80.0
Mount Robert (d) (h)	O/C	SC + MC			31	31	-			82.0
Warkworth (d) (i)	O/C + U/G	SC + MC	6.2	125	481	613	475			44.5
Winchester South (d) (j)	O/C	MC	78	146	132	356	192			75.0

Notes
(a) Likely mining method: O/P = open pit; O/C = open cut; U/G = underground; D/O = dredging operation.
(b) Coal type: SC=steam/thermal coal, MC=metallurgical/coking coal.
(c) Rio Tinto reports coal Resources on an in situ moisture basis.
(d) Hail Creek, Hunter Valley Operations, Kestrel, Mount Robert, Warkworth and Winchester South have had material Resources changes since previous publication..
(e) The increase in Resources tonnes at Hail Creek follows the completion of a Pre-feasibility study.
(f) Resources tonnes increased at Hunter Valley Operations following technical and economic studies.
(g) Resources tonnes increased at Kestrel Coal following re-evaluation of the recoverable coal footprint for a potential underground development in addition to technical and economic studies.
Kestrel West is now reported under Kestrel Coal.
(h) Mount Robert Resources are reported for the first time following technical and economic studies.
(i) Resources tonnes increased at Warkworth following re-evaluation of the recoverable coal footprint for a potential underground development.
(j) Resources tonnes increased at Winchester South following technical and economic studies.

Summary of information to support the Mineral Resources estimates

Mineral Resource Estimate increases for Hail Creek, Hunter Valley Operations, Warkworth, Kestrel and Kestrel West, Winchester South and Mt Robert are supported by JORC Table 1 (Section 1 to 3) documents provided in Appendices 1 to 6 of this release and also located at www.riotinto.com/JORC.

An increase in Hail Creek Mineral Resources follows the completion of Pre-Feasibility level mining studies for opencast and underground deposits. Geology models supporting the Mineral Resource increase were updated to incorporate new and legacy drilling data and 3D seismic data, leading to revised interpretations of coal seam structure, yield and quality.

An increase in Hunter Valley Operations (HVO) Mineral Resources follows the completion of mining and strategic optimization studies for opencast and underground deposits. Geology models supporting the Mineral Resource increase were merged and updated to incorporate new and legacy drilling data, leading to revised interpretations of coal seam structure, yield and quality. This work was the continuation of work referred to in the 2014 HVO Mineral Resource increase.

An increase in Warkworth Mineral Resources follows the completion of mining studies for underground deposits. The Geology model supporting the Mineral Resource increase was updated to incorporate new and legacy drilling data, leading to revised interpretations of coal seam structure, yield and quality.

An increase in Kestrel and Kestrel West Mineral Resources follows the completion of integrated mining studies for underground deposits. Geology models supporting the Mineral Resource increase were merged and updated to incorporate new and legacy drilling data, leading to revised interpretations of coal seam structure, yield and quality. Kestrel West Mineral Resources are now reported under Kestrel Coal.

An increase in Winchester South Mineral Resources follows the completion of mining studies for opencast deposits. The Geology model supporting the Mineral Resource increase was updated to incorporate new and legacy drilling and 2D seismic data, leading to revised interpretations of coal seam structure, yield and quality.

Maiden reporting of Mt Robert Mineral Resources follows the completion of mining studies for opencast deposits. The geology model supporting the Mineral Resource estimate incorporates new and legacy drilling data.

Mineral Resource estimates for Hail Creek, HVO, Warkworth, Kestrel, Kestrel West and Mt Robert all employ consistent opencast and underground estimation methods and consistent economic inputs.

The following summary of information for Mineral Resource Estimates is provided in accordance with Chapter 5.8 of ASX Listing Rules.

Geology and geological interpretation

Hunter Valley Operations and Mount Thorley Warkworth (MTW) are located within the Sydney Basin of New South Wales (NSW), a world–class export thermal coal mining district. Hail Creek, Mt Robert, Winchester South, Kestrel and Kestrel West are located within the Bowen Basin of central Queensland, a world-class metallurgical coal mining district.

All of the NSW and Queensland Geology models contain comprehensive datasets and well defined interpretations for coal quality and geological structure, including coal seam continuity and faulting. Coal seam sub-crops, limits of oxidation and igneous intrusions are well defined for all deposits. All of the Geology models are supported by surface outcrop mapping, drilling and airborne geophysical data.   In total, 6,058 holes are drilled into Hail Creek deposit, 9,557 holes are drilled into HVO deposits, 2,628

holes are drilled into MTW deposit, 1,473 holes are drilled into Kestrel and Kestrel West deposits, 1,250 holes are drilled into Winchester South deposit and 1,107 holes are drilled into Mt Robert deposit.

The Hail Creek Geology model is also supported by 3D seismic surveying and opencast pit mapping and surveying data. The HVO and MTW Geology models are also supported by opencast pit mapping and surveying data. The Kestrel Geology model is also supported by underground panel mapping and surveying data. The Winchester South Geology model is also supported by 2D seismic surveying data.

Drilling techniques

For all NSW and Queensland deposits open hole drilling was the preferred method for delineating coal and waste structure.   Core drilling, including 4C (100mm), HQ3 and PQ3 diameters was also completed for all deposits for the purpose of coal quality, geotechnical and gas characterization. Large diameter 8C (200mm) holes have also been drilled at Hail Creek, HVO, Kestrel and Winchester South for the purpose of characterizing coal quality and to support sizing studies. Downhole geophysical logging was completed for the majority of drill holes in all deposits, employing a comprehensive suite of down hole tools to collect calliper, gamma, density, neutron and sonic measurements. Acoustic scanner measurements were also routinely completed for cored holes to obtain additional data for geotechnical assessments.

Sampling, sub-sampling method and sample analysis method

For all NSW and Queensland deposits the sampling of drill core was completed according to a universal standard set of instructions. Samples were bagged at the drill site and then transported to an external accredited laboratory for analysis. All samples were weighed, air-dried and then re-weighed before being crushed to a nominal size. A rotary splitter was used to divide the sample into portions available for further analysis. For all deposits coal quality analysis was by a three-stage method comprising raw analysis for all plies followed by washability and product testing on composite samples. All sample treatment and analysis was conducted according to procedures which adhere to Australian or International equivalent standards in National Association of Testing Authorities certified laboratories.

Criteria used for classification

Rio Tinto Coal Australia employed a common methodology for classifying all NSW and Queensland Mineral Resources into inferred, measured and indicated confidence categories. Drill holes were assessed according to the value and reliability of contained data to contribute a point of observation to Mineral Resource classifications. Structure and coal quality confidence limits were plotted separately on a seam group basis with classification of coal inventory into areas of low, medium or high confidence. These were combined to delineate areas of Measured, Indicated and Inferred coal inventory as a basis for classifying Mineral Resource tonnage estimates.

Kestrel and Winchester South Mineral Resource estimates also employed findings of recent geostatistical studies to support classification limits.

For all NSW and Queensland deposits a range of drill hole spacing limits were identified to reflect the inherent variability of each seam group modelled within each structural domain of the deposit. Structure classifications correspond with typical drill hole spacing distances of 125m to 650m for high, 250m to 1,200m for medium and 750m to 3,000m for low confidence limits. Coal quality classifications correspond with typical drill hole spacing distances of 175m to 750m for high, 500m to 1,350m for medium and 1,200m to 3,000m for low confidence limits.

Estimation methodology

Geology models for all NSW and Queensland deposits were constructed on a consistent basis employing coal industry standard software. For structural modelling a Finite Element Method (FEM) interpolator was

employed. For coal quality modelling an inverse distance squared interpolator was employed. All surfaces and coal qualities were interpolated into grids with 20-50 m^2 node spacing. Modelling was completed on an iterative basis by checking cross sections and contours of structural and coal quality attributes. Database values were posted on contours to provide a further check. For all deposits a volume / tonnage check was completed with predecessor models to provide final validation.

Reasonable prospects for eventual economic extraction

Rio Tinto Coal Australia employed a standard approach for all NSW and Queensland deposits to identify Mineral Resource volumes with reasonable prospects for eventual economic extraction.

For Hail Creek, HVO, Winchester South and Mt Robert opencast deposits a minimum coal thickness of 0.2m and density of 1.8 g/m^3 were applied as cut-off parameters for reporting Mineral Resources. Opencast resource volumes correspond with the limits of a "break even" ($0 margin) Lerchs-Grossman optimised shell. This method identifies the maximum depth or lowermost seam to be considered.

For Hail Creek, HVO, Warkworth, Kestrel and Kestrel West underground resources a minimum coal thickness of 1.8m and certain depth limits provide cut-off parameters for reporting Mineral Resources. Underground Mineral Resources correspond with practically mineable coal seam volumes employing longwall or board and pillar methods. Underground Mineral Resources must support longwall mining layouts with a break-even" or better economic result, including reasonable development capital costs.

Summary of information to support the Ore Reserves estimates

An increase in Hail Creek Ore Reserves follows the completion of Pre-Feasibility level studies for opencast deposits.

Whilst at Hunter Valley Operations completion of Rio Tinto Coal Australia's Rapid Resource Estimation (RRE) process and detailed strategic optimisation has led an increase to the previously reported Ore Reserves. In the case of Hunter Valley Operations, this work was the continuation of the work referred to in the 2014 Ore Reserve increase.

Ore Reserve Estimate upgrades for Hunter Valley Operations and Hail Creek are supported by JORC Table 1 (Section 4) documents provided in Appendices 1 and 3 of this release and located at www.riotinto.com/JORC. The following summary of information for Ore Reserve Estimates is provided in accordance with Chapter 5.9 of ASX Listing Rules.

Economic assumptions

Rio Tinto applies a common process to the generation of commodity price estimates (as an input into Ore Reserves) across the group. This involves generation of long-term price curves based on current sales contracts, industry capacity analysis, global commodity consumption and economic growth trends. In this process, a price curve rather than a single price point is used to develop estimates of mine returns over the life of the project. The detail of this process and of the price point curves is commercially sensitive and is not disclosed.

Criteria used for classification

For both deposits the stated Proved and Probable Ore Reserves directly coincide with the Measured and Indicated Mineral Resources, respectively. There are no Inferred or Unclassified resources included in the stated reserve numbers.

Mining and recovery factors

For both deposits mine design strips and blocks were applied to the in-situ coal resource model to generate the raw Reserves used to create a separate mine schedule database. The mine schedule database also reflects working sections or seam aggregations, mining methods and associated loss and dilution impacts. The mine schedule database was used as the basis for Ore Reserves reporting.

Both mines utilises dragline, truck and shovel for waste movement, while coal is loaded using a combination of loaders and excavators with haulage to the Run Of Mine (ROM) hopper undertaken using rear dump trucks. The operations are supported by additional equipment including dozers, graders and water carts.

All pit end-walls have benched and battered designs based on typical Rio Tinto Coal Australia practice with allowances made for increasing depth of mining. The design provides for mining roadways and catch benches.

Cut-off grades

Working section or seam aggregation logic pre-determines what is defined as mineable coal by applying working section tests based on minimum coal thickness of 30cms. Hunter valley Operations applies a post aggregation maximum ash test of 50% on an air-dried basis.

Coal loss and dilution factors are also applied and vary by the equipment type uncovering the various coal seams (i.e. excavator/truck versus dragline). Typical roof and floor coal loss thickness ranges from 2cm–59cm. Typical roof and floor waste dilution thickness ranges from 3cm–16cm.

Processing

The processes used across the operating mines and projects are standard for the coal industry and so are well tested technologies. All samples were wash/cut-point tested and so the representativeness of test work undertaken is implicit in the Resource classification status.

In-seam dilution was included in sample testing.

Ore Reserve estimation was based on existing product specifications.

Modifying factors

Rio Tinto Coal Australia has an extensive environmental and heritage approval and compliance process. No issues are expected that would impact on the Mineral Reserve estimate. Mining operations, management of waste, and storage/discharge of any solids, liquids or gases, meet current environmental requirements. All necessary Government approvals are expected to be received within the timeframes anticipated in the life of mine (LOM) plan.

Hail Creek and Hunter Valley Operations are operating sites with existing infrastructure in place to support each operation. The current LOM requires sustaining capital only to maintain the existing infrastructure.

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Competent Persons Statement

The information in this report that relates to Mineral Resources is based on information compiled by Dr Richard Ruddock, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy. Dr Ruddock is a full-time employee of the company.

The information in this report that relates to Ore Reserves for Hail Creek is based on information compiled by Mr Matthew Hillard, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy. Mr Hillard is a full-time employee of the company.

The information in this report that relates to Ore Reserves for Hunter Valley Operations is based on information compiled by Mr Greg Doyle, a Competent Person who is a Member of The Australasian Institute of Mining and Metallurgy. Mr Doyle is a full-time employee of the company

Dr Ruddock, Mr Doyle and Mr Hillard have sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as Competent Persons as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Dr Ruddock, Mr Doyle and Mr Hillard consent to the inclusion in the report of the matters based on the information in the form and context in which it appears.'

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Hunter Valley Operations Table 1

The following table provides a summary of important assessment and reporting criteria used at Hunter Valley Operations (HVO) for the reporting of exploration results, Mineral Resources and Ore Reserves in accordance with the Table 1 checklist in *The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition)*. Criteria in each section apply to all preceding and succeeding sections.

SECTION 1 SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
Sampling techniques	• A combination of open hole (predominantly for structural definition) and cored (for coal quality (CQ), geotechnical and gas sampling) have been used.
Drilling techniques	• A total of 9,557 drill holes (585,019m) support the Resource estimate. Cored drilling represents 34% of the total metres and open hole drilling 66%. The drill holes are up to 616m in length and average 67m. The drill holes were all nominally recorded as vertical - boreholes which deviated by more than 5% from vertical of the total drill holes length the drill hole were redrilled.
	• Coring has predominantly been done using a HQ3-sized (63mm) bit and open hole drilling to an equivalent hole diameter size. In addition a limited number of large diameter (LD) holes have been drilled: 103 holes at 101mm (4") and six holes at 200mm (8") diameter sizes.
Drill sample recovery	• Standardised Rio Tinto Coal Australia logging systems are utilised for all drilling, logging, and sampling.
	• Core recovery is recorded by the geologist while logging the drill hole. If core recovery for a coal ply is less than 95%, then that section of the hole is redrilled to ensure a representative sample is taken.
	• Ply samples are checked for representativeness using a theoretical mass that is determined using analysed relative density, sample thickness and core diameter prior to composite definition.
	• Open hole chip recovery is assessed qualitatively by the rig geologist.
Logging	• Core is geologically and geotechnically logged and open hole chip samples are taken every 1m and logged for lithology changes. Logging for lithology, grainsize, weathering and hardness is conducted using standard dictionary definitions. Colour and any additional qualitative comments are also recorded.
	• All core is photographed on the core table (0.5m increment) and in 4m (HQ) or 5m (N/PQ) trays. Chip samples are photographed in 1m intervals.
	• All holes are logged using a comprehensive suite of downhole geophysics tools (calliper, gamma, density, neutron, sonic) with acoustic scanner (for geotechnical assessment) also run on cored holes.
Sub-sampling techniques and sample preparation	• Core sampling is completed at the drill site and based on set of standard criteria (determined by lithology and structure). Samples are bagged at the drill site and then transported to an external accredited laboratory for analysis as a complete hole batch.
	• All samples are weighed, air-dried and then re-weighed before being crushed to an 11.2mm top size. A rotary splitter is used to divide the sample into portions available for further CQ analysis.
	• CQ analysis is by a three-stage method involving raw analysis on all plies followed by washability and product testing on composite samples as defined by the geologist.
	• All sample treatment and analysis is conducted according to procedures which adhere to Australian (or International equivalent) standards in a National Association of Testing Authorities certified laboratory.
Quality of assay data and laboratory tests	• Non-formalised quality assurance/quality control (QAQC) involving duplicate samples is completed and, in addition, Rio Tinto Coal Australia checks laboratory round robin and basic reproducibility tests provided by the primary laboratory. All results are assessed via cross-plots and statistics for precision and accuracy.

Verification of sampling and assaying	• All CQ sampling and analysis is overseen and checked by Rio Tinto personnel.
	• Data transfer from site is covered by an agreed protocol. This system documents primary data, data entry procedures, data verification, data storage (physical and electronic) into a geological database.
Location of data points	• The topographic surface is derived from a combination of Lands and Property Management Authority 10m contours which originated from the early 1980s, and recent (September 2008) 2m contours derived from an airborne LiDAR survey. Drill hole collars and mine survey data were also used. The digital terrain model was created with a 50m × 50m cell size triangulation at 0.2m decimation.
	• All surveyed coordinates are within Map Grid of Australia 1994 MGA (MGA94) Zone 56 projection using datum GDA94.
	• Drill hole collars were surveyed post drilling by licensed surveyors using differential global positioning system with an accuracy of ±10mm.
	• Downhole surveying has been undertaken using downhole verticality and calliper tools since 2007, including attempted resurvey of earlier drill holes. Overall 84% of the diamond drilling metres have been surveyed downhole over the entire drill hole length but only 40% of the total open hole drilling metres have been downhole surveyed.
Data spacing and distribution	• Drill hole spacing for core holes is on an equilateral triangle grid of 500m or less. For open holes spacing is on a 250m or less equilateral triangle grid.
	• All core samples are composited within defined seam boundaries.
Orientation of data in relation to geological structure	• The coal measures show a relatively consistent layering and are not subject to steep dips. The orientation of drilling is therefore suitable for flat lying stratified deposits.
Sample security	• Core/chip samples are taken at the drill site and then transported daily to the locked HVO core shed for storage. Once the hole has been completed the samples are transported to the laboratory via a dedicated courier service.
Audits or reviews	• HVO has had one audit completed in the past five years. The audit was conducted in September 2011 by the Quantitative Group Pty Ltd (report: *Rio Tinto Corporate Assurance Resources and Reserves Internal Audit Report. Hunter Valley Operations. 2.1*).
	• The review concluded that the fundamental data collection techniques are appropriate.

SECTION 2 REPORTING OF EXPLORATION RESULTS

Criteria	Commentary
Mineral tenement and land tenure status	• Tenements are 100% owned by Coal and Allied Industries Limited, which is in turn a 100% owned subsidiary of Rio Tinto Coal Australia.
	• HVO contains numerous leases and licences (see Figure 1, note that this is schematic only):
	○ 2 × authorisations covering 533ha
	○ 3 × consolidated coal leases covering 1782.5ha
	○ 5 × coal leases covering 247ha
	○ 1 × coal mining lease covering 2162ha
	○ 6 × exploration leases covering 5849ha
	○ 14 × mining leases covering 6924.47ha
	○ 5 × mining lease applications covering 251.96ha
	○ 1 × assessment lease application covering 430ha
	• All leases containing Resources are in good standing.

Figure 1 HVO mining and exploration titles

Exploration done by other parties

- HVO is an amalgamation of several previously independent mines: Howick, Hunter Valley, and Lemington. Each mine was developed at different times resulting in variable exploration summarised as follows:
  - Howick open-cut (west pit) – exploration initiated in the 1940s and 1950s undertaken by the Joint Coal Board and the Bureau of Mineral Resources. Drilling to 200m–300m spacing for cored holes and 50m–150m spacing for open holes.
  - Hunter Valley No.1 & 2 mines – exploration initiated in the 1960s and early 1970s by the New South Wales (NSW) Department of Mines. Drilling to 212m spacing for cored holes and 100m spacing for open holes.
  - Lemington South open-cut and underground mines – exploration initiated in the 1970s by the Joint Coal Board. Drilling to 200m– 800m spacing for cored holes.

Geology

- HVO is located in the Hunter Coalfield in the northern part of the Sydney Basin which contains numerous important coal producing intervals in the Permian stratigraphy. The Late Permian Wittingham Coal Measures are further sub-divided into the Vane sub-group (West and Mitchell Pits to the north of HVO) and the Jerrys Plains sub-group (Carrington, Cheshunt and Riverview Pits to the central and south parts of HVO). These sub-groups host the main coal deposits mined at HVO. The main rock types of these sub-groups are sandstone, siltstone and conglomerate, which occur with subordinate coal and tuffaceous claystone.

Drill hole information

- Drilling data summary since consolidation of the mines into one operation (as HVO):

	Area/year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Open Holes	Carrington	43	20	31							11	102			
	Cheshunt	23	7	2	6	16	43		3	19	51		2	15	
	West	37			25		9	134	38			6	5	4	
	Mitchell	13										43			
	Riverview	84			8		29		26	14	47		24	33	
	Southern										12	25			
Cored Holes	Carrington		1	7				17	4		5	40			
	Cheshunt	10	1		5	5	8		4	8	8	4		2	
	West	4	7		8		3	7	4	4	3	9		2	
	Mitchell										5	1			
	Riverview				1	1			1	15	8	2			
	Auckland											18			6
	Southern										15				

- Since the previous resources upgrade in 2014 there have been an additional 2,153 drillholes added due to 6 new holes drilled but mostly to a major legacy database update

Data aggregation methods

- Ply samples are combined to create composites (for washability and product coal analyses) representing mineable seam working sections.

Relationship between mineralisation widths and intercept lengths

- Based on drilling techniques and stratigraphy, the coal seam intercepts approximate the true coal thickness.

Diagrams

Figure 2: HVO location

Open holes (blue); cored holes (red)

Figure 3: Schematic drill collar locations
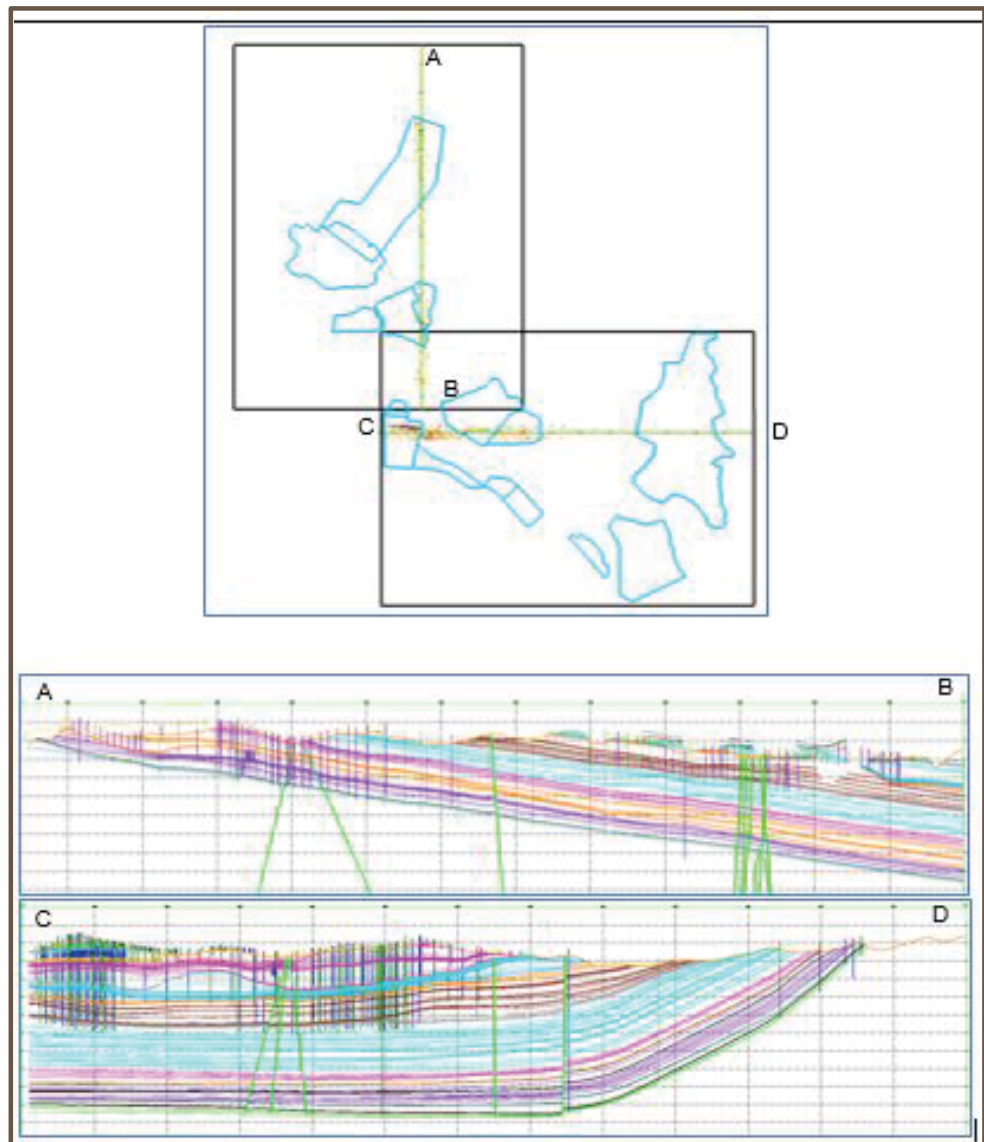
Cross-section A–B is north to south / cross-section C–D is west to east

Figure 4: Schematic HVO cross-sections

Balanced reporting	• Not applicable. Rio Tinto Coal Australia has not specifically released exploration results for these deposits.
Other substantive exploration data	• In addition to drilling, resistivity surveys, ground and airborne magnetic surveys have been completed to identify faults, dykes, and alluvial limits.
Further work	• Drilling for both pre-production and strategic brown/green fields drilling is ongoing and analytical (CQ, geotechnical, gas) results will be ongoing. • Greenfields exploration includes investigations in the Auckland and Southern areas. In addition regional scale exploration and evaluation are being made to assess the underground potential of HVO and the adjoining areas (Mount Thorley Warkworth (MTW) directly south of HVO).

SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Database integrity	• All drill hole data are securely stored in a database which is duplicated on multiple servers (HVO and Singleton) and is backed up daily. • Data are validated at the drill site and also prior to loading into the database by the responsible geologist. • The database contains automated validation processes, during data loading and prevents invalid data being loaded.
Site visits	• The Resources Competent Person visited HVO in 2015.
Geological interpretation	• The deposit is well known and tabular with all major structures and coal seam continuity (including coal quality) and limits (i.e. LOX, sub-crop and igneous intrusions) defined. Infill drilling, mining exposure and mapping have supported and refined the model. The additional legacy data added has confirmed this and the current interpretation is thus considered to be robust.
Dimensions	• The deposit trends 20km northwest to southeast and is 10km in width. The deposit extends to a depth of 515m below the topographic surface.
Estimation and modelling techniques	• Modelling was completed using resource modelling software. For structural modelling a proprietary fine element method (FEM) interpolator is used and for CQ an inverse distance squared interpolator is used. All surfaces and coal qualities are interpolated into grids with 50m × 50m node spacing. • The model is of the coal seams only with waste modelled by default. Resource estimates are therefore of the coal seams only and restricted on a whole seam group basis only. • Modelling is completed on an iterative basis by checking cross-sections and contours of structural and CQ attributes. Database values are posted on contours as a further check. A volume/tonnage check between the model and its predecessor are completed as a final validation. • The previous resources upgrade in 2014 was based on two separate resource models (north and south of the Hunter River) – these models have been merged for this update. • The underground estimates are based on a separate model which spans HVO south of the Hunter River and the Mount Thorley Warkworth deposit directly adjacent to the south. This model only considers the Vane sub-group.
Moisture	• All tonnages are estimated on an in situ moisture basis, which is determined as air-dried moisture content plus 4%. • This number is derived using the assumption that the run of mine (ROM) and in situ moisture are comparable. At HVO, the run of mine (ROM) moisture content is not well understood due to the lack of sampling equipment on the feed to the coal handling and preparation plant (CHPP). At MTW, which has such equipment, the ROM moisture is typically 4% higher than the air-dried moisture content. Since the coals mined at HVO and MTW are similar rank and largely from the same sequence, the same relationship is assumed to be valid at HVO.

Cut-off parameters	• Nominally coal is washed to produce a semi-soft coking coal product at 9% air-dried ash or to three types of thermal products (11% air-dried ash, 13% air-dried ash and 18% air-dried ash). For all products, product moisture is at 9%. Air-dried is quoted at a 2.5% moisture basis. • A minimum coal thickness of 0.25m and density of 1.8 g/m^3 are applied as cut-off parameters for reporting coal. • Economic resources are defined by a "break even" ($0 margin) Lerchs-Grossman optimised shell for opencast coal – this effectively sets the maximum depth or lowermost seam considered. For underground resources the limits are based on either an order of magnitude study or standard set of rules (i.e. coal below "break even" shell, less than 600m deep and greater than 1.8m thick).
Mining factors or assumptions	• Development of this Mineral Resource estimate assumes mining using standard Rio Tinto Coal Australia equipment. The assumed mining method is overburden removal via draglines, and conventional truck and shovel open-cut coal mining. • Mining practices utilise detailed extraction plans to effectively manage grade control. These extraction plans are generated from real time blast hole drill compliance monitoring, in-pit visual inspections and survey monitoring and control.
Metallurgical factors or assumptions	• A combination of density separation (magnetite/water) and fines flocculation processes are used for the processing of HVO coal.
Environmental factors or assumptions	• Rio Tinto Coal Australia has an extensive environmental and heritage approval and compliance process. No issues are expected that would impact on the Mineral Resource estimate.
Bulk density	• Certain boreholes samples have only true relative density (RD) analysis; some have both apparent relative density (ARD) and true RD, and most have ARD. Relationships between ARD and RD were determined from the paired sets of ARD and RD analyses. The relationships used to populate the ply by ply data with missing ARDs or RDs are: RD(ad) = 1.042 × ARD (ad) – 0.018. • The in situ relative density (i.e. the density of materials at an in situ moisture basis) is calculated using the Preston and Sanders equation: $$RD2= [RD1*(100-M1)]/ [100+RD1*(M2-M1)-M2]$$ • Where RD1 is true RD (ad), M1 is moisture (ad) and M2 is the in situ moisture (M1 + 4).
Classification	• The classification of the Mineral Resources into varying confidence categories is based on a standardised process of utilising points of observation (PoO). Drill holes are assessed according to their reliability and value in estimation. The PoOs are used to categorise structure and quality continuity. • Radii of influence are then plotted around PoO maps for structure and quality. The radii of influence were determined by consideration of the observed variability in structure and CQ for seam groups, and by examining histograms and statistics of ash content of seam groups. As there are many plies at HVO, seam groups (equivalent to the seam names) were used for categorisation. • Areas of confidence (low, medium, high) are produced from these plots (structure, CQ for each seam group) and finally these are combined to produce areas of Measured, Indicated and Inferred Resources which are used to subdivide the tonnage estimates. • In summary structural radii range 175-250m for high confidence, 350-500m for medium and 1,400-2,000m for low; and, for CQ 450-500m radii for high, 900-1,000m for medium and 2,700-3,000m for low confidence respectively. The ranges reflect variability within the nineteen seam groups modelled at HVO. • The Competent Person is satisfied that the stated Mineral Resource classification reflects the geological controls interpreted and the estimation constraints of the deposits.
Audits or reviews	• In September 2011 an audit into the modelling and Resource estimation process at HVO

Criteria	Commentary
	was completed (report: *Rio Tinto Corporate Assurance Resources and Reserves Internal Audit Report. Hunter Valley Operations. 2.1*).
	• The outcome of this audit was overall a satisfactory rating with a number of recommendations made and acted upon by Rio Tinto Coal Australia.
Discussion of relative accuracy/ confidence	• Rio Tinto Coal Australia operates multiple mines in NSW and Queensland. The Mineral Resource data collection and estimation techniques used for the HVO deposit are consistent with those applied at other deposits which are being mined.
	• Reconciliation of actual production with the Mineral Resource estimates for the existing operational deposits are generally within 3% for tonnes. This result is indicative of a robust process.
	• Accuracy and confidence of Mineral Resource estimate has been accepted by the Competent Person.

SECTION 4 ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• A 3D gridded Resource model of topography, structure and quality are used for in situ Resource definition.
	• Mine design strips and blocks are applied to the in situ Resource model to generate the raw Reserves used to create a separate mine schedule database. The mine schedule database also reflects working sections or seam aggregations, mining methods and associated loss and dilution impacts. The mine schedule database is used as the basis for Ore Reserves reporting.
	• Mineral Resources are exclusive of Ore Reserves. Declared Ore reserves are for the open pit operation only.
Site visits	• The Reserves Competent Person visited HVO in 2015.
Study status	• HVO is an operating mine project. The reportable Ore Reserve is based on the life of mine (LOM) plan and has determined a mine plan that is technically achievable and economically viable, and that material modifying factors have been considered.
Cut-off parameters	• Periodic (<3yrs) pit optimisation work used to define pit shells is conducted using Rio Tinto economics prices and an estimate of unit operating costs including a $/ROMt allowance for sustaining capex. This process was conducted in 2015 and led to the inclusion of additional pits in the LOM plan and ultimately additional reserves.
	• For annual JORC Reserves reporting purposes, detailed mine design and schedules are constructed to generate detailed cash flow schedules. This work includes identifying the mining sequence, equipment requirements, and incremental and sustaining capital.
	• A discounted cashflow analysis is conducted to re-assess under the latest economic assumptions the potential Reserves that remain net cashflow positive.

Mining factors or assumptions	• The HVO mine utilises dragline, and truck and shovel for waste movement, while coal is loaded using a combination of loaders and excavators with haulage to the ROM hopper undertaken using rear dump trucks. The operations are supported by additional equipment including dozers, graders, and water carts. • All pit end walls have benched and battered designs based on the existing operation with allowances made for increasing depth of mining. The design provides for mining roadways and catch benches. • Working section or seam aggregation logic pre-determines what is defined as mineable coal by applying working section tests based on minimum coal thickness of 30cm, and a maximum raw ash of 50% on an air-dried basis. • Coal loss and dilution factors are also applied and vary by the equipment type uncovering the various coal seams (i.e. excavator/truck versus dragline). Typical roof and floor coal loss thickness ranges from 5cm–25cm. Typical roof and floor waste dilution thickness ranges from 3cm–7cm. • LOM plans for strategic planning purposes may contain Inferred Resources, provided that the LOM plan would not be compromised by non-inclusion of this coal. Inferred Resources included in LOM plans retain this designation and are not referred to as Reserves. Neither are they reported in either JORC or Securities and Exchange Commission compliant reserve statements. • The HVO LOM valuation has been tested removing the inferred and unclassified coal from the schedule to ensure they still remain compliant.
Metallurgical factors or assumptions	• HVO has three CHPPs: Hunter Valley CHPP, West Pit CHPP and the Newdell CHPP. • Only Hunter Valley CHPP and West Pit CHPP are operational, with Newdell CHPP used purely as a coal handling plant and no longer used to wash coal. • The processes used are standard for the coal industry and so are well tested technologies. • All samples are wash/cut-point tested and so the representativeness of test work undertaken is implicit in the Resource classification status. • In-seam dilution is included in sample testing. • Detailed reconciliation during the course of 2015 updated predicted yield. The updated yield was validated against operating perofmance. • Ore Reserve estimation is based on existing product specifications.
Environmental	• HVO has a large number of current mining and exploration titles. • All the various mining leases across HVO are defined by a 21 year consent limit. This consent limit is particular to each mining lease, and as such leases are constantly being renewed. There is a dedicated tenements manager to ensure the application for lease renewal occurs on time. All necessary Government approvals are expected to be received within the timeframes anticipated in the LOM plan. • Coarse rejects are dumped within the mine overburden dumps, while the fines coal washery rejects are stored within dedicated tailings dams. Rejects material and completed tailings dams must be covered by at least 3m of inert waste rock material. • Overburden waste rock has low acid forming potential.
Infrastructure	• HVO is an operating site with existing infrastructure in place to support the operation. The current LOM requires sustaining capital only to maintain the existing infrastructure.

Costs	• Based on detailed annual operating plan (AOP) process. Beyond AOP, sustaining capex based on $/ROMt plus equipment replacements and additions required to deliver the mine plan.
	• First principles estimating and aligned with AOP. Budget prices for major consumables and labour.
	• Adjustments are made for energy.
	• Commodity prices are supplied by Rio Tinto Economics and Markets Team (RTEM), based on: expected demand, current supply, known expansions, and expected incentivised supply.
	• Exchange rates are supplied by RTEM.
	• Transport charges are obtained from coal chain team based on existing contracts and expected tonnages.
	• State Government royalties, based on current NSW royalty rates.
	• Additional Reserves were added due to an improved operational cost focus, leading to a demonstrated reduction in unit cost over 2013-2015 periods. Incorporation of legacy data into the underlying geological model improved classifications leading to additional reserves.
Revenue factors	• Rio Tinto applies a common process to the generation of commodity price estimates across the group. This involves generation of long-term price curves based on current sales contracts, industry capacity analysis, global commodity consumption and economic growth trends. In this process, a price curve rather than a single price point is used to develop estimates of mine returns over the life of the project. The detail of this process and of the price point curves is commercially sensitive and is not disclosed.
Market assessment	• The supply and demand situation for coal is affected by a wide range of factors, and coal consumption changes with economic development and circumstances. Rio Tinto Coal Australia delivers products aligned with its Mineral Resources and Ore Reserves, these products have changed over time and successfully competed with coal products supplied by other companies.
Economic	• Economic inputs such as foreign exchange rates, carbon pricing, and inflation rates are also generated internally at Rio Tinto. The detail of this process is commercially sensitive and is not disclosed.
Social	• A small parcel of reserves has been omitted due to the HVO South Aboriginal Cultural Heritage Restricted Access Area 2. This area was been removed from the reserve schedule valuation.
	• Rio Tinto Coal Australia established the Upper Hunter Valley Cultural Heritage Working Group as a consultation and management process to negotiate cultural heritage issues with local Aboriginal communities. As part of releasing a ground disturbance permit on site, authority must be gained to destroy/remove sites of cultural interest. This involves archaeological mapping and removal of artefacts prior to ground disturbance.
	• There are no sites of European cultural heritage at HVO.
Other	• Semi-quantitative risk assessments have been undertaken throughout the LOM and Reserve phases. No material naturally occurring risks have been identified through the above mentioned risk management processes.
Classification	• The Ore Reserves consist of 77% Proved Reserves and 23% Probable Reserves, this is an increase in proven reserves from 67% Proved in 2014.
	• The Competent Person is satisfied that the stated Ore Reserve classification reflects the outcome of technical and economic studies.

Audits or reviews	• HVO has had one audit completed in the past five years. The audit was conducted in September 2011 by the Quantative Group Pty Ltd (report: *Rio Tinto Corporate Assurance Resources and Reserves Internal Audit Report. Hunter Valley Operations. 2.1*). The review concluded that the fundamental data collection techniques are appropriate and consistent with previously audited HVO models.
Discussion of relative accuracy/ confidence	• Rio Tinto Coal Australia operates multiple mines in Queensland and New South Wales. The Ore Reserve estimation techniques utilised for HVO are consistent with those applied across the other operations. Reconciliation of actual production with the Ore Reserve estimate for the existing operations is generally within 5% for tonnage and grade. This result is indicative of a robust Ore Reserve estimation process.
	• Accuracy and confidence of modifying factors are generally consistent with the current operation.

Mount Thorley Warkworth Table 1

The following table provides a summary of important assessment and reporting criteria used at Mt Thorley Warkworth (MTW) for the reporting of exploration results, Mineral Resources and Ore Reserves in accordance with the Table 1 checklist in *The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition)*. Criteria in each section apply to all preceding and succeeding sections.

<h3 style="color:red; text-align:center;">SECTION 1 SAMPLING TECHNIQUES AND DATA</h3>

Criteria	Commentary
Sampling techniques	• A combination of open hole (predominantly for structural definition) and cored (for coal quality (CQ), geotechnical and gas sampling) have been used.
Drilling techniques	• A total of 2,628 drill holes (274,585m) support the Resource estimate Cored drilling represents 45% of the total metres and open hole drilling 55%. The drill holes are up to 725m in length and average 92m. The drill holes were all nominally recorded as vertical, boreholes deviated by more than 5% were to be re-drilled by contractor. • Coring has predominantly been done using a HQ3-sized (63mm) and open hole drilling to an equivalent hole diameter size. In addition a limited number of large diameter (LD) holes have been drilled: seven holes at 150mm (6") and 49 holes at 200mm (8") diameter sizes.
Drill sample recovery	• Standardised Rio Tinto Coal Australia logging systems are utilised for all drilling logging and sampling. • Core recovery is recorded by the geologist while logging the drill hole. If core recovery for a coal ply is less than 95%, then that section of the hole is redrilled to ensure a representative sample is taken. • Ply samples are checked for representativeness against a theoretical mass after raw CQ analysis and prior to composite definition. • Open hole chip recovery is assessed qualitatively by the rig geologist.
Logging	• Core is geologically and geotechnically logged and open hole chip samples are taken every 1m and logged for lithology changes. Logging for lithology, grainsize, weathering and hardness is conducted using standard dictionary definitions. Colour and any additional qualitative comments are also recorded. • All core is photographed on both a core table (0.5m increment) and a 5m tray basis. Chips are photographed as laid out by 1m intervals. • All holes are logged using a comprehensive suite of downhole geophysics tools (calliper, gamma, density, neutron, and sonic) – with the addition of acoustic scanner that is used for geotechnical assessment in cored holes
Sub-sampling techniques and sample preparation	• Core sampling is completed at the drill site and based on set of standard criteria (determined by lithology and structure). Samples are bagged at the drill site and then transported to an external accredited laboratory for analysis as a complete hole batch. • Prior to May 2013 samples were analysed by Australian Laboratory Services Steel River, Newcastle laboratory. • All samples are weighed, air-dried and then re-weighed before being crushed to an 11.2mm top size. A rotary splitter is used to divide the sample into portions available for further CQ analysis. • CQ analysis is by a three stage method involving raw analysis on all plies followed by washability and product testing on composite samples as defined by the geologist. • All sample treatment and analysis is conducted according to procedures which adhere to Australian (or International equivalent) standards in a National Association of Testing Authorities certified laboratory.
Quality of assay data and laboratory tests	• Non-formalised quality assurance/quality control (QAQC) involving duplicate samples is completed and, in addition, Rio Tinto Coal Australia checks laboratory round robin and basic reproducibility tests provided by Bureau Veritas. All results are assessed via cross-plots and statistics for precision and accuracy.
Verification of sampling and	• All CQ sampling and analysis is overseen and checked by other Rio Tinto personnel. • Data transfer from site is covered by an agreed protocol. This system documents primary assaying data, data entry procedures, data verification, and data storage (physical and

	electronic) into Ventyx/Mincom's geological database
Location of data points	• The topographic surface is derived from a combination of 2m and 5m contour data digitised from topographic maps and 10m digitised data from the Bulga 1st edition topographic map covering the mined areas. Drill hole collars and mine survey data were also used. The digital terrain model was created with a 20m × 20m cell size triangulation at 0.2m decimation. • All surveyed coordinates are within Map Grid of Australia 1994 MGA Zone 56. • Drill hole collars were surveyed post drilling by licensed surveyors using differential global positioning system with an accuracy of ±10mm. • Downhole surveying has been undertaken using downhole verticality and calliper tools since 2007, including attempted resurvey of earlier drill holes. Overall 84% of the diamond drilling metres have been surveyed downhole over the entire drill hole length but only 40% of the total open hole drilling metres have been downhole surveyed.
Data spacing and distribution	• Drill hole spacing for core holes is on an equilateral triangle grid of 250m or less. For open holes spacing is on a 125m or less equilateral triangle grid. • All core samples are composited within defined seam boundaries.
Orientation of data in relation to geological structure	• The coal measures show a relatively consistent layering and are not subject to steep dips. The orientation of drilling is therefore suitable for flat lying stratified deposits.
Sample security	• Core/chip samples are taken at the drill site and then transported daily to the locked MTW core shed for storage. Once the hole has been completed the samples are stored in a refrigerated unit prior to being transported to the laboratory via a dedicated courier service.
Audits or reviews	• MTW has had one audit completed in the past five years. The audit was conducted in March 2010 by the Xstract Group (report: Resources and Reserves Internal Audit Report Executive Summary Mt Thorley Warkworth).The review concluded that the fundamental data collection techniques are appropriate.

SECTION 2 REPORTING OF EXPLORATION RESULTS

Criteria	Commentary

Mineral tenement and land tenure status	• MTW is an amalgamation of two previously independent mines – Mt Thorley Operations and Warkworth Mining Limited. Each mine was developed at approximately the same time and combined by Coal & Allied Limited (CNA) in 2004.
	
	• MTW is operated by CNA on behalf of the joint venture (JV) participants. There are two JV partnerships – one for each of the formerly separate operations. Participants in the JVs are outlined below.
	
	• Mount Thorley Operations (MTO)
	    o Mount Thorley Operations Pty Ltd (a subsidiary of CNA) (share: 80%)
	    o Posco Australia Pty Ltd (share: 20%).
	
	• Warkworth Mining Limited (WML):
	    o CNA Resources (a subsidiary of CNA) (share: 28.750%)
	    o CNA Warkworth Australasia Pty Ltd (a subsidiary of CNA) (share: 26.824%)
	    o Mitsubishi Development Pty Ltd (share: 28.898%)
	    o Mitsubishi Materials (Australia) Pty Ltd (share: 6.000%)
	    o Nippon Steel (Australia) Pty Ltd (share: 9.528%).
	
	• MTW contains numerous leases and licences including:
	    o one consolidated coal lease covering 4192ha
	    o one coal lease covering 1992ha
	    o one exploration licence covering 1988ha
	    o three mining leases covering 29ha
	    o two mining lease applications covering 1370ha
	
	• All leases containing Resources are in good Standing.
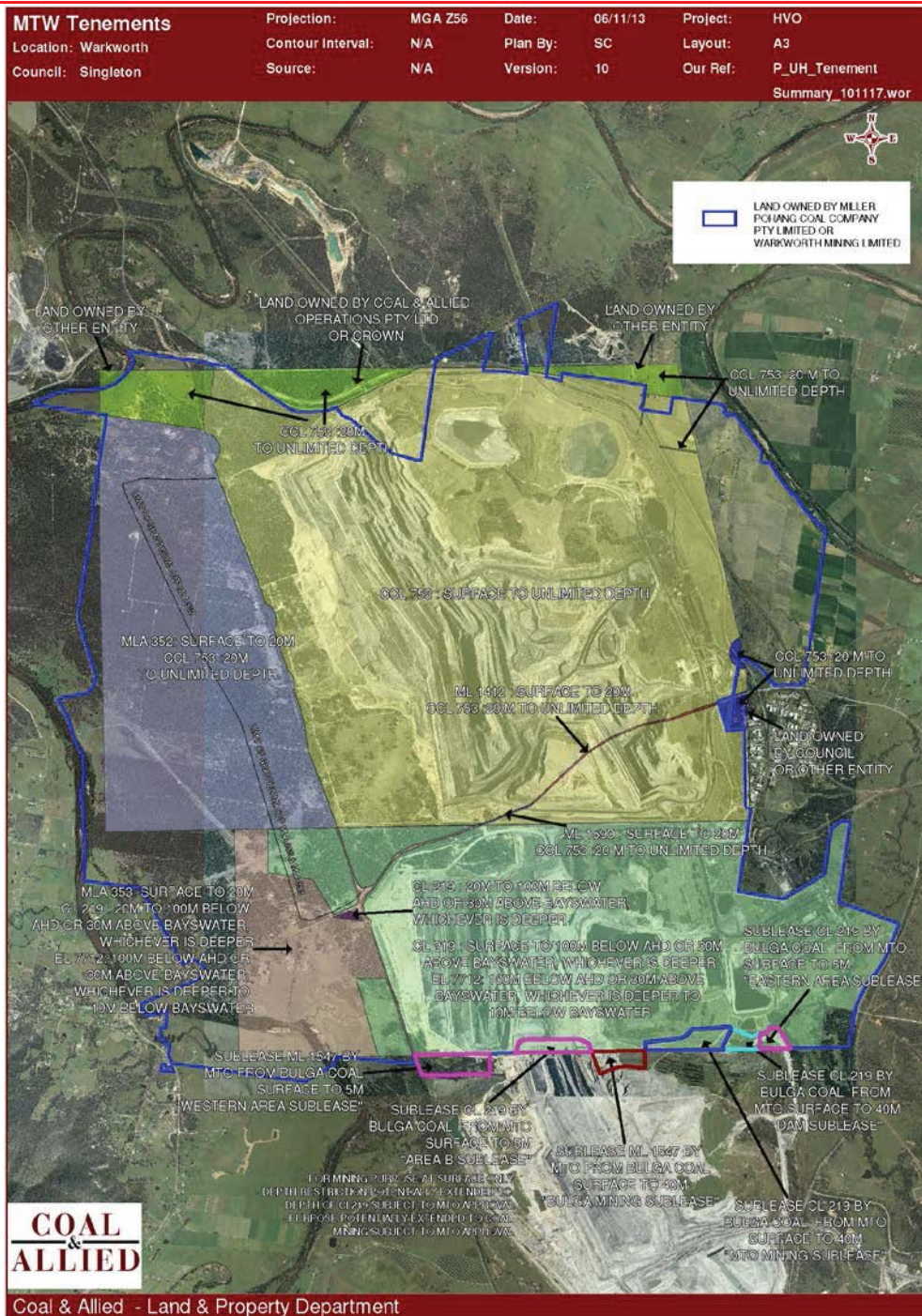
Figure 1: MTW mining and exploration titles

Exploration done by other parties	• 1949–1950: Newly formed Joint Coal Board commence drilling shallow percussion boreholes (McMenamins and JCB Warkworth series).
	• 1960s: Clutha Bargo explored the Whybrow Seam for coking coal potential.
	• Early 1970s: Armco conducted diamond drilling in the Bulga area.
	• 1970-1975: Department of Mines conducts fully cored hole drilling programme (DM Warkworth and DM Doyles Creek series).
	• 1976: Warkworth Consortium is formed (later established as WML) and awarded mining bid for Warkworth area. Commenced exploration programme with 12 rigs drilling fully cored, HQ-size holes and large diameter (LD) core drilling in selected seams.
	• 1976: Drilling programme started at Mt Thorley site – similar to Warkworth drilling programme. Main concentration of drilling was in the shallower, eastern parts of the lease.
	• 1980s & 990s: Main focus at Warkworth was open-hole drilling. Mt Thorley increased open holing with production, and a concerted effort at core drilling during the 1990s.

	•	2002–2005: Little drilling was undertaken.
	•	2006–2014: Pre-production and further exploration drilling was undertaken. Focus was on: improving borehole data density, testing in situ gas content, provide data for underground Resources, testing the geology of Abbey Green, and extending pre-production drilling 3yrs ahead of mining (MTO and WML).
	•	Drilling completed on both sites has been combined into a single geological database.
Geology	•	MTW is located in the Hunter Coalfield in the northern part of the Sydney Basin which contains numerous important coal producing intervals in the Permian stratigraphy of the Vane subgroup. The main rock types of this subgroup include sandstone, siltstone and conglomerate, which occur with subordinate coal and tuffaceous claystone.
Drill hole information	•	Drilling data summary since consolidation of the mines into one operation (as MTW):

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Open holes	35	11	71	75	23	62	103	39	45	6	28	5
Cored holes	7	1	6	19	18	17	24	47	44	31	13	3

	•	Since the previous resources upgrade in 2012 there have been an additional 422 drillholes added due to new drilling or database updates
Data aggregation methods	•	Ply samples are combined to create composites (for washability and product coal analyses) representing mineable seam working sections.
Relationship between mineralisation widths and intercept lengths	•	Based on drilling techniques and stratigraphy, the coal seam intercepts therefore approximate the true coal thickness.
Diagrams		

Figure 2: MTW location

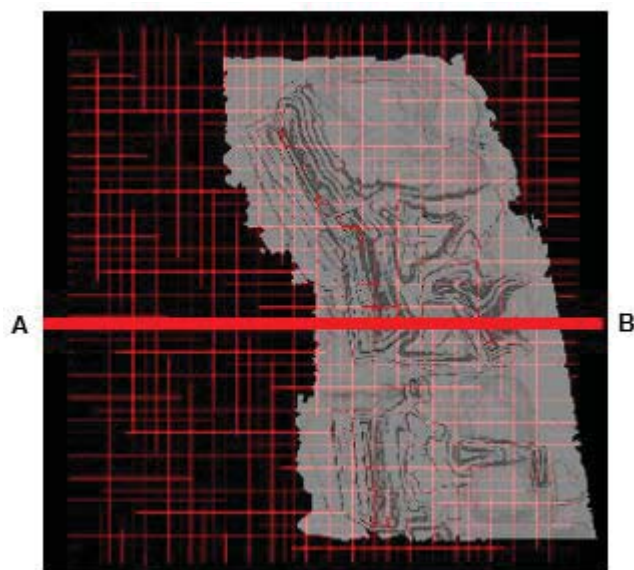*Open holes (blue); coreholes (red)*

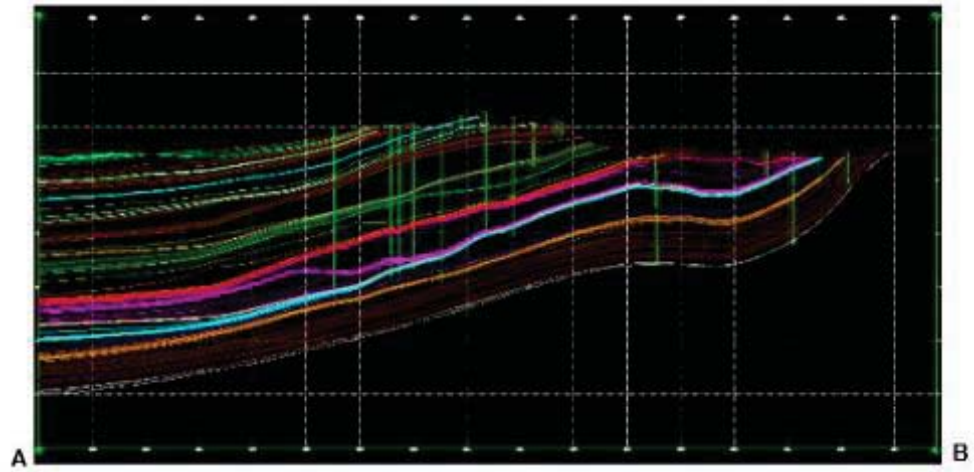**Figure 3: Drill collar locations**
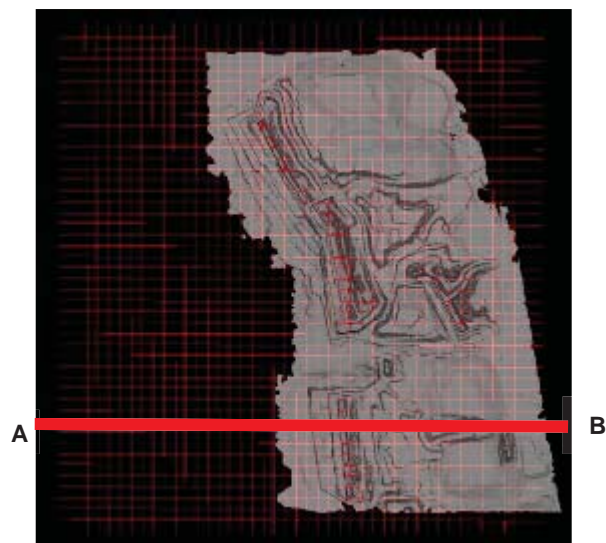
Figure 4: MTW open-cut operations

Figure 5 Warkworth mining line of cross-section
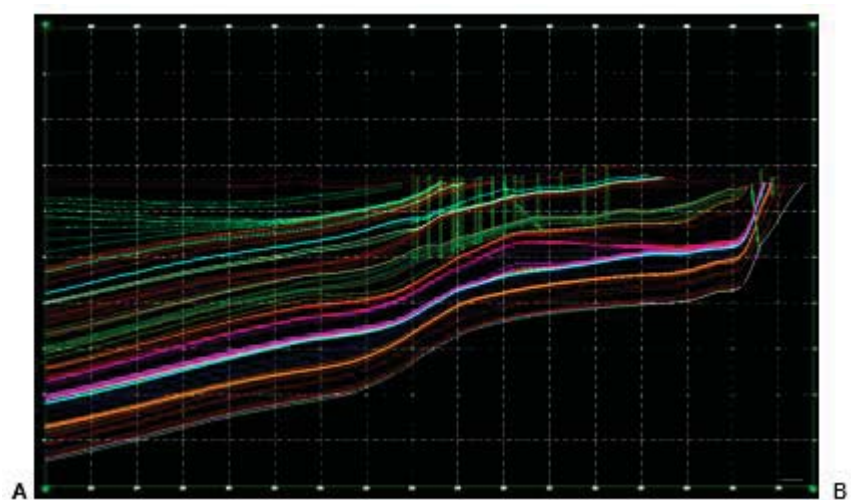
Cross-section A–B is west to east

Figure 6 Warkworth mining lease cross-section

Figure 7 Mount Thorley operations line of cross section

Cross-section A–B is west to east

Figure 8 Mount Thorley operations cross-section

Balanced reporting	• Not applicable. Rio Tinto Coal Australia has not specifically released exploration results for these deposits.
Other substantive exploration data	• In addition to drilling, resistivity surveys, ground and airborne magnetic and 2D seismic surveys have been completed to identify faults, dykes, and alluvial limits.
Further work	• Both pre-production drilling and strategic brownfields drilling is ongoing, and analytical (CQ, geotechnical, and gas) results will be ongoing. • Brownfields exploration includes the MTW underground conceptual study. This covers the areas of the present open-cut pits and to the western extents of the licences shown in Figure 4: *MTW open-cut operations*.

SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Database integrity	• All drill hole data is securely stored in a database which is duplicated on multiple servers (MTW and Singleton) and is backed up daily. • Data is validated at the drill site and also prior to loading into the database by the responsible geologist. • The database contains automated validation processes which are activated during data loading and prevent un-validated data being loaded.
Site visits	• The Resources Competent Person visited MTW in 2015.
Geological interpretation	• The deposit is well known and tabular (layer-cake) with all major structures defined. Infill drilling and mining exposure and mapping has supported and refined the model. The current interpretation is thus considered to be robust.
Dimensions	• The deposit trends 8km northwest to southeast and is 8.5km in width. The deposit extends to a depth of 460m below the topographic surface.
Estimation and modelling techniques	• Modelling was undertaken using resource modelling software (version 5.9). For structural modelling a proprietary fine element method (FEM) interpolator is used and for CQ an inverse distance squared interpolator is used. All surfaces and coal qualities are interpolated into grids with 20m × 20m node spacing. • The model consists of the coal seams only with waste modelled by default. Resource estimates are therefore of the coal seams only and restricted on a whole seam group basis only. • Modelling is completed on an iterative basis with checking of cross sections and contours of structural and CQ attributes. Database values are posted on contours as a further check. A volume/tonnage check between the model and its predecessor are completed as a final validation. • The underground estimates for the Vane sub-group are based on a separate model which spans MTW and HVO south of the Hunter River and directly adjacent to the north. Previous/existing underground resource estimates at MTW had been confined to the Jerrys Plains sub-group.
Moisture	• All tonnages are estimated on an in situ moisture basis, which is determined as air-dried moisture content plus 4%. This offset was derived by comparing the difference between the average total moisture content of shipments of coal that have by-passed the coal plant, and the average air-dried moisture content of that coal.
Cut-off parameters	• Nominally coal is washed to produce an export thermal product (11%–15% air-dried ash), a domestic thermal product (25% air-dried ash) and a semi-soft coking coal product at 9.0% air-dried ash. For all products, product moisture is at 9%. Air-dried is quoted at a 2.5% moisture basis. • A minimum coal thickness of 0.25m and density of 1.8 g/m^3 are applied as a cut-off parameters for reporting coal. • Economic resources are defined by a "break even" ($0 margin) Lerchs-Grossman optimised shell for opencast coal – this effectively sets the maximum depth or lowermost

	seam considered. For underground resources the limits are based on either an order of magnitude study or standard set of rules (i.e. coal below "break even" shell, less than 600m deep and greater than 1.8m thick).
Mining factors or assumptions	• Development of this Mineral Resource estimate assumes mining using standard Rio Tinto Coal Australia equipment. The assumed mining method is overburden removal via draglines, and conventional truck and shovel open pit coal mining. • Mining practices utilise detailed extraction plans to effectively manage grade control. These extraction plans are generated from real time blast hole drill compliance monitoring, in pit visual inspections, and survey monitoring and control. • Conceptual underground mining will be by longwall methods.
Metallurgical factors or assumptions	• It is assumed that a combination of density separation (magnetite/water) and fines flocculation processes used by Rio Tinto Coal Australia will be applicable for the processing of MTW coal.
Environmental factors or assumptions	• Rio Tinto Coal Australia has an extensive environmental and heritage approval and compliance process. No issues are expected that would impact on the Mineral Resource estimate.
Bulk density	• Certain boreholes samples have only true relative density (RD) analysis; some have both apparent relative density (ARD) and true RD, and most have ARD. Relationships between ARD and RD were determined from the paired sets of ARD and RD analyses. The relationships used to populate the ply by ply data with missing ARDs or RDs are: RD (ad) = 1.0003 x ARD 1.0645, and ARD = 1.0045 x RD 0.9316. • The in situ relative density (i.e. the density of materials at an in situ moisture basis) was calculated using the Preston and Sanders equation: RD2=[RD1*(100-M1)]/[100+RD1*(M2-M1)-M2] *Where RD1 is true RD (ad), M1 is moisture (ad) and M2 is the in situ moisture.(M1 +4)*
Classification	• The classification of the Mineral Resources into varying confidence categories is based on a standardised process of utilising points of observation (PoO) (i.e. drill holes) according to their reliability and value in estimation. The PoO are used to categorise structure and quality continuity (or both) or support continuity. • Radii of influence are then plotted around PoO maps for structure and quality. The radii of influence were determined by consideration of the perceived and observed variability in structure and CQ for seam groups, and by examining histograms and statistics of ash content of seam groups. As there are many plies at MTW, seam groups (equivalent to the seam names) were used for categorisation. • Areas of confidence (low, medium, high) are produced from these plots (structure, CQ for each seam group) and these are finally combined to produce areas of Measured, Indicated and Inferred which are used to subdivide the Resource tonnage estimates. • In summary structural radii range 150-250m for high confidence, 300-500m for medium and 1,200-2,000m for low; and, for CQ 300-500m radii for high, 600-1,000m for medium and 1,800-3,000m for low confidence respectively. The ranges reflect variability within the fifteen seam groups modelled at MTW. • The Competent Person is satisfied that the stated Mineral Resource classification reflects the geological controls interpreted and the estimation constraints of the deposits.
Audits or reviews	• MTW has had one audit completed in the past five years. The audit was conducted in March 2010 by the Xstract Group (report: Resources and Reserves Internal Audit Report Executive Summary Mt Thorley Warkworth). • The outcome of this audit was overall a satisfactory rating with a number of recommendations made and acted upon by Rio Tinto Coal Australia.
Discussion of relative accuracy/ confidence	• Rio Tinto Coal Australia operate multiple mines in New South Wales (NSW) and Queensland (QLD). The Mineral Resource data collection and estimation techniques used for the MTW deposit are consistent with those applied at other deposits which are being mined. • Reconciliation of actual production with the Mineral Resource estimates for the existing operational deposits are generally within 4% for tonnes, however grade is not reconciled against. This result is indicative of a robust process. • Accuracy and confidence of Mineral Resource estimation estimate has been accepted by

SECTION 4 ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• A 3D gridded Resource model of topography, structure, and quality are used for in situ Resource definition. • Mine design strips and blocks are applied to the in situ Resource model to generate the raw reserves used to create a separate mine schedule database. The mine schedule database also reflects working sections or seam aggregations, mining methods and associated loss and dilution impacts. The mine schedule database is used as the basis for Coal Reserves reporting. • Coal Resources are in addition to Coal Reserves. Open pit ore reserves are as reported in 2014, with an adjustment for mining depletion.
Site visits	• The Reserves Competent Person visited Mount Thorley Warkworth in 2015.
Study status	• MTW is an operating mine project. The reportable Ore Reserve is based on the life of mine (LOM) plan and has determined a mine plan that is technically achievable and economically viable, and that material modifying factors have been considered.
Cut-off parameters	• Periodic pit optimisation work used to define pit shells is conducted using Rio Tinto economics prices and an estimate of unit operating costs and including a $/ROMt allowance for sustaining capex. This process was conducted in 2015 at a long-term consensus view of the thermal coal price of US$92.00/t. • For annual JORC reserves reporting purposes, detailed mine design and schedules are constructed to generate detailed cash flow schedules. This work includes identifying the mining sequence, equipment requirements, incremental and sustaining capital. • A discounted cashflow analysis is conducted to re-assess under the latest economic assumptions the potential reserves that remain net cashflow positive.
Mining factors or assumptions	• The MTW mine utilises dragline, truck and shovel for waste movement, while coal is loaded using a combination of loaders and excavators. Haulage to the ROM hopper is undertaken using rear dump trucks. The operations are supported by additional equipment including dozers, graders, and water carts. • All pit end-walls have benched and battered designs based on the existing operation with allowances made for increasing depth of mining. The design provides for mining roadways and catch benches. • Working section or seam aggregation logic pre-determines what is defined as mineable coal by applying working section tests based on minimum coal thickness of 25cm, and a maximum raw ash of 55% on an air-dried basis. • Coal loss and dilution factors are also applied and vary by the equipment type uncovering the various coal seams (excavator/truck versus dragline). Typical roof and floor coal loss thickness ranges from 8cm–25cm. Typical roof and floor waste dilution thickness ranges from 4cm–13cm. • LOMs for strategic planning purposes may contain Inferred Resources, provided that the LOM plan would not be compromised by non-inclusion of this coal. Inferred Resources included in LOM plans retain this designation and are not to be referred to as Reserves. Neither are they to be reported in JORC or Securities and Exchange Commission compliant Reserve statements. • MTW has 10.5% Inferred coal within the existing LOM plan.
Metallurgical factors or assumptions	• MTW has two coal handling and preparation plants (CHPP): North CHPP and South CHPP. Both plants are operational, with North CHPP is a single product washing and South CHPP is capable of two-product washing. • The processes used are standard for the coal industry and so are well tested technologies. • All samples are wash/cut-point tested and so the representativeness of test work

	undertaken is implicit in the resource classification status.
	• In-seam dilution is included in sample testing.
	• Coal Reserve estimation is based on existing product specifications.
Environmental	• MTW has a number of current mining and exploration titles.
	• All the various mining leases across MTW are defined by a 21yr consent limit. This consent limit is particular to each mining lease, and as such leases are constantly being renewed. There is a dedicated tenements manager to ensure the application for lease renewal occurs on time.
	• An appeal of the project approval for Reserves west of Wallaby Scrub Road was upheld (disapproved) by the NSW Land and Environment Court in April 2013. A 350m modification within this area was subsequently secured in January 2014 and Rio Tinto Coal Australia management worked through a process that resulted in further approvals being granted in November 2015.
	• Coarse rejects are dumped within the mines overburden dumps, while the fines coal washery rejects are stored within dedicated tailings dams. Rejects material and completed tailings dams must be covered by at least 3m of inert waste rock material.
	• Overburden waste rock has low acid forming potential.
Infrastructure	• MTW is an operating site with existing infrastructure in place to support the operation. The current LOM requires sustaining capital only to maintain the existing infrastructure.
Costs	• Based on detailed Annual Operating Plan (AOP) process. Beyond AOP, sustaining capex is based on $/ROMt plus equipment replacements and additions required to deliver the mine plan.
	• First principles estimating are aligned with AOP. Budget prices for major consumables and labour.
	• Adjustments are made for energy.
	• Commodity prices are supplied by the economics and markets team, and are based on: expected demand, current supply, known expansions, and expected incentivised supply.
	• Exchange rates are supplied by the economics and markets team.
	• Transport charges are obtained from the coal chain team based on existing contracts and expected tonnages.
	• State Government royalties based on current NSW royalty rates.
Revenue factors	• Rio Tinto applies a common process to the generation of commodity price estimates across the group. This involves generation of long-term price curves based on: current sales contracts, industry capacity analysis, global commodity consumption, and economic growth trends. In this process, a price curve rather than a single price point is used to develop estimates of mine returns over the life of the mine. The detail of this process and of the price point curves is commercially sensitive and is not disclosed.
Market assessment	• The supply and demand situation for coal is affected by a wide range of factors, and coal consumption changes with economic development and circumstances. Rio Tinto Coal Australia delivers products aligned with its Mineral Resources and Ore Reserves, these products have changed over time and successfully competed with coal products supplied by other companies.
Economic	• Economic inputs such as foreign exchange rates, carbon pricing, and inflation rates are also generated internally at Rio Tinto. The detail of this process is commercially sensitive and is not disclosed.
Social	• There are no claims to Native Title over the MTW lease area. No Reserves have been omitted on this basis.
	• Rio Tinto Coal Australia established the Upper Hunter Valley Cultural Heritage Working Group as a consultation and management process to negotiate cultural heritage issues with local Aboriginal communities. As part of releasing a ground disturbance permit on site, authority must be gained to destroy/remove sites of cultural interest. This involves archaeological mapping and removal of artefacts prior to ground disturbance.
	• There are no sites of European heritage within the existing area of MTW operations. No reserves have been omitted on this basis.

Other	• Semi-quantitative risk assessments have been undertaken throughout the LOM and Reserve phases. No material naturally occurring risks have been identified through the above mentioned risk management processes.
Classification	• The Ore Reserves consist of 85% Proved Reserves and 15% Probable Reserves Mount Thorley area. • The Ore Reserves consist of 50% Proved Reserves and 42% Probable Reserves Warkworth area. • The Competent Person is satisfied that the stated Ore Reserve classification reflects the outcome of technical and economic studies.
Audits or reviews	• MTW has had one audit completed in the past six years. The audit was conducted in March 2010 by the Xstract Group (report: *Resources and Reserves Internal Audit Report Executive Summary Mt Thorley Warkworth*). • The review concluded that the fundamental data collection techniques are appropriate and consistent with previously audited MTW models.
Discussion of relative accuracy/ confidence	• Rio Tinto Coal Australia operates multiple mines in QLD and NSW. The Ore Reserve estimation techniques utilised for the Mount Thorley Warkworth Mine are consistent with those applied across the other operations. Reconciliation of actual ROM production with the Ore Reserve estimate for the existing operations is generally within 6% for tonnage and grade. This result is indicative of a robust Ore Reserve estimation process. • Accuracy and confidence of modifying factors will continue to be monitored to identify potential improvements.

Hail Creek Table 1

The following table provides a summary of important assessment and reporting criteria used at Hail Creek Mine for the reporting of exploration results, Mineral Resources and Ore Reserves in accordance with the Table 1 checklist in *The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition)*. Criteria in each section apply to all preceding and succeeding sections.

<p style="text-align:center; color:red;">SECTION 1 SAMPLING TECHNIQUES AND DATA</p>

Criteria	Commentary
Sampling techniques	• A combination of open hole (predominantly for structural definition) and cored (for coal quality (CQ), geotechnical and gas sampling) have been used.
Drilling techniques	• 6,058 drill holes (578,879m) support the Resource estimate. Cored drilling represents 17% of the total metres, and open hole drilling 83%. The drill holes are up to 518m deep and average 84m. The drill holes were all nominally recorded as vertical with a redrill required if the hole exceeds specified deviation. • Coring has predominantly been done using a 4C-sized bit (576 holes at 100mm) and open hole drilling to an equivalent hole diameter size. In addition a number of HQ-3, PQ-3 and large diameter (LD) holes have been drilled: 98 holes HQ-3 (63mm), 95 holes PQ-3 (83mm), and 83 holes LD (200mm) diameter sizes.
Drill sample recovery	• Standardised Rio Tinto Coal Australia logging systems are utilised for all drilling logging and sampling. • Core recovery is recorded by the geologist while logging the drill hole. If core recovery for a coal ply is less than 95%, then that section of the hole is redrilled to ensure a representative sample is taken. • Ply samples are checked for representativeness using a theoretical mass that is determined using analysed relative density, sample thickness and core diameter prior to composite definition. • Open hole chip recovery is assessed qualitatively by the rig geologist.
Logging	• Core is geologically and geotechnically logged and open hole chip samples are taken every 1m and logged for lithology changes. Logging for lithology, grainsize, weathering and hardness is conducted using standard dictionary definitions. Colour and any additional qualitative comments are also recorded. All core is photographed on both a core table (0.5m increment) and a single 2.8m core tray basis for 4-C and PQ-3 and single 4.5m core tray basis for HQ-3. Chips are photographed in 20m $\times$ 1m intervals. • All holes are logged using a comprehensive suite of downhole geophysics tools (calliper, gamma, density, neutron, sonic, verticality, temperature) with acoustic scanner (for geotechnical assessment) also run on cored holes.
Sub-sampling techniques and sample preparation	• Core sampling is completed at the drill site and based on set of standard criteria (determined by lithology and structure). Samples are bagged at the drill site and then transported to an external accredited laboratory for analysis as a complete hole batch. • All samples are weighed, air-dried and then re-weighed before being crushed to a 19mm top size. A rotary splitter is used to divide the sample into portions available for further CQ analysis. • CQ analysis is by a three stage method involving raw analysis on all plies followed by washability and product testing on composite samples as defined by the project geologist. • All sample treatment and analysis is conducted according to procedures which adhere to Australian (or International equivalent) standards in a National Association of Testing Authorities certified laboratory.
Quality of assay data and laboratory tests	• Non-formalised quality assurance/quality control (QAQC) involving duplicate samples is completed and, in addition, Rio Tinto Coal Australia checks laboratory round robin and basic reproducibility tests provided by the primary laboratory. All results are assessed via cross-plots and statistics for precision and accuracy.
Verification of sampling and assaying	• All CQ sampling and analysis is overseen and checked by other Rio Tinto personnel. • Data transfer from site is covered by an agreed protocol. This system documents primary data, data entry procedures, data verification, and data storage (physical and electronic) into a geological database.

Location of data points	• The topographic grid has been constructed from an orthophoto DTM obtained from AAM Hatch on 18 June 2002. The grid has a 20m cell size and covers the entire Hail Creek Syncline as shown in Figure 2 below. • All surveyed co-ordinates are within Australian Geodetic Datum 1984 (MGD84) MGA Zone 55. • Drill hole collars were surveyed post drilling by licensed surveyors (Hail Creek Mine employees) using differential GPS with an accuracy of ±10mm. • Downhole surveying has been undertaken using downhole verticality and calliper tools for all holes 2005 onwards. From all holes drilled and modelled at Hail Creek, 49% of cored holes have verticality data and 44% of open holes have verticality data recorded.
Data spacing and distribution	• Drill hole spacing for core holes is on an equilateral triangle grid of 500m or less. For open holes, spacing is on a 250m or less equilateral triangle grid. Holes for sub-crop delineation were drilled on a distance as required (observed <100m). • Due to the maturity of the exploration, the majority of the recently drilled holes (2012 to 2015) were not set on a grid basis but rather governed by required data. • Pre-production holes are based on sub-100m grid spacing (between 75m- 86m). • All core samples are composited within defined seam boundaries.
Orientation of data in relation to geological structure	• The Coal Measures show relatively consistent layering and are not subject to steep dips – the orientation of drilling is therefore suitable for flat lying stratified deposits.
Sample security	• Core/chip samples are taken at the drill site and then transported daily to the exploration office for storage under refrigeration. Once the hole has been completed the samples are transported to the laboratory via a dedicated courier service again under refrigeration.

Audits or reviews	• Hail Creek has had three audits completed in the past six years, they include:
	   o An audit in September 2014 conducted by the Xstract Group (report: *Rio Tinto Group Audit and Assurance Resources Internal Audit: Hail Creek Mine*)
	   o An audit in October 2010 conducted by the Xstract Group (report: *Resources and Reserves Internal Audit – Hail Creek Mine. Project No. P1361*)
	   o An audit in November 2009 conducted by Snowden (report: *Rio Tinto Corporate Assurance: Resources and Reserves Internal Audit – Hail Creek Mine. Project No. 00509*).
	• These reviews concluded that the fundamental data collection techniques are appropriate.

SECTION 2 REPORTING OF EXPLORATION RESULTS

Criteria	Commentary

Mineral tenement and land tenure status	• Hail Creek Mine is operated under a joint venture agreement. The joint venture partners are listed below:
	   o Queensland Coal Pty Limited[*] (82% share)
	   o Marubeni (6.6667% share)
	   o Sumisho (3.3333% share)
	   o Nippon Steel Australia (8% share).
	     [*] *A 100% owned subsidiary of Rio Tinto Ltd.*
	• The area making up the Hail Creek Resource model makes up the eastern portion of ML 4738.
	• Other licences and permits includes:
	   o two exploration permits
	   o two mining development licences.
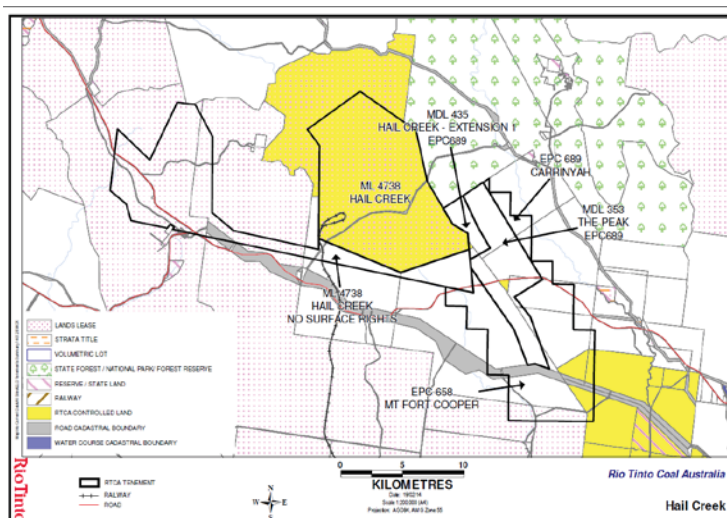
Figure 1 HCM mining and tenements map

| Exploration done by other parties	• Small government and private coal exploration was undertaken between 1887 and 1969, but only small Reserves were reported for the Elphinstone and Kemmis Creek coalfields. The realisation of the Hail Creek syncline for coking coal was not until 1969. Mine administration undertook extensive exploration during the 1970s. The project partners took some poor options in testing the coal. Frequent changes of project ownership and personnel hampered the interpretation and documentation of this early work. • All exploration of the Hail Creek Syncline after the major partnering of Rio Tinto in the early 1990s was conducted by Pacific Coal Pty Ltd followed by the current custodian, Rio Tinto Coal Australia Pty Ltd.
Geology	• Hail Creek is located in the northern part of the Bowen Basin which contains numerous important coal producing intervals in the Permian stratigraphy. The Late Permian Fort Cooper and Rangal Coal Measures host the coal deposits mined at Hail Creek. The main rock types of these measures are sandstone, siltstone and conglomerate, which occur with coal and tuffaceous claystone.
Drill hole information	• Drilling data summary of Hail Creek for periods 1993-2001 and 2003-2014:

Table 1: Drilling activities for period 1993-2001

Year		Open Holes	HQ3 Core	100mm Core	Large Core	Totals
1993	N°. of holes	7	2	-	8	17
	Metres drilled	612	88	-	369	1,069
1994	N°. of holes	46	-	-	-	46
	Metres drilled	4,220	-	-	-	4,220
1995-96	N°. of holes	392	19	53	11	475
	Metres drilled	26,903	718	4,712	705	33,038
1997	N°. of holes	65	-	13	34	112
	Metres drilled	7,566	-	844	2,008	10,417
1998	N°. of holes	602	1	50	-	653
	Metres drilled	29,263	37	2,698	-	31,998
2001	N°. of holes	-	-	-	6	6
	Metres drilled	-	-	-	292	292

Table 2: Drilling activities for period 2003-2015

Year	Drilling Detail	Open Holes	HQ3 Core	PQ3 Core	100mm Core	Large Core	Totals
2003	N°. of holes	508	9	-	173	3	693
	Metres drilled	22,418	559	-	7,323	149	30,449

3

2004	Nº. of holes	781	10	-	82	11	884
	Metres drilled	46,043	326	-	7,680	965	55,014
2005	Nº. of holes	1,033	38	-	83	7	1,161
	Metres drilled	99,420	8,832	-	8,527	829	117,608
2006	Nº. of holes	248	-	-	32	-	280
	Metres drilled	15,927	-	-	2,184	-	18,111
2007	Nº. of holes	511	-	-	53	-	564
	Metres drilled	39,757	-	-	4,741	-	44,498
2008	Nº. of holes	51	0	0	30	16	97
	Metres drilled	6,289	0	0	4,909	1,777	12,975
2009	Nº. of holes	126	4	0	84	7	221
	Metres drilled	22,525	721	0	13,866	662	40,832
2010	Nº. of holes	242	-	-	45	5	292
	Metres drilled	39,753	-	-	7,047	704	47,504
2011	Nº. of holes	118	6	26	29	0	179
	Metres drilled	23,992	1,618	8,592	5,297	0	39,499
2012	Nº. of holes	134	5	12	12	0	162
	Metres drilled	30,122	1,429	2,592	2,734	0	36,108
2013	Nº. of holes	157	27	24	0	0	208
	Metres drilled	45,429	7,298	4,654	0	0	57,381
2014	Nº. of holes	41	2	23	0	0	66
	Metres drilled	19,025	764	3,478	0	0	23,267
2015	Nº. of holes	34	4	0	0	5	43
	Metres drilled	8,847	681	0	0	632	10,160

- Since the previous resources upgrade in 2011 there have been an additional 370 drillholes added due to new drilling or database updates

Data aggregation methods	• Ply samples are combined to create composites (for washability and product coal analyses) representing mineable seam working sections.
Relationship between mineralisation widths and intercept lengths	• Based on drilling techniques and stratigraphy, the coal seam intercepts approximate true coal thickness.

Diagrams

Figure 2: Hail Creek location
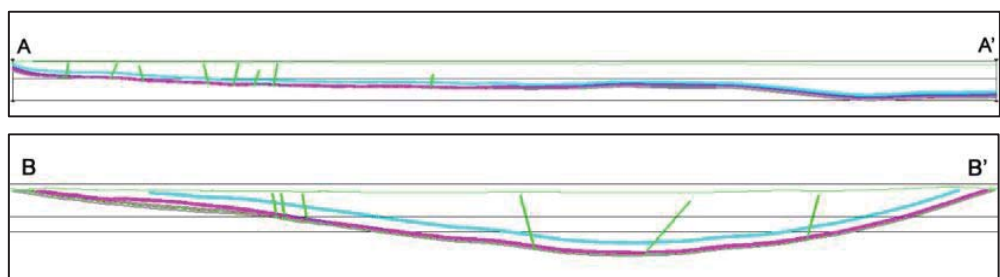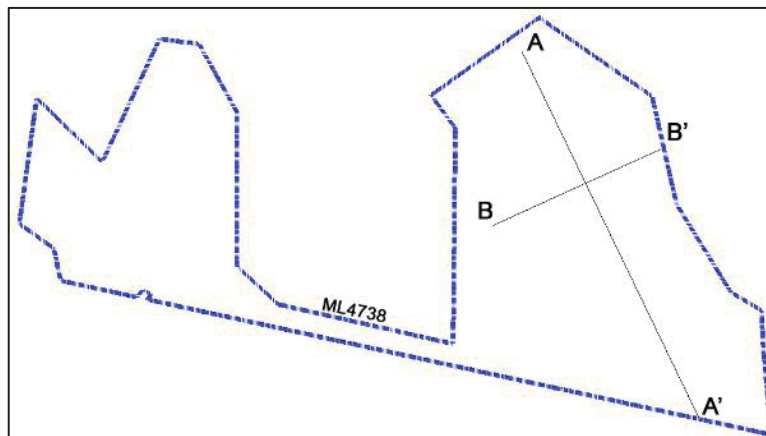

Open holes (blue); cored holes (red)
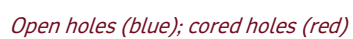
Figure 3 Drill collar locations
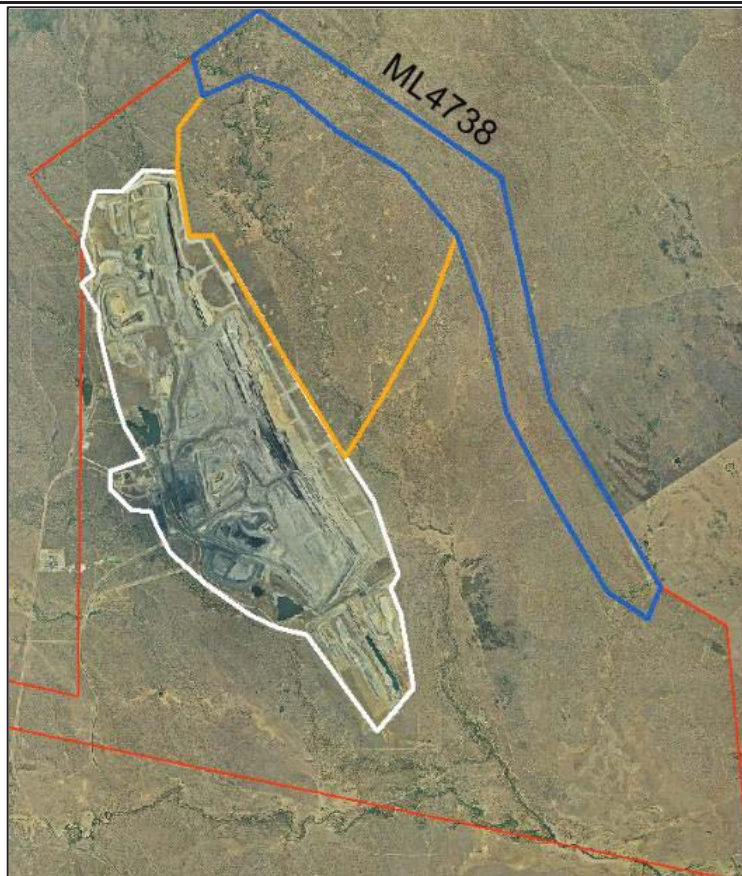
Active pit (white), underground (orange), and eastern margin (blue) resource areas

Figure 4 Current Hail Creek activities

Cross-section A is north to south / cross-section B is west to east

Figure 5 Hail Creek cross-sections

Balanced reporting	• Not applicable. Rio Tinto Coal Australia has not specifically released exploration results for these deposits.
Other substantive exploration data	• In addition to drilling, a 3D seismic survey (underground exploration target) and airborne magnetic surveys have been completed to delineate structure, faults, dykes, and alluvial limits.
Further work	• Drilling for both pre-production and strategic brownfields, and analytical (CQ, geotechnical, gas) results will be ongoing. • Brownfields exploration includes a potential eastern margin, an underground Resource, and potential coal Resources in the south of the syncline.

SECTION 3 - ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Database integrity	• All drill hole data are securely stored in a database which is stored on the Brisbane server and is backed up daily. • Data are validated at the drill site and also prior to loading into the database by the responsible geologist. • The database contains automated validation processes, during data loading to prevent un-validated data being loaded.
Site visits	• The Resources Competent Person visited Hail Creek in 2015.
Geological interpretation	• The deposit is a south-southeast plunging, asymmetrical syncline with all major structures defined. The deposit is part of a series of anticlines and synclines known as the Nebo Synclinorium. Infill drilling, 3D seismic, mining exposure and mapping has supported and refined the model. The current interpretation is thus considered to be robust.
Dimensions	• The deposit trends 14km north-northwest to south-southeast and is 6km in width. The deposit extends to a depth of 530m below the topographic surface in the south.
Estimation and modelling techniques	• Modelling was undertaken using resource modelling software. For structural modelling the Fine Element Method (FEM) interpolator is used and for CQ an inverse distance squared interpolator is used. All surfaces and coal qualities are interpolated into grids with 20m $\times$ 20m node spacing. • The model is of the coal seams only and waste modelled by default and not assigned any grade. Resource estimates are therefore of the coal seams only and restricted on a whole seam group basis only. • Modelling is completed on an iterative basis with checking of cross-sections and contours of structural and CQ attributes. Database values are posted on contours as a further check. A volume/tonnage check between the model and its predecessor are completed as a final validation.
Moisture	• All tonnages are estimated on an in situ moisture basis, which is determined to be 5%.

Cut-off parameters	• Nominally coal is washed to produce three products:
	    ○ a premium low-ash (8.5 per cent) prime hard coking product
	    ○ a higher ash (10 per cent) hard coking product.
	    ○ a high ash (23-35 per cent) thermal product
	• Blending of coal from the two major seams (Elphinstone and Hynds) is common.
	• A secondary thermal product has recently been introduced from the rejects streams of the above products and is a 25% ash product.
	• The site also produces smaller amounts of bypass thermal rejects.
	• For all products, product moisture is 10%. Air-dried moisture is quoted at a 1.5% moisture basis.

Mining factors or assumptions	• Development of this Mineral Resource estimate assumes mining using standard Rio Tinto Coal Australia equipment. • The assumed open-cut mining method is overburden removal via draglines, and conventional truck and shovel open pit coal mining. • Mining practices utilise detailed extraction plans to effectively manage grade control.

	These extraction plans are generated from short term geological models, in pit visual inspections and survey monitoring and control. • Conceptual underground mining will be by longwall methods and, in addition, bord and pillar and highwall mining extraction styles have been considered..
Metallurgical factors or assumptions	• It is assumed that a combination of density separation (magnetite/water) and fines flocculation processes used by Rio Tinto Coal Australia will be applicable for the processing of Hail Creek coal.
Environmental factors or assumptions	• Rio Tinto Coal Australia has an extensive environmental and heritage approval and compliance process. No issues are expected that would impact on the Mineral Resource estimate.
Bulk density	• All boreholes are reported on relative density (RD). • The in situ relative density; i.e. the density of materials at an in situ moisture basis, was calculated using the Preston and Sanders equation: $$RD2=[RD1*(100-M1)]/[100+RD1*(M2-M1)-M2]$$ *Where RD1 is true RD (ad), M1 is moisture (ad) and M2 is the in situ moisture.*
Classification	• The classification of the Mineral Resources into varying confidence categories is based on a standardised process of utilising points of observation (PoO) (ie drill holes) according to their reliability and value in estimation. The points of observation are used to categorise structure and quality continuity (or both) or support continuity. • Radii of influence are then plotted around PoO maps for structure and quality. The radii of influence were determined by consideration of the perceived and observed variability in structure and CQ for seams, and using small radii than that recommended in a geostatistical review previously undertaken. • Areas of confidence (low, medium, high) are produced from these plots (structure, CQ for each seam) and these are finally combined to produce areas of Measured, Indicated and Inferred which are used to subdivide the resource tonnage estimates. • In summary structural radii range 125-250m for high confidence, 250-500m for medium and 750-1,500m for low; and, for CQ 250-500m radii for high, 500-1,000m for medium and 1,500-3,000m for low confidence respectively. • The Competent Person is satisfied that the stated Mineral Resource classification reflects the geological controls interpreted and the estimation constraints of the deposits.

Audits or reviews	• Hail Creek has had three audits completed in the past six years, they include:
	  o An audit in September 2014 conducted by the Xstract Group. No material errors were noted in the model, only a few minor discrepancies were identified. The model was considered to be fit for the purposes of resource and reserve estimation and mine planning.
	  o An audit in October 2010 conducted by the Xstract Group
	  o An audit in November 2009 conducted by Snowden
	  o An external audit of the methodology of for defining "eventual economic extraction" (via Whittle for opencast and advanced economic analysis of underground) was completed by Xstract Mining Consultants in 2015. This considered the process to be a robust, transparent and fit for purpose methodology.
	• These reviews concluded that the modelling and estimation techniques are appropriate

Discussion of relative accuracy/ confidence	• Rio Tinto Coal Australia operates multiple mines in New South Wales (NSW) and Queensland. The Mineral Resource data collection and estimation techniques used for the Hail Creek deposit are consistent with those applied at other deposits which are being mined. Reconciliation of actual production with the Mineral Resource estimates for the existing operational deposits are generally within three percent for tonnes. This result is indicative of a robust process. • Accuracy and confidence of Mineral Resource estimation estimate has been accepted by the Competent Person.

SECTION 4 ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
Mineral Resource	• A 3D gridded resource model of topography, structure and quality are used for in situ

estimate for conversion to Ore Reserves	resource definition.
	• Mine design strips and blocks are applied to the in situ resource model to generate the raw Reserves used to create a separate mine schedule database. The mine schedule database also reflects working sections or seam aggregations, mining methods and associated loss and dilution impacts. The mine schedule database is used as the basis for Coal Reserves reporting.
	• Coal Resources are in addition to Coal Reserves.
Site visits	• The Reserves Competent Person visited Hail Creek in 2015.
Study status	• Hail Creek is an operating mine project. The reportable Ore Reserve is based on the Life of Mine (LOM) plan assumptions and has determined a mine plan that is technically achievable and economically viable, and that material modifying factors have been considered. This update to reserves is a result of the completion of Pre-Feasibility studies and evaluations that include the eastern margin.
Cut-off parameters	• Periodic (<3yrs) pit optimisation work used to define pit shells is conducted using Rio Tinto economics prices and an estimate of unit operating costs including a $/ROMt allowance for sustaining capex.
	• For annual JORC Reserves reporting purposes, detailed mine design and schedules are constructed to generate detailed cash flow schedules. This work includes identifying the mining sequence, equipment requirements, incremental and sustaining capital.
	• A discounted cashflow analysis is conducted to re-assess under the latest economic assumptions the potential Reserves that remain net cashflow positive.
Mining factors or assumptions	• The declared Ore reserves are for open cut only.
	• The Hail Creek mine utilises dragline, truck and shovel for waste movement, while coal is loaded using a combination of loaders and excavators with haulage to the Run Of Mine (ROM) hopper undertaken using rear dump trucks. The operations are supported by additional equipment including dozers, graders and water carts.
	• All pits and strips have been designed based on the existing operation with inclusion of access ramps, minimum mining widths, nominal bench heights and designed geotechnical criteria including the Slope Dump Management Plan (SDMP) for Hail Creek. This detailed design also considers pit access requirements, equipment selection, production sequencing, and safety. The pit designs are integrated with the spoil designs for dragline and for truck and shovel.
	• Working section or seam aggregation logic pre-determines what is defined as mineable coal by applying working section tests based on minimum coal thickness of 30cms.
	• Coal loss and dilution factors are also applied and vary by the equipment type uncovering the various coal seams (i.e. excavator/truck versus dragline). Typical roof and floor coal loss thickness ranges from 2cm–59cm. Typical roof and floor waste dilution thickness ranges from 4cm–16cm.
	• Life of Mine Plans for strategic planning purposes may contain Inferred Resources, provided that the LOM plan would not be compromised by non-inclusion of this coal. Inferred Resources included in LOM plans retain this designation and are not to be referred to as Reserves. Neither are they to be reported in JORC or Securities and Exchange Commission compliant reserve statements.
	• Hail Creek mine has only limited (<11%) inferred coal within the existing LOM plan.
Metallurgical factors or assumptions	• Hail Creek has a coal handling and preparation plant (CHPP) that is operational, which is used as a coal handling plant and is also used to wash coal.
	• The processes used are standard for the coal industry and so are well tested technologies.
	• All samples are wash/cut-point tested and so the representativeness of test work undertaken is implicit in the resource classification status.
	• In-seam dilution is included in sample testing.
	• Coal Reserve estimation is based on existing product specifications.
	• A secondary thermal product is a feature of the reserves and is produced from the rejects streams of the primary products.
	• The reserve is based on inclusion of a secondary 25% ash thermal that has been tested with the market throughout 2014/2015.
Environmental	• Coarse rejects are combined with fine tailings to form a co-disposal slurry that is pumped to an emplacement area. Rejects material must be covered by inert waste rock material.

	- Ex-pit dumps are offset from any creeks to prevent any constriction of creek flows.
	- Overburden waste rock has low acid forming potential.
Infrastructure	- Hail Creek is an operating site with existing major infrastructure in place to support the ongoing operation. The current LOM requires moderate additional capital to be able to extend operations. A detailed infrastructure plan and costing has been undertaken as part of Prefeasibility studies and evaluations, which includes additional requirements for mining in the eastern margin and continuation of the current western margin.
Costs	- Based on detailed Annual Operating Plan (AOP) process. Beyond AOP, sustaining capex based on $/ROMt plus equipment replacements and additions required to deliver the mine plan. - First principles estimating and aligned with AOP. Budget prices for major consumables and labour. - Adjustments are made for ash. - Commodity prices supplied by the economics and markets team, based on expected demand, and current supply, known expansions and expected incentivised supply. - Exchange rates supplied by the economics and markets team. - Transport charges obtained from coal chain team based on existing contracts and expected tonnages. - State Government royalties are based on current Queensland (QLD) royalty rates.
Revenue factors	- Rio Tinto applies a common process to the generation of commodity price estimates across the group. This involves generation of long-term price curves based on current sales contracts, industry capacity analysis, global commodity consumption and economic growth trends. In this process, a price curve rather than a single price point is used to develop estimates of mine returns over the life of the project. The detail of this process and of the price point curves is commercially sensitive and is not disclosed.
Market assessment	- The supply and demand situation for coal is affected by a wide range of factors, and coal consumption changes with economic development and circumstances. Rio Tinto Coal Australia delivers products aligned with its Mineral Resources and Ore Reserves, these products have changed over time and successfully competed with coal products supplied by other companies.
Economic	- Economic inputs such as foreign exchange rates, carbon pricing, and inflation rates are also generated internally at Rio Tinto. The detail of this process is commercially sensitive and is not disclosed.
Social	- There are no Native Title Claims over Hail Creek that would impact on Reserves. No Reserves have been omitted on this basis. - A process is embedded in the normal operating regime at Hail Creek to provide cultural heritage clearance such that no effects are expected to restrict the Hail Creek Reserves. As part of releasing a ground disturbance permit on site, authority must be gained to destroy/remove sites of cultural interest. This involves archaeological mapping and removal of artefacts prior to ground disturbance. - There are no sites of European Cultural Heritage at Hail Creek.
Other	- Semi-quantitative risk assessments have been undertaken throughout the LOM and Reserve phases. During this process, one small pit (R102N) in the north east was identified as being at risk to successfully complete the tenure process and as such has been removed from reserves. Subsequently due to shared capital another smaller pit to the north (R100N) was also removed from reserves. - R1E a small pit in the R1S endwall was also assessed further and removed from reserves due to short-term waste dump benefit and access/haulage issues. - No other material naturally occurring risks have been identified through the above mentioned risk management processes.
Classification	- The Ore Reserves consist of 32% Proved Reserves and 68% Probable Reserves across the deposit. The Western Margin Ore Reserves consist of 87% Proved Reserves and 13% Probable Reserves. The Ore Reserves in the Eastern margin are 100% Probable Reserves. - The Competent Person is satisfied that the stated Ore Reserve classification reflects the outcome of technical and economic studies.

Audits or reviews	• Hail Creek has a number of audits and reviews completed in the past five years, they include:
	   o An audit in June 2015 conducted by Rio Tinto Group Audit & Assurance and Xstract Mining Consultants (reports: Reserves Internal Audit Report – June 2015)
	   o An series of reviews in 2014/2015 conducted by the Encompass mining group (reports: External review of the HCX PFS mine Planning Data and modelling – April 2014; External review of the HCX Step 2 PFSA Mine Planning Data and modelling – December 2014; External review of the HCX PFS Step 3 - Minemax case matrix definition and methodology – February 2015; External review of the HCX PFS Step 4 – Deswik Scheduling – April 2015)
	   o A review in December 2014 conducted by MEC mining (reports: Hail Creek East Mine Plan Review – December 2014)
	   o An audit in October 2010 conducted by the Xstract Group (report: *Resources and Reserves Internal Audit – Hail Creek Mine. Project No. P1361*)
	
	• These reviews concluded that the fundamental data collection and modelling techniques are appropriate and consistent with previously audited Hail Creek models.

Discussion of relative accuracy/ confidence	• Rio Tinto Coal Australia operates multiple mines in Queensland and New South Wales. The Ore Reserve estimation techniques utilised for the Hail Creek Operation are consistent with those applied across the other operations. Reconciliation of actual production with the Ore Reserve estimate for the existing operations is generally within 5% for tonnage and grade. This result is indicative of a robust Ore Reserve estimation process. • Accuracy and confidence of modifying factors are generally consistent with the current operation.

Kestrel Hub Table 1

The following table provides a summary of important assessment and reporting criteria used at Kestrel Mine for the reporting of exploration results, Mineral Resources and Ore Reserves in accordance with the Table 1 checklist in *The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition)*. Criteria in each section apply to all preceding and succeeding sections.

SECTION 1 SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
Sampling techniques	• A combination of open hole (predominantly for structural definition) ,cored (for coal quality (CQ), geotechnical and gas sampling) and channel sampling have been used.
Drilling techniques	• 1,473 drill holes (346,709 metres) support the Resource estimate. Cored drill holes represent 39% of the total holes and open holes 61%. The drill holes are up to 609m in length and average 233m. The drill holes were all nominally recorded as vertical; boreholes deviated by more than 5% were to be re-drilled by contractor.
	• Coring has predominantly been done using a HQ3-sized (63mm) bit and open hole drilling to an equivalent hole diameter size. In addition a limited number of large diameter (LD) holes have been drilled: 22 holes at 150mm (6"), and 14 holes at 200mm (8") diameter sizes.
Drill sample recovery	• Standardised Rio Tinto Coal Australia logging systems are utilised for all drilling logging and sampling. Core recovery is recorded by the geologist while logging the drill hole. . If core recovery for a coal ply is less than 95%, then that section of the hole is redrilled to ensure a representative sample is taken.
	• Ply samples are checked for representativeness using a theoretical mass that is determined using analysed relative density, sample thickness and core diameter prior to composite definition.
	• Open hole chip recovery is assessed qualitatively by the rig geologist.
Logging	• Core is geologically and geotechnically logged and open hole chip samples are taken every 1m and logged for lithology changes. Logging for lithology, grainsize, weathering and hardness is conducted using standard dictionary definitions. Colour and any additional qualitative comments are also recorded.
	• All core is photographed on both a core table (0.5m increment) and a 5m tray basis. Chips are photographed as laid out by 1m intervals.
	• All holes are logged using a comprehensive suite of downhole geophysics tools (calliper, gamma, density, neutron, sonic), with acoustic scanner (for geotechnical assessment) also run on cored holes.
Sub-sampling techniques and sample preparation	• Core sampling is completed at the drill site and based on set of standard criteria (determined by lithology and structure). Samples are bagged at the drill site and then transported to an external accredited laboratory for analysis as a complete hole batch All samples are weighed, air-dried and then re-weighed before being drop shattered from 2m ten times. The product is dry sized at 25, 16, 8, 4, 2, 1, 0.5 (ww) mm and weigh size fractions. The size fractions are then recombined into one whole sample and dry tumbled for three minutes. The sample then goes through wet pre-treatment, float/sink and froth flotation testing before undergoing raw coal analysis.
	• CQ analysis is by a three stage method involving raw analysis on all plies followed by washability and product testing on composite samples as defined by the project geologist..
	• All sample treatment and analysis is conducted according to procedures which adhere to Australian (or International equivalent) standards in a National Association of Testing Authorities certified laboratory.
Quality of assay data and laboratory tests	• Non-formalised quality assurance/quality control (QA/QC) involving duplicate samples is completed. In addition, Rio Tinto Coal Australia checks laboratory round robin and basic reproducibility tests provided by the primary laboratory. All results are assessed via cross-plots and statistics for precision and accuracy.

Verification of sampling and assaying	• All CQ sampling and analysis is overseen and checked by other Rio Tinto personnel. • Data transfer from site is covered by an agreed protocol. This system documents primary data, data entry procedures, data verification, and data storage (physical and electronic) into a geological database.
Location of data points	• The topographic surface is derived from a combination of aerial survey data and drill hole collars. • All surveyed coordinates are within Australian Geodetic Datum 1984 Zone 55. • Drill hole collars were surveyed post drilling by licensed surveyors using differential GPS with an accuracy of ±10mm. • Downhole surveying has been undertaken using downhole verticality and calliper tools.
Data spacing and distribution	• Drill hole spacing for core holes is on an equilateral triangle grid of 500m or less. Open holes spacing is on a 250m or less equilateral triangle grid. • All core samples are composited within defined seam boundaries.
Orientation of data in relation to geological structure	• The Coal Measures show a relatively consistent layering and are not subject to steep dips. The orientation of drilling is therefore suitable for flat lying stratified deposits.
Sample security	• Core/chip samples are taken at the drill site and then transported daily to the refrigerated Kestrel storage area. Once the hole has been completed the samples are transported to the laboratory via a dedicated courier service, again under refrigeration.

Audits or reviews	• Kestrel has had three audits completed in the past seven years, they include:
	   ○ An external audit of the structural and CQ databases, and models was completed by Xenith Consulting in 2007. No material errors were noted in the model, only a few minor discrepancies were identified. The model was considered to be fit for the purposes of resource and reserve estimation and mine planning.
	   ○ An external audit of the CQ database was completed by McMahon Coal Quality Resources in 2007. This audit concluded that the level of errors detected unlikely to significantly affect modelled CQ values.
	   ○ An internal technical evaluation group (TEG) peer review of the CQ estimate of coking coal grade (fluidity and rank), and Kestrel Mine extension (KME) Project valuation in 2007 found sufficient confidence in CQ grade estimates for the KME Project to be approved in December 2007.
	• These reviews concluded that the fundamental data collection techniques are appropriate.

SECTION 2 REPORTING OF EXPLORATION RESULTS

Criteria	Commentary

Mineral tenement and land tenure status	• The Kestrel West Project and Kestrel Mine are managed by Kestrel Coal Pty Limited on behalf of the Kestrel Coal Joint Venture. The Joint venture participants are:
	   ○ Queensland Coal Pty Ltd (QCPL) (share: 80%)
	   ○ Mitsui Kestrel Coal Investment Pty Limited (Mitsui) (share: 20%).
	• Kestrel Mine contains the following leases and licences:
	   ○ Four mining leases (ML) covering 9507. 332ha
	   ○ Three mineral development licences (MDL) totalling 14,089.6033ha, of which one MDL (totalling 12,608.293ha) is pending approval for grant of renewal.
	• The Kestrel West Project is contained within MDL 182 and all leases are in good standing.
	• Previously Kestrel and Kestrel West have been reported separately for reosurces and reserves.
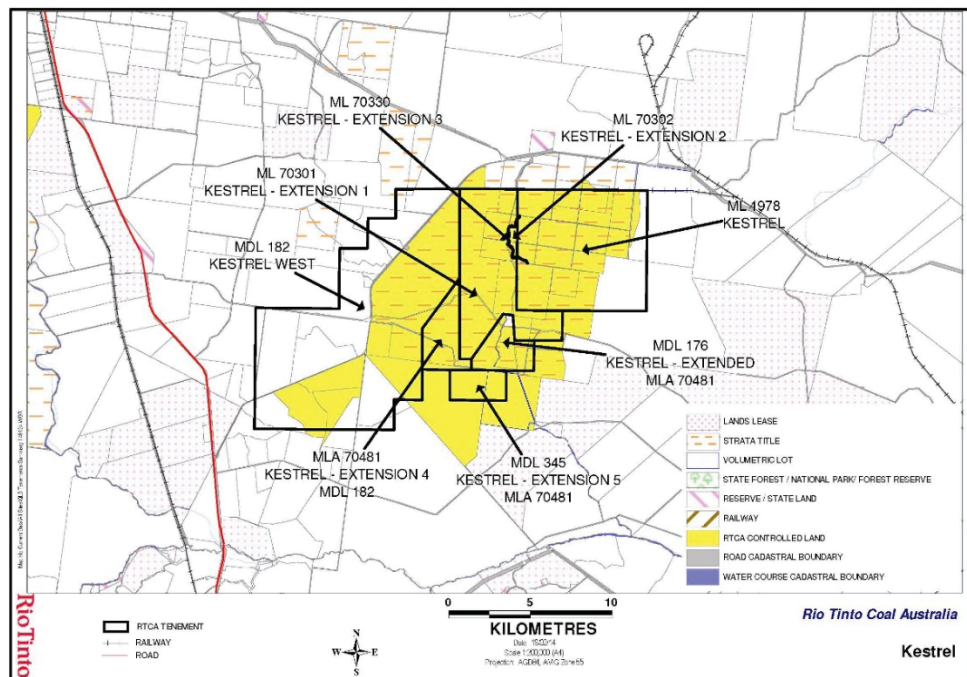
Figure 1 Kestrel tenement titles

Exploration done by other parties	• Mid to late 1960s: Regional exploration for open-cut coking coal was undertaken by the Bellambi Coal Company and Mount Isa Mines Ltd. • 1971–1975: The Queensland Department of Mines drilled 37 holes. • 1982: The Denham Coal Associates Joint Venture (DCAJV) was awarded tenure. • 1982–1984: DCAJV drilled 280 drill holes. • March 1985: A feasibility study confirmed the technical and economic feasibility of a single longwall operation. • 1988–1990: An exploration drift was completed. • August 1990: Mine construction commenced.
Geology	• The Kestrel deposit is located in the southwest part of the northern Bowen Basin. The northern Bowen Basin is the northernmost part of the 1800km long Bowen-Gunnedah-Sydney Basin, a meridional accumulation of Permian and Triassic sediments in eastern Queensland (QLD) and New South Wales (NSW). • The Kestrel deposit is located on the Comet Platform on which deformation is limited to broad, low amplitude basin and dome structures. The Kestrel resource is located on the western limb of the gently south-westerly plunging Talagai Syncline which defines the prevailing southerly to south-easterly regional dip in the mine area. The sequence at the Kestrel deposit comprises the German Creek Formation overlain by the Macmillan and Fairhill Formations. • At Kestrel, coal is mined from the German Creek Seam which is hosted in the German Creek Formation.

Drill hole information	• Drilling data summary from Rio Tinto Coal Australia drilling campaigns- note that this table includes only open vertical holes and/or cored holes

Drilling Program	Hole Type				
	Open Hole	HQ-3 Core	Large Core (150mm/200 mm)	Wedged	Total Holes
1999/2000	10	36	5	4	55
2000 Crinum Fault	1	11	0	0	12
2001	6	1	0	0	7
2004	36	26	0	0	62
2006	27	65	0	0	92
2007	8	0	0	0	8
2009	5	0	0	0	5
2011	1	6	0	0	7
2012	11	44	0	0	55
2013	1	0	0	0	1
2014	2	15	0	0	17
2015	3	0	0	0	3
Totals	111	204	5	4	315

• Since the previous resources upgrade in 2009 there have been an additional 91 drillholes added due to new drilling or database updates

| Data aggregation methods	• Ply samples are combined to create composites (for washability and product coal analyses) representing mineable seam working sections.
Relationship between mineralisation widths and intercept lengths	• Based on drilling techniques and stratigraphy, the coal seam intercepts therefore approximate the true coal thickness.
Diagrams	
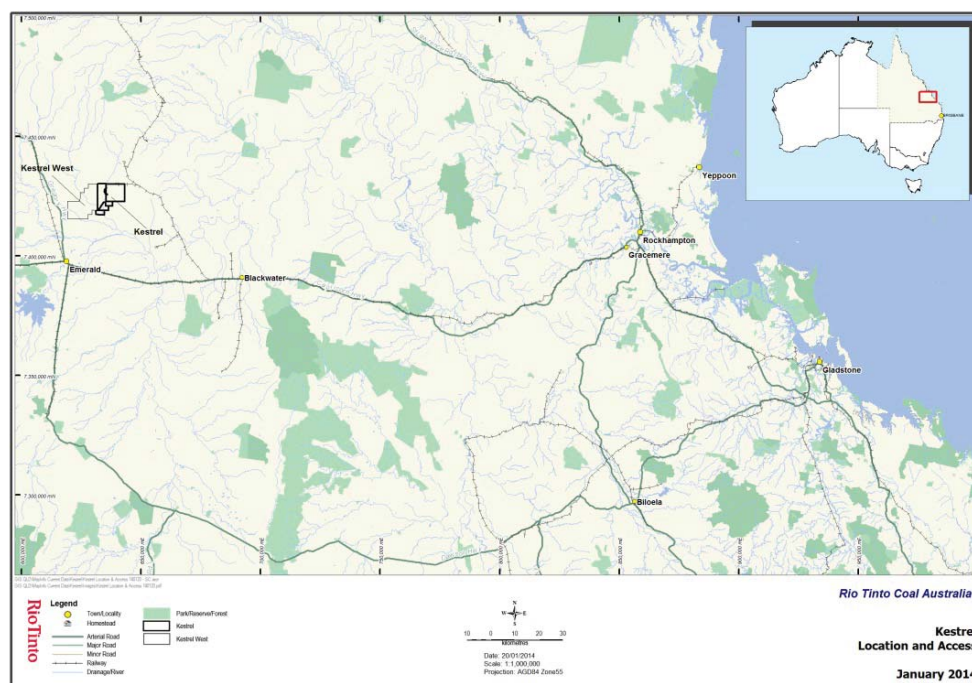
Figure 2 Kestrel location
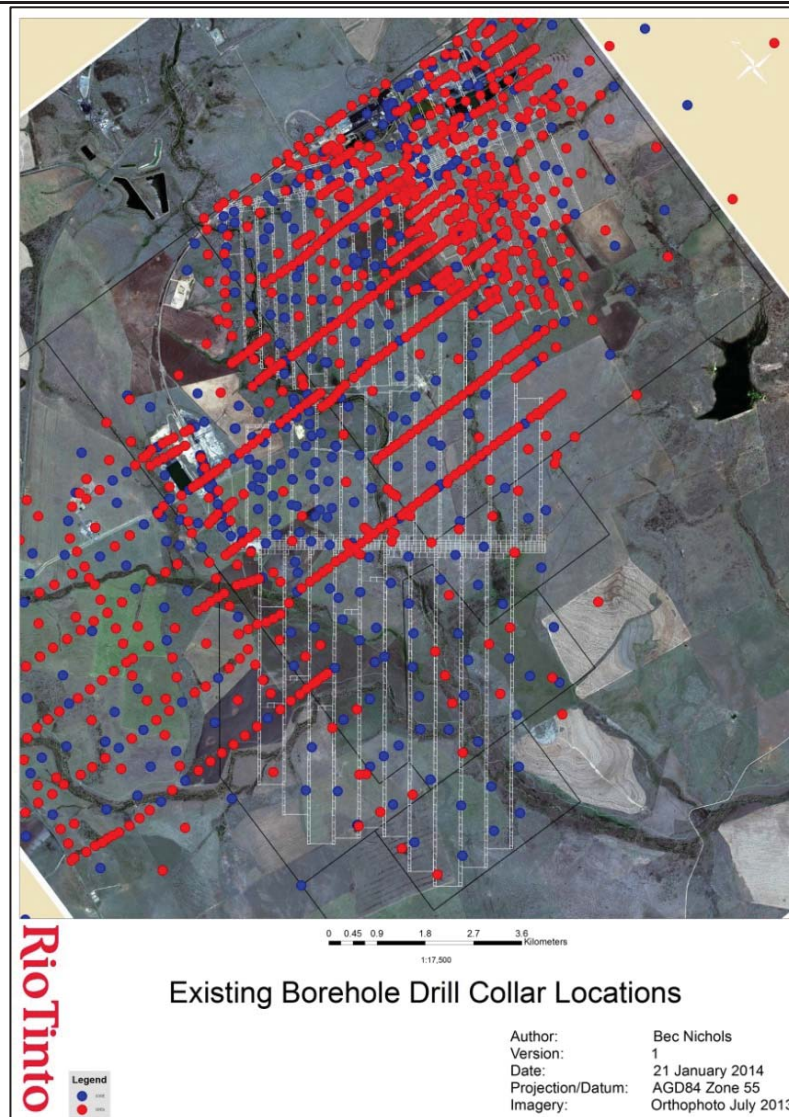
Open holes (blue); cored holes (red)

Figure 3 Drill collar locations
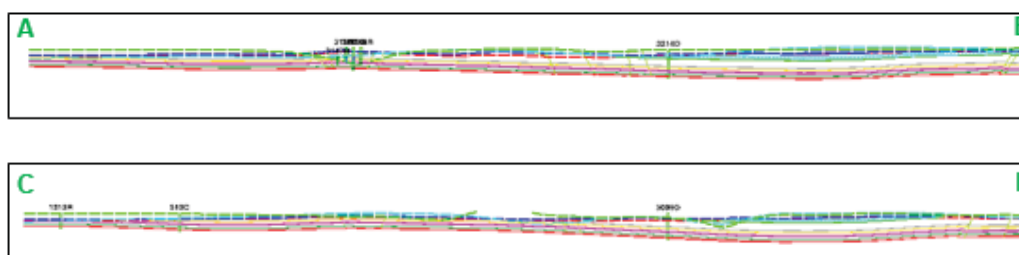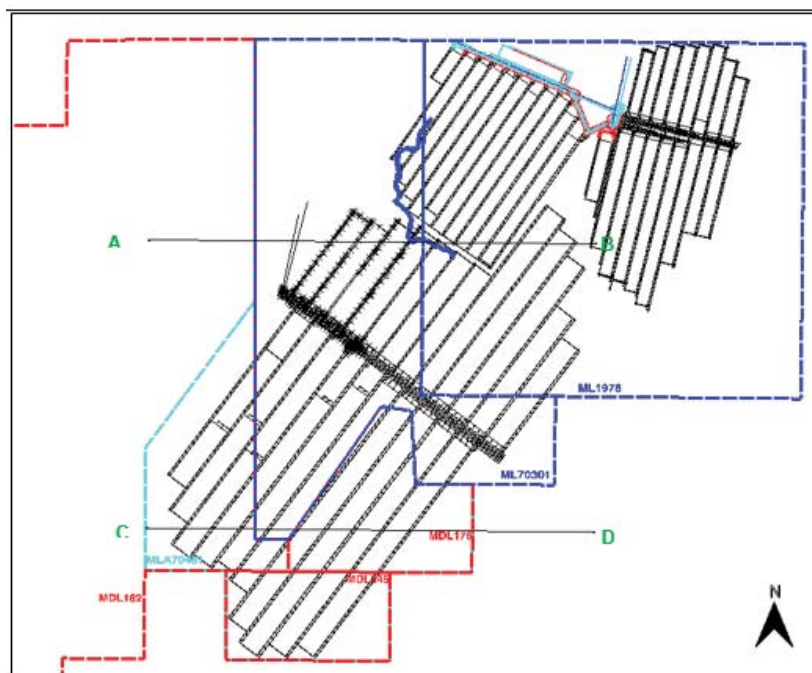
Cross-section A–B is west to east / cross-section C–D is west to east

Figure 4 Kestrel Cross-sections

Balanced reporting	• Not applicable. Rio Tinto Coal Australia has not specifically released exploration results for these deposits.
Other substantive exploration data	• Apart from surface exploration drilling, data has been collected from underground drilling and channel sampling.
Further work	• Drilling (surface and underground) for both pre-production and strategic purposes (including analytical (CQ, geotechnical, gas) sampling) will be ongoing

SECTION 3 - ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Database integrity	• All drill hole data are securely stored in a database which is stored on the Brisbane server and is backed up daily. • Data are validated at the drill site and also prior to loading into the GDB database. • The GDB database contains automated validation processes (load limits) which are activated during data loading and prevent un-validated data being loaded.
Site visits	• The Resources Competent Person visited Kestrel in 2015.
Geological interpretation	• The deposit is well known and tabular (layer-cake) with all major structures defined. Infill drilling and mining exposure and mapping has supported and refined the model. The current interpretation is thus considered to be robust.
Dimensions	• The deposit trends 17.5km northeast to southwest and is 10km in width. The deposit

	extends to a depth of 490m below the topographic surface.
Estimation and modelling techniques	• Modelling was undertaken using resource modelling software. For structural modelling a Finite Element Method (FEM) interpolator is used. For CQ an inverse distance squared interpolator with search radius of 5000m is used. All surfaces and coal qualities are interpolated into grids with 50m × 50m node spacing. • The model is of the coal seams only with waste modelled by default and not assigned any grade. Resource estimates are therefore of the coal seams only and restricted on a whole seam group basis only. • Modelling is completed on an iterative basis with checking of cross-sections and contours of structural and CQ attributes. Database values are posted on contours as a further check. A volume/tonnage check between the model and its predecessor are completed as a final validation. • The previous and separate (for Kestrel and Kestrel West) resources upgrade was based on separate resource models – these models have been merged for this update.
Moisture	• All tonnages are estimated on an in situ moisture basis, which is determined as 6%. This is based upon imprecise relationships between air-dried and equilibrium moisture, with in situ moisture tempered by knowledge coal rank and type, water addition during mining, and plant feed moisture.

Cut-off parameters	• Nominally coal is washed to produce three types of products:
	   o a primary product 6.5% air-dried ash high volatile hard coking coal
	   o a secondary product 13% air-dried ash thermal coal
	   o 8.5% air-dried ash high volatile semi-coking coal created by blending the primary and secondary washery products.

Mining factors or assumptions	• Development of this Mineral Resource estimate assumes mining using standard Rio Tinto Coal Australia equipment. The assumed mining method is development and longwall methods and, in addition, bord and pillar style extraction has been considered.
Metallurgical factors or assumptions	• It is assumed that a combination of density separation (magnetite/water) and fines flocculation processes used by Rio Tinto Coal Australia will be applicable for the processing of Kestrel coal.
Environmental factors or assumptions	• Rio Tinto Coal Australia has an extensive environmental and heritage approval and compliance process. No issues are expected that would impact on the Mineral Resource estimate.
Bulk density	• Coal relative density is currently modelled at a 6% in situ moisture basis. Conversion to the in situ moisture basis has been carried out by applying the Preston and Sanders method using the equation: relative density ($in\ situ$) = $\dfrac{RD_{ad}*(100-M_{ad})}{100+RD_{ad}*(ISM-M_{ad})-ISM}$ *Where: Rdad = relative density, air-dried basis; Mad = moisture, air-dried basis, ISM = in situ moisture.*
Classification	• The classification of the Mineral Resources into varying confidence categories is based on a standardised process of utilising points of observation (PoO) (i.e. drill holes) according to their reliability and value in estimation. The PoO are used to categorise structure and quality continuity (or both) or support continuity. • Radii of influence are then plotted around PoO maps for structure and quality. The radii of influence were based on an initial geostatistical study and moderated by consideration of the perceived and observed regional variability in structure and CQ for the German Creek Seam. • Areas of confidence (low, medium, high) are produced from these plots (structure, CQ for each seam group) and these are finally combined to produce areas of Measured, Indicated and Inferred which are used to subdivide the resource tonnage estimates. • In summary radii are 500m radii for high, 1,000m for medium and 3,000m for low confidence respectively • The Competent Person is satisfied that the stated Mineral Resource classification reflects the geological controls interpreted and the estimation constraints of the deposits.
Audits or reviews	• Kestrel has had two audits completed in the past seven years on the estimation and reporting of Mineral Resources, they include:

	o An external audit of the structural and CQ databases, and models was completed by Xenith Consulting in 2007. No material errors were noted in the model, only a few minor discrepancies were identified. The model was considered to be fit for the purposes of resource and reserve estimation and mine planning.
	o An internal technical evaluation group (TEG) peer review of the CQ estimate of coking coal grade (fluidity and rank), and Kestrel Mine extension (KME) Project valuation in 2007 found sufficient confidence in CQ grade estimates for the KME Project to be approved in December 2007.
	o An external audit of the methodology of for defining "eventual economic extraction" (via Whittle for opencast and advanced economic analysis of underground) was completed by Xstract Mining Consultants in 2015. This considered the process to be a robust, transparent and fit for purpose methodology.
	• These reviews validated the modelling and estimation of Resources at Kestrel to-date.
Discussion of relative accuracy/ confidence	• Rio Tinto Coal Australia operate multiple mines in NSW and QLD. The Mineral Resource data collection and estimation techniques used for the Kestrel deposit are consistent with those applied at other deposits which are being mined and is indicative of a robust process.
	• Accuracy and confidence of Mineral Resource estimation estimate has been accepted by the Competent Person.

SECTION 4 ESTIMATION AND REPORTING OF ORE RESERVES

Criteria	Commentary
Mineral Resource estimate for conversion to Ore Reserves	• A 3D gridded resource model of topography, structure and quality is used for in situ resource definition.
	• Mine design blocks are applied to the in situ resource model to generate the raw reserves used to create a separate mine schedule database. The mine schedule database also reflects working sections, mining methods and associated assumptions. The mine schedule database is used for Coal Reserves reporting.
	• Coal Resources are in addition to Coal Reserves. Underground ore reserves are as reported in 2014, with an adjustment for mining depletion.
Site visits	• The Reserves Competent Person has not visited Kestrel in 2015. Due to changes in personnel, the new designated Reserves Competent Person for Kestrel Mine has not been able to travel to the mine site. This will be remedied in subsequent reserves sign-offs.
Study status	• Kestrel is an operating mine. The reportable Ore Reserve is based on the life of mine (LOM) plan and has determined a mine plan that is technically achievable and economically viable, and that material modifying factors have been considered.
Cut-off parameters	• A comprehensive margin ranking exercise was carried out in 2005 to determine the economic limits of the deposit. These limits are still valid and are tested annually as part of the LOM process.
	• For annual JORC reserves reporting purposes, detailed mine design and schedules are constructed to generate detailed cash flow schedules. This work includes identifying the mining sequence, equipment requirements, incremental and sustaining capital.
	• A discounted cashflow analysis is conducted to re-assess under the latest economic assumptions the potential reserves remain net cashflow positive.
Mining factors or assumptions	• Kestrel is an underground mine that targets the German Creek Seam. It utilises continuous mining units for in-seam development to gain access to the reserve and longwall retreat to extract the majority of the reserve.
	• Material and personnel movement in and out of the mine is by drive in access via a dedicated inclined transport drift; and coal clearance out of the mine is via a second dedicated inclined drift.
	• The LOM assumes 375m wide longwall panels that increase to 415m in District 400 and District 500. The length of longwall panels are determined by a combination of factors including faults, conveyor belt drive technology and ventilation requirements.
	• All main headings and gate-road pillars have been designed to provide the required

	stability with appropriate factors of safety as have barrier pillars between the longwall panel take-offs and the main headings. The plan is optimised at 037.25°/217.2° panel alignment to maintain 90° conveyor transfer angles as well as for in situ horizontal stress for rib stability.
	• The mining dilution or loss factors are used depending on the primary roof or floor. 300mm of dilution or loss is used in the development and a range from 10mm–100mm used for the longwall.
	• LOMs for strategic planning purposes may contain Inferred Resources, provided that the LOM plan would not be compromised by non-inclusion of this coal. Inferred Resources included in LOM plans retain this designation and are not to be referred to as Reserves. Neither are they to be reported in JORC or Securities and Exchange Commission compliant reserve statements.
	• Kestrel has only very limited Inferred coal within the existing LOM plan.
	• Site infrastructure includes coal handling and preparation plant (CHPP), co-disposal dump, rail loop, mine offices, workshop, warehouse and water/sewage treatment plants.
Metallurgical factors or assumptions	• The Kestrel CHPP consists of raw coal handling facilities and stockpile, coal preparation plant, product stockpile and train load-out facility and co-disposal area.
	• The CHPP produces both coking and thermal products. Yield for each product is estimated from laboratory tests of exploration samples and modelled. Coal qualities modelled include volatile matter, sulphur, phosphorus, crucible swelling number (CSN), fluidity, dilatation, reflectance, and thermal energy.
	• During the annual reconciliation process, the actual plant performance is compared to model forecast. An adjustment factor for the coke/thermal split is derived from this data to increase alignment of actual and forecast results.
Environmental	• Appropriate environmental authorities and licences are in place for mining operations at Kestrel.
	• The main impact of mining at Kestrel is subsidence of the surface as the area above the coal seam falls in mined-out area. The land management strategy centres on protecting the soil from erosion during subsidence, and working to return affected areas to productive agricultural use.
	• Reject material from the CHPP is disposed of in the surface co-disposal area, which will be rehabilitated prior to mine closure.
Infrastructure	• Kestrel is an operating site with existing infrastructure in place to support the operation. The current LOM requires sustaining capital only to maintain the existing infrastructure.
Costs	• Based on detailed Annual Operating Plan (AOP) process. Beyond AOP, sustaining capex based on $/ROMt plus equipment replacements and additions required to deliver mine plan.
	• First principles estimating and aligned with AOP. Budget prices for major consumables and labour.
	• Commodity prices supplied by the economics and markets team, based on expected demand, current supply, known expansions, and expected incentivised supply.
	• Exchange rates supplied by the economics and markets team.
	• Transport charges obtained from coal chain team based on existing contracts and expected tonnages.
	• State Government royalties are based on current QLD royalty rates.
Revenue factors	• Rio Tinto applies a common process to the generation of commodity price estimates across the group. This involves generation of long-term price curves based on current sales contracts, industry capacity analysis, global commodity consumption, and economic growth trends. In this process, a price curve rather than a single price point is used to develop estimates of mine returns over the life of the project. The detail of this process and of the price point curves is commercially sensitive and is not disclosed.
Market assessment	• The supply and demand situation for coal is affected by a wide range of factors, and coal consumption changes with economic development and circumstances. Rio Tinto Coal Australia delivers products aligned with its Mineral Resources and Ore Reserves, these products have changed over time and successfully competed with coal products supplied by other companies. Price and volume forecasts are the basis for these forecasts.

Economic	• Economic inputs such as foreign exchange rates, carbon pricing, and inflation rates are also generated internally at Rio Tinto. The detail of this process is commercially sensitive and is not disclosed.
Social	• Kestrel is committed to making a sustained contribution to the social and economic wellbeing of Queensland's Central Highlands Region beyond providing over 350 direct jobs at the mine site. • The Kestrel Mine Community Development Fund has supported many local projects since its launch in 2003. The fund works with community partners on projects addressing economic development, creation of employment and training opportunities and enhancement of industry. • Local suppliers and service people are given opportunities to tender for projects related to Kestrel.
Other	• Semi-quantitative risk assessments have been undertaken throughout the LOM and Reserve phases. No material naturally occurring risks have been identified through the above mentioned risk management processes.
Classification	• The Ore Reserves consist of 28.8% Proved Reserves and 71.1% Probable Reserves. • The competent Person is satisfied that the stated Ore Reserve classification reflects the outcome of technical and economic studies.
Audits or reviews	• No external audits have been performed. • Internal Rio Tinto Coal Australia peer review processes have been completed. These reviews concluded that the fundamental data collection techniques are appropriate and consistent with previously audited Kestrel models.
Discussion of relative accuracy/ confidence	• Rio Tinto Coal Australia operates multiple mines in QLD and NSW. The Ore Reserve estimation techniques utilised for the Kestrel Mine are consistent with those applied across the other operations. • Reconciliation of actual production with the Ore Reserve estimate for the existing operations is generally within 5% for tonnage and grade. This result is indicative of a robust Ore Reserve estimation process. • Accuracy and confidence of modifying factors are generally consistent with the current operation.

Winchester South Project Table 1

The following table provides a summary of important assessment and reporting criteria used at Winchester South for the reporting of exploration results and coal resources in accordance with the Table 1 checklist in *The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition)*. Criteria in each section apply to all preceding and succeeding sections.

SECTION 1 SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
Sampling techniques	• A combination of open hole (predominantly for structural definition) and cored (for coal quality (CQ), geotechnical, and gas sampling) have been used.
Drilling techniques	• A total of 1,250 drill holes (133,542m) support the Resource estimate. Cored drilling represents 26% of the total metres and open hole drilling 74%. The drill holes are up to 819m in length and average 104m. The drill holes were all nominally recorded as vertical. Boreholes that deviated by more than 5% were to be re-drilled by contractor. • Coring has predominantly been done using a HQ3-sized (63mm) bit and open hole drilling to an equivalent hole diameter size. In addition 27 large diameter (LD) holes, assumed to be 200mm (8") in diameter, have been drilled.
Drill sample recovery	• Standardised Rio Tinto Coal Australia logging systems are utilised for all drilling logging and sampling. • Core recovery is recorded by the geologist while logging the drill hole. If core recovery for a coal ply is less than 95%, then that section of the hole is redrilled to ensure a representative sample is taken. • Ply samples are checked for representativeness using a theoretical mass that is determined using analysed relative density, sample thickness and core diameter prior to composite definition. • Open hole chip recovery is assessed qualitatively by the rig geologist.
Logging	• Core is geologically and geotechnically logged and open hole chip samples are taken every 1m and logged for lithology changes. Logging for lithology, grainsize, weathering and hardness is conducted using standard dictionary definitions. Colour and any additional qualitative comments are also recorded.. • All core is photographed on both a core table (0.5m increment) and a 5m tray basis. Chips are photographed as laid out by 1m intervals. • All holes are logged using a comprehensive suite of downhole geophysics tools (calliper, gamma, density, neutron, and sonic), with acoustic scanner (for geotechnical assessment) also run on cored holes.
Sub-sampling techniques and sample preparation	• Core sampling is completed at the drill site and based on set of standard criteria (determined by lithology and structure). Samples are bagged at the drill site and then transported to an external accredited laboratory for analysis as a complete hole batch • All samples are weighed, air-dried and then re-weighed before being crushed to a 19mm top size. A rotary splitter is used to divide the sample into portions (¼ for raw coal) and (¾ for wash and clean coal). • CQ analysis is by a three-stage method involving raw analysis on all plies followed by washability and product testing on composite samples as defined by the geologist. • All sample treatment and analysis is conducted according to procedures which adhere to Australian (or International equivalent) standards in a National Association of Testing Authorities certified laboratory.
Quality of assay data and laboratory tests	• A Non-formalised quality assurance/quality control (QA/QC) involving duplicate sample is completed. In addition, Rio Tinto Coal Australia checks laboratory round robin and basic reproducibility tests provided by the primary lab. All results are assessed via cross-plots and statistics for precision and accuracy.
Verification of sampling and assaying	• All CQ sampling and analysis is overseen and checked by other Rio Tinto personnel. • Data transfer from site is covered by an agreed protocol. This system documents primary data, data entry procedures, data verification, and data storage (physical and electronic) into a geological database.

Location of data points	• The topographic surface is derived from Lidar data processed to a vertical accuracy of 0.1m within the mineral development lease (MDL) border by AAM in 2011. The digital topographic model was created in Minescape with an 8m $\times$ 8m cell size triangulation at 0.5m decimation.
	• All surveyed co-ordinates are within Map Grid of Australia 1994 MGA Zone 55.
	• Drill hole collars were surveyed post drilling by licensed surveyors using differential global positioning system with an accuracy of ±10mm.
	• Downhole surveying has been undertaken using downhole verticality and calliper tools.
Data spacing and distribution	• Drill hole spacing for open holes is on an equilateral triangle grid of ~500m. For cored holes spacing is on a ~1000m or less equilateral triangle grid for undrilled areas, otherwise infill drilling/redrilling of the first BP program was used.
	• All core samples are composited within defined seam boundaries.
Orientation of data in relation to geological structure	• The Rangal Coal Measures lying within the MDL are part of the Winchester South syncline. The seams have relatively consistent layering with steeping dips on the limbs. The orientation of drilling is therefore suitable for these stratified deposits.
Sample security	• Core samples taken at the drill site were transported daily to the Winchester South drill camp for storage and placed into a freezer. Once the hole has been completed, the samples are transported to the laboratory via a dedicated courier service.
Audits or reviews	• No external audits have been performed.
	• Internal Rio Tinto Coal Australia peer and technical reviews have been completed, and are ongoing.

SECTION 2 REPORTING OF EXPLORATION RESULTS

Criteria	Commentary
Mineral tenement and land tenure status	• Winchester South is 100% owned by Queensland Coal Pty Ltd, which is owned by Rio Tinto Coal Australia (75%) and Westfield Limited (25%), and is managed by Rio Tinto Coal Australia.
	• Winchester South is defined by the boundaries of MDL 183 covering 10,952ha. The lease is in good standing.

Figure 1 Winchester South tenement boundary

Exploration done by other parties	• Only one other exploration programme has been carried out on the tenement by other parties. This was by BP Coal who carried out exploration in 1981. The focus of their exploration programme was to understand the structure, geology, and CQ for a feasibility study on a low volatile thermal product. Drilling was done to ~250m spacing for cored holes and ~500m spacing for cored holes.
Geology	• Winchester South is located in Queensland near Moranbah in the northern part of the Bowen Basin which contains numerous important coal producing intervals in the Permian stratigraphy. The sequences of economic interest include the Late Permian Rangal Coal Measures and the Moranbah Coal Measures. The main rock types of these sub-groups are sandstone, siltstone with minor stratigraphic layers of conglomerate, and tuffaceous bands.
Drill hole information	• The table below provides a summary of drill hole data summary for all drilling that has been completed to-date.

	1981-1982	2005	2010–2011	2013	2014
Open holes	825	11	107	0	1
Cored holes	204	12	73	6	11

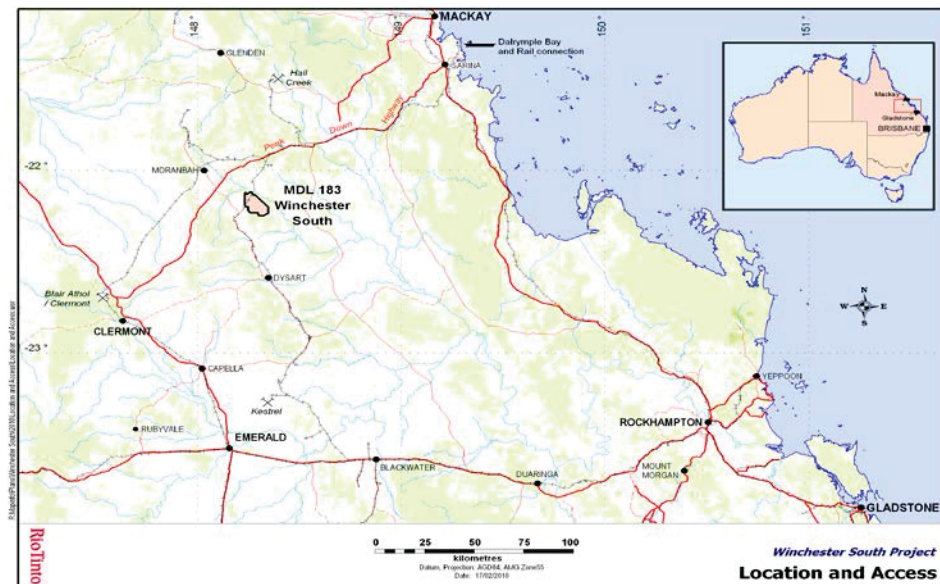|	
	• Since the previous resources upgrade in 2009 there have been an additional 200 drillholes added due to new drilling or database updates
Data aggregation methods	• Ply samples are combined to create composites (for washability and product coal analyses) representing mineable seam working sections.
Relationship between mineralisation widths and intercept lengths	• Based on drilling techniques and stratigraphy, the coal seam intercepts therefore approximate the true coal thickness.

Diagrams

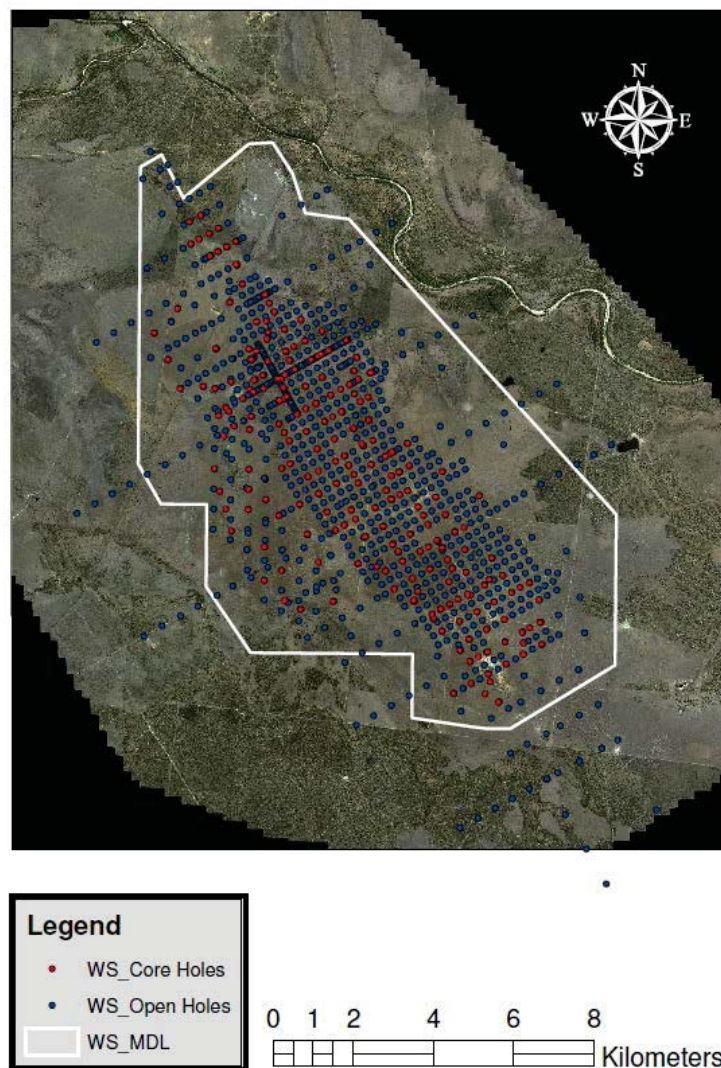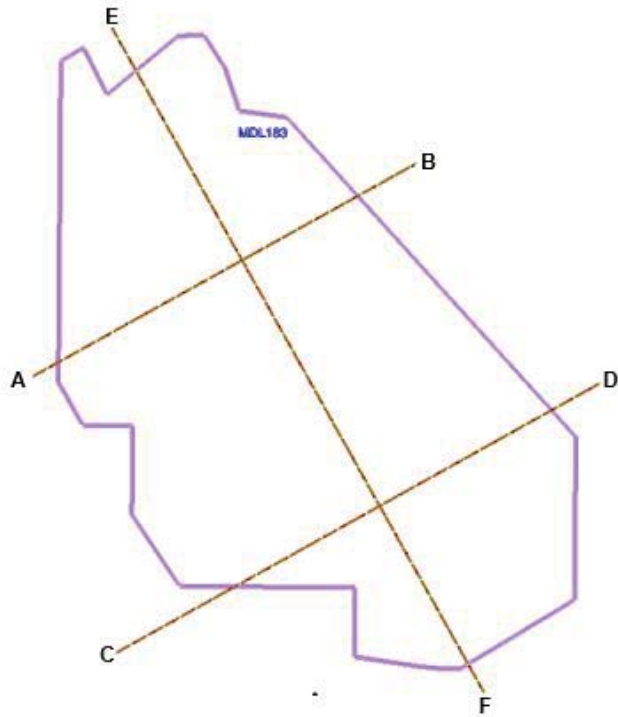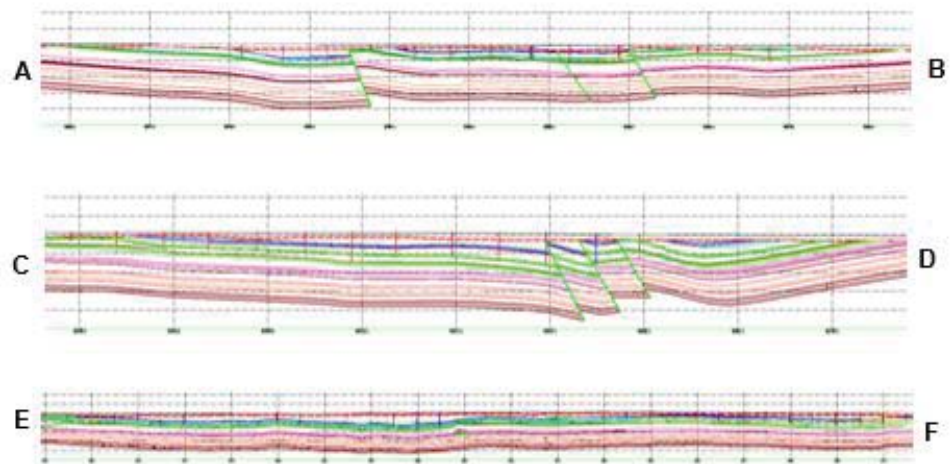**Figure 2 Winchester South location**

Figure 3 Drill collar locations

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Figure 4 Winchester South cross-section map

Cross-sections A–B and C–D are southwest to northeast / cross-section E–F is northwest to southeast
Figure 5 Winchester South cross-sections

Balanced reporting	• Not applicable. Rio Tinto Coal Australia has not specifically released exploration results for these deposits.
Other substantive exploration data	• In addition to drilling, 2D seismic lines have been completed to identify faults, folds, and possible igneous intrusions.
Further work	• Drilling into the underlying Moranbah Coal Measures for potential underground Resources is ongoing.

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SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Database integrity	• All drill hole data are securely stored in a database (in Brisbane) and are backed up daily. • Data are validated at the drill site and also prior to loading into the database by the responsible geologist. • The database contains automated validation processes which are activated during data loading and prevent un-validated data being loaded.
Site visits	• The Resources Competent Person visited the site in 2015.
Geological interpretation	• The deposit is well known and tabular for the Rangal Coal Measures with most major structures defined. New drill holes along with seismic has supported and refined the model. The current interpretation is thus considered to be robust.
Dimensions	• The deposit trends 17km northwest to the southeast following the Winchester South syncline and is 9km thickness in width. The deposit extends to a depth of ~200m below the topographic surface.
Estimation and modelling techniques	• The Resource model was last modelled in 2013 was undertaken using resource modelling software (version 5.4). For structural modelling a Finite Element Method (FEM) interpolator is used and for CQ an inverse distance squared interpolator is used. All surfaces and coal qualities are interpolated into grids with 50m × 50m node spacing. • The models are of the coal seams only with waste modelled by default and not assigned any grade. Resource estimates are therefore of the coal plies only. • Modelling is completed on an iterative basis with checking of cross-sections and contours of structural. Database values are posted on contours as a further check. A volume/tonnage check between the model and its predecessor are completed as a final validation.
Moisture	• All tonnages are estimated on an in situ moisture basis, which is determined to be 5%.. This assumption was based on Hail Creek mine.

Cut-off parameters	• Nominally coal is washed to produce three types of products:
	    o 7.5% air-dried ash coking product
	    o 10% air-dried ash coking product
	    o 18-25% air-dried ash thermal product.
	
	• For all products, product moisture is 11%. Air-dried moisture is quoted at a 3% moisture basis.
	
	• Economic resources are defined by a "break even" ($0 margin) Lerchs-Grossman optimised shell for opencast coal – this effectively sets the maximum depth or lowermost seam considered. For underground resources the limits are based on either an order of magnitude study or standard set of rules (i.e. coal below "break even" shell, less than 600m deep and greater than 1.8m thick).

Mining factors or assumptions	• Development of this Mineral Resource estimate assumes mining using standard Rio Tinto Coal Australia equipment. The assumed mining method is overburden removal via draglines, and conventional truck and shovel open-cut coal mining.
Metallurgical factors or assumptions	• It is assumed that a combination of density separation (magnetite/water) and fines flocculation processes used by Rio Tinto Coal Australia will be applicable for the processing of Winchester South coal.
Environmental factors or assumptions	• Rio Tinto Coal Australia has an extensive environmental and heritage approval and compliance process. No issues are expected that would impact on the Mineral Resource estimate.
Bulk density	• The Winchester South 2013 Resource model uses average densities to determine coal mass as shown in the table below. **Table 1 Average density values**

Seam	Density

Upper Leichhardt Seam, L1	1.57
Lower Leichhardt Seam, L2	1.48
Upper Vermont Seam, VU	1.60
Lower Vermont Seam, VML	1.82

- Coal relative density is currently modelled at a 6% in situ moisture basis. Conversion to the in situ moisture basis has been carried out by applying the Preston and Sanders method using the equation:

$$\text{relative density } (\textit{in situ}) = \frac{RD_{ad}*(100 - M_{ad})}{100 + RD_{ad}*(ISM - M_{ad}) - ISM}$$

Where: Rdad = relative density, air-dried basis; Mad = moisture, air-dried basis, ISM = in situ moisture.

Classification	- The classification of the Mineral Resources into varying confidence categories is based on a standardised process of utilising points of observation (PoO) (i.e. drill holes) according to their reliability and value in estimation. The PoO are used to categorise structure and quality continuity (or both) or support continuity. - Radii of influence as determined by geostatistical analysis are then plotted around PoO maps for structure and quality. As there are many plies at Winchester South, seam groups (equivalent to the seam names) were used for categorisation. - Areas of confidence (low, medium, high) are produced from these plots (structure and CQ for each seam group). These are finally combined to produce areas of Measured, Indicated, and Inferred which are used to subdivide the Resource tonnage estimates. - In summary structural radii are 250-650m for high confidence, 500-1,200m for medium and 1,075-2,475m for low; and, for CQ 175-750m radii for high, 550-1350m for medium and 1,200-2,625m for low confidence respectively - The Competent Person is satisfied that the stated Mineral Resource classification reflects the geological controls interpreted and the estimation constraints of the deposits.
Audits or reviews	No formal audits have been completed on the estimation and reporting of Mineral Resources at Winchester South to-date.
Discussion of relative accuracy/ confidence	- Rio Tinto Coal Australia operates multiple mines in New South Wales (NSW) and Queensland (QLD). The Mineral Resource data collection and estimation techniques used for the Winchester South deposit are consistent with those applied at other deposits which are being mined, and is indicative of a robust process. - Accuracy and confidence of Mineral Resource estimation estimate has been accepted by the Competent Person.

Mount Robert Project Table 1

The following table provides a summary of important assessment and reporting criteria used at Mount Robert for the reporting of exploration results and coal resources in accordance with the Table 1 checklist in *The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition)*. Criteria in each section apply to all preceding and succeeding sections.
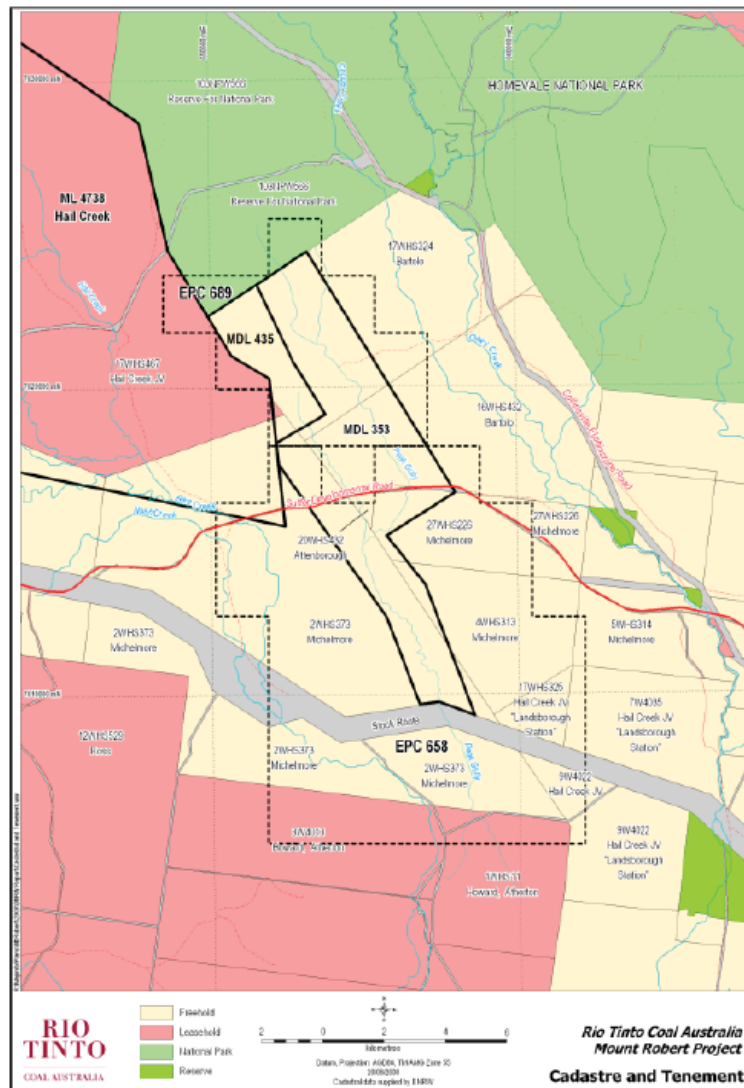
SECTION 1 SAMPLING TECHNIQUES AND DATA

Criteria	Commentary
Sampling techniques	• A combination of open hole (predominantly for structural) and cored (for coal quality (CQ) and geotechnical) have been used.
Drilling techniques	• A total of 1,107 drill holes (107,599m) support this maiden Resource estimate. Cored drilling represents 25% of the total metres and open hole drilling 75%. The drill holes are up to 518m in length and average 97m. The drill holes were all nominally recorded as vertical. Boreholes that deviated by more than 5% were to be re-drilled by contractor.
	• Coring has predominantly been done using a HQ3-sized (63mm) bit and open hole drilling to an equivalent hole diameter size. In addition 8 large diameter (LD) holes, assumed to be 200mm (8") in diameter, have been drilled.
Drill sample recovery	• Standardised Rio Tinto Coal Australia logging systems are utilised for all drilling logging and sampling.
	• Core recovery is recorded by the geologist while logging the drill hole. If core recovery for a coal ply is less than 95%, then that section of the hole is redrilled to ensure a representative sample is taken.
	• Ply samples are checked for representativeness using a theoretical mass that is determined using analysed relative density, sample thickness and core diameter prior to composite definition.
	• Open hole chip recovery is assessed qualitatively by the rig geologist.
Logging	• Core is geologically and geotechnically logged and open hole chip samples are taken every 1m and logged for lithology changes. Logging for lithology, grainsize, weathering and hardness is conducted using standard dictionary definitions. Colour and any additional qualitative comments are also recorded.
	• All core is photographed on both a core table (0.5m increment) and a 8m tray basis. Chips are photographed as laid out by 1m intervals.
	• All holes are logged using a comprehensive suite of downhole geophysics tools (calliper, gamma, density, neutron, and sonic), with acoustic scanner (for geotechnical assessment) also run on selected cored holes.
Sub-sampling techniques and sample preparation	• Core sampling is completed at the drill site and based on set of standard criteria (determined by lithology and structure). Samples are bagged at the drill site and then transported to an external accredited laboratory for analysis as a complete hole batch.
	• All samples are weighed, air-dried and then re-weighed before being crushed to a 19mm top size. A rotary splitter is used to divide the sample into portions (¼ for raw coal) and (¾ for wash and clean coal).
	• CQ analysis is by a three-stage method involving raw analysis on all plies followed by washability and product testing on composite samples as defined by the geologist.
	• All sample treatment and analysis is conducted according to procedures which adhere to Australian (or International equivalent) standards in a National Association of Testing Authorities certified laboratory.
Quality of assay data and laboratory tests	• A non-formalised quality assurance/quality control (QA/QC) involving duplicate sample is completed. In addition, Rio Tinto Coal Australia checks laboratory round robin and basic reproducibility tests provided by the primary lab. All results are assessed via cross-plots and statistics for precision and accuracy.
Verification of sampling and assaying	• All CQ sampling and analysis is overseen and checked by other Rio Tinto personnel.
Location of data	• The topographic surface is derived from Lidar data processed to a vertical accuracy of

points	0.1m within the Mount Robert tenements by AAM in 2011. Where Lidar coverage was lacking drill hole collar elevation data was used. The digital topographic model was created in Minescape with an 8m $\times$ 8m cell size triangulation at 0.5m decimation.
	• All surveyed co-ordinates are within Australian Geodetic Datum 1984 MGA Zone 55.
	• Drill hole collars were surveyed post drilling by licensed surveyors using differential global positioning system with an accuracy of ±10mm.
	• Downhole surveying has been undertaken using downhole verticality and calliper tools.
Data spacing and distribution	• Drilling traverses have historically been orientated across strike at a spacing of 200 – 1,000 m, but typically around 500 m. The drill holes on each traverse are usually at intervals of 50 – 100m. The length of the drill traverses ranges from 300 – 1,800 m, though typically in the range of 800 – 1,200 m.
	• All core samples are composited within defined seam boundaries.
Orientation of data in relation to geological structure	• The coal seams within the Mount Robert Project are part of the Hail Creek syncline have relatively consistent layering with a westward dipping trend that varies from 15-20 degrees in the north and steepens to 45 degrees in the south. The orientation of drilling is considered suitable for these stratified deposits.
Sample security	• Core samples taken at the drill site were transported daily to the Mount Robert drill camp for. Once completed week the samples are transported to the laboratory via a dedicated courier service.
Audits or reviews	• No external audits have been performed.
	• Internal Rio Tinto Coal Australia peer and technical reviews have been completed, and are ongoing.

SECTION 2 REPORTING OF EXPLORATION RESULTS

Criteria	Commentary
Mineral tenement and land tenure status	• The Mount Robert Project is owned by the Hail Creek Joint Venture (HCJV), owners of the Hail Creek Mine. The partners of the HCJV include Queensland Coal Pty Ltd (82 per cent), Nippon Steel Australia Pty Ltd (8 per cent), Marubeni Coal Pty Ltd (6.67 per cent) and Sumisho Coal Development Pty Ltd (3.33 per cent). The HCJV is currently managed by Rio Tinto Coal Australia.
	• The MRP area consists of 4 tenements including EPC 658, EPC 689, MDL 353 and MDL 435 as shown in both Table 1 and Figure 1.

Table 1: Mount Robert tenements

Title	Type	Area	Grant Date
EPC 689	Exploration Permit for Coal	12 sub-blocks	09/08/1999
EPC 658	Exploration Permit for Coal	32 sub-blocks	17/11/1997
MDL 353	Mineral Development Licence	3859.8 ha	18/11/2004
MDL 435	Mineral Development Licence	718.9 ha	12/12/2012

• An application for the consolidation of all tenements into one MDL for Mount Robert was submitted to DNRM on 4 November 2015.

Figure 2: Mount Robert tenement boundaries

Exploration done by other parties	• The Mount Robert Project has had numerous companies explore the area since the early 1970s including The Geological Survey of Queensland, Thiess Peabody Mitsui Coal Pty Ltd, Mines Administration Pty Ltd, CRA Exploration Pty Ltd, Thiess Dampier Mitsui Coal Pty Ltd, BHP Mitsui Coal Pty Ltd, Thiess Pty Ltd, Australian Bulk Minerals Pty Ltd and Eastern Coal Joint Venture Pty Ltd. The bulk of the drilling was aimed at the Rangal and Moranbah Coal Measures.
Geology	• The Mount Robert Project is located in the north-eastern portion of the Bowen Basin, on the eastern limb of the Nebo synclinorium which contains numerous important coal producing intervals in the Permian stratigraphy. The sequences of economic interest include the Late Permian Exmoor Formation, Moranbah Coal Measures, Fort Cooper Coal Measures and Rangal Coal Measures. The main rock types of these sub-groups are sandstone, siltstone with minor stratigraphic layers of conglomerate, and tuffaceous bands.
Drill hole information	• A total of 1,107 drill holes support this maiden Resource estimate. Cored drilling represents 280 of the total holes and open hole drilling represents 827.
Data aggregation	• Ply samples are combined to create composites (for washability and product coal

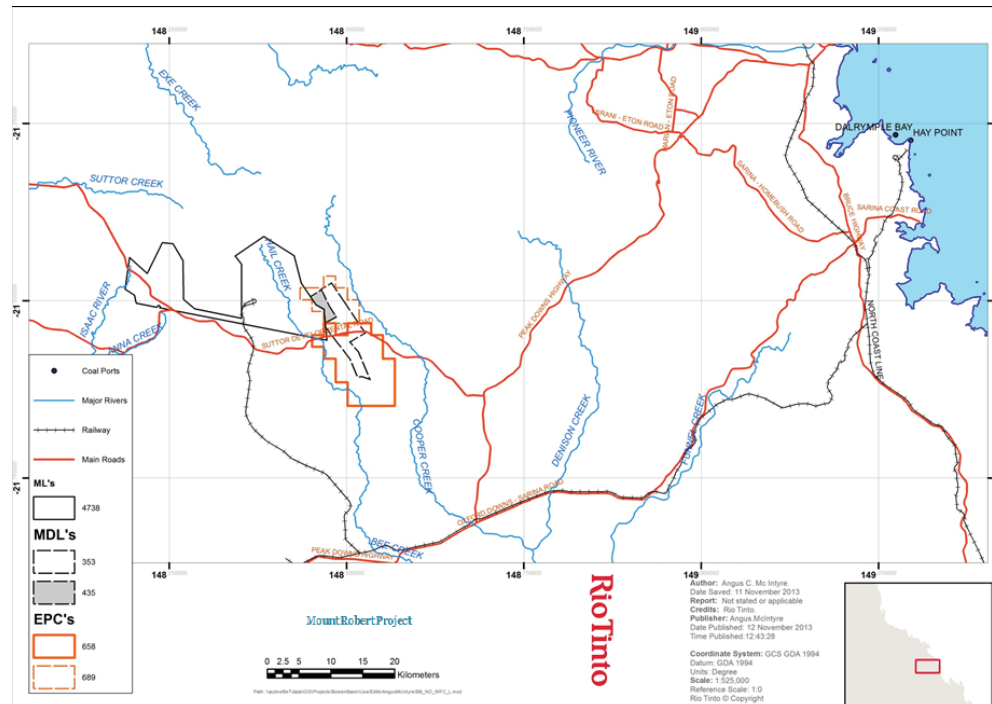| methods	analyses) representing mineable seam working sections.
Relationship between mineralisation widths and intercept lengths	• Based on drilling techniques and stratigraphy, the coal seam intercepts therefore approximate the true coal thickness.
Diagrams	

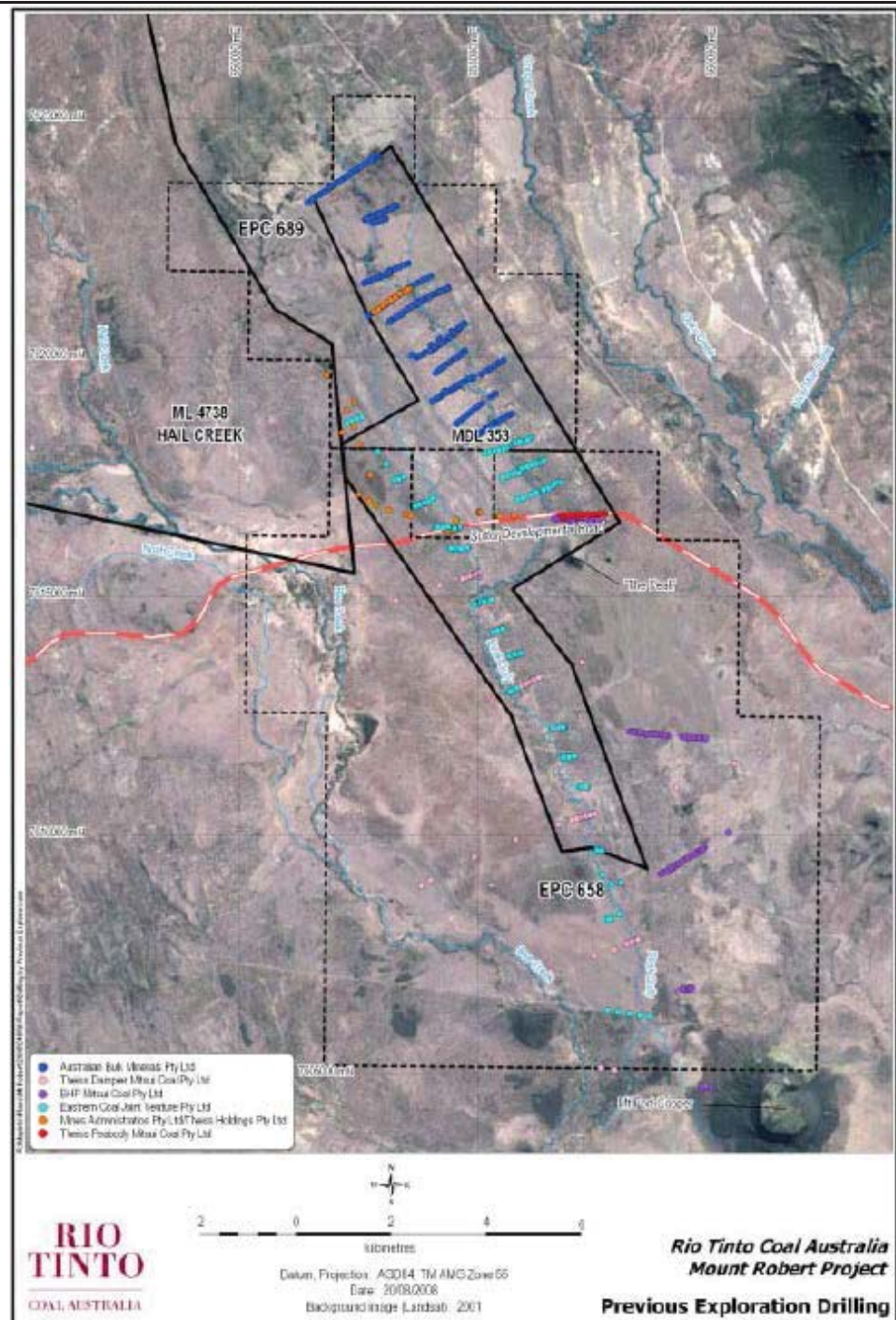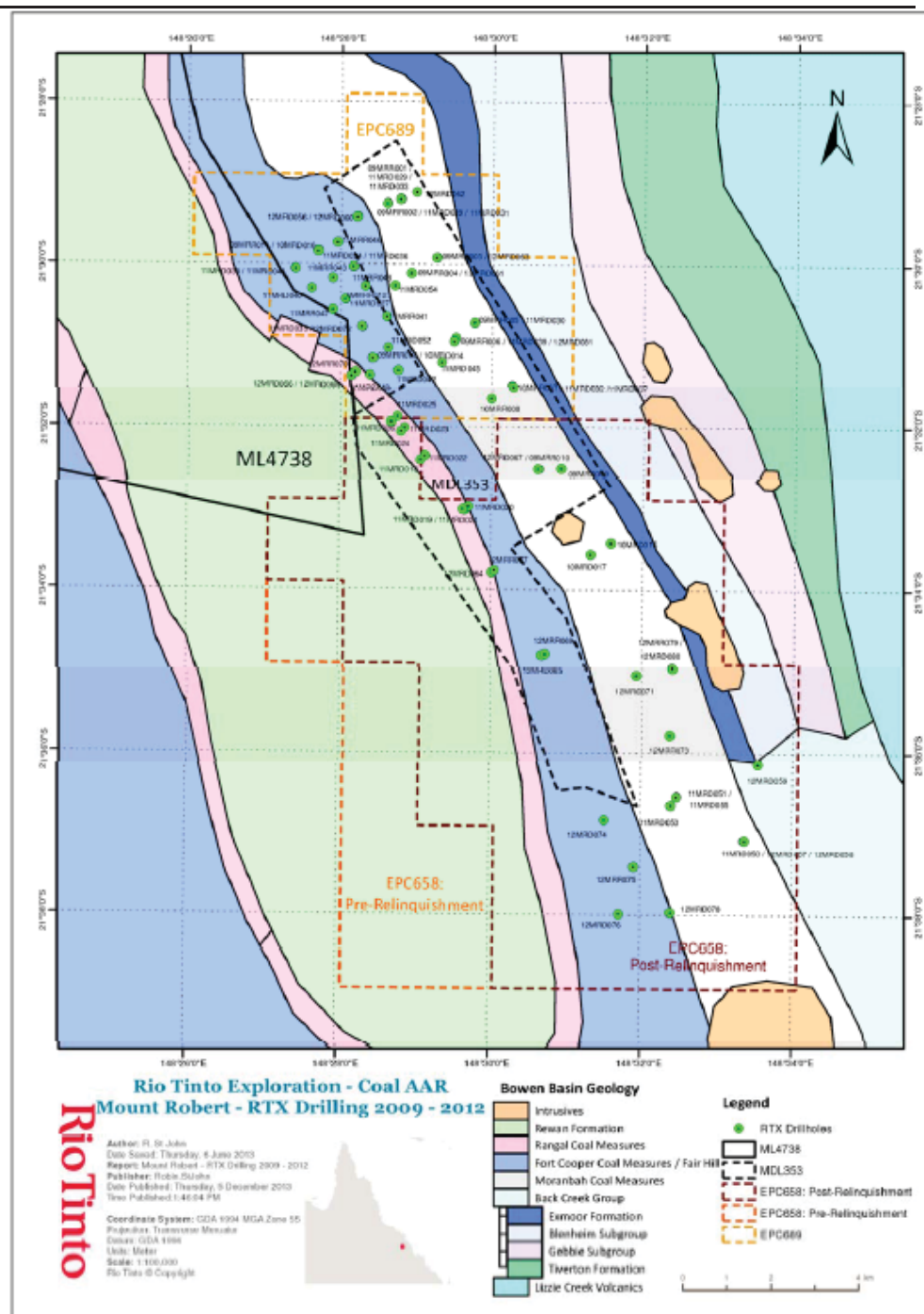**Figure 3: Mount Robert location**

Figure 4: Historical Drilling

Figure 4: Local Geology and Recent Drilling

Balanced reporting	• Not applicable. Rio Tinto Coal Australia has not specifically released exploration results for these deposits.
Other substantive exploration data	• No other exploration apart from surface exploration drilling has been collected at Mount Robert.
Further work	• A further programme of surface/aerial geophysics, seismic survey and drilling has been planned but not implemented to date.

SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	Commentary
Database integrity	• All drill hole data are securely stored in a database (in Brisbane) and are backed up daily. • Data are validated at the drill site and also prior to loading into the database by the responsible geologist. • The database contains automated validation processes which are activated during data loading and prevent un-validated data being loaded.
Site visits	• The Resources Competent Person has not visited the project site.
Geological interpretation	• The deposit is well known and tabular for the Exmoor Formation, Moranbah Coal Measures, Fort Cooper Coal Measures and Rangal Coal Measures with most major structures defined. New drill holes have supported and refined the model. The current interpretation is thus considered to be robust.
Dimensions	• The deposit trends 17km northwest to the southeast following the Hail Creek syncline and is 9km in width. The deposit extends to a depth of ~200m below the topographic surface.
Estimation and modelling techniques	• Modelling was undertaken in 2015 using resource modelling software. For structural modelling a Finite Element Method (FEM) interpolator is used. For CQ an inverse distance squared interpolator with search radius of 20,000m is used. All surfaces and coal qualities are interpolated into grids with 50m $\times$ 50m node spacing. • The models are of the coal seams only with waste modelled by default and not assigned any grade. Resource estimates are therefore of the coal plies only. • Modelling is completed on an iterative basis with checking of cross-sections and contours of structural. Database values are posted on contours as a further check. A volume/tonnage check between the model and its predecessor are completed as a final validation.
Moisture	• All tonnages are estimated on an in situ moisture basis, which is estimated as 5%. This assumption was based on the adjacent Hail Creek mine.

Cut-off parameters	• Based on the adjacent Hail Creek Operation it is expected that coal from Mount Robert would be is washed to produce three types of products:
	   o a premium low-ash (8.5 per cent) prime hard coking product
	   o a higher ash (10 per cent) hard coking product.
	• In addition a 23% air-dried ash thermal product would be expected. Since semi-anthracite coal occurs within the Moranbah Coal Measures this would be expected as an additional product. More work into specifications and marketing is required before this type of product coal is defined.
	• For all Hail Creek products, product moisture is 11%. Air-dried moisture is quoted at a 3% moisture basis.
	• Economic resources are defined by a "break even" ($0 margin) Lerchs-Grossman optimised shell for opencast coal – this effectively sets the maximum depth or lowermost seam considered. For underground resources the limits are based on either an order of magnitude study or standard set of rules (i.e. coal below "break even" shell, less than 600m deep and greater than 1.8m thick).

Mining factors or assumptions	• Development of this maiden Mineral Resource estimate assumes mining using standard Rio Tinto Coal Australia equipment. Due to the steep dips at Mount Robert the assumed conventional truck and shovel open-cut coal mining.
Metallurgical factors or assumptions	• It is assumed that a combination of density separation (magnetite/water) and fines flocculation processes used by Rio Tinto Coal Australia at the adjacent Hail Creek Operation will be applicable for the processing of Mount Robert coal.
Environmental factors or assumptions	• Rio Tinto Coal Australia has an extensive environmental and heritage approval and compliance process. No issues are expected that would impact on the Mineral Resource estimate.

Bulk density	• In some areas, for some plies, there is limited borehole data which are reported as relative density (RD).
	• The in situ relative density; i.e. the density of materials at an in situ moisture basis, was calculated using the Preston and Sanders equation:
	$$RD2=[RD1*(100-M1)]/[100+RD1*(M2-M1)-M2]$$
	• Where analysed density is not available a default in situ density of 1.4 g/cc is used.
Classification	• The classification of the maiden Mineral Resources into varying confidence categories is based on a standardised process of utilising points of observation (PoO) (i.e. drill holes) according to their reliability and value in estimation. The PoO are used to categorise structure and quality continuity (or both) or support continuity.
	• Radii of influence are then plotted around PoO maps for structure and quality. The radii of influence were determined by consideration of the perceived and observed variability in structure and CQ for seam groups, and by examining histograms and statistics of ash content of the seam groups. As there are many plies at Mount Robert, seam groups (equivalent to the seam names) were used for categorisation.
	• Areas of confidence (low, medium, high) are produced from these plots (structure and CQ for each seam group). These are finally combined to produce areas of Measured, Indicated, and Inferred which are used to subdivide the Resource tonnage estimates.
	• In summary structural radii are 250m for high confidence, 500m for medium and 1,500-2,000m for low; and, for CQ 250-500m radii for high, 500-1,000m for medium and 2,000-3,000m for low confidence respectively
	• The Competent Person is satisfied that the stated Mineral Resource classification reflects the geological controls interpreted and the estimation constraints of the deposits.
Audits or reviews	• No formal audits have been completed on the estimation and reporting of Mineral Resources at Mount Robert to-date.
Discussion of relative accuracy/ confidence	• Rio Tinto Coal Australia operates multiple mines in New South Wales (NSW) and Queensland (QLD). The Mineral Resource data collection and estimation techniques used for the Mount Robert deposit are consistent with those applied at other deposits which are being mined, and is indicative of a robust process.
	• Accuracy and confidence of Mineral Resource estimation estimate has been accepted by the Competent Person.