Atrum Coal
COAL FOR STEEL

ASX Release

20 October 2014

ATRUM COAL – SUPPLEMENTARY PFS DELIVERS A$1.7 BILLION NPV FOR GROUNDHOG NORTH

HIGHLIGHTS

- Supplementary Pre-feasibility Study (SPFS) delivers improved economics for 5.4Mtpa run-of-mine (ROM) underground operation at Groundhog North compared to original PFS
- Mine life increased 138% from 16 years to 38 years
- All-in FOB costs reduced from US$89/t to US$86/t on truck-to-port operation
- Capital required to deliver small scale mining reduced 25% from US$77m to US$58m
- Maximum capital drawdown before net operational cashflow to deliver full scale mine reduced 25% from US$229m to US$171m on owner operator basis
- Post-tax NPV10 increased 62% from A$1,040M to A$1,685M
- Post-tax IRR increased from 39% to 42%
- Post-tax LOM Free Cash Flow increased 232% from A$3,360M to A$11,159M
- Groundhog North to be funded through non-dilutive project equity sell-down (commencing H1 2015), strategic offtake financing, leasing and debt

Executive Chairman, Mr James Chisholm commented on the SPFS stating:

"The SPFS has delivered outstanding improvements to project economics following our recent resource upgrade at Groundhog North. Senior appointments including Ben Smith (VP Operations), Peter Doyle (VP Business Development), Theo Renard (VP Finance)and Rick Greene (Mine Manager) are working closely with our PFS consultant, Vince Martin and his team at Valzan to prepare the Company for its transition from explorer to developer. Subject to permitting, we anticipate our first coal sales in the second half of 2015 from the world's largest undeveloped ultra-high grade anthracite deposit."

ASX:ATU - Share Information
Issued Shares: 163.5m

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EXECUTIVE SUMMARY

	PFS (MAY)	SPFS (OCTOBER)	
Mining Method	Underground	Underground	
Life of Mine	16yrs	38yrs	+138%
JORC Coal Resource	305Mt	609Mt	+100%
Mineable ROM	75Mt	176Mt	+135%
Annual Saleable Production (LOM Average)	3.2Mtpa	3.2Mtpa	
FOB Production Cost (average LOM / Inc royalties)	$89/t	$86/t	-3.4%
All-in Capital Cost (owner operator / excluding sustaining)	$631M	$596M	-5.5%
Max. Capital Drawdown to Operational Cash Flow	$229M	$171M	-25.3%
Projected off Balance Sheet Capital	$377M	$293M	
Minimum Capital to Small Scale Production	$77M	$58M	-24.7%
Projected First Coal Sales	H2 2015	H2 2015	
Post-tax NPV10 (nominal)	A$1,040M	A$1,685M	+62%
Post-tax IRR (nominal)	39%	42%	
Post-tax LOM Free Cash Flow (nominal)	A$3,360M	A$11,159M	+232%

Asset Description	
Ownership	100%
Location	British Columbia, Canada
JORC Resources	1.57Bt (609Mt at Groundhog North)
Coal Type	High Grade and Ultra-high Grade Anthracite
Groundhog North Underground Mine	
Mining Method	Underground (adit into bord & pillar and mini-wall)
Mine Life	38 years
ROM production (avg)	5.4Mtpa
Saleable Production (avg)	3.2Mtpa
Products	52% sized products (avg. 10% ash) 48% non-sized product (avg. 10% ash)
Costs	
Max Capital Drawdown to Positive Cashflow	$171M
Operating (avg LOM)	$86/t FOB cash (including royalties)
Revenue	
Sales Price	Wood Mackenzie $186/t FOB (2014 real) (average received across all products)
Lump Products	Premium to HCC / Discount to export Coke
Non-sized Products	ULV PCI, sinter, breeze and specialty
Margin	Average margin $100/t real (average for all products)

Forecast Operating Costs (LOM / US$/t)	
Mining	$25
Processing	$5
Yield	60%
Ex-mine (FOR/t)	$50
Transport & Port	$25
Other	$11
Total Cash Cost (FOB/t)	$86

All-in Capital Expenditure (excl. sustaining, US$)	
Underground Mine Equipment & Development	$395M
Surface Infrastructure	$14M
Camp & Site Office	$13M
CHPP	$54M
Power (BC Hydro connection)	$52M
Road	$60M
Port Upgrade	$8M
TOTAL	$596M
ROM Capacity	5.4Mtpa
CAPEX per tonne annual capacity (tac)	$110 /tac

Indicative GHN Anthracite (washed 60% Yield)	
Inherent Moisture (ad)	1.5%
Ash (ad)	10.0%
Volatile Matter (ad)	5.0%
Fixed Carbon (ad)	83.5%
Sulphur (ad)	0.60%
SE kcal/kg (gad)	7,350
SE kcal/kg (daf)	8,300
HGI	65

SUPPLEMENTARY PFS COMPLETED

Atrum Coal NL ("**Atrum**" or the "**Company**") (**ASX: ATU**) is pleased to announce the results of its optimisation of the Groundhog North underground mine Pre-Feasibility study. New developments at Atrum's Groundhog Anthracite Project including acquisition of additional leases, additional drilling and coal quality test work, has led to an increase in JORC Resources, which has in turn facilitated improvements in project economics due to optimisation of the mine plan combined with refinement of road, rail and port infrastructure plans.

Groundhog North covers less than 5% of Atrum's broader Groundhog Anthracite Project in British Columbia, Canada which hosts a JORC Resource of 1.57 billion tonnes.

The SPFS was independently prepared by Valzan Pty Ltd (Valzan), with inputs on pricing from Wood Mackenzie, modelling assistance from Deloitte Touche Tohmatsu and independent cost inputs from industry participants in relation to port, power and road CAPEX.

WHAT HAS CHANGED?

Significant improvements to project metrics are largely attributed to the following:

- Total anthracite resource, mineable resource, and mine life have increased following optimised mine planning facilitated by additional drilling carried out this year, combined with an increase in the Groundhog North boundaries resulting from the acquisition of adjacent coal licences from Anglo Pacific Group PLC (August 2014);
- Operating costs have reduced on an 'owner operator' basis due to the identification of operational efficiencies;
- Capital costs have reduced across all facets of the operation. Mining fleet costs increased due to the decision favour an 'owner operator' model and employ and train locally. Surface infrastructure costs have reduced as expensive overland conveyors have been eliminated from the logistics chain. Road construction estimates have reduced due to broader tendering. CHPP has been redesigned as a modular arrangement, allowing staged capital expenditure; and
- Port capital costs have reduced due to a simpler stockpile management and storage design utilising much of the existing infrastructure at the port rather than new infrastructure as was modelled previously.

Further details of the SPFS are highlighted in the Company's power point presentation titled "Groundhog North Underground; Supplementary Feasibility Study"

The Company had $10.3m cash at bank as of June 30, 2014 and currently has a fully diluted share structure of 176.3 million with a fully diluted market capitalisation of $254 million at $1.44.

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Competent Person Statement

Coal Resources

The coal resources documented in this report were estimated in accordance with the guidelines set out in the JORC Code, 2012. They are based on information compiled and reviewed by Mr Nick Gordon, who is a Member of the Australasian Institute of Mining and Metallurgy and is a full-time employee of Gordon Geotechniques Pty Ltd.

With more than 28 years of experience in open cut and underground coal mining, Mr Gordon has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration to qualify him as a Competent Person as defined in the JORC Code, 2012 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves."

Neither Mr Gordon nor Gordon Geotechniques Pty Ltd have any material interest or entitlement, direct or indirect, in the securities of Atrum or any companies associated with Atrum. Fees for the preparation of this report are on a time and materials basis. Mr Gordon recently visited the Groundhog project area on 21st March 2014 whilst exploration personnel were preparing for the next drilling program. Two days were also spent with Atrum geological personnel in Victoria, British Columbia evaluating the geological, coal quality and geotechnical information relevant to the Groundhog project area.

Mr Gordon consents to the inclusion in the report of the matters based on the information, in the form and context in which it appears.

Forward Looking Statements

This release includes forward looking statements. Often, but not always, forward looking statements can generally be identified by the use of forward looking words such as "may", "will", "expect", "intend", "plan", "estimate", "anticipate", "continue", and "guidance", or other similar words and may include, without limitation statements regarding plans, strategies and objectives of management, anticipated production or construction commencement dates and expected costs or production outputs. Forward looking statements in this release include, but are not limited to, the capital and operating cost estimates and economic analyses from the Study.

Forward looking statements inherently involve known and unknown risks, uncertainties and other factors that may cause the company's actual results, performance and achievements to differ materially from any future results, performance or achievements. Relevant factors may include, but are not limited to, changes in commodity prices, foreign exchange fluctuations and general economic conditions, increased costs and demand for production inputs, the speculative nature of exploration and project development, including the risks of obtaining necessary licences and permits and diminishing quantities or grades of resources or reserves, political and social risks, changes to the regulatory framework within which the company operates or may in the future operate, environmental conditions including extreme weather conditions, recruitment and retention of personnel, industrial relations issues and litigation.

Forward looking statements are based on the company and its management's good faith assumptions relating to the financial, market, regulatory and other relevant environments that will exist and affect the company's business and operations in the future. The company does not give any assurance that the assumptions on which forward looking statements are based will prove to be correct, or that the company's business or operations will not be affected in any material manner by these or other factors not foreseen or foreseeable by the company or management or beyond the company's control.

Although the company attempts to identify factors that would cause actual actions, events or results to differ materially from those disclosed in forward looking statements, there may be other factors that could cause actual results, performance, achievements or events not to be anticipated, estimated or intended, and many events are beyond the reasonable control of the company. Accordingly, readers are cautioned not to place undue reliance on forward looking statements.

Forward looking statements in this release are given as at the date of issue only. Subject to any continuing obligations under applicable law or any relevant stock exchange listing rules, in providing this information the company does not undertake any obligation to publicly update or revise any of the forward looking statements or to advise of any change in events, conditions or circumstances on which any such statement is based.

ASX Listing Rule 5.8 Compliance

The following information is provided in compliance with Listing Rule 5.8 and the JORC guidelines.

Location and Tenement Details

The Groundhog Anthracite Project (**Groundhog**) is located in the Groundhog Coalfield in the northern part of the Bowser Basin in north-western British Columbia, approximately 890km northwest of Vancouver, 150km northeast of Stewart, and 300km northeast of Prince Rupert. At the time the Company first acquired the Groundhog project, it comprised 22 granted coal licenses covering an area of 13,776 hectares and 4 coal licence applications covering an area of 9,039 hectares, providing a total land holding of 22,815 hectares.

In January 2014, Atrum expanded upon its footprint in BC, through the acquisition of a further 11 coal licence applications from Panstone Mines and Minerals Ltd, covering a total of 15,554ha. This footprint was further expanded in September 2014 when the Company acquired a further 20 granted coal licences and a further 1 coal licence application from Anglo Pacific Group PLC, which covered an area of 10,235ha within the Groundhog and Panorama Coalfield.

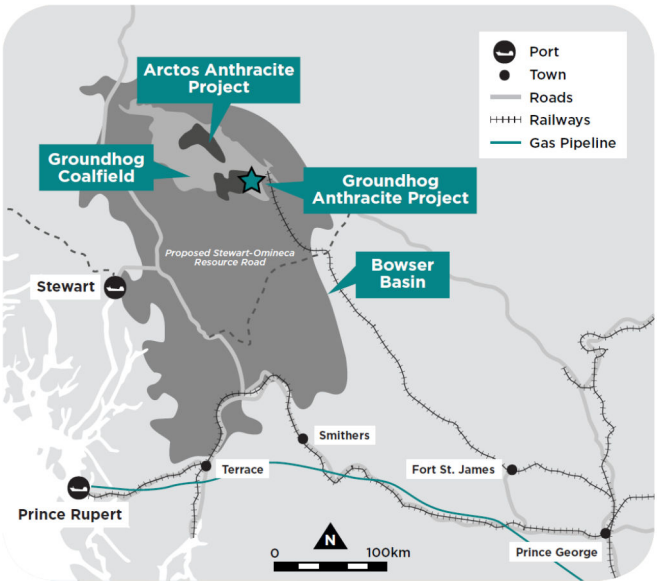
In July 2014, Kuro Coal Panorama Inc. acquired an additional 10 coal licence applications covering an area of 13,787ha from Panstone Mines and Minerals Ltd. This acquisition complemented the existing land holding in the Panorama coalfield held by Kuro Coal Panorama Inc. which covered an area of 18,375ha. This has provided the Company with a total footprint in the Panorama coalfield of 33,012ha.

The Groundhog Anthracite Project (**Groundhog**), including Panorama, now comprises 45 granted coal licences and 33 coal licence applications covering an area of 81,616 hectares.

The Groundhog project is located in close proximity to key mining infrastructure including rail, port, road, power and water facilities. A rail easement or 'right-of-way' completed by the British Columbia Railway ("BCR") foundation runs adjacent to the project for approximately 30km southwards. At this point it connects with existing rail, at the Minaret Terminus, and continues on to the dedicated coal terminals at the deep sea ports of Prince Rupert and Port Metro Vancouver.

The infrastructure centre relevant to the Groundhog Project is the deep sea port town of Stewart which lies approximately 150km southwest of the property. However, the southern boundary of the properties is in close proximity (~30 km) to the British Columbia Railway (BCR) foundation /rail subgrade, which connects southwards with train services to the Prince Rupert coal terminal. In 2005, the Canadian National Railway acquired BCR, and submitted a proposal to extend the track through the Groundhog Project to access Fortune Mineral's "Arctos" anthracite project, located approximately 80 km north of the Groundhog Project.

The distance by rail from the Groundhog Project to Fort St. James is 381km, to Prince George 497km, to Prince Rupert via the British Columbia and the Canadian National railways 1,234km and to Vancouver 1,294km.



Groundhog Anthracite Project – Location Map

CN Rail operates under a long term lease arrangement with BCR, and operates the rail line between Prince George and Port of Prince Rupert and on the Dease Lake Line to Minaret.

Geology and Geological Interpretation

The Groundhog Coalfield is located in the northern portion of the Bowser Basin, bounded by the Skeena Arch to the north and the Stikine Arch to the south. The basin is situated in the Cordilleran Eugeosyncline and characterized by a regressive coarsening upwards sequence of clastic sediments deposited when uplift of the Coastal Mountains formed an inland sea. This marine regression deposited an approximately 4000m thick regressive sequence known as the Bowser Lake Group. The Bowser Lake Group is unconformably overlain by the Late Cretaceous Tango Creek Member of the Sustut Group and unconformably overlies the Triassic/Jurassic Takla-Hazelton assemblage, though neither of these bounding assemblages is present on Atrum Coal's Property.

Using the nomenclature coined by Cookanoo and Bustin in 1991, the formations of the Bowser Lake Group from oldest to youngest are as follows: the Ashman Formation, Currier Formation, McEvoy Formation, and the Devil's Claw Formation.

Ashman Formation

The approximately 1800m thick, fully marine Ashman Formation is the oldest formation in the Bowser Lake Group and has been referred to in pre-1991 reports as the Panorama Sequence or the Panorama Unit. The Jurassic age formation is composed of mostly dark bluish grey to black shale that coarsens upwards repetitively to shallow-marine sandy mudstone and sandstone. Weathered tan coloured sandstone units near the top of the formation have been noted by Gulf geologists as containing bivalve fossils.

Currier Formation

The Currier Formation is approximately 1000 metre thick and is the primary coal bearing formation of the Groundhog Coalfield. Prior to 1991 the Currier Formation was referred to either as the Groundhog Sequence or Groundhog Unit. The change from a fully marine depositional environment to this alternating marine and non-marine depositional environment is recorded in the gradational contact between the Ashman and Currier Formations. The deltaic Currier Formation is composed of alternating beds of shale and sandstone with lesser amounts of siltstone, conglomerate and coal.

The coarsening upwards strata range from 30m to 60m thick beds at the bottom of the formation then begin to thin into 6m to 10m thick beds approaching the top.

Historically the northern part of the Bowser Basin has good coal development within the Currier Formation. Twenty-five meta-anthracite to anthracite grade coal seams have been recorded in the northern Bowser Basin.

McEvoy Formation

Strata from the 600 to 1000 metre thick McEvoy Formation are interpreted as being deposited in paralic marine and brackish waters from a fluvially dominated delta system. Evidence for this depositional environment can be seen in terrestrial plant fossils preserved in the sediments.

Coarsening-upward, silty mudstones are the dominant facies but sandstones and conglomerates are present, as well as thin sub-anthracite seams. The gradational contact with the overlaying Devil's Claw Formation is observed as a major increase in the frequency of conglomerate units.

Devil's Claw Formation

The Devil's Claw Formation consists primarily of thick successions of conglomerates with minor interbeds of sandstone, siltstone and shale. This 300 to 500 metre thick formation is interpreted as being deposited in a high energy environment such as that of an alluvial fan. Both large scale cross bedding of conglomerates with pebble to cobble sized clasts and homogenous conglomerates can be seen in the Devil's Claw Formation. Both are clast-supported and composed of well-sorted and well-rounded chert, volcanic quartz and occasionally granodiorite clasts.

The coal-bearing Currier Formation consists of alternating beds of shale and sandstone, with lesser amounts of siltstone, conglomerate and coal. Strata are generally arranged in coarsening-upward units ranging from 30m to 60m thick in the lower part of the formation.

On the Groundhog Anthracite Project, the thickness of the coal-bearing unit, locally known as the Groundhog Unit, is approximately 600m thick. Coal occurrences indicate the base of the Groundhog unit.

Atrum's 2013 and 2014 exploration drilling program focussed on the northwest sector (known as the 'North West Area') of the Groundhog Anthracite project. The exploration focus in the North West Area (NW area) during 2013 and 2014 was a consequence of the positive coal intersections derived from the eight cored drillholes drilled during the 2012 season.

Drilling

The 2013 drilling comprised of 64 HQ diamond drill holes (both inclined and vertical), and an additional 19 PQ holes. Combined with the historic drilling and trenches, a total of 52 drill holes and 5 trenches are located within the NW area. In 2014, the Company drilled a further 45 drill holes within the NW area and the regional drilling areas.

Drilling based on current geological modelling has correlated a total of 46 seams. The seam naming convention is a numbering system from seam S30 at the base of the correlated stratigraphy to seam S92 being the uppermost in the correlated sequence.

Atrum's primary exploration focus during the 2014 field season was to target the S70 seam followed by a secondary deeper target comprising the S40 seam located some 100 to 200 metres below the S70. In 2013, a total of 64 drill holes were drilled in the NW area at Groundhog. In 2014, a total of 42 drill holes were completed in the NW area and in the regional drill locations. Of the 42 drill holes, 6 were drilled in regional areas designed to increase the coal footprint with the remaining 36 drill holes being targeted within the bulk sample area.

The S70 coal seam is the primary target in the NW area due to its relative thick and continuous nature, as well as good quality and its potential for both open pit and underground mining. The S70 coal seam was the focus of exploration drilling during the 2013 and 2014 drilling campaign with a high percentage of drill holes terminating after intersecting the S70.

The S70 coal seam was intersected in 43 of the 52 drill holes within the NW area. In two drill holes (DHGH12_10 and DHGH13_33) the S70 sub-cropped, and the remaining four drillholes terminated before intersecting the S70 seam. Intersection depths for the S70 range from 5.07m in DHGH13_28 to 196.20 m in DHGH13_39. The average depth to the S70 is 71.92 m.

Seam thickness ranges from 0.56 m to 4.75 m, with drill intersections averaging 2.08m in thickness and an average modelled thickness of 1.94m. Seam thickness is relatively consistent across the NW area, however there is evidence at one location (drill hole DHGH13_03) of structural thickening. This interpretation is supported by down hole geophysics and core photography.

The S40 is considered by Atrum to be the secondary deeper coal seam target. The S40 coal seam was intersected in 16 of the 52 drill holes within the NW area. Intersection depth ranges from 117.22 m in DHGH13_21 to 370.99 m in DHGH13_18. The average depth to the S40 is 265.29m.

Seam thickness intersections range from 0.69m to 6.72m, averaging 2.93m with a modelled average thickness of 2.67m. Seam thickness is relatively consistent across the NW area with no established trend in thickness identified from the current dataset.

All holes were logged with a slim-line gamma-density tool which was lowered through the drill stem to obtain at least one complete geophysical log of the hole. Detailed logging (1:50 Scale) was undertaken only over significant coal seam intervals. Whenever possible exploration drill-holes were also logged open hole. In the later stages of the project dipmeter, sonic and acoustic televiewer were also used.

In general, all holes were logged through the drill stem to obtain a gamma density log at 1:100 and 1:200 scale, a neutron log at 1:100 scale and an expanded scale gamma density at 1:50 scale.

All cores collected were descriptively logged in detail by geologists on site. Once described and measured, the coals and selected host rock samples were bagged and labelled for subsequent analysis.

Atrum adopted international best practice exploration procedures including:

- An Atrum geologist is present at the drill rig at all times
- Boreholes drilled with the aim of maximising coal core recovery (a minimum of 90% is required) and to date, the average coal core recovery sent to the laboratory is 95%
- Core recovery is measured by an Atrum geologist whilst the core lies in the core barrel splits in its original condition. The core recovery is then compared to the seam thickness derived from the downhole geophysical logs
- Bore cores are logged in the inner split tube of the core barrel at the drill rig by a geologist before it is removed. This ensures the core is logged in its original state with minimal disturbance to the core
- The coal seam cores are photographed in the core barrel splits
- All boreholes are geophysically logged and to determine seam thickness, roof and floor depth and to assist with correlation
- Consistent sampling of coal seams is ensured by using the downhole geophysical logs to determine ply sample intervals
- Timely despatch of samples for analysis by internationally accredited coal laboratories in Canada ensures delivery of samples within 5 to 6 days of being drilled
- Inspection of internationally recognised and accredited Canada analytical laboratories has been conducted
- Geological and analytical data is entered into the Minescape borehole database for further validation checking.

Sampling and Analytical Methods

All cores of the coal seams were recovered using HQ (63mm diameter) core barrels. Core recovery was above 90% and on average was 95% for all boreholes completed to date. This is considered to be within the limits expected by international standards.

A summary of the in-situ coal quality results indicate generally the coal has minimum impurities including low-medium ash and low sulphur as well as possessing very favourable metallurgical attributes sort after by steel makers in many countries.

The evaluation of coal quality for the 2013 and 2014 exploration programs is based upon the analytical results of core obtained from drill-holes, and from bulk samples collected from the Groundhog Property. The primary purpose of the coring programs was to obtain sufficient samples of significant coal seams for reliable determinations of the raw and some clean quality characteristics of the Groundhog Property.

The 2013 and 2014 laboratory testing was more comprehensive than in 2012, samples were not only tested for coal quality, but also for environmental analysis, mineral properties and geotechnical parameters. Typically, specific lab analyses on core samples were performed by ALS Laboratories in Burnaby, Vancouver, British Columbia however some samples went to Loring Laboratories Ltd. of Calgary, Alberta. Most samples collected were representative of selected coal units and their associated internal partings. Roof and floor samples were also collected for most significant seams but were not analysed.

Samples were all weighed and air dried, selected samples (individual plies and composites) were then designated one of four analytical flow paths for analysis based on the mass of material available for testing (PQ Major Ply, HQ Major Ply, HQ Small Ply or Basic).

Analysis focused on the shallow coal seams (mainly Seam 70 or above) in the NW portion of the project where initial bulk sample work is anticipated). Analysis of HQ Major Ply and HQ Small Ply, HQ Basic and PQ Major were done by the process outlined in their respective flow charts. Clean Coal Composites were compiled where yield /ash SG cuts warranted.

In addition to the coal quality program, 11 samples were selected for petrographic analysis which was performed by VanPetro of Vancouver, BC, a subset of 5 samples was then analysed by ALS with an XRD. 31 geotechnical samples were collected over the summer and 16 of these were selected for rock strength testing by Golder Associates of Vancouver, BC. A total of 20 gas content samples were collected from multiple seams at three separate locations to characterise the ventilation requirements of potential mining operations.

Coal on the Groundhog Coalfield is anthracite in rank by the ASTM classification of coal rank with RoMax vitrinite values generally ranging from 3.83 to more than 5 percent.

The results show it is possible to clean the raw coal to less than 10% ash product with a calorific value around 7500Kcal/kg.

Resource estimation methodology and cut-offs

The process for the estimation of the Coal Resources for the Groundhog Anthracite Project was undertaken by Mr Nick Gordon of Gordon Geotechniques. The Coal Resources were classified in accordance with the 2012 JORC Code.

The process comprised the following steps:

- Check the borehole logs, wireline logs and analytical data, and validate the data files used for developing the geological and coal quality models in the Minescape Software system.
- Develop a structural interpretation derived from the available data sets including the BC Government geological map, the outcrop data derived from surface mapping and the Atrum borehole seam intersections.
- Determine the appropriate distance criteria for the classification of the JORC Resource categories based on the consistency and continuity of the coal seams.
- Generate resource polygons for each seam based on the distance criteria above, the borehole locations and the coal outcrop data.

With the recent borehole data, the detail correlation of coal seams across the eastern part of BBM tenement has demonstrated a consistency and continuity of coal attributes on a seam basis. Based on this consistency of coal seam geology, the categorisation of the Resources is based upon the following observations:

- Measured Coal Resources are based on boreholes spaced up to 500m apart
- Indicated Coal Resources are based on boreholes spaced up to 1,000m apart
- Inferred Coal Resources are based on boreholes spaced up to 2,000m apart.

Coal resources have been estimated and reported according to resource classification in two large resource blocks – namely, Block "Res_01" located on the eastern side of the Skeena River, and Block "Res_02" located on the western side of the Skeena River. Resource blocks are limited by tenement outlines, a 100 metre offset from the Skeena River and by an interpreted fault boundary in the south east.

The large majority of historical and recent exploration has taken place in Block "Res_02" and this is the focus of economic interest.

The following resource classification criteria were adopted:

- Points of observation for resource classification purposes were defined as cored drill hole intersections of seams with 80% or better core recovery and coal quality composites (at least raw coal moisture, ash and total sulphur) that pass all QA/QC checks. Interval correlations and thicknesses must also be supported by down-hole geophysics.

- The resource is classified as Measured if the distance between valid points of observation is less than 500m (effective maximum 250m radius around points of observation).
- The resource is classified as Indicated if the distance between valid points of observation is greater than 500m and less than 1,000m.

- The resource is classified as Inferred if the distance between valid points of observation is greater than 1,000m and less than 2,000m.

- At least two intersecting points of observation radii were required for classification (i.e. no isolated drill holes allocated areas of influence).

TABLE 1 - SAMPLING TECHNIQUES AND DATA

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• For the Atrum Coal 2014 exploration program all coal seams intersected were sampled. Coal plies were sampled discretely on the basis of lithological characteristics and quality. All non-coal material and partings were included with the lower coal ply and noted in the lithological description. Non-coal interburden was sampled separately. • The immediate roof and floor samples were submitted for geotechnical testing. • All coal and roof and floor dilution samples were double bagged at site and marked with sample number, date, hole and project. These were retained on site until geophysical corrections confirmed representative core recovery of the seam and samples. The qualified samples were then transported to the laboratory via courier. • Coal Quality samples from the Atrum Coal Drilling program were sent to Loring Laboratories and ALS Laboratories in Calgary and Vancouver, respectively. • All coal quality samples were prepared and analysed using Canadian and International Standard testing methodologies.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• All coal quality holes were cored (partially or fully) using a HQ size core barrel producing a 63.3 mm core diameter. • Large diameter drill holes for bulk material extraction were cored using a PQ size core barrel producing an 83.1 mm core diameter.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• An assessment of core recovery was completed by comparing the recovered thickness measured during geological logging and by the driller, to geophysical picked thicknesses from the geophysical logs. • Volumetric analysis of samples was conducted on the Atrum Coal exploration program • The analysis was based on sample mass received versus expected sample mass derived from sample length by core diameter by apparent Relative Density • If sample mass was below 95% a separate exercise interrogating the linear recovery via photos and logs was undertaken to decide whether the sample could be included and not bias the results.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• All core was geologically logged, marked and photographed before sampling. Geological and geotechnical features were identified and logged. • All drill holes have been geophysical logged with a minimum density, calliper, gamma and verticality unless operational difficulties prevented full or partial logging of the drill hole. • The calibration of the geophysical tools was conducted by the geophysical logging company. Century Wireline Services
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is*	• All core samples were double bagged on site and transported to the Laboratory for testing. • Loring Laboratories and ALS Laboratories comply with Canadian and International Standards for sample preparation and sub sampling. • Large wash samples were pre-treated and dry sized and various sizes before sample splitting and analysis. Proximate analysis was completed on a portion of the original sample. • Raw analysis procedure keeps ½ of the sample as reserve.

Criteria	JORC Code explanation	Commentary
	representative of the in situ material collected, including for instance results for field duplicate/second-half sampling. • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• Loring Laboratories and ALS Laboratories comply with the Canadian and International Standards for coal quality testing and are certified. • Geophysical tools were calibrated by the logging company Century Wireline Services. • The density measurement is calibrated to precise standards and where possible validated in a calibration hole.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• Loring Laboratories and ALS Laboratories comply with the Canadian and International Standards for coal quality testing and as such conduct the verifications for coal quality analysis outlined in the standards. • Coal Quality results were verified by Xstract Mining Consultants Pty Ltd before inclusion into the geological model and resource estimate. • No adjustments have been made to the Coal quality data.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• Professional Survey of the coal quality boreholes for the Atrum Coal exploration program was completed by DMT Geosciences.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• Data spacing sufficient to establish the degree of geological and grade continuity for inclusion as Inferred, Indicated and Measured Resource estimation procedures were employed. • Multiple samples were obtained for some seams within the Groundhog Project area. As such, where appropriate, sample compositing has been completed. Samples were weighted against sample thickness and in situ RD.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• A combination of vertical and inclined drill holes were completed from the same drill pad to ensure that a suitable understanding of the geological structure and orientation of the geology was captured.
Sample security	• *The measures taken to ensure sample security.*	• Sample Security was ensured under a chain of custody between Atrum Coal personnel on site and Loring and ALS laboratories.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Sampling was undertaken by Atrum Coal personnel. Loring and ALS undertook internal audits and checks in line with the Canadian and International standards

TABLE 2 - REPORTING OF EXPLORATION RESULTS

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• Coal tenures relate to the Groundhog Anthracite project, which is 100% owned by Atrum Coal • The project consists of 18 granted coal licences and 8 coal licence applications totalling 22,815 hectares • Security of tenure is not compromised and there is no known impediments
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Exploration drilling within and in close proximity to the Groundhog project has been reviewed and evaluated for data purposes
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The Groundhog Project lies within the Bowser Basin. • The Bowser Basin, which is the largest contiguous basin in the Canadian Cordillera, developed as a result of tectonic compression and uplift of the Coast Mountains during the Upper Jurassic. • The dominant structural feature is the northwest-southeast trending Biernes Synclinorium. It resulted from northeast-southwest compression during the first phase of deformation ("F1"). Thrusting related to the F1 deformation is more intense in the southern part of the Groundhog Coalfield than in the northern part. • The second, less intense, phase of deformation ("F2") resulted from northwest-southeast compression. The F2 deformation is superimposed on the broad, open type of F1 folding. The F2 imprint is visible in a series of plunge changes in the F1 folds in the order of up to 5°. • F2 thrusts are generally flat lying and related to the hanging wall of drag folds. Displacement tends to be along bedding surfaces. The F2 fold structures superimposed on the major F1 synclinorium vary in wave length from 100 m to 700 m and vary in amplitude up to 100 m.

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *hole length.*
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*
		• All drill holes have been modelled from vertical, although hole deviation (from vertical) has been recorded for all drill holes.

Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.*	• All seams where multiple coal quality samples were taken were given a composite coal quality value. This composite value was generated within the Minescape software and was weighted on thickness and in situ RD. In situ RD was only weighted against thickness.

Criteria	JORC Code explanation	Commentary
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	• The inclusion of boreholes from neighbouring areas has given the model a reasonable amount of lateral continuity in all directions. • Point of observation spacing has been extrapolated in a maximum of a 2,000 m radius from the drill hole. • Seam thicknesses have been corrected to geophysics to ensure accuracy
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• All appropriate diagrams are contained within the main body of the report
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• All available exploration data for the Groundhog Project area have been collated and reported.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• No further exploration data were gathered and or utilised.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Further work consisting of additional drilling and seismic activity is being evaluated. The Company is currently planning an additional drilling program aimed at testing the continuity of the coal resources outside of the Groundhog North Mine area.

TABLE 3 - ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	• The resource estimates which form part of this report were based on drilling, trenching, and adit data collected, both recent and historical, mainly in the period from 1970 to 2014 by companies then active in the area now forming the Property, including Atrum Coal NL. Gordon Geotechniques completed a 100% validation of available current and historic work and created an independent database. The authors have reviewed the data for consistency and eliminated data that could not be constrained or confirmed in reports or government databases. The authors have concluded that work completed by the coal production and exploration companies was completed in a professional manner that was consistent with the data collection and reporting standards at that time. • The historical reports used for this compilation included historic reserve and resource estimates that no longer meet NI 43-101 criteria. • Current geological information utilised in the resource estimate include drilling and geophysical analysis as well as coal quality testing undertaken by Atrum Coal NL during the 2012, 2013 and 2014 exploration programs.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• Gordon Geotechniques has undertaken several site visits to the Groundhog North Mine area. • Several reviews were conducted of the field procedures and sampling practices, and they were deemed to be of an acceptable industry standard at the time of the visit.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• The Groundhog Project lies within the Bowser Basin. • The Bowser Basin, which is the largest contiguous basin in the Canadian Cordillera, developed as a result of tectonic compression and uplift of the Coast Mountains during the Upper Jurassic. • The dominant structural feature is the northwest-southeast trending Biernes Synclinorium. It resulted from northeast-southwest compression during the first phase of deformation ("F1"). Thrusting related to the F1 deformation is more intense in the southern part of the Groundhog Coalfield than in the northern part. • The second, less intense, phase of deformation ("F2") resulted from northwest-southeast compression. The F2 deformation is superimposed on the broad, open type of F1 folding. The F2 imprint is visible in a series of plunge changes in the F1 folds in the order of up to 5°. • F2 thrusts are generally flat lying and related to the hanging wall of drag folds. Displacement tends to be along bedding surfaces. The F2 fold structures superimposed on the major F1 synclinorium vary in wave length from 100 m to 700 m and vary in amplitude up to 100 m.

Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• For the Groundhog North area a reportable JORC resource has been determined for the points of observation with both quality and thickness data. For the purposes of this resource assessment, quality data has been applied to all 2014 drilling points of observation.
		• For the estimate of the coal resource in the Groundhog North area, the following constraints have been used:
		  • 100m offset from the Skeena River. Resources to the east of the Skeena are not included.
		  • Measured resource extrapolated 500m from points of observation.
		  • Indicated resource extrapolated 1,000m from points of observation.
		  • Inferred resource extrapolated 2,000m from points of observation.
		  • A maximum of 0.3m stone parting.
		  • A minimum 0.4m mining thickness for open cut mining at <300m depth.
		  • A minimum 1m mining thickness for underground mining at >300m depth. The 300m depth cut off for open cut mining equates to a strip ratio of 17 based on an average of 5.7m of cumulative coal per 100m.
		• The total coal resource for the Groundhog North area using these constraints is estimated to be 609.2Mt. This compares to 305.2Mt estimated in May 2014. The significant increase in coal resource is due to:
		  • Acquisition of the Anglo-Pacific licences to the west.
		  • Inclusion of seams 30, 35 and 90 based on both quality and thickness data
		  • Increasing the constraint for open cut mining from a depth of 100m (May 2014) to 300m, for a maximum strip ratio of 17.

Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.* • *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• Import data into the mining software package. • Create fault surface triangulations using surface and subsurface fault traces as well as fault/drillhole intersections. • Correlate drill holes, trenches, adits and surface exposures on or directly adjacent to the Property. • Create final fault blocks by applying a Boolean Test to a blank fault block solid using the fault surface triangulations. • Grid the topography and base of weathering triangulation surfaces. • Create seam grids and triangulations in Model Stratigraphy using the FixDHD Mapfiles, topography grid, and base of weathering grid. Seam grids were cropped against the base of weathering grid to remove oxidized coal. • Create HARP (Horizon Adaptive Rectangular Prism) block models for each sub area using the parting and thickness grids as qualities. Blocks were 25 m x 25 m with a sub-blocking of 2 (x and y directions). • Create coal/parting fraction attributes for each seam in the HARP and populate it using the quality grids (coal thickness/aggregate seam thickness). • Classify block confidence using the distance of the block centroid to the nearest data point • Determine the cumulative stripping ratio for each block of coal within the model (total volume of waste/total tonnage of product). • Constrain resource estimation by the current expanded Lease boundaries. • Constrain resource estimation to seam thickness greater than 0.4 m (open cut) or 1m (underground).
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of*	• The tonnages are reported on an As Received Basis with natural moisture included. The moisture content is

	determination of the moisture content.	determined from the results of Proximate Analysis laboratory testing.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• The resource estimate was made using a minimum thickness of 0.4m (open cut) or 1m (underground).
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• Atrum is currently undertaking engineering studies and mine planning analysis. Initial mine extraction method is shallow adit underground mining with mini-long wall extraction following initial bord and pilar early workings.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• Independent quality analysis had been completed for each of the resource areas. Sampling programs included HQ diameter core samples, adit channel samples, and adit bulk samples. Analytical and petrographic analyses were completed at A.S.T.M certified labs. Core intervals containing coal were sampled using project-defined procedures, processed as raw and clean core samples, and analysed.
Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• Additional work is required to be undertaken by Atrum.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.* • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• A constant bulk density value was assumed across the property and was determined from the coal rank and average ash contents as defined in GSC 88-21. A bulk density of 1.65 g/cm^3 was used.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• The resource estimate has been compiled according to the JORC 2012 guidelines applicable at the time and relevant to the Groundhog Project. • The resource estimate has been categorised according to JORC Measured, Indicated and Inferred.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• An internal Company review of the Resource and the associated Technical Reports was undertaken prior to the public release of this information.

Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• The categories of the resource in accordance with the JORC 2012 guidelines were considered acceptable by the Qualified Person during the classification of the resources.