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Atrum Coal
COAL FOR STEEL

ASX Release

21 October 2019

Amended Isolation South Exploration Update

Atrum Coal Ltd (ASX: ATU) provides the following amended Isolation South Exploration Update originally released to ASX on 17 October 2019 (*Thick, Shallow Coal at Isolation South)*.

Page 10 of this announcement has been updated to include additional information in reference to the Isolation South Exploration Target, that was included in an announcement to the ASX on 22 January 2019.

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Managing Director/CEO	M. Wang
Non-Executive Director	R. Barker
Non-Executive Director	G. Edwards
Non-Executive Director	C. Fear
Company Secretary	J. Stedwell

Key Projects

Elan	100%
Groundhog	100%
(incl Panorama North JV)	(65%)
Bowron River	100%

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Thick, Shallow Coal at Isolation South

HIGHLIGHTS

- **Further 12 holes completed in the northern area of Isolation South; thick coal intersections returned at shallow depths**
- **Coal intersected in all holes with cumulative apparent thicknesses ranging from 12.6m to 68.8m, at an average of 31.3m**
- **Starting depth of coal in all holes was less than 50m below surface, and as shallow as only 9m below surface**
- **The S3 seam appears very thick in a number of holes, which is likely the result of structural thickening**
- **Further highlights potential of significant resources for low-strip ratio mining at Isolation South**
- **Drilling ongoing in northern area of Isolation South and at Elan South**
- **Elan Project resource updates, including Isolation South, expected in 4Q 2019**

Atrum Coal Ltd (**Atrum** or the **Company**) (ASX: ATU) is pleased to provide an update on drilling progress at its 100%-owned Elan Hard Coking Coal Project (**Elan Project**) in southern Alberta, Canada.

Managing Director, Max Wang, commented: "*The latest batch of holes completed at Isolation South have provided some incredible results, with up to 69 metres of apparent cumulative coal thickness. While depth to the coal seams is quite predictable below the Cadomin Formation capping the western slope of Cabin Ridge, we are seeing some exceptionally thick coal seam intersections. Drilling continues, however we are increasingly confident that this dynamic is a function of structural thickening and low angle thrusting. The result offers significant potential for open-pit mine economics, over and above the already geometrically attractive nature of the coal deposition at Isolation South.*"

Isolation South drilling update

A further 12 holes have been completed at Isolation South since Atrum's previous exploration update for this area (refer Atrum ASX release dated 18 September 2019, *Isolation South Exploration Update*).

The focus of the current drilling at Isolation South, including all 12 of the recent holes, has been north of the Old Man River on Cabin Ridge. This northern area is where the existing Isolation South resource estimate of 120 Mt is delineated (see Appendix for further details).

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A total of 24 rotary air blast holes have now been completed at Isolation South since the commencement of drilling there in late August. This release contains results for Holes 13 to 24.

These holes (Holes 13 to 24) intersected thick cumulative apparent coal seam thicknesses ranging from 12.6 to 68.8 metres (average 31.3 metres; see Table 1). All holes had shallow depths to first coal in the Seam 1 group - all were less than 50m below surface, including as little as 8.9m below surface.

Table 1: Isolation South drill hole locations and cumulative coal thickness (apparent)

Drillhole ID	Drill Type	Easting	Northing	Elevation	Total Depth	Azimuth	Dip	Total Coal Thickness Apparent (m)	Start Depth of Seam 1 Coal (m)
ISRAB19-13	RAB	682,608	5,537,937	1,820	186.8	75	-65	25.9	42.6
ISRAB19-14	RAB	682,701	5,538,397	1,745	162.1	75	-65	24.8	41.9
ISRAB19-15	RAB	682,903	5,538,068	1,850	184.1	75	-65	50.7	42.4
ISRAB19-16	RAB	683,189	5,537,586	1,774	97.9	75	-65	46.5	8.9
ISRAB19-17	RAB	682,897	5,538,535	1,905	188.5	75	-65	49.3	35.6
ISRAB19-18	RAB	682,557	5,538,818	1,864	186.4	75	-65	28.9	45.3
ISRAB19-19	RAB	682,790	5,539,120	1,961	198.5	75	-65	68.8	37.4
ISRAB19-20	RAB	683,034	5,538,717	1,980	134.5	75	-65	24.9	38.5
ISRAB19-21	RAB	683,326	5,538,405	2,061	106.2	75	-65	12.6	22.7
ISRAB19-22	RAB	683,086	5,538,997	2,036	134.4	75	-65	13.3	33.6
ISRAB19-23	RAB	682,842	5,540,373	2,164	106.8	75	-65	17.0	20.6
ISRAB19-24	RAB	682,868	5,539,495	2,014	146.3	75	-65	13.4	33.2

See Figure 1 for location of the Isolation South area within the Elan Project. See Figure 2 for locations of completed 2019 drill holes in the northern area of Isolation South (which is 16 of the 24 holes) and the existing resource outline at Isolation South. The seams at Isolation South are correlated into Seam Groups 1 to 4, with a stratigraphic column and type section shown in Figure 3.

Structural thickening

Where intersected, the full sequence of coal seams (from Seam 1 to Seam 4) can present more than 40m of cumulative coal thickness (apparent), as evidenced by Holes 13, 14 and 18 (that have no structural thickening evident).

Seams 1 and 2 are shown to be relatively uniform from one drill hole to the next, while there is a zone where Seam 3 appears to be thickened as the result of structural deformation. This characteristic of structural thickening in Mist Mountain coals is well documented at nearby projects including Grassy Mountain.

The structural thickening appears to be the result of low angle thrusting and compression, with Seam 3 representing a major plane of weakness in the strata. As a result, the Seam 3 group achieves an apparent thickness of 37.3m in Hole 15, 38.3m in Hole 17 and 61.0m in Hole 19 (see Figure 4). The area where structural thickening of Seam 3 is most evident is shown in plan in Figure 2.

All holes drilled at Isolation South have been moderately inclined to the east (at 25 degrees from horizontal) at an azimuth of 75 degrees to account for the moderate westerly dipping seams, so that coal seam intersections are as close to true thickness as possible. All boreholes detailed in this release have been geophysically logged by Century Wireline Services with a suite of tools including natural gamma, caliper, long and short spaced density, resistivity, deviation and dipmeter.

In the area of structural thickening, inspection of the dipmeter logs (which measures the dip of the strata) does not show steep dips that might suggest that the drill holes have intersected steeply dipping or sub-vertical coal seams.

More exploration will be required to fully delineate zones of structural thickening and to reliably model faults in this area. The current drill spacing in this area of Isolation South, achieved through this year's drilling program, is typically in the range of 100 to 250 metres (as shown in Figure 2).

Next steps

A total of 35 holes are planned to be drilled at Isolation South through the 2019 program.

Drilling will now progress to the north along the dip slope at Cabin Ridge to where numerous historical drill holes, outcrops and adits were located. Historical wireline logs from the OMR series of drill holes were recently acquired and are being professionally scanned to electronic format for easy and reliable use in geological modelling software.

Several cored holes are also planned at Isolation South in 2019 to further increase confidence in coal quality and washability. Further updates on drilling and coal quality results from Isolation South are planned over coming months.

An updated resource estimate for Isolation South, inclusive of 2019 drilling results from both the northern and southern areas, is expected to be completed in 4Q 2019.

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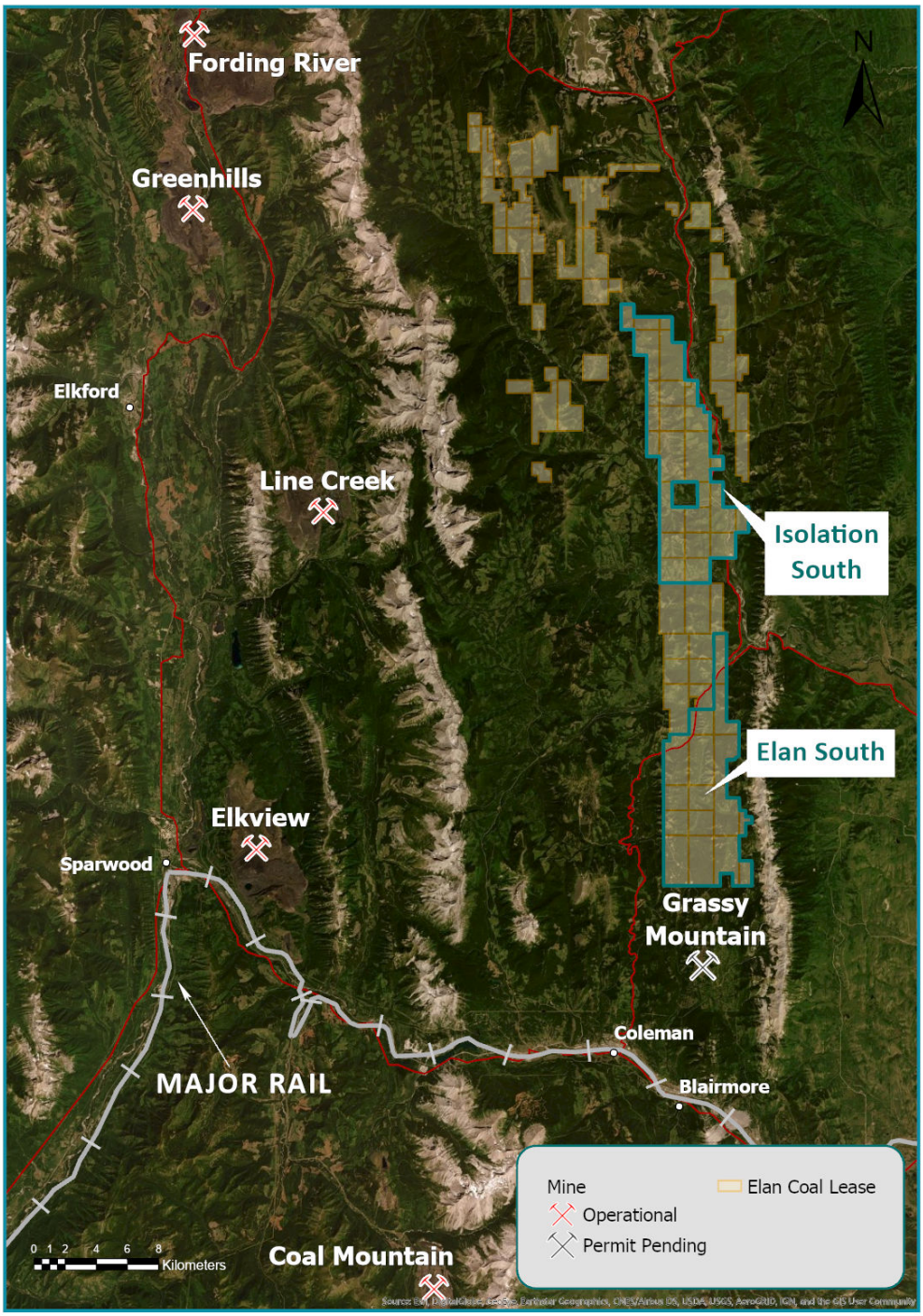

Figure 1: Elan Project plan view showing relative Isolation South location

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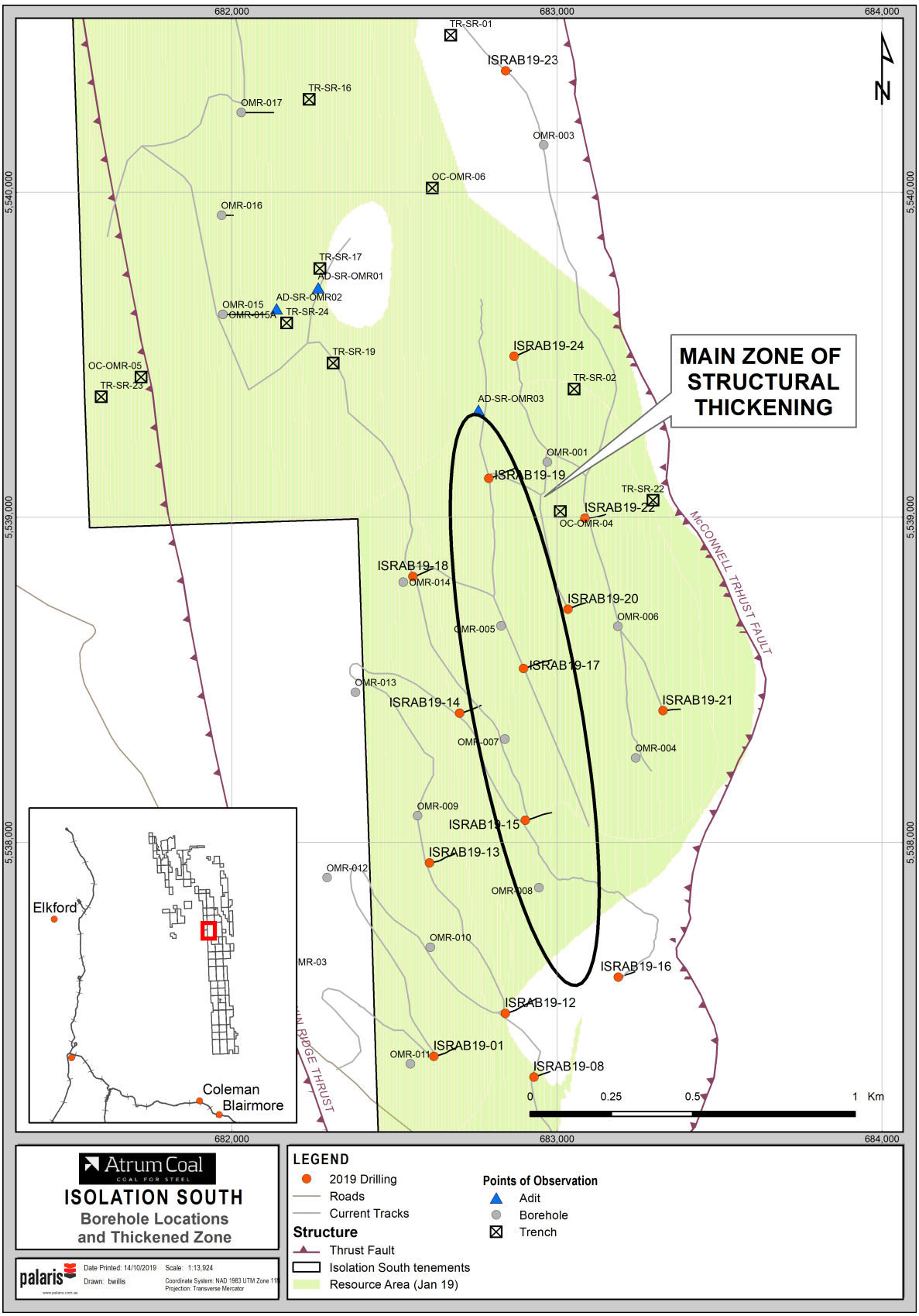

Figure 2: Completed drill hole locations and zone of structural thickening at Isolation South

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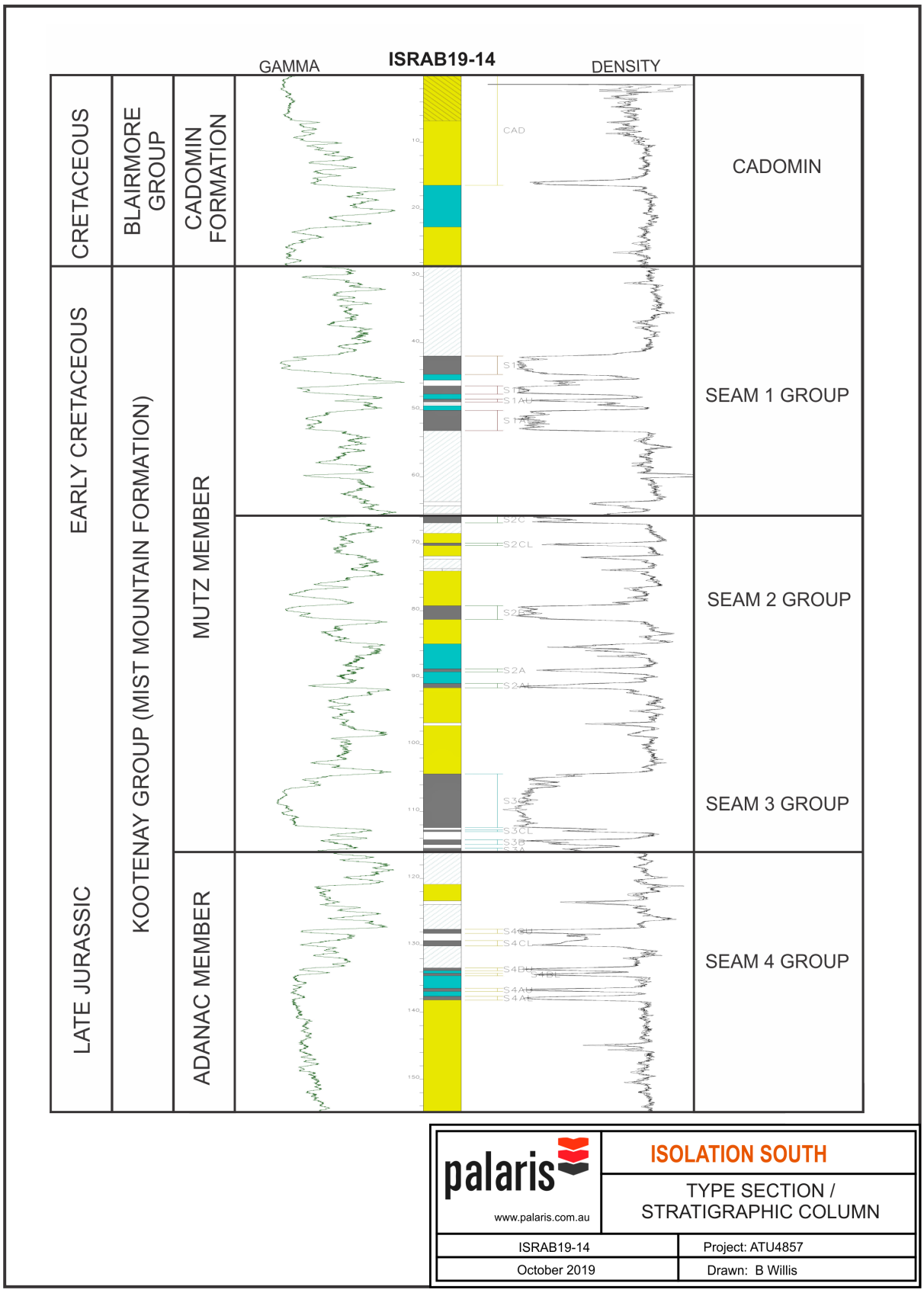

Figure 3: Isolation South stratigraphic column and type section from ISRAB19-14

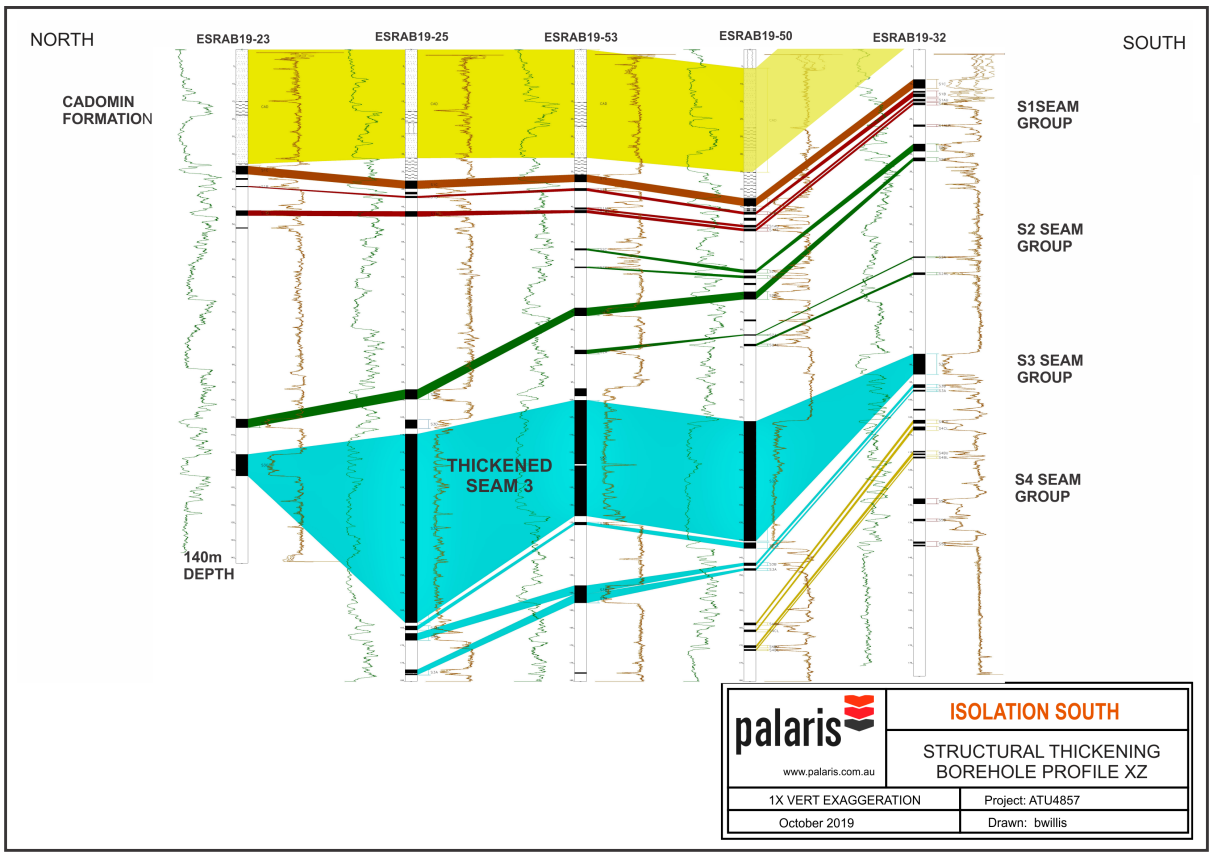

Figure 4: Borehole profile section (north-south) showing extent of seam thickening in Seam 3 group

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APPENDIX: Further Isolation South Details

Geology

Historically referred to as the Old Man River Prospect, the area that has been explored at Isolation South occurs on Cabin Ridge on the western side of the McConnell Thrust fault. It is bounded to the west by the Twin Ridge Thrust. The Old Man River flows south-east through the Isolation South area and dissects it into northern and southern areas.

The coal seams at Isolation South dip to the west at relatively moderate angles (around 15 - 20 degrees). The topographical surface of the coal seams mimics the topography and likely represents a dip slope on the western side of the ridge. Seam outcrops are prevalent on the eastern side of the ridgeline.

The coal seams outcrop near the surface location of the McConnell Thrust fault and in a crescent shaped cropline due to the topography of Cabin Ridge. On the eastern side of the McConnell Thrust, the seams occur at depth through a series of unnamed synclines and anticlines within the central and eastern parts of the Isolation South area (as determined through mapping and coal seam gas exploration wells).

Historical drill holes and clear outcrops show that the coal seams extend to the north and south of the northern area where resources have been estimated. Both north and south areas of the coal seam extensions are present along the zone between the Twin Ridge Thrust and McConnell Thrust fault, and significant areas of Kootenay Formation have been mapped at surface.

Historical exploration

Scurry-Rainbow Oil Limited (**Scurry**) undertook exploration of the Isolation South area in 1970. Exploration activities included bulldozer-assisted trenching, establishment of 22.5km of access roads and 19 HQ size fully cored holes for a total of 3,286m of coring.

The cored holes were accompanied by geophysical logging and seam intervals interpreted from geophysical log depths, although not all geophysical log hard copies are available. Core samples were subjected to raw coal quality testing and clean coal testing at CF1.50 with average core recovery estimated at 79% (providing a reasonable dataset).

Scurry also completed excavation of 10 adits, although information can only be sourced for three of these. Bulk samples taken from the adits were subjected to raw and washability testwork. Scurry concluded that there was a significant deposit of potentially open cut mineable coal at Isolation South.

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Existing Resources

A resource estimate for Isolation South was undertaken as part of the overall resource estimation work for the northern Elan tenements, as announced by Atrum on 22 January 2019 (*Additional 201Mt JORC Resources defined for Elan Project*). The resource estimate for Isolation South (as at 31 December 2018) was 120 Mt (39 Mt Indicated and 81 Mt Inferred)[1].

The existing resource estimate is located in the northern area of Isolation South (north of the Old Man River).

Existing Exploration Target

The southern area of Isolation South (south of the Old Man River) has a limited amount of historical drilling, trenching and mapping data available. As announced by Atrum on 22 January 2019 (*Additional 201Mt JORC Resources defined for Elan Project*), Atrum has estimated an Exploration Target of 60 – 200 Mt[2] for this area, with an expected range in coal quality of 15 – 35 % (raw ash) and an expected range in rank of 1.20 – 1.30 % (vitrinite reflectance)[1&2].

[1] Other than the drilling results released to ASX including this announcement in 2019, Atrum confirms that it is not aware of any new information or data that materially affects the information included in that release. All material assumptions and technical parameters underpinning the estimates in that release continue to apply and have not materially changed.

[2] The potential quantity and quality of the Exploration Target is conceptual in nature. Insufficient exploration has been undertaken to estimate a Mineral Resource and it is uncertain that further exploration will result in the estimation of a Mineral Resource.

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About Atrum Coal

Atrum Coal (ASX: ATU) is a metallurgical coal developer. The Company's flagship asset is the 100%-owned Elan Hard Coking Coal Project in southern Alberta, Canada. Elan hosts large-scale, shallow, thick, hard coking coal (HCC) deposits with a current JORC Resource Estimate of 298 Mt (70 Mt Indicated and 228 Mt Inferred).[1] Comprehensive quality testing of Elan South coal on samples from the 2018 exploration program, combined with review of substantial historical testwork data for the broader Elan Project, has confirmed Tier 1 HCC quality.

The initial focus for development is the Elan South area, which is located approximately 13 km from an existing rail line with significant excess capacity, providing direct rail access to export terminals in Vancouver and Prince Rupert. Elan South shares its southern boundary with Riversdale Resources' Grassy Mountain Project, which is in the final permitting stage for a 4.5 Mtpa open-cut HCC operation. Around 30 km to the west, Teck Resources operates five mines (the Elk Valley complex) producing approximately 25 Mtpa of premium HCC for the seaborne market.

A Scoping Study to evaluate development of Elan South is underway with targeted completion in 4Q 2019. This work will feed into a Pre-Feasibility Study (PFS) which is planned to be completed in 2H 2020.

[1] Other than the drilling results released to ASX including this announcement in 2019, Atrum confirms that it is not aware of any new information or data that materially affects the information included in its ASX releases dated 6 January 2019 (*Elan South Hard Coking Coal Resource increased by 170% to 97Mt*) and 22 January 2019 (*Additional 201Mt JORC Resources defined for Elan Project*). All material assumptions and technical parameters underpinning the estimates in these releases continue to apply and have not materially changed.

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Competent Persons Statement

Exploration Results

The information in this document that relates to Exploration Results of Isolation South project area is based on, and fairly represents, information and supporting documentation prepared by Mr Brad Willis, who is a Member of the Australasian Institute of Mining and Metallurgy (#205328) and is a full-time employee of Palaris Australia Pty Ltd.

Mr Willis has read and understands the requirements of the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Exploration Targets, Mineral Resources and Ore Reserves (JORC Code, 2012 Edition). Mr. Willis is a Competent Person as defined by the JORC Code, 2012 Edition, having twenty years' experience that is relevant to the style of mineralisation and type of deposit described in this document.

Neither Mr. Willis nor Palaris Australia Pty Ltd has 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. Willis has visited the Elan project site with Atrum coal personnel during the exploration programs in 2018 and 2019.

The JORC Code (2012)

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.*	▪ From the 24 completed drill holes in the 2019 program, open cut cuttings have been sampled at 1m depth intervals. These samples are not intended to be used for coal quality testwork, ▪ The preference is for a coring program to be undertaken this year, twinning selected open holes ▪ Selected holes will be twinned for coring and sampling for coal quality testwork ▪ This report relies on sampling from historical exploration work undertaken by various companies. ▪ Historical samples were taken from cored drillholes and bulk samples from adits; these have been collated and included in the geological model ▪ Cored drillholes are used to collect HQ size core samples, which were logged and sampled for coal quality testwork ▪
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).*	▪ The 24 boreholes completed in 2019 were percussion (rotary air blast) boreholes with a 4 1/2" diameter hammer drill bit ▪ All of the boreholes completed in 2019 were geophysically logged to total depth in the open hole ▪ Historically, HQ size diamond cored drilling was typically undertaken ▪ Many of the historical boreholes were geophysically logged to total depth in the open hole, these wireline logs have been obtained and scanned to LAS files
Drill sample recovery	▪ *Method of recording and assessing core and chip sample recoveries and results*	▪ Not relevant for the cuttings samples taken in 2019, as they will not be tested (core samples provide much better sample representivity and

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Criteria	JORC Code explanation	Commentary
	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.*	will be used for coal quality testwork, with a coring and testing included in this years drill program) ▪ The 2019 boreholes were geophysically logged and seam intervals have been determined from the geophysical log data
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.*	▪ Open hole cuttings (rotary air blast) are logged in 1m sample intervals taken ▪ Boreholes were geophysically logged with geophysical sondes including density, caliper and gamma, deviation and dipmeter
Sub-sampling techniques and sample preparation	▪ *If core, whether cut or sawn and whether quarter, half or all core taken.* ▪ *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* ▪ *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* ▪ *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* ▪ *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* ▪ *Whether sample sizes are appropriate to the grain size of the material being sampled.*	▪ Not applicable to the current program
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.*	▪ Not applicable to the current program
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.*	▪ Geological data is collected in line with Atrum Coal's exploration procedures and guidelines ▪ No coring or sampling for coal quality testwork has been undertaken at Isolation South in 2019 ▪ Twinning of selected existing rotary air blast holes will be undertaken later in the year. The twinned holes will also incorporate geophysical logging ▪ Sample interval depths and thicknesses are as measured by the field geologist (drillers depths),

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Criteria	JORC Code explanation	Commentary
		and adjusted to align with geophysical log depths ▪ GWIL Birtley undertakes preliminary checks of assay data using regression analysis, and checked by Atrum Coal and Palaris geologists
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.*	▪ The locations of boreholes drilled in 2019 have been surveyed using DGPS (Trimble) ▪ The co-ordinate system is UTM projected grid NAD83 Zone 11N ▪ A LiDAR survey is planned over the project area (Q4 2019) ▪ The surveyed locations of boreholes, trenches and adits have been sourced from historical exploration reports ▪ In many cases, borehole co-ordinates were surveyed in local co-ordinate systems, and were later converted to grid co-ordinates. Checks have been made by georeferencing historical borehole plans to ensure they are plotting in the correct locations
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.*	▪ The 12 boreholes presented in this announcement are located on Cabin Ridge, the dip slope of Isolation South, located north of Oldman River ▪ The 12 boreholes completed on the northern area are infilling the resource areas identified during exploration by Scurry Oil in the 1970's ▪ The current drill spacing is generally 100 – 250m between holes (including historical drilling) ▪ The borehole locations are shown in Figure 2 of this announcement ▪ Resource classification and estimation will be revisited at the end of this year's drilling program
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.*	▪ The 24 drill holes completed in 2019 are inclined at 65 degrees towards the east (azimuth 75) as shown in Table 1 ▪ Inclined holes are used in areas where dipping seams exist, in order to intersect the seams closer to their true thickness ▪ Almost every borehole has electronic deviation data available that has been imported into the Minex borehole database. The geological modelling software captures the downhole inclination and deviation, and structural modelling assists in correcting the apparent seam thicknesses to true thicknesses in model grids ▪ 3D representation is relatively good with the 2019 infill program.
Sample security	▪ *The measures taken to ensure sample security.*	▪ Not applicable to the 2019 program
Audits or reviews	▪ *The results of any audits or reviews of sampling techniques and data.*	▪ Palaris representatives visited the site in 2018 and 2019 to oversee the drilling program, and ensure a high standard of geological data is provided by Atrum Coal's geologists ▪ It is recognised that the historical data may not have the same level of accuracy relative to modern practices, and is being confirmed by the current drilling

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Table 1 – Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	▪ *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* ▪ *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	▪ The Isolation South coal agreements were granted to Elan Coal Ltd in 2012/13, Elan Coal was acquired by Atrum Coal in March 2018. Coal Lease agreements provide the right to exclusively explore the land within the boundaries of the lease and are granted for a term of 15 years (with an option to extend at expiry) ▪ The Property falls within the Rocky Mountain Forest Reserve, which is managed by the Alberta Government ▪ The project is located in an area that has been classified as Category 2 in accordance with the Coal Development Policy for Alberta. Surface mining is not traditionally considered in Category 2 areas either because it is an area where infrastructure is inadequate to support mining activities or it is an area associated with high environmental sensitivity ▪ An Exploration Permit for Isolation South was granted to Atrum Coal by the Alberta Energy Regulator (AER) covering exploration activities planned in 2019 (as reported to the ASX on 29 July 2019)
Exploration by other parties	▪ *Acknowledgment and appraisal of exploration by other parties.*	▪ Scurry-Rainbow Oil Limited (Scurry) undertook exploration of the Isolation South area in the 1970s, then referred to as the Oldman River prospect. ▪ Exploration activities included bulldozer assisted trenching, establishment of 22.5km of access roads, numerous adits and 19 HQ size fully cored holes for a total of 3,286m of coring. ▪ The cored holes were accompanied by geophysical logging and seam intervals interpreted from geophysical log depths
Geology	▪ *Deposit type, geological setting and style of mineralisation.*	▪ Atrum Coal's Elan project is located in the province of Alberta, in the Crowsnest Pass area of the Crowsnest Coalfield, on the Front Ranges of the Canadian Rocky Mountains ▪ Coal-bearing sedimentary sequences occur within the Mist Mountain Formation of the Late Jurassic to Early Cretaceous aged Kootenay Group, which was strongly deformed during the Late Cretaceous Laramide Orogeny. This resulted in the development of north to northwest-trending folds and steeply dipping reverse faults. The project is located within the Rocky Mountain Thrust Belt, west of the Livingstone Thrust fault and the project extent encompasses the McConnell thrust sheet ▪ Major folds regionally trend in a northerly direction. Secondary local thrusts typically occur within the area, generally determining the distribution and outcrop of coal seams along the thrust fault zones. In many areas of the Crowsnest Coalfield, structure is principally the controlling factor in resource development.
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:* o *easting and northing of the drill hole collar* o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* o *dip and azimuth of the hole*	▪ This information is provided for all boreholes completed in 2019 at Isolation South, in Table 1 of this ASX announcement.

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Criteria	JORC Code explanation	Commentary
	○ *down hole length and interception depth* ○ *hole length.*	
Data aggregation methods	▪ *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* ▪ *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* ▪ *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	▪ No cut-off grades were applied to the exploration results in this announcement ▪ For rotary air blast holes, individual samples are taken at 0.5m sample increments ▪ No lab testing has been undertaken in 2019
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').*	▪ Discrepancies between apparent and true seam thickness are an important consideration for interpretation of the drilling results in this announcement ▪ The results tabulated in this announcement are apparent thicknesses as recorded in drill holes, and may be significantly different to the true thickness of the seams. ▪ More work will need to be undertaken to understand how true thicknesses are represented in the deposit, and will be addressed through use of borehole deviation survey data, and updated structural interpretation / fault modelling ▪ Reported seam intersections in boreholes and as evidenced by seam outcrops (road cuttings) show evidence of fault thickening, and / or thickening through folded zones
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.*	▪ Borehole locations plans are provided along with drill hole locations from the 2019 program ▪ Work has commenced on updating geological models incorporating the recent drilling results ▪ The Competent Person has deemed it would be appropriate to update the geological model before providing updated cross sections and other geological plans in this release
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.*	▪ To ensure balance reporting of Exploration Results, Tables 1 includes all boreholes drilled at Isolation South in 2019
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.*	▪ Atrum Coal geologists have undertaken a significant surface mapping program in 2019, collecting data points from outcrops of the Cadomin Formation, coal seams of the Mist Mountain Formation ▪ Along with surface mapping and trenching, road and track cuttings have provided a very useful source of outcrop measurements ▪ This will be included with the volumes of geological data that will be used for geological model updates and to assist in controlling the structure of the coal seams
Further work	▪ *The nature and scale of planned*	▪ The drilling of percussion (air-blast) structure holes will

Criteria	JORC Code explanation	Commentary
	further work (e.g. 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.*	be continued in 2019, with up to 35 holes to be completed ▪ Cored boreholes will be drilled in 2019 with around 10 cored boreholes planned ▪ The cores will be subjected to detailed raw quality sizing and washability test work, including comprehensive testing of clean coal composites ▪ Palaris has commenced with interpretation of data and updating 3D geological models of Isolation South

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