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**ASX Announcement**

**16 July 2020**

# FURTHER THICK COAL INTERSECTIONS AT ISOLATION SOUTH

## HIGHLIGHTS

- Rapid completion of first 60 (of planned 115) rotary air blast (RAB) holes of the 2020 exploration program for 11,000 metres of drilling at Isolation South
- Drilling predominantly focused on Inferred resource areas within the optimised pit shell (identified in the Elan Scoping Study); targeting upgrades to resource classification for inclusion in the Pre-Feasibility Study (**PFS**) mine schedule
- Preliminary results have been successful in demonstrating the continuity of target coal seams in Inferred resource areas
- Thick, shallow coal intersections consistently achieved in the current program; cumulative apparent coal thicknesses averaging 32 metres per hole, and starting from as little as 3 metres below surface, were in-line with or above expectations for the drilled areas
- Three coring rigs also now operating at site, with six large diameter core (**LDC**) holes and two HQ hydrogeological holes completed
- Good core recoveries achieved from the LDC holes completed, with coal cores sampled and submitted for detailed coal quality, washability and clean coal laboratory testwork
- Interim Elan Project resource update targeted for 4Q 2020

Atrum Coal Limited (ASX: ATU) (**Atrum** or the **Company**) is pleased to advise initial results from the 2020 drilling program at its 100%-owned Elan Hard Coking Coal Project (**Elan Project**) in southern Alberta, Canada.

The 2020 exploration program at Isolation South has progressed rapidly with 60 RAB holes completed to date. These holes are primarily testing the Inferred resource areas in the central to northern domains at Isolation South. The initial drilling has successfully established that the coal seams of the Mist Mountain Formation are largely continuous over the pit shell area identified during the Scoping Study. This delivers significant potential for the Inferred resource areas that were excluded from the Scoping Study mine plan to be upgraded in classification and incorporated into the PFS mine schedule.

Atrum Chief Executive Officer, Andrew Caruso, commented: *"The coal intersections from the first half of the 2020 RAB drilling program are highly encouraging. In particular, the results deliver enhanced confidence towards achieving our target of significantly upgrading classification of the Inferred resource component at Isolation South. We look forward to completing the RAB program in 3Q 2020 and, alongside large diameter core drilling for further coal quality testing, this work underpinning a targeted Isolation South resource update during 4Q 2020."*

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## Drilling progressing strongly

The RAB drilling program commenced in late May 2020 with two purpose-built drilling rigs making rapid progress. The first 60 holes of a total 115-hole program have been completed for approximately 11,000 metres of drilling to date in the 2020 program.

The RAB drilling has initially prioritised the areas within the Scoping Study pit shell currently classified as Inferred resources; these areas are primarily located in the northern and central domains of Isolation South. Some infill drilling in the southern domains has also commenced.

## Initial RAB results

The initial results of the RAB program have been excellent with total apparent coal thicknesses averaging 32 metres per hole drilled. This is in-line with expectations for those areas of the deposit in which the holes were drilled. The coal intersections were also shallow, with starting depth being as little as 3m below surface.

The 2020 drilling to date has established that the coal seams of the Mist Mountain Formation are largely continuous over the pit shell area identified during the Scoping Study. Total apparent coal thicknesses per hole and starting depths for 57 holes are shown in Figure 1 and Appendix A (three holes are still to be geophysically logged).

### *Northern Area*

The initial drilling continues to yield good results in the northern area with total apparent coal thicknesses in boreholes typically close to the 32m average. Current drilling sees the coal seams in two main packages with good seam continuity between holes. Seam 3 is developing a thick package overall, with the interburden distance to Seam 4 decreasing to almost coalesce with the base of Seam 3.

Drilling progressed eastward up onto the North 1 domain, which is also referred to as the Table Top due to the flat topography on the top of the ridge. All holes intersected coal near expected depths, although several holes near the top of the ridge indicated some faulting.

### *Central Area*

The Central 2 domain contains a valley feature associated with Manystick Creek. Some or all of the seams were previously suspected to have been eroded through the valley, and in the previous resource estimate, an area of Seams 3 and 4 were excluded due to suspected erosion in the valley.

The recent drilling in this area has indicated the presence of more coal relative to previous models, and most holes have encountered thick sequences of Seams 3 and 4 from shallow depths. The coal seams are quite disturbed, with evidence of structural thickening and thrust repeats evident in the wireline logs.

Despite being structurally complex, drilling in the Central 2 domain has demonstrated thick coal seams at shallow depths that can be considered for quick access to early coal when developing the mining sequence for the upcoming PFS.

### *Southern Area*

Continuation of RAB drilling in the southern areas (South 1, 2 and 3 domains) tested the central to southern parts of the area known as the dip slope. This included in-filling some existing gaps and structurally complex areas, as well as testing the Inferred resource areas towards the ridgeline. The drilling results were generally within expected ranges based on the 2019 exploration, with total coal thicknesses often varying based on the variability exhibited in the Seam 3 group of coal seams.

Seams 1 and 2 remain very consistent and unaffected by faulting, while Seams 3 and 4 are affected by structural thickening or thrust faulting in many holes. The structure observed in some recent holes shows repeated sections of boreholes that have been overthrust, while boreholes in the upper part of the ridge (South 3 domain) typically show thinner Seam 3 intersections, primarily as the result of faulting.

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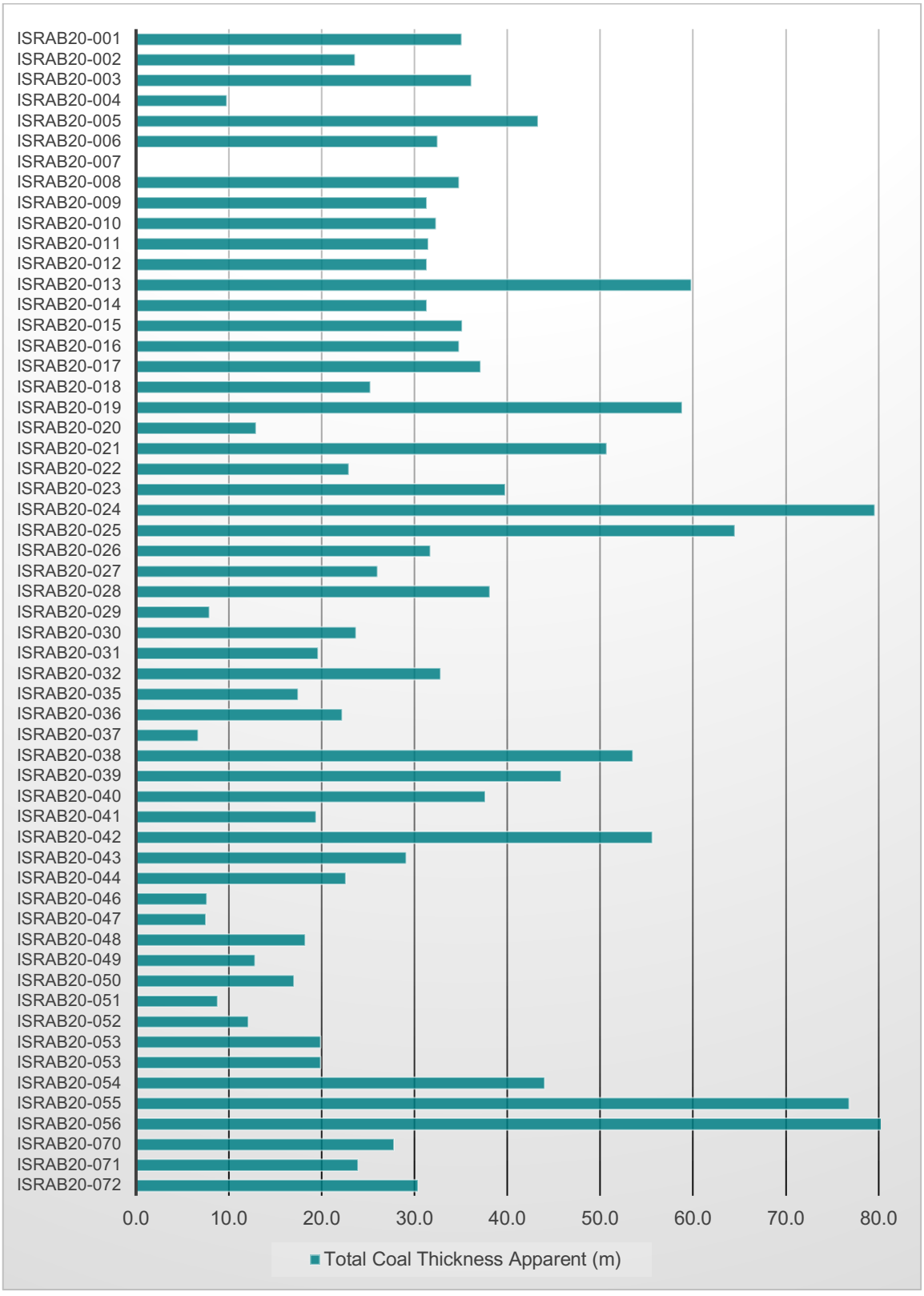


**Figure 1: Total apparent coal thicknesses (57 of the first 60 holes completed)**

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## Coring program

The drilling of LDC holes has also commenced, with two LDC rigs now operating on site. The LDC holes drilled have currently been targeting the southern domains, which was the primary focus of RAB drilling in 2019.

Six LDC holes have been successfully completed to date (ISLD20-004 to 009), with good core recoveries obtained. Coal cores from the first four LDC holes have been sampled and submitted to GWIL Birtley in Calgary for commencement of detailed coal quality, washability and clean coal laboratory testwork.

The planned coring program in 2020 consists of 32 LDC holes for the collection and sampling of 6" diameter drill core for coal quality and washability testing. The locations and spacing of the LDC program is designed to improve and demonstrate confidence in coal quality characteristics over the Scoping Study pit shell area, targeting upgrading of Inferred resource areas to Indicated or Measured resource classification.

The LDC program aims to demonstrate continuity of coal quality characteristics over the Isolation South area. It is set to feed into CHPP design, determination of practical processing yield, product specification and optimisation for the PFS.

Stage 1 of the LDC program consists of 22 holes with most located within the currently Inferred resource areas in the central to northern domains of Isolation South. It is expected to be completed, along with the subsequent coal quality testwork, in order to allow for incorporation into a targeted 4Q 2020 resource update for the Elan Project.

Two fully cored HQ hydrogeological holes have also been drilled to date in the 2020 program. These are for assessment and monitoring of groundwater aquifers, while HQ coal core samples with sufficient core recovery are also being sampled and submitted for coal quality testing. Vibrating wire piezometers (VWPs) are being installed for the measurement of pore water pressures.

The locations of completed RAB, LDC and hydrogeology holes are shown in Figures 2 and 3. An indicative borehole profile section is shown in Figure 4.

## Conclusions and next steps

The 2020 RAB drilling program is progressing well. The preliminary results have been successful in demonstrating the continuity of target coal seams in Inferred resource areas of Isolation South that were excluded from the mine schedule in the Elan Project Scoping Study, in accordance with the current ASX/ASIC regulatory framework (see Atrum ASX release dated 16 April 2020, *Elan Project Scoping Study*)[1].

The entire 115-hole RAB drilling program and Stage 1 of the LDC program (22 LDC holes of the 32-hole program) are planned to be completed prior to an interim Elan Project resource update targeted for 4Q 2020.

This week, an airborne LiDAR (Light Detection and Ranging) survey is being flown in order to provide improved confidence in the topography for detailed mine planning.

A shallow 2D seismic survey consisting of 15 line-kilometers is planned between August and September. This is set to assist in the interpretation of structural features, including thrust faults that result in stacking and the structurally thickened coal zones observed in some areas.

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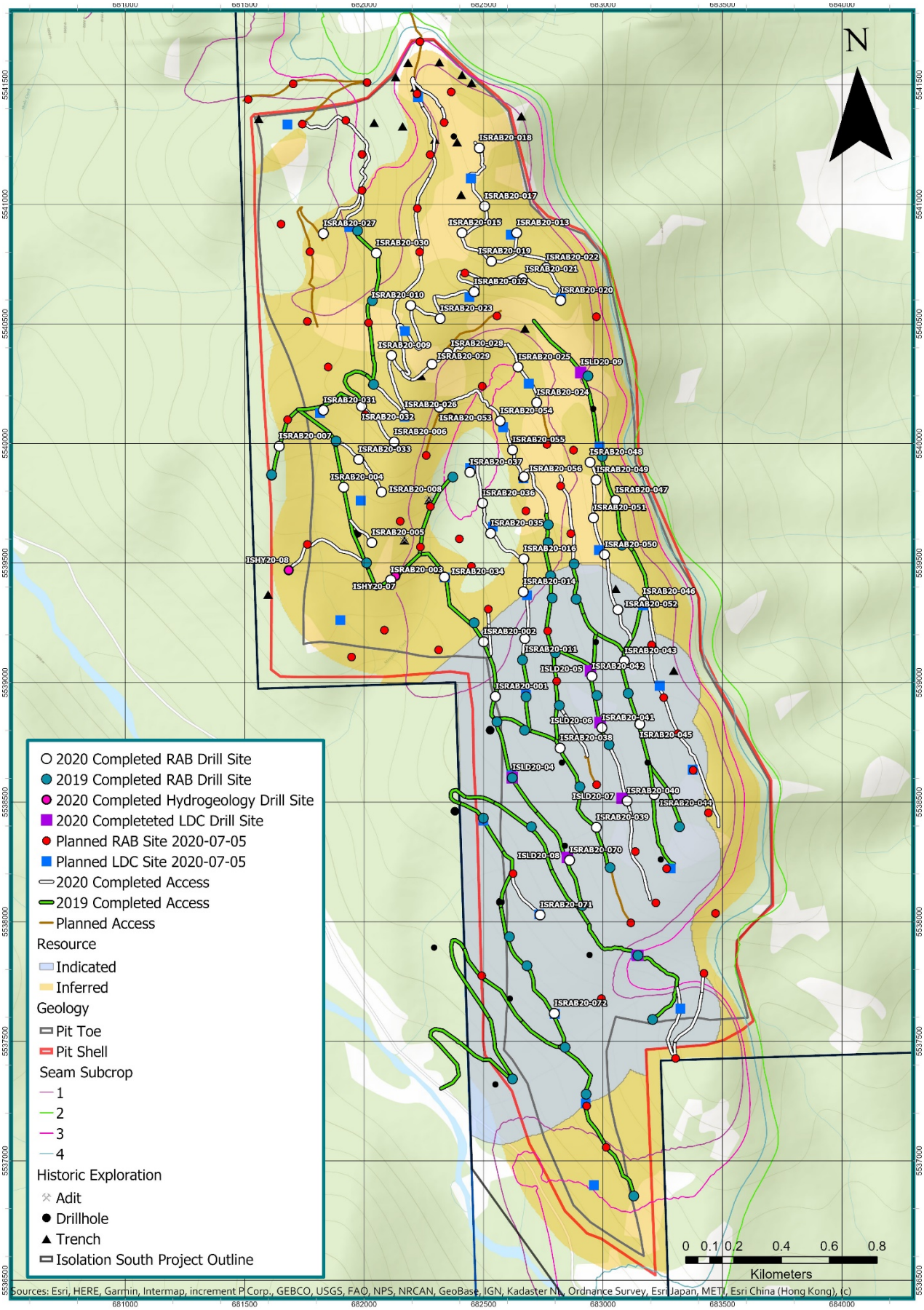


**Figure 2: Location of 2020 RAB, LDC and HQ holes – completed and planned**

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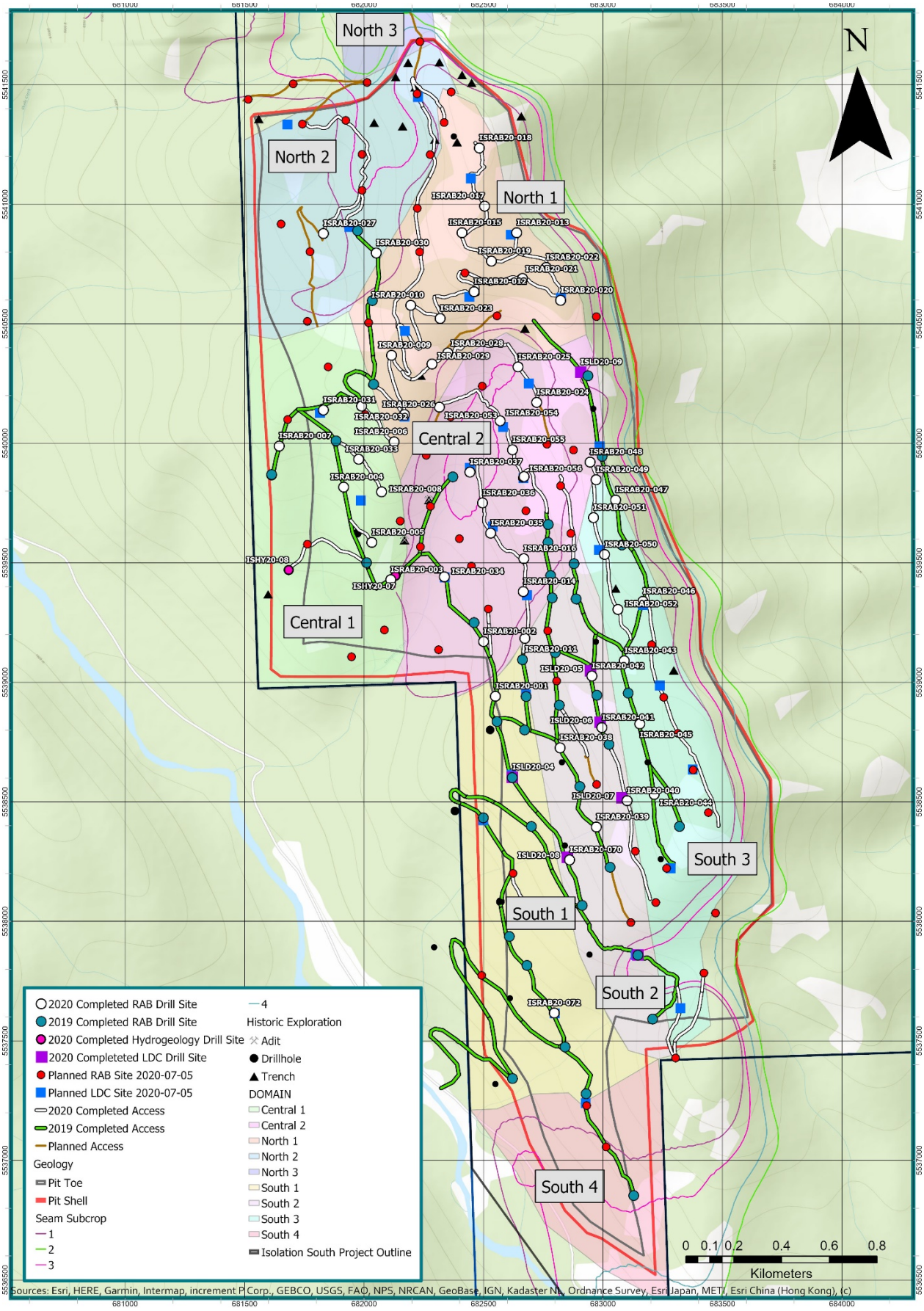


**Figure 3: Location of 2020 RAB, LDC and HQ holes with geological domains**

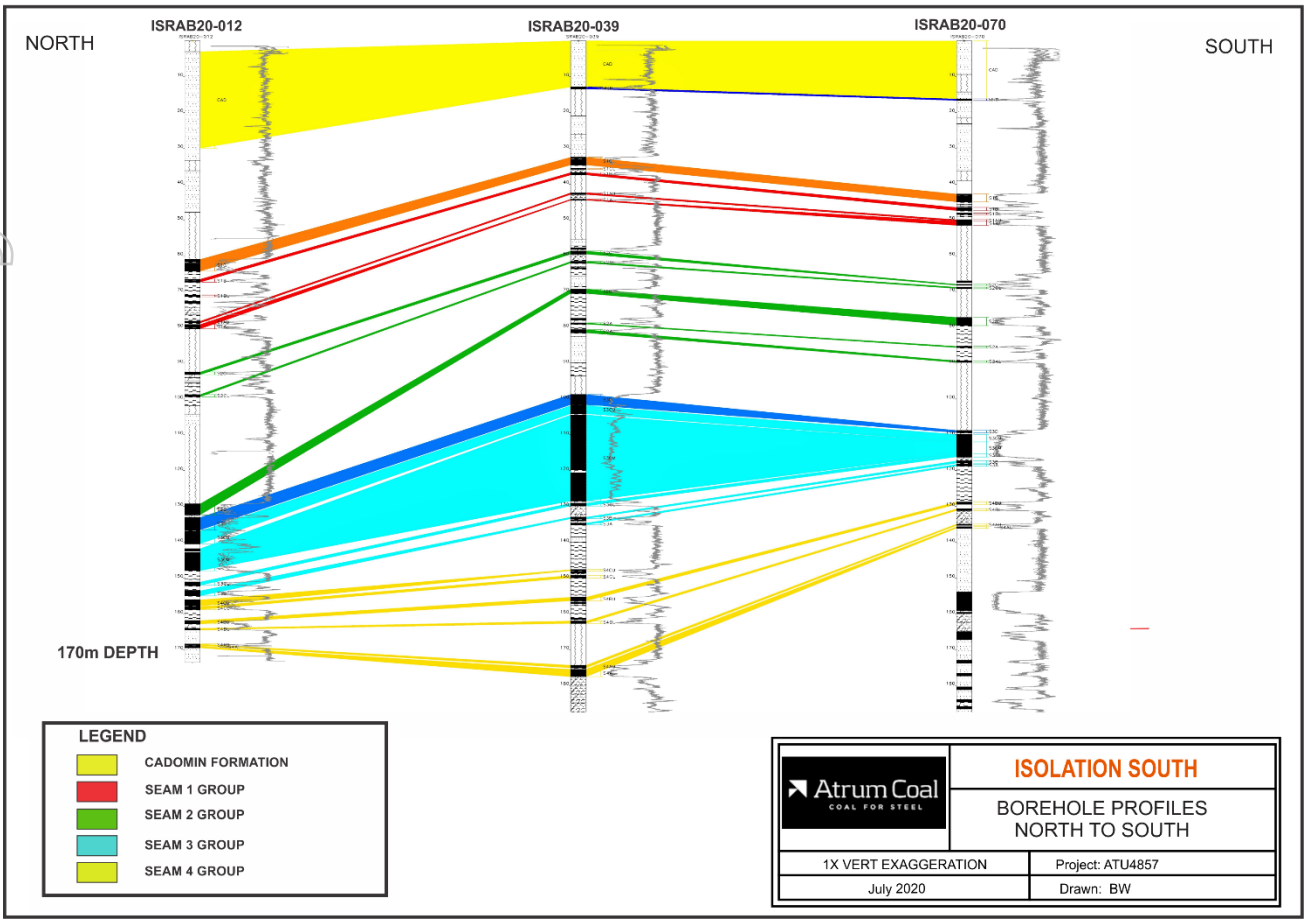


**Figure 4: Borehole profile section of select 2020 RAB drill holes**

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**This ASX release was authorised on behalf of the Atrum Coal Board by:**

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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 resource estimate of 454Mt (142Mt Indicated and 312Mt Inferred). Comprehensive coal quality testing from the 2018 and 2019 exploration programs, combined with review of substantial historical testwork data for the broader Elan Project, has confirmed Tier 1 HCC quality.

Elan 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. It shares its southern boundary with Riversdale Resources' Grassy Mountain Project, which is in the final permitting stage for a 4.5 Mtpa (saleable) open-cut HCC operation. Around 30km to the west, Teck Resources operates four mines (the Elk Valley complex) producing approximately 25Mtpa of premium HCC for the seaborne market.

Atrum completed a Scoping Study in April 2020 which demonstrated the strong technical and economic viability of development of the Elan Project.

[1] For full Scoping Study and resource details refer to Atrum ASX release dated 16 April 2020, *Elan Project Scoping Study*. Atrum confirms that all material assumptions underpinning the production target and forecast financial information within the Scoping Study, and the resource estimate outlined above, continue to apply and have not materially changed.

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## APPENDIX A: DRILLING RESULTS

**RAB hole details and total apparent coal thickness**

| Drillhole ID | Drill Type | Easting | Northing | Elevation | Total Depth | Azimuth | Dip | Total Coal Thickness Apparent (m) | Start Depth of Coal (m) |
|---|---|---|---|---|---|---|---|---|---|
| **ISRAB20-001** | RAB | 682,550 | 5,538,942 | 1,843 | 163.6 | 0 | -90 | 35.1 | 17.3 |
| **ISRAB20-002** | RAB | 682,499 | 5,539,170 | 1,821 | 89.2 | 0 | -90 | 23.6 | 3.9 |
| **ISRAB20-003** | RAB | 682,111 | 5,539,429 | 1,813 | 176.2 | 0 | -90 | 36.1 | 10.7 |
| **ISRAB20-004** | RAB | 681,915 | 5,539,817 | 1,903 | 236.4 | 0 | -90 | 9.8 | 216.0 |
| **ISRAB20-005** | RAB | 682,033 | 5,539,586 | 2,036 | 293.6 | 0 | -90 | 43.3 | 94.3 |
| **ISRAB20-006** | RAB | 682,136 | 5,540,003 | 1,994 | 266.8 | 0 | -90 | 32.5 | 44.1 |
| **ISRAB20-007** | RAB | 681,640 | 5,540,001 | 1,940 | 335.3 | 0 | -90 | 0 | - |
| **ISRAB20-008** | RAB | 682,073 | 5,539,797 | 1,945 | 197.5 | 0 | -90 | 34.8 | 54.9 |
| **ISRAB20-009** | RAB | 682,115 | 5,540,368 | 2,074 | 177.2 | 0 | -90 | 31.3 | 40.8 |
| **ISRAB20-010** | RAB | 682,195 | 5,540,578 | 2,158 | 196.0 | 0 | -90 | 32.3 | 46.5 |
| **ISRAB20-011** | RAB | 682,673 | 5,539,184 | 1,913 | 135.2 | 0 | -90 | 31.5 | 16.1 |
| **ISRAB20-012** | RAB | 682,460 | 5,540,635 | 2,201 | 173.6 | 0 | -90 | 31.3 | 61.0 |
| **ISRAB20-013** | RAB | 682,639 | 5,540,881 | 2,252 | 204.9 | 0 | -90 | 59.8 | 58.0 |
| **ISRAB20-014** | RAB | 682,675 | 5,539,367 | 1,910 | 143.9 | 0 | -90 | 31.3 | 41.7 |
| **ISRAB20-015** | RAB | 682,410 | 5,540,882 | 2,264 | 183.5 | 0 | -90 | 35.1 | 64.0 |
| **ISRAB20-016** | RAB | 682,637 | 5,539,510 | 1,899 | 137.6 | 0 | -90 | 34.8 | 4.0 |
| **ISRAB20-017** | RAB | 682,504 | 5,540,992 | 2,280 | 213.2 | 0 | -90 | 37.1 | 68.7 |
| **ISRAB20-018** | RAB | 682,482 | 5,541,236 | 2,314 | 213.0 | 0 | -90 | 25.3 | 109.0 |
| **ISRAB20-019** | RAB | 682,533 | 5,540,762 | 2,245 | 212.1 | 0 | -90 | 58.8 | 55.1 |
| **ISRAB20-020** | RAB | 682,823 | 5,540,598 | 2,237 | 218.9 | 0 | -90 | 12.9 | 50.2 |
| **ISRAB20-021** | RAB | 682,637 | 5,540,668 | 2,223 | 210.9 | 0 | -90 | 50.7 | 48.4 |
| **ISRAB20-022** | RAB | 682,747 | 5,540,751 | 2,244 | 216.2 | 0 | -90 | 22.9 | 48.2 |
| **ISRAB20-023** | RAB | 682,319 | 5,540,522 | 2,175 | 213.2 | 0 | -90 | 39.8 | 50.6 |
| **ISRAB20-024** | RAB | 682,722 | 5,540,171 | 2,045 | 209.0 | 0 | -90 | 79.6 | 36.6 |
| **ISRAB20-025** | RAB | 682,644 | 5,540,319 | 2,049 | 128.1 | 0 | -90 | 64.5 | 2.9 |
| **ISRAB20-026** | RAB | 682,169 | 5,540,120 | 2,038 | 175.0 | 0 | -90 | 31.7 | 34.0 |
| **ISRAB20-027** | RAB | 681,838 | 5,540,907 | 2,002 | 160.3 | 0 | -90 | 26.0 | 6.5 |
| **ISRAB20-028** | RAB | 682,471 | 5,540,415 | 2,096 | 183.1 | 0 | -90 | 38.1 | 8.6 |
| **ISRAB20-029** | RAB | 682,285 | 5,540,331 | 2,089 | 61.7 | 0 | -90 | 7.9 | 5.4 |
| **ISRAB20-030** | RAB | 682,051 | 5,540,796 | 2,070 | 92.1 | 0 | -90 | 23.7 | 17.2 |
| **ISRAB20-031** | RAB | 681,810 | 5,540,152 | 1,979 | 296.8 | 65 | -60 | 19.6 | 154.1 |
| **ISRAB20-032** | RAB | 681,989 | 5,540,156 | 2,014 | 228.6 | 0 | -90 | 33.8 | 63.8 |
| **ISRAB20-032** | RAB | 681,989 | 5,540,156 | 2,014 | 228.6 | 0 | -90 | 32.8 | 63.8 |
| **ISRAB20-033*** | RAB | 681,977 | 5,539,933 | 2,039 | TBC | 0 | -90 | TBC | TBC |
| **ISRAB20-035** | RAB | 682,530 | 5,539,624 | 1,897 | 87.5 | 0 | -90 | 17.4 | 14.1 |
| **ISRAB20-036** | RAB | 682,495 | 5,539,750 | 1,899 | 204.7 | 0 | -90 | 22.2 | 12.3 |
| **ISRAB20-037** | RAB | 682,443 | 5,539,880 | 1,899 | 133.0 | 0 | -90 | 6.7 | 11.0 |

| Drillhole ID | Drill Type | Easting | Northing | Elevation | Total Depth | Azimuth | Dip | Total Coal Thickness Apparent (m) | Start Depth of Coal (m) |
|---|---|---|---|---|---|---|---|---|---|
| **ISRAB20-038** | RAB | 682,809 | 5,538,716 | 1,911 | 228.5 | 0 | -90 | 53.5 | 42.3 |
| **ISRAB20-039** | RAB | 682,972 | 5,538,394 | 1,904 | 206.6 | 0 | -90 | 45.8 | 32.5 |
| **ISRAB20-040** | RAB | 683,101 | 5,538,504 | 1,977 | 191.2 | 0 | -90 | 37.6 | 37.8 |
| **ISRAB20-041** | RAB | 682,995 | 5,538,811 | 1,976 | 160.3 | 0 | -90 | 19.4 | 42.9 |
| **ISRAB20-042** | RAB | 682,953 | 5,539,026 | 1,990 | 181.6 | 0 | -90 | 55.6 | 42.6 |
| **ISRAB20-043** | RAB | 683,089 | 5,539,091 | 2,042 | 169.9 | 0 | -90 | 29.1 | 37.0 |
| **ISRAB20-044** | RAB | 683,215 | 5,538,532 | 2,028 | 185.9 | 0 | -90 | 22.6 | 36.0 |
| **ISRAB20-045*** | RAB | 683,154 | 5,538,826 | 2,042 | 200.0 | 0 | -90 | TBC | TBC |
| **ISRAB20-046** | RAB | 683,162 | 5,539,329 | 2,076 | 124.0 | 0 | -90 | 7.6 | 55.2 |
| **ISRAB20-047** | RAB | 683,052 | 5,539,763 | 2,110 | 133.9 | 0 | -90 | 7.5 | 56.6 |
| **ISRAB20-048** | RAB | 682,946 | 5,539,922 | 2,094 | 123.4 | 0 | -90 | 18.2 | 5.8 |
| **ISRAB20-049** | RAB | 682,954 | 5,539,839 | 2,101 | 153.5 | 0 | -90 | 12.8 | 88.0 |
| **ISRAB20-050** | RAB | 682,997 | 5,539,542 | 2,083 | 157.8 | 0 | -90 | 17.0 | 34.5 |
| **ISRAB20-051** | RAB | 682,958 | 5,539,731 | 2,094 | 156.1 | 0 | -90 | 8.8 | 32.9 |
| **ISRAB20-052** | RAB | 683,025 | 5,539,362 | 2,066 | 154.1 | 0 | -90 | 12.1 | 32.7 |
| **ISRAB20-053** | RAB | 682,315 | 5,540,152 | 2,012 | 179.5 | 0 | -90 | 19.9 | 9.2 |
| **ISRAB20-053** | RAB | 682,315 | 5,540,152 | 2,012 | 179.5 | 0 | -90 | 19.9 | 9.2 |
| **ISRAB20-054** | RAB | 682,570 | 5,540,094 | 1,991 | 201.0 | 0 | -90 | 44.0 | 7.3 |
| **ISRAB20-055** | RAB | 682,621 | 5,539,973 | 1,989 | 201.0 | 0 | -90 | 76.8 | 3.0 |
| **ISRAB20-056** | RAB | 682,669 | 5,539,861 | 1,977 | 200.2 | 0 | -90 | 80.6 | 12.2 |
| **ISRAB20-070** | RAB | 682,858 | 5,538,257 | 1,859 | 191.5 | 0 | -90 | 27.8 | 42.8 |
| **ISRAB20-071** | RAB | 682,763 | 5,538,031 | 1,803 | 239.9 | 0 | -90 | 23.9 | 43.6 |
| **ISRAB20-072** | RAB | 682,795 | 5,537,617 | 1,687 | 209.1 | 0 | -90 | 30.4 | 10.7 |

* ISRAB20-033 and 045 are yet to be geophysically logged

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# APPENDIX B: JORC TABLES

## Competent Persons Statement

***Exploration Results***

The information in this document that relates to Exploration Results for the 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.*<br>▪ *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*<br>▪ *Aspects of the determination of mineralisation that are Material to the Public Report.* | ▪ Nine cored drillholes have been completed 2020 at Isolation South for the collection of large diameter (LD) samples which are logged and sampled for coal quality testwork<br>▪ Sampling has been undertaken on LD (150mm or 6" diameter) cored holes, as well as HQ core samples from hydrogeology holes<br>▪ Samples are taken on ply intervals and are manually composited in the laboratory after results for raw light transmittance (LT) ash, ARD and IM are received from grab samples<br>▪ Atrum Coal provides the instructions to the laboratory for manually compositing individual ply samples<br>▪ In order to ensure representivity, coal seams sampled with <80% linear core recovery are not tested at the laboratory<br>▪ From the 60 RAB holes completed to date in the 2020 program, open cut cuttings have been sampled at 1m depth intervals. These samples are not intended to be used 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).* | ▪ Four LD holes were completed in February 2020 and an additional nine holes drilled between June and July 2020<br>▪ The LD cored holes are drilled with PDC or tungsten bits and use double tube core barrels (triple tube core barrels with LD core are uncommon in Canada)<br>▪ The LD holes were geophysically logged to total depth in the open hole, with seam and sample intervals adjusted to the geophysical log depths (where necessary)<br>▪ The 60 RAB completed in 2020 are percussion (rotary air blast) boreholes with a 4 1/2" diameter hammer drill bit<br>▪ All of the boreholes completed in 2020 were geophysically logged to total depth in the open hole, or through HQ drill pipe in the event of severe hold instability |
| *Drill sample recovery* | ▪ *Method of recording and assessing core and chip sample recoveries and results assessed.*<br>▪ *Measures taken to maximise sample recovery and ensure representative nature of the samples.*<br>▪ *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.* | ▪ The LD cored boreholes were geophysically logged and cored seam intervals have compared to the geophysical log data<br>▪ Core recoveries are recorded and cumulative tallies kept. Achieving consistently high core recoveries can be difficult due to the fractured and friable nature of the coal seams<br>▪ The LD coring programs at Elan have generally achieved better core recoveries than PQ or HQ cores, and appears to be a more suitable coring technique for this type of coal<br>▪ Core recoveries were recorded and cumulative tallies kept. |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | | Any samples from seams with less than 80% linear recovery (relative to geophysical log depths) are not tested by the laboratory<br>▪ Cored boreholes were geophysically logged to ensure recovered core lengths are representative of the full seam |
| *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.*<br>▪ *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.*<br>▪ *The total length and percentage of the relevant intersections logged.* | ▪ Core samples were logged in detail including lithology, brightness, sedimentary features and defects<br>▪ Boreholes were geophysically logged with downhole tools including long and short spaced density, caliper and gamma, sonic, deviation and dipmeter<br>▪ The seam intervals in RAB holes have been determined from the geophysical log signatures |
| *Sub-sampling techniques and sample preparation* | ▪ *If core, whether cut or sawn and whether quarter, half or all core taken.*<br>▪ *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*<br>▪ *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*<br>▪ *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*<br>▪ *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.*<br>▪ *Whether sample sizes are appropriate to the grain size of the material being sampled.* | ▪ All core sampled is sent to the testing lab (no slabbing or splitting of core is undertaken)<br>▪ The LD cores are subject to drop shatter testing, sizing analysis and subjected to float sink testing by size fraction (31.5mm x 1mm, 1.0mm x 0.25mm and -0.25mm), with raw coal analysis being undertaken after completion of the initial drop shatter and dry sizing.<br>▪ Clean coal composites are typically prepared at selected cut-points for each size fraction as directed by Atrum Coal, for detailed coal quality and carbonisation testing.<br>▪ Carbonisation samples are generally seam blend composites, with varying proportions of each seam group, as directed by Atrum Coal<br>▪ The LD core provides a much better representation of size fractions relative to smaller diameter core samples and is preferred for coal preparation design |
| *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.*<br>▪ *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.*<br>▪ *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.* | ▪ Analytical testwork (raw, washability and initial clean coal testing) undertaken by nationally accredited laboratory GWIL Birtley of Calgary, generally to ASTM standards. The lab participates in International Canadian Coal Laboratories Round Robin series (CANSPEX) and test results are consistently ranked in preferred groupings.<br>▪ The Competent Person undertook a site visit and tour of the GWIL Birtley laboratory in 2018<br>▪ Drop shatter, sizing analysis and float sink testing is undertaken on LD samples according to testing protocols designed by Atrum Coal<br>▪ Clean coal composites are prepared by Birtley and forwarded to COALTECH Petrographic Associates, USA (for clean coal characterisation tests)<br>▪ Blended products are designed by Atrum and prepared by Birtley for delivery to two world-class coal carbonisation laboratories in Europe; DMT Coal Coke Group (Germany) and INCAR (Spain) |
| *Verification of sampling and assaying* | ▪ *The verification of significant intersections by either independent or alternative company personnel.*<br>▪ *The use of twinned holes.*<br>▪ *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*<br>▪ *Discuss any adjustment to assay data.* | ▪ Geological data is collected in line with Atrum Coal's exploration procedures and guidelines<br>▪ Sample interval depths are as measured by the field geologist (drillers depths), and adjusted to align with geophysical log depths, while measured sample interval thicknesses are retained<br>▪ GWIL Birtley undertakes preliminary checks of assay data using regression analysis, and the data is checked by Atrum Coal and Palaris geologists<br>▪ All data has been encoded, collated and cross checked by Atrum Coal, and later by Palaris<br>▪ Twinning of existing rotary air blast (RAB) holes is used for targeted coring of coal seams in the LD cored holes. The twinned cored holes are also geophysically logged<br>▪ Reported results in this announcement have not been adjusted in any way, shape or form |

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|---|---|---|
| *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.*<br>▪ *Specification of the grid system used.*<br>▪ *Quality and adequacy of topographic control.* | ▪ The collar locations of the LD boreholes have been surveyed using DGPS (Trimble)<br>▪ The co-ordinate system is UTM projected grid NAD83 Zone 11N<br>▪ The topographical surface is sourced from a LiDAR survey and has a reasonable correlation with borehole collars (a new LiDAR survey is being flown)<br>▪ RAB hole collars and borehole details are provided in Appendix A of this announcement |
| *Data spacing and distribution* | ▪ *Data spacing for reporting of Exploration Results.*<br>▪ *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.*<br>▪ *Whether sample compositing has been applied.* | ▪ RAB hole density has been increased to a typical spacing of 100 – 200 metres between holes in most areas<br>▪ The nine LD holes drilled are located on the dip slope area of Isolation South, located north of Oldman River and are typically spaced at approximately 250m apart<br>▪ Resource classification and estimation will be revisited at the end of this year's drilling program<br>▪ Sample compositing (into seam intervals) is generally manually undertaken in the laboratory after instructions are provided by Atrum Coal.<br>▪ Additional compositing is undertaken in Minex software and requires 80% linear recovery as specified in the Minex BHDB settings, while composite values are mass weighted using both thickness and true RD as weighting variables |
| *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.*<br>▪ *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 nine LD holes completed in 2020 have been drilled vertically, twinning existing vertical RAB holes<br>▪ The RAB holes completed in 2020 are all vertical, except for one hole inclined at 65 degrees towards the east (azimuth 75) as shown in Appendix 1<br>▪ Electronic deviation data from each hole is 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<br>▪ 3D representation is relatively good with the 2020 infill program, and will improve with ongoing infill drilling and the 2D seismic program to be undertaken |
| *Sample security* | ▪ *The measures taken to ensure sample security.* | ▪ The LD core is photographed, sampled, labelled and bagged before being submitted to the testing laboratories<br>▪ Samples have a unique sample number that is provided on tags in the bag, outside the bag and in separate digital and hard copy sample advice. Each item of advice lists project name, borehole, top and base of sample and sample number<br>▪ The laboratory records provided include sample identification numbers and weighed sample mass<br>▪ All measures are taken to ensure sample security represents best practice by industry standards |
| *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<br>▪ Processing consultants Sedgman have reviewed and provided input into the sizing and washability components of the testing program |

**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.*<br>▪ *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)<br>▪ The Property falls within the Rocky Mountain Forest Reserve, which is managed by the Alberta Government<br>▪ An Exploration Permit for Isolation South was granted to Atrum Coal by the Alberta Energy Regulator (AER) covering exploration activities undertaken in February 2020 (as |

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| | | 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.<br>▪ Exploration activities included bulldozer assisted trenching, establishment of access roads, numerous adits and 19 HQ size fully cored holes for a total of 3,286m of coring.<br>▪ 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<br>▪ 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<br>▪ 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:*<br>o *easting and northing of the drill hole collar*<br>o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*<br>o *dip and azimuth of the hole*<br>o *down hole length and interception depth*<br>o *hole length.* | ▪ This information is provided for all RAB completed in 2020 at Isolation South, in Appendix 1 of this ASX announcement |
| *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.*<br>▪ *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.*<br>▪ *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<br>▪ No coal quality results are presented in this announcement |
| *Relationship between mineralisation widths and intercept lengths* | ▪ *These relationships are particularly important in the reporting of Exploration Results.*<br>▪ *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.*<br>▪ *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 results tabulated in this announcement are apparent thicknesses as recorded in vertical drill holes and may be different to the true thickness of the seams<br>▪ Seam dips are generally moderate (25 degrees) at Isolation South<br>▪ More work will need to be undertaken to determine true seam thickness; this will be addressed through use of borehole deviation survey data, seismic survey, and updated structural interpretation / fault modelling<br>▪ |
| *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.* | ▪ Previous ASX announcements have provided progressive updates on Exploration Results and Coal Resources at Isolation South<br>▪ Borehole locations plans are provided along with drill hole locations from the 2020 program<br>▪ Work has commenced on updating geological models incorporating the recent drilling results |

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| *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, the coal quality results include all clean coal composites tested at Isolation South in 2020<br>▪ To ensure balance reporting of Exploration Results, Appendix 1 includes the results for all RAB holes drilled at Isolation South in 2020 |
| *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.* | ▪ A 2D seismic survey is planned for August – September 2020<br>▪ Previous ASX announcements have provided progressive updates on Exploration Results and Coal Resources at Isolation South<br>▪ Atrum Coal geologists have undertaken a significant surface mapping program in 2019, collecting data points from outcrops of the Cadomin Formation and coal seams of the Mist Mountain Formation |
| *Further work* | ▪ *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).*<br>▪ *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.* | ▪ A further 55 RAB holes are planned to be completed as part of the current 115-hole program<br>▪ The drilling of LD cored holes will be continued as part of the current exploration program, with 32 LD holes to be completed at Isolation South in 2020<br>▪ A 2D seismic survey is planned for August – September 2020<br>▪ Cored boreholes will be a main priority in 2020 to support geotechnical, coal quality and washability requirements to support the planned PFS<br>▪ Palaris continues with the interpretation of data and updating 3D geological models of Isolation South, with an update to the resource estimate planned for Q4 2020. |

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