

# Lochinvar North Exploration Target

ASX Release | 15 April 2019

## HIGHLIGHTS

- An Exploration Licence, Conditional Mining Licence and Option Agreement (“Lochinvar North Licence”) were granted to NAE on 8 April 2019 by The Coal Authority over an area of 66.5 km<sup>2</sup> adjoining and to the north and east of the existing Lochinvar Licence.
- Localised coal mining occurred within the Lochinvar North Licence from the mid-1800’s to the early 1920’s in the eastern part of the coalfield, where the coal seams are exposed at the surface.
- 4 boreholes drilled by the National Coal Board (“NCB”) in the 1950’s intersected the Nine Foot and/or Six Foot Coking Coal seams within the Lochinvar North Licence.
- Based on these NCB borehole Intersections, the Nine Foot Seam has an average thickness of 4.1m and the Six Foot Seam has an average thickness of 1.8m within the Lochinvar North Licence. These intersections show a thickening of the coal seams, when compared to the adjacent Lochinvar Licence to the west and southwest.
- Coal sampling results on these NCB borehole intersections demonstrate coking coal properties consistent with the coking coal quality recorded in drilling by NAE in the adjacent Lochinvar licence.
- Exploration data from NAE’s adjacent Lochinvar Licence, combined with National Coal Board borehole data and seismic data obtained in the Lochinvar North Licence area have provided the basis for an Exploration Target over the Lochinvar North Licence.
- An Exploration Target<sup>1</sup> of 77-142 Mt of coking coal has been determined for the newly granted Lochinvar North Licence using a minimum seam thickness of 1.2m and a maximum depth of cover of 1,000m
- Lochinvar North has the potential to extend the Lochinvar resource, reduce the depth to first coal from surface therefore reducing the length and capital cost of the decline, increase mining production rate and increase mine life for the total Lochinvar project.
- A work program initially aimed at defining a Coal Resource from Lochinvar North from existing historic drilling and geological data has been planned.

***NAE Executive Director, Joshua Wellisch, commented: “We are very pleased with the outcome of the review done by the highly experienced consultants at Palaris. The results underpin the expectations we have of the northern licence and highlight the overall value of securing the tenure. We look forward to progressing the whole of Lochinvar to the next stage and unlocking the value for shareholders.”***

<sup>1</sup> ***The potential quantity and quality of the Exploration Targets 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.***

# Lochinvar North Exploration Target

## LICENCE DETAILS

An Exploration Licence, Conditional Mining Licence and Option Agreement (“Lochinvar North Licence”) were granted to NAE on 8 April 2019 by The Coal Authority over an area of 66.5 km<sup>2</sup> adjoining and to the north and east of the existing Lochinvar Licence. (Figure 1).

## HISTORICAL EXPLORATION

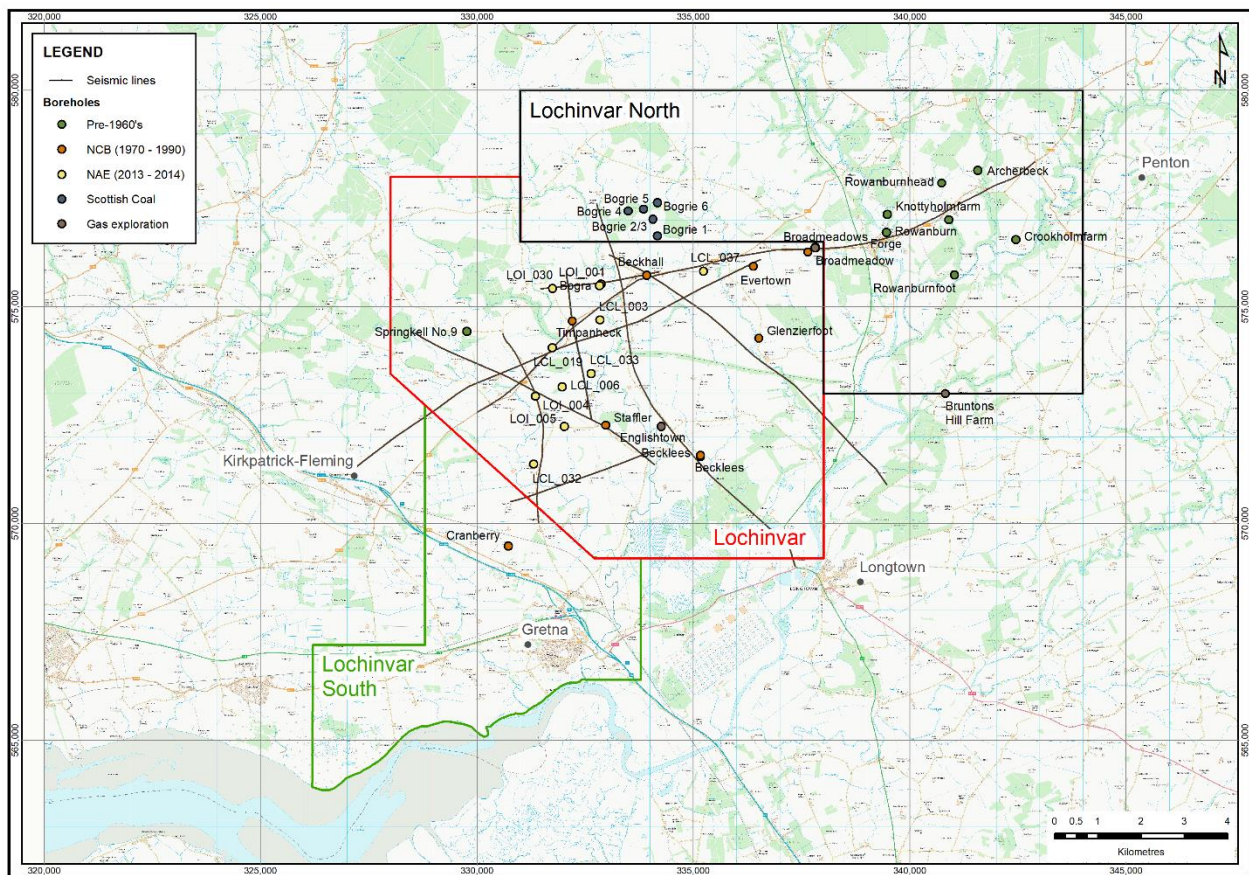


Figure 1 NAE Lochinvar Licence Areas and Borehole Collar Locations<sup>2</sup>

## Historical Mining

Localised coal mining occurred within the Lochinvar North Licence from the mid-1800’s to the early 1920’s in the eastern part of the coalfield in the Canonbie and Rowanburn area, where the coal seams are exposed near the surface.

<sup>2</sup> The Lochinvar South Licence initial 5-year term ends on 10 April 2019 and the licence is currently in the process of being renewed.

## National Coal Board 1950's Drilling

Four of the five boreholes drilled by the National Coal Board in the 1950's within the Lochinvar North Licence area intersected the Nine Foot Seam and/or the Six Foot Seam within the Middle Coal Measures (Rowanburnfoot, Knottyholm, Crookholm Farm and Woodhouselees). The locations of these holes are shown in Figure 1. Lithological logs are available for all these holes and some have also been geophysically logged. As shown in Table 1, these data confirm the continuity of the Nine Foot Seam and other coal seams within the Middle Coal Measures within the Lochinvar North Licence.

**Table 1 Lochinvar North Historical BoreHole Intercepts**

Bore	Seam	Depth roof	Depth floor	Thickness
Knottyholm Farm	Six Foot	445.31	446.84	1.53
	Nine Foot	470.41	474.12	3.71
Crookholm Farm	Six Foot	427.02	428.5	1.48
	Nine Foot	448.54	453.00	4.46
Rowanburnfoot	Six Foot	550.44	552.75	2.31
	Nine Foot	573.9	577.95	4.05
Woodhouselees <sup>3</sup>	Six Foot	901.36	903.21	1.85
	Nine Foot	Faulted Out?		

Based on these NCB borehole Intersections, the Nine Foot Seam has an average thickness of 4.1m and the Six Foot Seam has an average thickness of 1.8m within the Lochinvar North Licence. These intersections show a thickening of the coal seams, when compared to the adjacent Lochinvar Licence to the west and southwest.

Coal sampling results on the NCB borehole intersections demonstrate coking coal properties consistent with the coking coal quality recorded in drilling by NAE in the adjacent Lochinvar licence.

## National Coal Board (1970's-1980's) Drilling

A number of coal exploration boreholes were drilled by the National Coal Board in the Lochinvar licence area between 1979 and 1983. Geological logs, coal analysis and downhole geophysical logs are available for the majority of these holes.

## Seismic Surveys

British Coal undertook seismic surveys between 1980 and 1983 and The Oil Company undertook further seismic surveys during 1986-87 over the coalfield. The majority of seismic lines are located on the Lochinvar Licence however one line extends across the Lochinvar North Licence. Reprocessing and interpretation of this seismic data has been undertaken by seismic consultants engaged by NAE.

## Bogrie Holes

Scottish Coal drilled a series of holes north of the Lochinvar Licence ("Bogrie holes"). While the location of these holes has been confirmed, detailed lithological information from these holes is scant. However, the information available suggests that coal seams of similar thickness to those encountered at the northern part of Lochinvar, persist into Lochinvar North. As such, this may provide an opportunity for shallower

<sup>3</sup> Substantial faulting below the Six Foot seam in Woodhouselees borehole

underground access to first coal and reduce the length and capital cost of the decline required for the Lochinvar project.

## EXPLORATION TARGET

Exploration data from NAE's adjacent Lochinvar property, combined with National Coal Board borehole data and seismic data obtained in the Lochinvar North Licence area have provided the basis for an Exploration Target over the Lochinvar North Licence.

An **Exploration Target for the Lochinvar North Licence ranging from 77-172 million tonnes** has been estimated in the Nine Foot and/or Six Foot Seams to a maximum depth of 1,000m and minimum thickness of 1.2 m (see Table 2). The lower end of the exploration target range includes the Nine Foot Seam only with a 10% discount for faulting. The upper end of the exploration target includes the Nine Foot Seam and the Six Foot Seam with a 10% discount for faulting. The location of the areas within Lochinvar North comprising the Exploration Target are shown in Figure 2.

The Exploration Target is based on extrapolation of the geological model of target coal seams in the Lochinvar Project. The Exploration Target has been reported in accordance with the JORC Code (2012) and has been independently estimated by Palaris Australia Pty Ltd, an internationally recognised mining consultancy specialising in coal exploration and mining.

**Table 2 Lochinvar North Exploration Target**

Description	Tonnage Range (Mt)
Nine Foot Seam Only	77-104 Mt
Nine Foot Seam plus Six Foot Seam	105 -142 Mt
Lochinvar North Licence Exploration Target	77-142 Mt

*The potential quantity and quality of the Exploration Targets 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.*

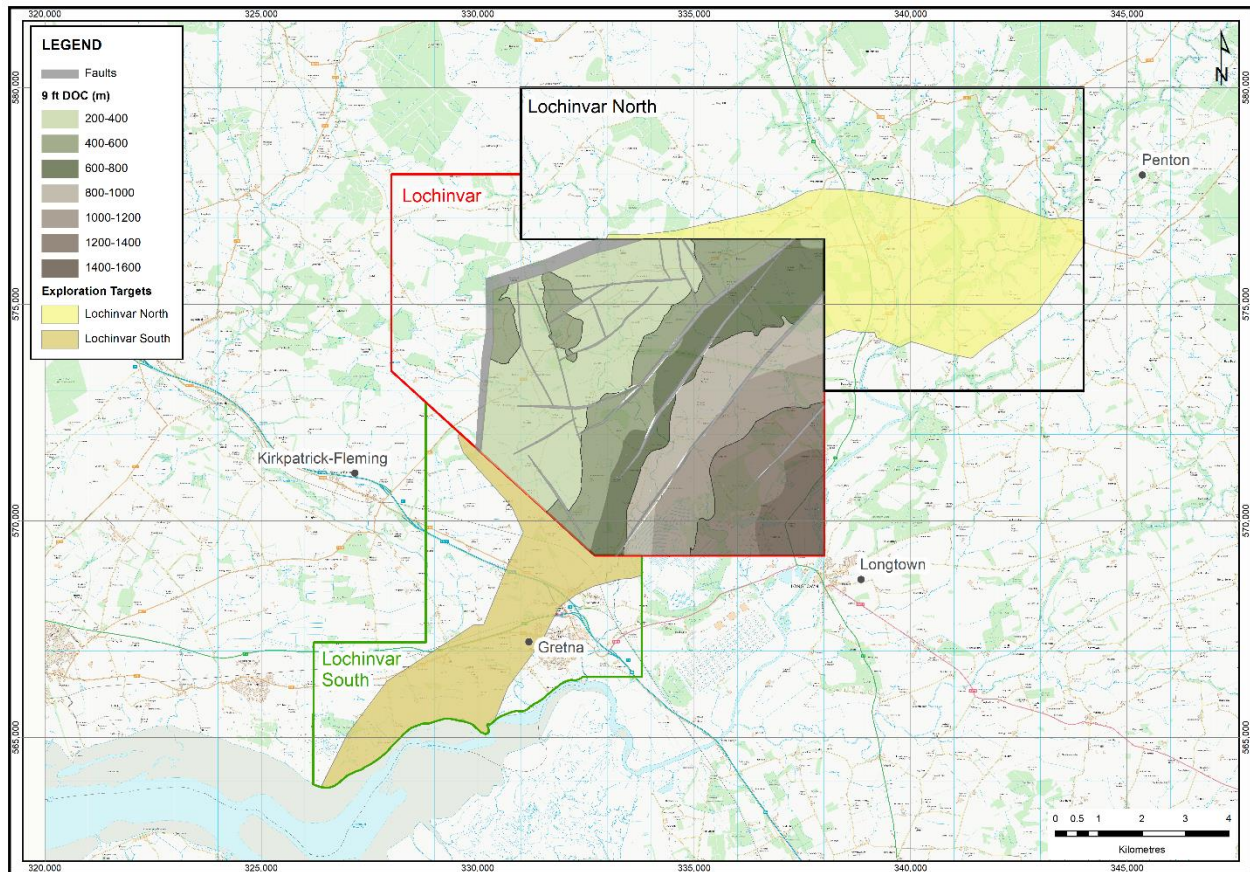


Figure 2 - NAE Lochinvar Licences and Exploration Targets

## WORK PROGRAM

An initial 12 to 24 month work program has been developed for the Lochinvar North Licence Area. The key aim of this work program will be to define a JORC compliant Resource to an Inferred and Indicated status – similar to that which NAE has already defined over the Lochinvar Licence.

The primary task for the first year will be a data collation, assessment, and interpretation of the Lochinvar North Licence area. NAE will utilise its understanding the northern area of the Solway basin to complete a re-interpretation of the region. This will include:

- Data collation and review
- Geological mapping
- Review and interpretation of historic Seismic lines
- JORC Resource Update: With the existing information in Lochinvar North it is proposed to update the Lochinvar Resource estimate to include Lochinvar North. This will be subject to further validation of the existing data and research into previous works that may assist in defining a JORC compliant resource.

The estimated budget for completion of the Lochinvar North Work Program is included in Table 1.

**Table 3 Lochinvar North Work Program Cost Estimate (GBP)**

Activity	Cost Estimate (GBP)
<b>YEAR 1</b>	
Data Collation and Review	10,000
Geological Mapping	5,000
Seismic Assessment	10,000
Resource Update	7,500
Geological Management and Supervision	10,000
<b>Total – Year 1</b>	<b>42,500</b>

## SYNERGIES WITH LOCHINVAR

Lochinvar North has the potential to extend the Lochinvar resource, reduce the depth to first coal and therefore the capital cost of the decline, increase mining production rate and increase mine life for the total Lochinvar project.

## COMPETENT PERSON'S STATEMENT

The Exploration Target estimate is based on information compiled by Dr John Bamberry, who is a Member of the Australasian Institute of Geoscientists (Member No. 4090). Dr Bamberry is Principal Geologist with Palaris. He has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity he is undertaking to qualify as a Competent Person, as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Dr Bamberry has over 30 years' experience in exploration and mining of coal deposits.

Neither Dr Bamberry nor Palaris have a direct or indirect financial interest in, or association with New Age Exploration Ltd, the properties and tenements reviewed in this report, apart from standard contractual arrangements for the preparation of this report and other previous independent consulting work. In preparing this report, Palaris has been paid a fee for time expended based on standard hourly rates. The present and past arrangements for services rendered to New Age Exploration Ltd do not in any way compromise the independence of Palaris with respect to this review.

Dr Bamberry consents to the inclusion of the matters based in this ASX release on his information noted in the form and context in which it appears.

## FORWARD LOOKING STATEMENTS

This report contains "forward-looking information" that is based on the Company's expectations, estimates and forecasts as of the date on which the statements were made. This forward-looking information includes, among other things, statements with respect to the Company's business strategy, plans, objectives, performance, outlook, growth, cash flow, earnings per share and shareholder value, projections, targets and expectations, mineral reserves and resources, results of exploration and related expenses, property acquisitions, mine development, mine operations, drilling activity, sampling and other data, grade and recovery levels, future production, capital costs, expenditures for environmental matters, life of mine, completion dates, commodity prices and demand, and currency exchange rates. Generally, this forward-looking information can be identified by the use of forward-looking terminology such as "outlook", "anticipate", "project", "target", "likely", "believe", "estimate", "expect", "intend", "may", "would", "could", "should", "scheduled", "will", "plan", "forecast" and similar expressions. The forward-looking information is not factual but rather represents only expectations, estimates and/or forecasts about the future and therefore need to be read bearing in mind the risks and uncertainties concerning future events generally.

### **New Age Exploration Limited**

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**ASX: NAE**

## APPENDIX A

### JORC TABLE 1

#### CHECKLIST OF ASSESSMENT AND REPORTING CRITERIA

Table A.1 Sampling Techniques and Data

Criteria	Commentary
Sampling techniques	All coal seams at the Lochinvar North Project occur in the subsurface. Sampling was undertaken ply by ply sampling across whole or part intersections of coal seams. The coal analysis that is available are documented in National Coal Board reports.
Drilling techniques	Sampling of coal for analysis has been undertaken by use of conventional core drilling in holes 7.8 to 8.8 cm. Holes were drilled using open hole techniques (rotary rock-bit) down to a core point, and then cored until total depth.
Drill sample recovery	Linear core recovery is not noted on historical logs, but NCB coal analysis reports describe core recovery reported on a length by volume basis. Core losses from coal seams ranges from very poor to excellent recovery. Some attempts have been made to recovery recut sections of coal with whipstocks. Core recovery is reported as "always over 75%".
Logging	Detailed lithological logs are available for historical holes. The use of Scottish geological terms warrants some translation. Some historical holes were logged by Schlumberger "electrical logging" techniques, including temperature, resistivity, self-potential and gamma ray. These geophysical logs have not been sighted by the author.
Sub-sampling techniques and sample preparation	The coal was sampled by plies, with samples defined by lithological boundaries (that is; coal and stone sampling). Subdivision techniques undertaken are not documented in the laboratory reports for the historical drilling.
Quality of assay data and laboratory tests	Historical coal analysis was undertaken by the NCB. Original copies of coal analysis for the Knottyholmfarm and Rowanburnfoot boreholes have been located and record proximate analysis, float-sink analysis and clean coal composite tests. Hand-written coal quality data is available for Woodhouselees bore. Evidence in the reports on these boreholes suggest that the work was done to British Standards for coal analysis.
Verification of sampling and assaying	Coal seam intersections and the stratigraphy encountered in each borehole have been correlated and verified by various parties, including Palaris and NAE. Since the NCB boreholes intersect considerable depth, they have been used in geological studies of the area and, as such, the stratigraphy of boreholes is well established. In 2013, NAE twinned a historical borehole in the Lochinvar Licence area to validate the historical drilling.
Location of data points	Survey data for the Lochinvar North Project is recorded in the Ordnance Survey National Grid coordinate system which is the geographic grid reference used in Great Britain. Accuracy of historical borehole collars is unknown but are assumed to readily located by maps and records associated with the drilling.
Data spacing and distribution	Borehole data intersecting the coal sequence is in the order of 2.0 to 3.5 km spacing, and is mainly focused within areas where the coal is <1000m deep. The NCB drilling in the 1950's aimed to prove the existence of coal south of the Rowanburn Fault. The focus of later drilling was to the west, in the Lochinvar licence area, which now has boreholes at 0.5 to 1.5 km spacing.
Orientation of data in relation to geological structure	Seismic survey lines and exploration drilling have been used to interpret geological structure in the Lochinvar Project area, and adjacent Lochinvar North. Seismic lines were surveyed in NW-SE to SW-NE orientations, and as such, it is considered that major geological structures impacting the coal seams have been identified. Surface mapping near Canonbie and Rowanburn have identified major regional faults in that area.
Sample security	Specific sample security measures used by the NCB are not known or documented.
Audits or reviews	No evidence of review or audits of historical data is known to exist.



Table A.2 Reporting of Exploration Results

Criteria	Commentary																																									
<i>Mineral tenement and land tenure status</i>	<p>NAE have applied for the area referred to as Lochinvar North.</p> <p>NAE hold title to Coal Exploration Licence CA11/EXP/0515/N, covering the project area known as <i>Lochinvar</i>. NAE later acquired Coal Exploration Licence CA11/EXP/0545/N covering the project area known as <i>Lochinvar South</i>. Both tenements are wholly leased to NAE.</p>																																									
<i>Exploration done by other parties</i>	<p>The Lochinvar/Lochinvar North Project area has been explored for coal, oil and gas since the mid-1950s. Available data from 12 historical exploration boreholes has been utilised in combination with NAE data in the assessment of the tenements. Nine seismic lines totalling 64.15km have been collected over the Lochinvar/Lochinvar North Project area. The seismic data is a mix of dynamite sourced seismic lines acquired by British Coal between 1980 and 1983, and Vibroseis data collected by Lennox Oil Company between 1986 and 1987.</p> <p>The NAE licence area and area under application was overlapped by PEDL159 held by Dart Energy. The previous tenement holder, Greenpark Energy, drilled several wells in the PEDL that were located within the Lochinvar Project area. These wells included wells that twinned the Broadmeadows and Becklees bores. The Broadmeadows well was drilled close to the Lochinvar North licence area. Not all data is publicly available from these wells.</p>																																									
<i>Geology</i>	<p>The Canonbie Coalfield is located at the north-eastern end of the Solway Basin where NAE hold their exploration title. This basin complex contains Carboniferous-age deposits with a thickness of up to 8,000 metres. The target coal seams of the Lochinvar North Project occur in the Middle Coal Measures of the Upper Carboniferous Pennine Coal Measures. In the Canonbie Coalfield, the Solway Syncline is bounded in the north and east by faults, and to the south and west, by unconformity and poor development of coal seams.</p> <p>The Pennine Coal Measures are exposed at the surface to the north-east of the Lochinvar Coal Project, where they have been historically mined, and dip beneath the unconformable Permian-Triassic New Red Sandstone sediments (St Bees and Eden Shales Formations) to the south-west. Precise limits of the Canonbie Coalfield are poorly understood as the coalfield is concealed by the Permian-Triassic sediments.</p>																																									
<i>Drill hole Information</i>	<p>Boreholes utilised in the reporting of exploration results were drilled during the two exploration phases of the NCB (1950's, 1980's) and the drilling by NAE (2013-2014). Intersections of the key seams are shown below:</p> <table border="1"> <thead> <tr> <th>Bore</th> <th>Seam</th> <th>Depth roof</th> <th>Depth floor</th> <th>Thickness</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Knottyholm Farm</td> <td>Six Foot</td> <td>445.31</td> <td>446.84</td> <td>1.53</td> </tr> <tr> <td>Nine Foot</td> <td>470.41</td> <td>474.12</td> <td>3.71</td> </tr> <tr> <td rowspan="2">Crookholm Farm</td> <td>Six Foot</td> <td>427.02</td> <td>428.5</td> <td>1.48</td> </tr> <tr> <td>Nine Foot</td> <td>448.54</td> <td>453.00</td> <td>4.46</td> </tr> <tr> <td rowspan="2">Rowanburnfoot</td> <td>Six Foot</td> <td>550.44</td> <td>552.75</td> <td>2.31</td> </tr> <tr> <td>Nine Foot</td> <td>573.9</td> <td>577.95</td> <td>4.05</td> </tr> <tr> <td rowspan="2">Woodhouselees<sup>4</sup></td> <td>Six Foot</td> <td>901.36</td> <td>903.21</td> <td>1.85</td> </tr> <tr> <td>Nine Foot</td> <td colspan="2">Faulted Out?</td> <td></td> </tr> </tbody> </table>	Bore	Seam	Depth roof	Depth floor	Thickness	Knottyholm Farm	Six Foot	445.31	446.84	1.53	Nine Foot	470.41	474.12	3.71	Crookholm Farm	Six Foot	427.02	428.5	1.48	Nine Foot	448.54	453.00	4.46	Rowanburnfoot	Six Foot	550.44	552.75	2.31	Nine Foot	573.9	577.95	4.05	Woodhouselees <sup>4</sup>	Six Foot	901.36	903.21	1.85	Nine Foot	Faulted Out?		
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<i>Data aggregation methods</i>	Weight averaging techniques for data aggregation was done by weighing of quality parameters by length by density whereas density was weighted by length. CSN was weighted by length.																																									
<i>Relationship between mineralisation widths and intercept lengths</i>	Boreholes have been drilled vertically to intercept coal seams. Dip has been recorded on drill logs. The geological model takes into account the top and bottom intercepts of seams in the model and can be interrogated to provide true thickness. Boreholes entered into the geological model have been corrected for deviation where this data is available; however, only very basic deviation data has been collected on historical holes.																																									
<i>Diagrams</i>	Table of intercepts are provided in the Exploration Target report. Stratigraphic intersections are shown in graphic logs of the historical boreholes.																																									

<sup>4</sup> Substantial faulting below the Six Foot seam in Woodhouselees

<i>Balanced reporting</i>	<p>Average thickness of target seams intersected in boreholes are listed below:  Six Foot seam: 1.80 metres  Nine Foot seam: 4.1 metres</p> <p>The Nine Foot seam contains stone partings logged as “fireclay”; the thickness and continuity of the partings could not be established due to poor coal recovery in some bores, and the large distance between boreholes. It is expected that further drilling would enable correlation of partings, and establish continuity of minable sections of coal.</p>
<i>Other substantive exploration data</i>	<p>No other substantive exploration work has been undertaken in the coalfield.</p>
<i>Further work</i>	<p>No substantive exploration is currently planned.</p>