

**Public Garage Site
Fearn House Crescent
Hoyland**

Coal Mining Risk Assessment

On behalf of
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Document Control Sheet

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For and on behalf of Peter Vincent Design Ltd				

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1 Brief

1.1 Introduction

- 1.1.1 Peter Vincent Design Ltd (PVD) were appointed by Mr L Wardle of LTW Plumbing Heating and Electrical to prepare a coal mining risk assessment to support a developer proposal to construct a two storey detached dwelling on land currently occupied by public garages off Fearn House Crescent at Hoyland near Barnsley.
- 1.1.2 The proposed site is located in a development high risk area as designated by the Coal Authority.
- 1.1.3 The National Grid reference for the proposed site is E 436 503 N 400 322.
- 1.1.4 A copy of the site plan is appended at A.
- 1.1.5 The proposed site occupies an approximate area of 37m x 12m. The site also includes an access way from Fearn House Crescent.
- 1.1.6 No physical site inspection has been undertaken as part of this assessment.

1.2 Scope

- 1.2.1 This assessment has been carried out as a desk top study. Reference has been made to various web based maps and data. A Coal Mining report has been acquired from the Coal Authority.

2 Existing Topography

2.1 Source – Web based Aerial Images

- 2.1.1 The proposed site is located at an approximate elevation of 148m AOD.
- 2.1.2 The proposed site is located on sloping ground that dips approximately north to south at an indicative grade between 1 in 8 and 1 in 16.
- 2.1.3 The proposed site is located in an existing residential estate where properties bordering north-south aligned roads are constructed in terracing configurations to reflect the natural slope.
- 2.1.4 It appears the public garages on the site were demolished by 2002.

3 Historic OS Maps

3.1 General

- 3.1.1 A selection of historic OS maps published on the internet were inspected as part of this assessment.

3.2 1855 OS Map

- 3.2.1 The proposed site is located in what appears to be a field.
- 3.2.2 A sandstone quarry is shown approximately 90m to the south of the proposed site – next to a property called up as ‘Fearnleys’.

3.3 1893 OS Map

- 3.3.1 The site is located in what appears to be a field.
- 3.3.2 No reference is made to the sandstone quarry called up on the 1855 map.
- 3.3.3 The property called up as ‘Fearnleys’ now comprises a complex of buildings enclosing a courtyard.
- 3.3.4 The nearest boundary of a development called up as West Bank appears for the first time located some 60m north of the proposed site.
- 3.3.5 An air shaft is shown some 290m to the south east of the proposed site.

3.4 1905 OS Map

- 3.4.1 Minimal change is evident from the 1893 map.

3.5 1931 OS Map

- 3.5.1 Minimal change is evident from the 1905 map in the immediate area. General residential development is apparent in the wider district.

3.6 1956-57 OS Maps

- 3.6.1 General development is apparent some 80m to the east of the proposed site.

3.7 1968 OS Map

- 3.7.1 Fearn House Crescent and Springwood Road are shown around the proposed site with progressive residential development apparent along both streets.
- 3.7.2 The property previously called up as ‘Fearnleys’ is now shown as Fearnley Farm.

3.8 1970-79 OS Map

- 3.8.1 The proposed site is located in the modern day housing estate.
- 3.8.2 The public garages are shown within the proposed site.

- 3.8.3 The air shaft that first appeared on the 1893 map has disappeared and the general surrounds occupied by a residential estate. It appears an area of land close to the air shaft location was left undeveloped.

4 Coal Authority Mining Report

4.1 Report Reference 51002049272001

- 4.1.1 The report states the proposed site is located in a surface area that could be affected by underground mining in 8 seams of coal at 70m to 410m depth. The last workings within this sequence were completed in 1960.
- 4.1.2 The report advises residual ground movements associated with the worked seams identified at 4.1.1 should have stopped by now.
- 4.1.3 The report advises the proposed site is located in an area where coal is considered to be at or close to the ground surface. Such coal may have been worked in the past but no record would necessarily be made or kept of such workings. There is therefore a risk that unrecorded shallow coal workings may be present below the proposed site or within the immediate locality.
- 4.1.4 There are no planned or licenced future coal extractions to affect the general district – this includes both underground and opencast mining options.
- 4.1.5 No recorded mine entries (shafts/adits) are located within 20 metres of the proposed site.
- 4.1.6 The Coal Authority is not aware of any property damage associated with geological features (faults/joints/fissures) as a consequence of coal mining in the district.
- 4.1.7 The Coal Authority is not aware of any mine gas emissions in the locality that require action.
- 4.1.8 The proposed site has not been subject to remedial works by the Coal Authority under their emergency surface hazard call out procedure. It is understood this procedure has operated for approximately 25 years.
- 4.1.9 Reserves of coal exist within the local area that could potentially be worked in the future.
- 4.1.10 There have been three coal mining subsidence claims relating to separate residential properties within 50m of the proposed site.

5 Coal Authority Interactive Map

5.1 Source – Web Based Data

- 5.1.1 The interactive map indicates a coal seam outcrop is aligned through the proposed site.
- 5.1.2 The interactive map indicates a development high risk zone is aligned through the proposed site – matching the coal seam outcrop referenced at 5.1.1 above.
- 5.1.3 No probable shallow coal workings are shown to affect the proposed site.
- 5.1.4 A mine entry is shown close to the air shaft location identified on the historic OS maps.

6 BGS Map Data 1:50,000 Sheet 87 (1976 ed)

6.1 Source – Paper Map

- 6.1.1 The proposed site is shown to be located on Pennine Middle Coal Measures.
- 6.1.2 The proposed site is located on an outcrop of unnamed sandstone.
- 6.1.3 The Kent's Thin Coal is shown to outcrop some 40m to the south of the proposed site – the proposed site being located on the productive side of the coal seam.
- 6.1.4 The Kent's Thin Coal is shown to outcrop at the base of an unnamed sandstone unit – the same unit called up at 6.1.2 above.
- 6.1.5 The Wentworth Fault is shown to strike north west to south east and is aligned some 180m to the south west of the proposed site. The northern face of the fault is shown to downthrow some 70m.
- 6.1.6 The Barnsley seam is shown to outcrop south of the Wentworth Fault. The downthrow effect of the fault is construed to displace the Barnsley seam to greater depth below the proposed site.
- 6.1.7 Indicative strata dips of 5 degrees to the north east, are shown in the near locality.
- 6.1.8 A conjectured outcrop of unnamed sandstone is shown to the south of the proposed site but does not appear to extend to the sandstone quarry notated on the historic 1855 OS map – stopping some 85m short of the quarry location.

7 BGS Map Data 1:50,000 Sheet 87 (2008 ed)

7.1 Source – Paper Map

- 7.1.1 The proposed site is shown to be located on Pennine Middle Coal Measures.
- 7.1.2 The proposed site is located on coal measures strata called up generally as mudstones, siltstones and sandstones.
- 7.1.3 The Kent's Thin Coal is shown to outcrop some 100m to the north east of the proposed site – the proposed site being located on the barren side of the outcrop.
- 7.1.4 The Kent's Thin Coal is shown to outcrop at the base of an unnamed sandstone unit.
- 7.1.5 The Kent's Thin Coal is assigned a thickness of 0 to 1.9m.
- 7.1.6 The Wentworth Fault is shown to strike north west to south east and is aligned some 250m to the south west of the proposed site. The northern face of the fault is shown to downthrow some 70m.
- 7.1.7 The Barnsley seam is shown to outcrop south of the Wentworth Fault. The downthrow effect of the fault is construed to displace the Barnsley seam to greater depth below the proposed site.
- 7.1.8 Indicative strata dips of 5 degrees to the north east, are shown in the near locality.
- 7.1.9 An outcrop of unnamed sandstone is shown to the south of the proposed site but does not appear to extend fully to the sandstone quarry notated on the historic 1855 OS map.

8 BGS Map Data – Geology of GB Viewer

8.1 Source – Web Based Data

- 8.1.1 No borehole records are available for inspection within the immediate locality of the proposed site.
- 8.1.2 The general strata map aligns with the 2008 edition of sheet 87 in contrast to the 1976 edition in regard to the immediate vicinity of the proposed site.

9 Analysis

9.1 OS Map Data

- 9.1.1 Historic maps reveal no indication of shallow coal workings in the immediate locality.
- 9.1.2 A nearby mineral working (sandstone quarry) is shown on the 1855 OS map to the south of the proposed site.
- 9.1.3 The lack of apparent coal workings is not conclusive since crop workings may have been carried out prior to the production of OS maps.

9.2 BGS & Coal Authority Data

- 9.2.1 It appears the Coal Authority mining report and interactive map is based on the 1976 edition of BGS 1:50,000 sheet 87. This places the Kent's Thin Coal outcrop some 40m to the south of the proposed site. Such a configuration would result in the Kent's Thin coal being present below the proposed site (with the attendant risk of crop workings) at an estimated depth of 5-10m based on the elevation and strata dip data reviewed elsewhere in this assessment.
- 9.2.2 The 2008 edition of the BGS map differs from the earlier 1976 edition in that the Kent's Thin coal outcrop occurs to the north east of the proposed site. This would result in the Kent's Thin coal not being present below the proposed site and thus the risk of crop workings would be significantly reduced.
- 9.2.3 The 2008 edition of the BGS map calls up the Kent's Thin seam thickness between 0m and 1.9m. Potentially the thicker end of this band would represent a workable resource and thus the presence of the Kent's Thin seam below the site would create a risk of crop workings to the proposed development. Applying a standard multiplier of 10 x seam thickness this would present a risk of crown hole collapse from crop workings up to 20m depth. Potential mine entries (shafts/bell pits/adits) would also require consideration.
- 9.2.4 The two editions of the BGS map in common show the Kent's Thin Coal outcropping immediately below an unnamed sandstone unit. On this basis the presence of sandstone below the proposed site would provide a strong indication of the Kent's Thin Coal seam being present below the site. Conversely the presence of mudstone/siltstone/sandstone bandings would indicate the Kent's Thin Coal is absent and therefore the risk arising from crop workings becoming significantly reduced.

10 Conclusions & Recommendations

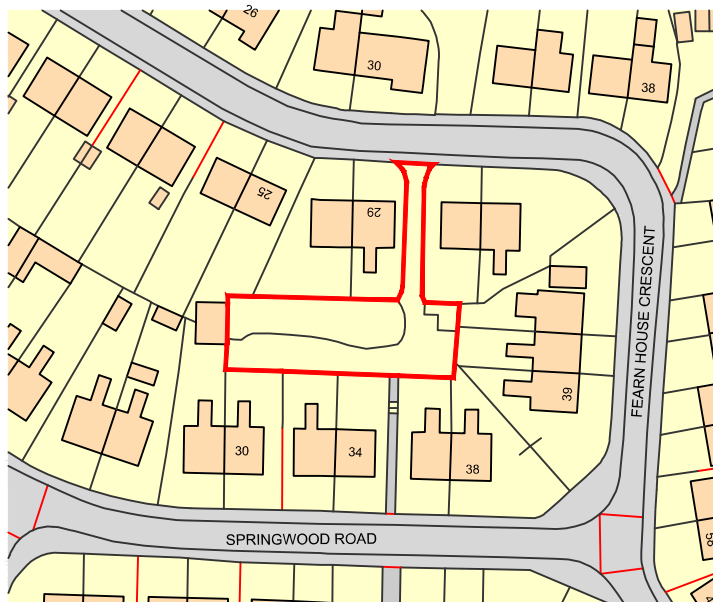
10.1 Conclusions

- 10.1.1 The presence of the Kent's Thin coal below the proposed site would constitute a potential risk to the intended development from crop workings.
- 10.1.2 Given the maximum potential seam thickness of 1.9m the risk from crop workings would arise from a seam depth of up to 20m.
- 10.1.3 The possible presence of abandoned mine entries (shafts/bell pits/adits) would need to be investigated if crop workings were proven below the proposed site.
- 10.1.4 The presence of thick sandstone below the site would provide a strong indication of Kent's Thin Coal being present below the site.
- 10.1.5 The presence of mudstone/siltstone/sandstone banding below the site would indicate Kent's Thin Coal is absent from below the site.

10.2 Recommendations

- 10.2.1 A shallow ground investigation should be commissioned involving machine dug trial pits to 3m depth to determine the underlying geology.
- 10.2.2 If sandstone is proven from these trial pits deeper investigations involving probe drilling or similar to 20m depth, should be commissioned to determine if coal workings are present. Such investigations would need to be licenced by the Coal Authority.
- 10.2.3 If coal workings are proven within 20m depth below the proposed site further investigations will be required to locate any mine entries within the development curtilage.
- 10.2.4 The presence of mining voids within 20m depth of the ground surface below the proposed site would require further design consideration to support safe development.
- 10.2.5 If the trial pits prove mudstone/siltstone/sandstone banding is present below the proposed site no further investigations will be necessary into the presence of crop workings below the proposed site.

Appendix A Site Location Plan



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Address: Public Garage Site,
Fearn House Crescent, Hoyland

The Client: Mr L Wardle

Drawing Title: Existing Location Plan

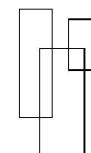
Drawing Scale: 1:1250 at A4

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