

SIMPSON MINING AND GEOTECHNICAL LTD

CONSULTING MINING & GEOTECHNICAL ENGINEERS

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**55 Westerlea Drive
Bridge of Allan
FK9 4DQ**

MINING RISK ASSESSMENT REPORT

FOR SITE AT

PARKHEAD FARM, HALLGLEN, FALKIRK

**Client : Mr Frank Barr
12 James Croft Drive
Glenburn Park
Falkirk
FK1 5UR**

Report No : 4058/IS

Engineer : W. Simpson

Issued : 09 February 2017

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3. SCOPE OF STUDY.

This report details the results of our investigations into the mining stability of the above site. Our report and conclusions has been based on a desk study. It is intended to construct three new dwelling houses within the site boundaries.

4. DESK STUDY.

The desk study comprised an examination and study of the following maps and publications.

1. The Geological Survey of Great Britain (Scotland), Stirlingshire, Sheet 30 NE, 1 : 10,560, 1921.
2. The British Geological Survey (Scotland), Geology for Land Use Planning, Falkirk-Grangemouth, Sheets NS 87 NE, 1 : 10,000, 1989.
3. The Economic Geology of the Central Coalfield of Scotland, Area 2, H.M.S.O., 1917.
4. Catalogue of Plans of Abandoned Mines, Volume 5 (Scotland), H.M.S.O. 1931.
5. The Coal Authority Interactive Maps.
6. Bores obtained from the British Geological Survey archives.

5. GEOLOGY.

The desk study revealed the site to be underlain by approximately 4 metres of boulder clay which rests in turn on rock strata of the Lower Coal Measures.

6. FAULTS.

A conjectural fault with a north-west to south-east trend, downthrowing the strata 55 metres to the north passes through the south-east corner of the site. Faults can cause problems in areas of active mining due to reactivation of the fault plane, followed by an increase in the magnitude of subsidence. The site area is no longer active with regards to mining and it is highly unlikely that deep mining will take place in the future. Consequently the presence of the fault need not be taken into account in the design of foundations.

7. SHAFTS AND ADITS.

There are no known shafts or adits within the site boundaries or influencing distances from them.

8. OPEN-CAST MINING.

No open-cast mining has taken place within 200 metres of the site boundaries and coals that exist beneath the site are too thin to open-cast. It is highly unlikely that a licence to open-cast coal within the site area or adjacent would be granted in the future.

9. REMEDIAL WORKS.

The Client has indicated that no remedial works have been carried out by the Coal Authority within the site boundaries or influencing distances from them.

10. PAST WORKING.

The desk study has revealed that no known minerals have been worked beneath the site.

11. GAS EMISSIONS.

Since no known minerals have been worked beneath the site migration of mine gases on to the site will not take place.

12. PRESENT.

No workings are at present taking place beneath the site.

13. FUTURE.

No coals of economic value lie beneath the site, and hence future deep mining beneath the site is considered to be highly unlikely.

14. MINING STABILITY ASPECTS AND FOUNDATION DESIGN.

As already discussed a conjectural fault runs through the site. To the north of the fault the strata dip at 2 degrees to the south, and to the south of the fault the strata dip at 6 degrees to the north.

AREA TO THE NORTH OF THE FAULT.

The general sequence of strata beneath point A is approximately as given below :-

BOULDER CLAY	4.00
STRATA	18.00
UPPER DRUMGRAY COAL (0.76)	18.76

(All measurements in metres)

The Upper Drumgray was worked to the north of the site, the workings terminating 100 metres to the north of the site. We were unable to locate any plans for the Upper Drumgray below the area of the site. However in the unlikely event of old, unrecorded workings in the Upper Drumgray beneath this area of the site, the thickness of the coal would indicate that it would almost certainly have been worked by the long wall method (see Appendix). The depth to the old workings, method of working and time that has elapsed since working ceased (circa 1860) will have ensured that all subsidence due to the working of this coal will have long since ceased. It is concluded that this area is stable with regards to old workings in the Upper Drumgray.

14. MINING STABILITY ASPECTS AND FOUNDATION DESIGN (cont).

The Upper Drumgray is the shallowest coal beneath the site. Other coals lie beneath the horizon of the Upper Drumgray but are deep enough to require no further consideration.

AREA TO THE SOUTH OF THE FAULT.

The general sequence of strata beneath point B is approximately as given below :-

BOULDER CLAY	4.00
STRATA	64.00
MILL COAL (0.46)	64.46

(All measurements in metres)

There are no records of the Mill Coal ever having been worked in this area of the Falkirk Coalfield. In the highly unlikely event of old, unrecorded workings having taken place in this coal beneath the site, the old workings would be deep enough to ensure stability. It is concluded that this area of the site is stable with regards to any old workings in this coal. The Mill Coal is the shallowest coal beneath this area of the site.

Several other coals lie beneath the horizon of the Mill Coal but are deep enough to require no further consideration.

15. CONCLUSIONS AND RECOMMENDATIONS.

- (1) The site has been classified as stable from a mining view point.
- (2) The presence of the conjectural fault need not be taken into account in the design of foundations.
- (3) There are no known shafts or adits within the site boundaries, or influencing distances from them.
- (4) A trial pit investigation will require to be carried out to ascertain the engineering properties of the superficial deposits. Thereafter the type of foundation can be specified.

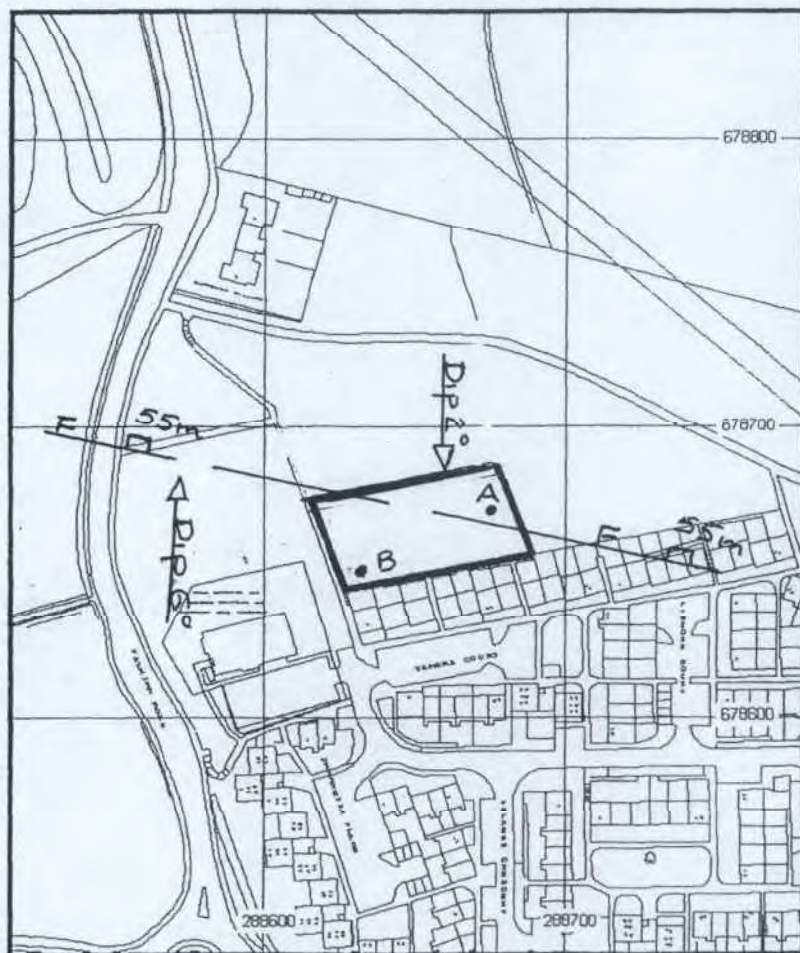


W SIMPSON B.Sc.(Mining), M.Sc., C. Eng., MICE, MIHT, F.G.S.

APPENDIX

APPENDIX 1

PLAN SHOWING SOLID GEOLOGY OF SITE AREA



SCALE 1:2500

F — — — — — F

F-F Conjectural Fault. Cross marks on down throw side

APPENDIX 2

METHODS OF MINING

METHODS OF MINING

Two methods of mining have been used in the past to extract minerals from stratified deposits, namely the stoop and room system, and the longwall system.

STOOP AND ROOM.

In this method, passage ways or rooms are driven, more or less at right angles to each other through the seam which is thus formed into square or rectangular blocks or stoops.

These stoops are formed in the "first" working, the workings being extended to the limit of the royalty. At the limit of the royalty, the stoops or part of the stoops are removed on retreating back to the shaft, this was some times referred to as the "second" working.

Depending on the depth to the mineral being extracted, thickness of mineral, and condition of the roof and floor, extraction rates of up to 80% could be achieved by this method.

The width of the rooms and pillars depended on depth to the mineral, thickness of mineral and condition of the roof and floor.

These stoops may continue to perform their function of supporting superincumbent strata for many years. However, depending on circumstances, the stoops can eventually fail causing subsidence and movement of the ground, and in the case of very shallow workings plump holes may be formed at the surface.

LONGWALL SYSTEM.

In this method the seam is completely extracted by means of dividing the seam into panels. The strata overlying the mined area is allowed to subside, and as a result all subsidence is normally completed shortly after the extraction of the seam.

However in the case where little or no rock cover exists over the workings instability could result due to the presence of old roadways remaining open.

APPENDIX 3

COAL AUTHORITY REPORT

Issued by:

The Coal Authority, Mining Reports Office, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire NG18 4RG
ON-Line Service: www.groundstability.com - Phone: 0845 762 6848 - DX 716176 MANSFIELD 5

FRANK BARR,
N/A,
12 JAMES CROFT DR,
GLENBURN PARK,
FALKIRK,
FALKIRK,
FK1 5UB

Person dealing with this matter:	Eric Fretwell
Our reference:	00042217-10
Your reference:	FARM
Electronic Ref:	EME_00014596180001_005
RRUID:	005.00014596180001
Date of your enquiry:	21 September 2010
Date we received your enquiry:	21 September 2010
Date of issue:	23 September 2010

This report is for the property described in the address below and the attached plan.

Coal Mining Report

Parkhead Farm, Hallglen, Falkirk, Stirlingshire

This report is based on and limited to the records held by the Coal Authority, at the time we answer the search.

Coal mining	Yes
-------------	-----

Information from the Coal Authority

Underground Coal Mining

Past

According to the records in our possession, the property is not within the zone of likely physical influence on the surface from past underground workings.

However the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

The property is not in an area for which a licence has been granted to remove coal using underground methods.

The property is not in an area that is likely to be affected at the surface from any planned future workings.

However reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

Coal-mining geology

The Authority is not aware of any evidence of damage arising due to geological faults or other lines of weakness that have been affected by coal mining.

Opencast Coal Mining

Past

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

Present

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

Coal-mining subsidence

The Coal Authority has not received a damage notice or claim for the property since 1 January 1984. There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

Withdrawal of Support

The property is not in an area for which a notice of entitlement to withdraw support has been published.

The property is not in an area for which a notice has been given under section 41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working Facilities Orders

The property is not in an area for which an Order has been made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

Payments to Owners of Former Copyhold Land

The property is not in an area for which a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Comments on Coal Authority information

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/ former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

Additional remarks

This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority Terms and Conditions 2006. The report is compliant with Home Information Pack and Home Report (Scotland) requirements.

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Issued by:	The Coal Authority, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG
Date:	23 Sep 2010
Coal and Brine Report at:	Parkhead Farm, Hallglen, Falkirk, Stirlingshire
Reference number:	00042217-10
Cost:	£64.00
Plus VAT:	£11.20
Total received:	£75.20
VAT registration number:	598 5850 68

Location map



Approximate
position
of property

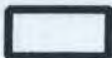


Enquiry boundary

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Key

Approximate position of enquiry boundary shown



APPENDIX 4

**BORES OBTAINED FROM THE ARCHIVES OF
THE BRITISH GEOLOGICAL SURVEY**

NS 87 NE / 25

SECTION OF

No 1 Bore

AT

Policy

Field S of Parkhead Steading 80 yds from
steading on road

Surface Level _____ O.D.

Communicated 1932 by Callendar Coal Co Ltd

Date of boring or sinking 1920 Borer J. Mann & Sons

One-inch Map _____ Six-inch Map (County and Half-Quarter Sheet) _____

	Thickness.			Depth from Surface.		
	Fathoms.	feet.	ins.	Fathoms.	feet.	ins.
Br cl & stones	3	5	-	3	5	-
Clay sa & gol		2	-	4	1	-
Dk B Cl		1	6	4	2	6
Soft bl & balls		3	6	5	0	0
Coal		1	3	5	1	3
Grey f & fel	2	-	9	7	1	0
soft dk. f		3	-	7	4	0
grey f	1	-	-	8	4	0
light py fel		2	-	9	0	0
hd int		1	-	9	1	-
Extra hd int		1	3	9	2	3
Broken int		3	9	10	-	-
soft dk bl		2	-	10	2	-
F & bl		1	9	10	3	9
dk f		3	-	10	11	-
broken bl w int ribs		4	-	11	2	-
Coal		5	-	11	2	5
p reb		2	-	11	2	7
Coal		4	-	11	2	11
dk fel		2	6	11	5	5
Grey f & fel		2	-	12	1	5
dk f		3	7	12	5	-
grey f	1	-	-	13	5	-
int	1	3	0	15	2	-
Extra hd int		8	-	15	2	8
int		4	4	16	1	-
dk py bl		2	6	16	4	6
dk f		1	6	17	-	-



SECTION OF

Six-inch Map (County and Quarter Sheet)

No 1 Policy
NS87NE/25

Thickness.

Depth from Surface.

Fathoms. feet. ins. Fathoms. feet. ins.

dk bl

srt

dk f

dk bl

coal

grey f

dk fel

coal

Faul coal

fel

coal

fel

Nd srt

py fel

Nd srt

grey f

hd srt

srt

grey f

hd srt

srt

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8

1 6

4

3

1 -

2

1 5

6

11

2

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1 -

10

2 -

1 5

1 2 -

1 1 1

2 -

1 1 -

1 6

2 -

2 2

17 - -

17 1 6

17 2 2

17 3 8

17 4 7

17 11 3

17 5 3

17 5 5

18 - 10

18 1 4

18 2 3

18 2 5

18 2 6

18 3 6

18 4 4

19 - 4

19 1 9

20 3 9

21 4 10

22 - 10

23 1 10

23 3 4

23 5 4

24 2 6

7 1 2

British
Geological Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

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[NS87NE BJ 25.]

SECTION OF

Policy N° 2

Six-inch Map (County and Quarter Sheet)

Steel, 30NE

42

NS 87NE/26 2₂

dk of bl & balls

srt

lk grey f

bl

Fuel coal

py fel

loam srt rib

f.

fel

Coal

f.

? Ball &

fel

coal

fel

coal

dk coaly fel

srt balls

srt extra fel

srt hard

srt hard

py srt

f.

srt, extra hd centroples

light fel

dk "

Coal

fel

Coal

srt f. rib

coal paul

coal clean

light fel

srt

Thickness.

Depth from Surface.

Fathoms. feet. ins.

Fathoms. feet. ins.

12 5 1

13 - 3 3

13 - 8

13 2 8

13 3 2

13 3 5

13 4 5

13 4 8

13 5 3

13 5 5

14 - 1 1/2

14 - 9

14 - 11

14 1 6 1/2

14 1 10

14 2 5

14 4 -

14 4 3

16 1 -

16 2 4

17 3 5

17 3 11

17 4 3

18 - 11

18 2 5

19 1 6

19 2 2

19 2 4

19 2 11

19 3 2

19 3 2

19 4 2

19 5 3

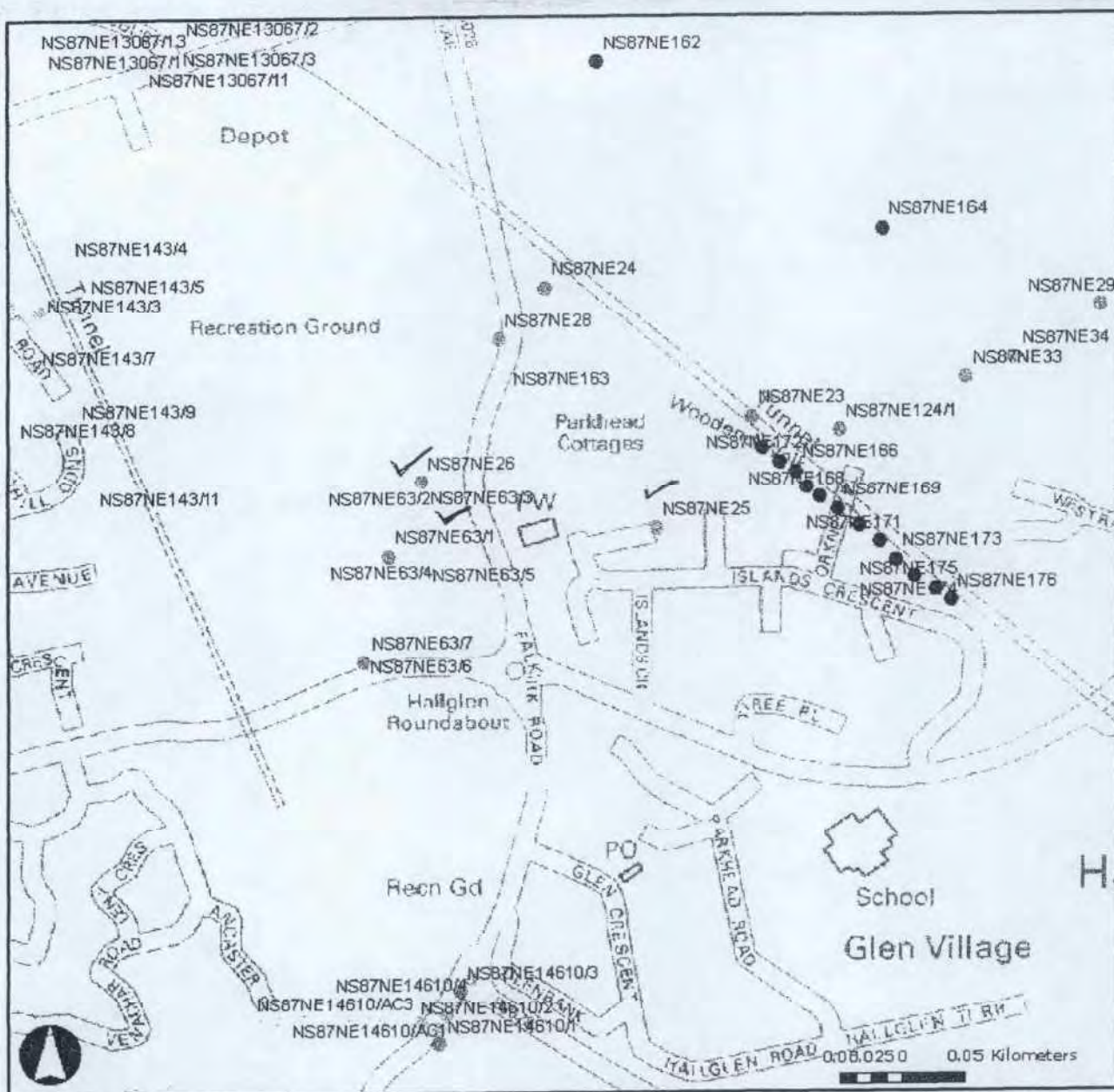
19 5 6

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[NS87NE BJ 26.]



Borehole records

- Confidential
- ⊙ 0 - 10m
- ⊠ 10 - 30m
- ⊗ 30m+

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