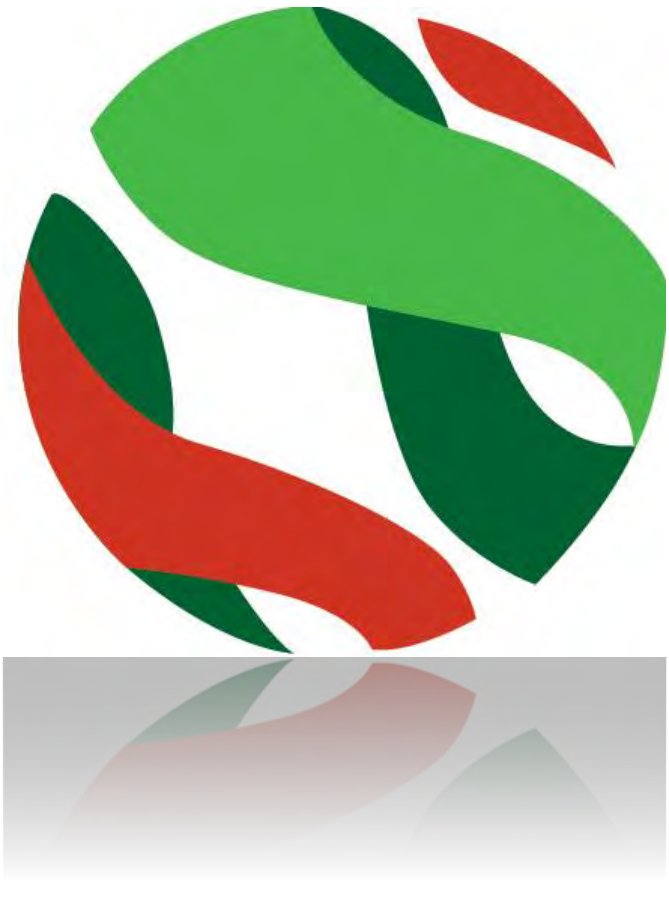
The Abergelli Power Gas Fired Generating Station Order

6.2 Environmental Statement Appendices - Volume H Ground Conditions Part Ib

Planning Act 2008
The Infrastructure Planning
(Applications: Prescribed Forms and Procedure) Regulations 2009

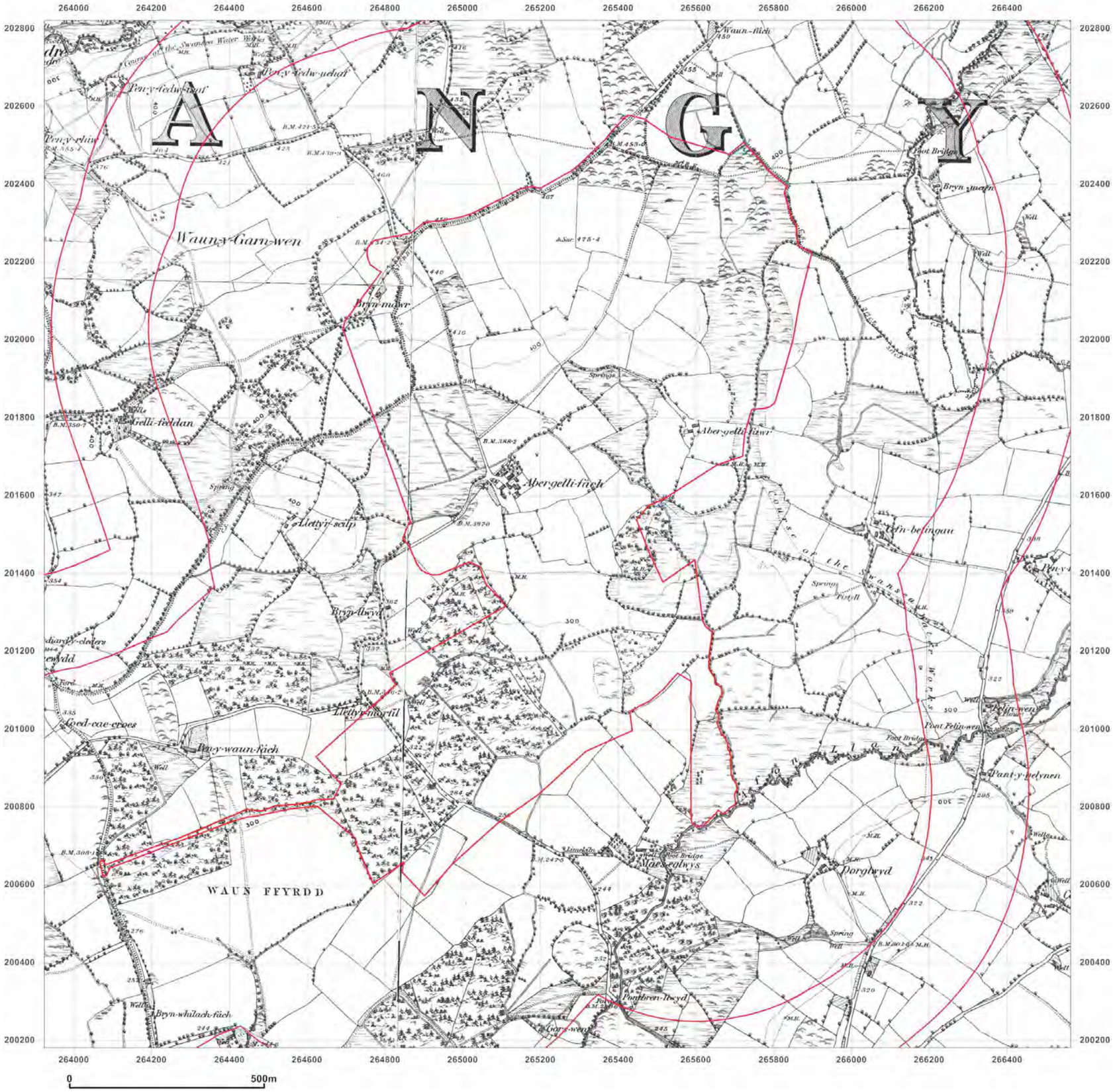
PINS Reference Number:	EN010069
Document Reference:	6.2
Regulation Number:	5(2)(a) & Infrastructure Planning (Environmental Impact Assessment) Regulations 2009
Author:	AECOM

Revision	Date	Description
0	May 2018	Submission Version



Appendix 10.1

Preliminary Geo-Environmental Risk Assessment
Part Ib



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1876-1878**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

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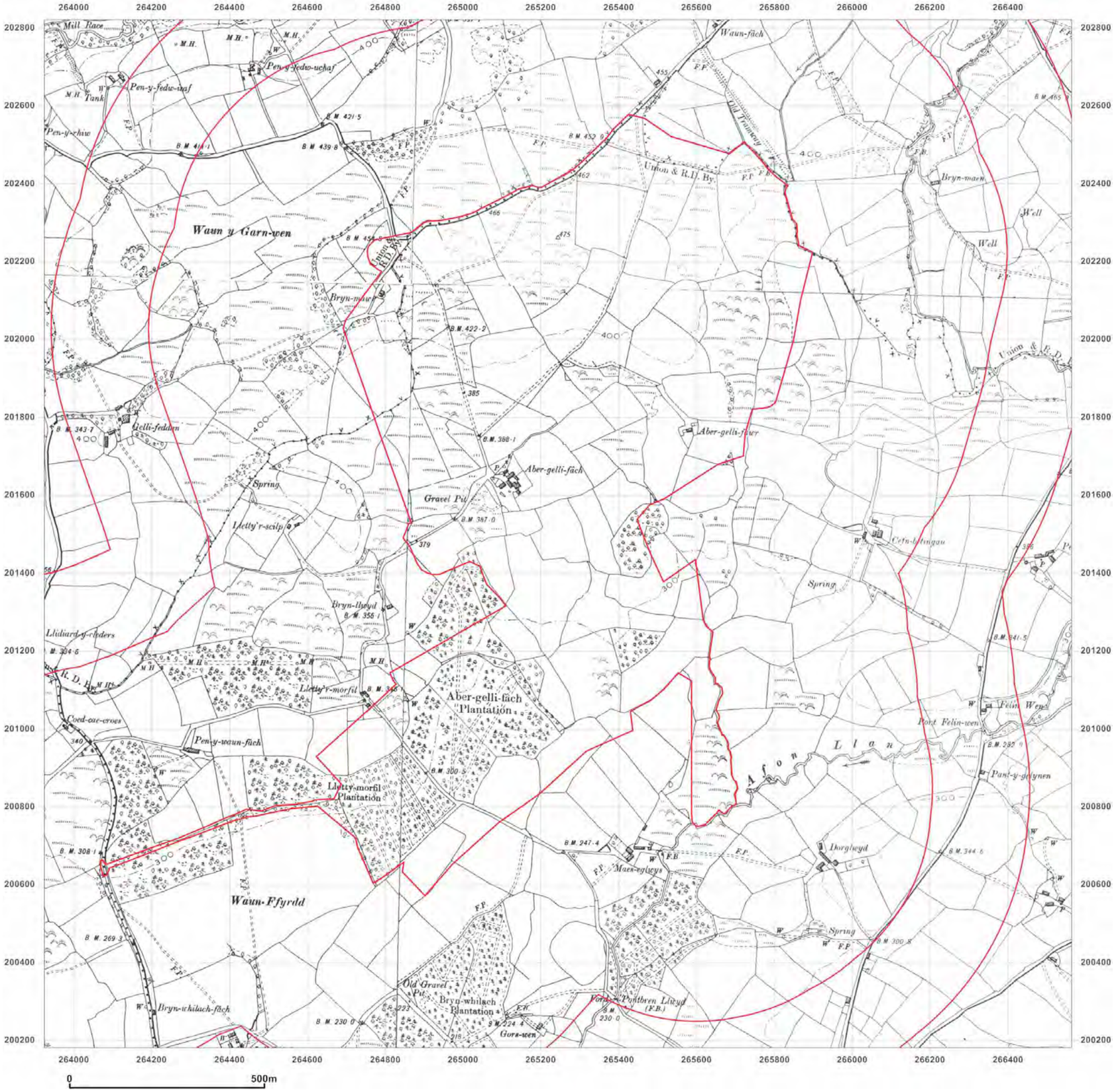

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1896-1897**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1876
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1897
Edition N/A
Copyright N/A
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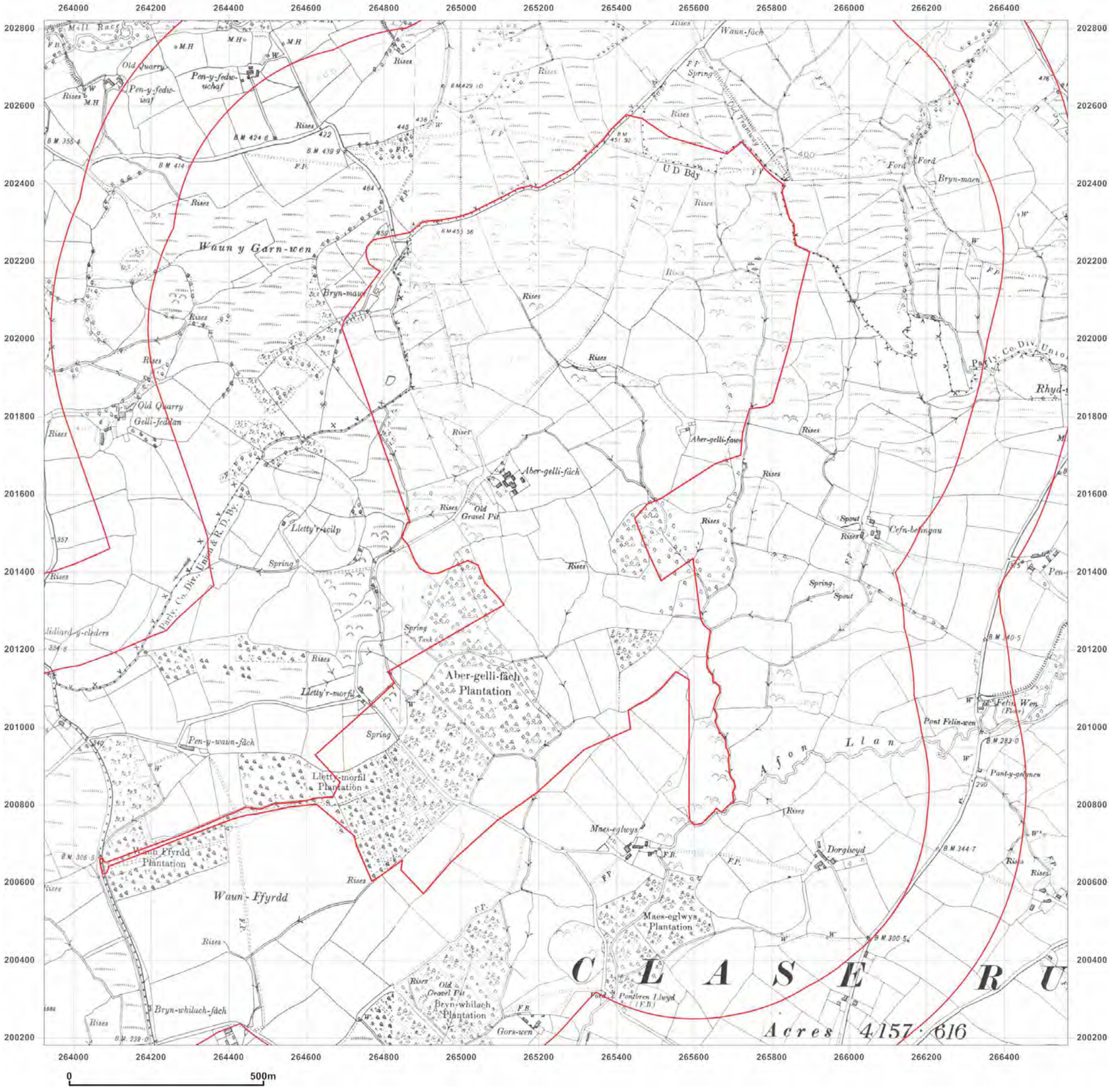

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1913-1914**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
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Surveyed 1875
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1914
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1913
Edition N/A
Copyright N/A
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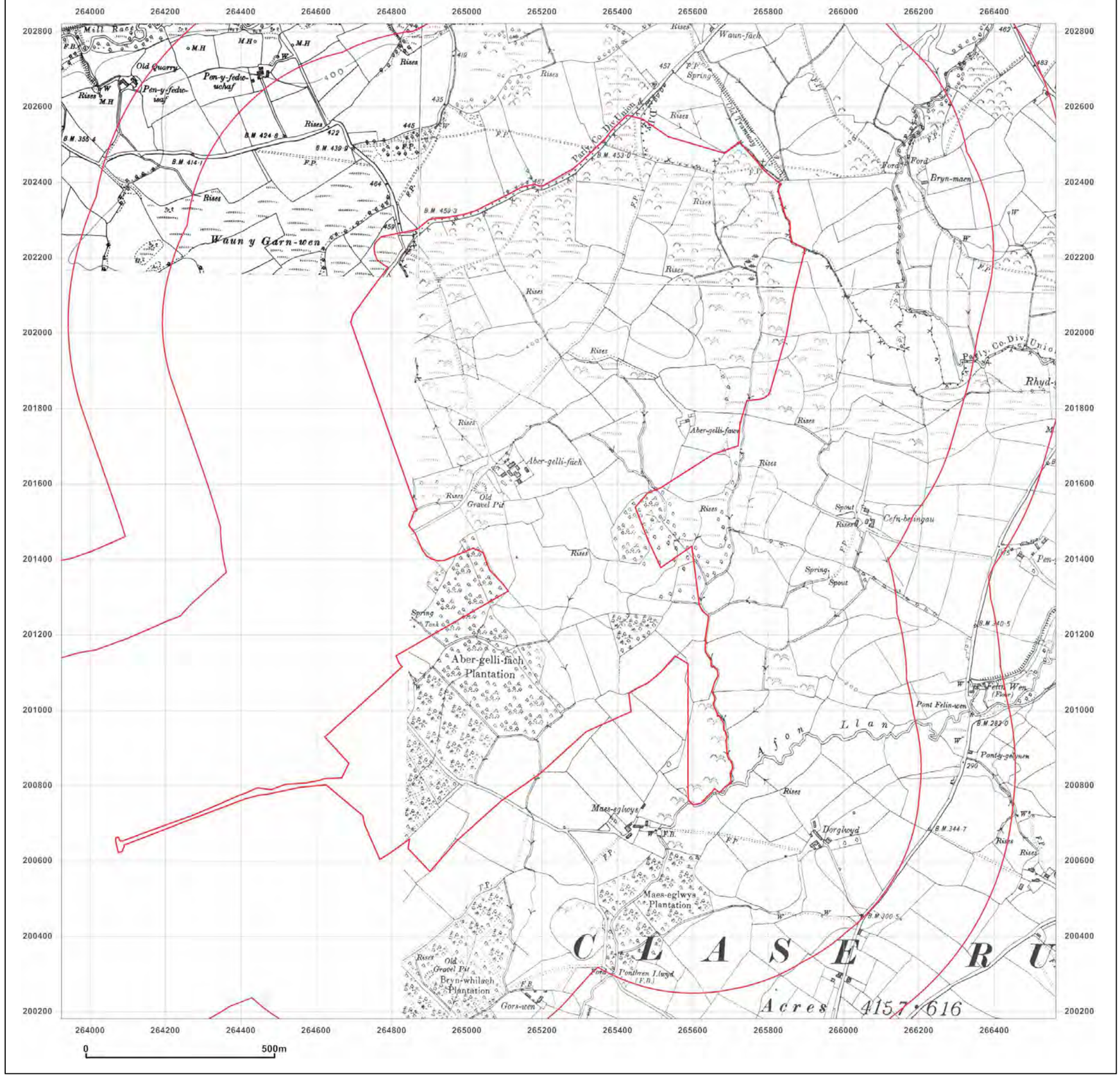

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1921**

Scale: 1:10,560

Printed at: 1:10,560

N
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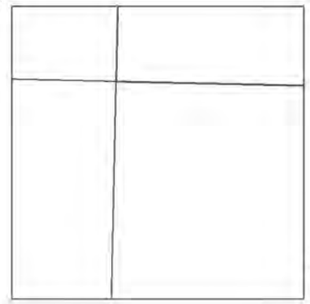
Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1921
Edition N/A
Copyright N/A
Levelled N/A



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Revised 1921
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 30 July 2014

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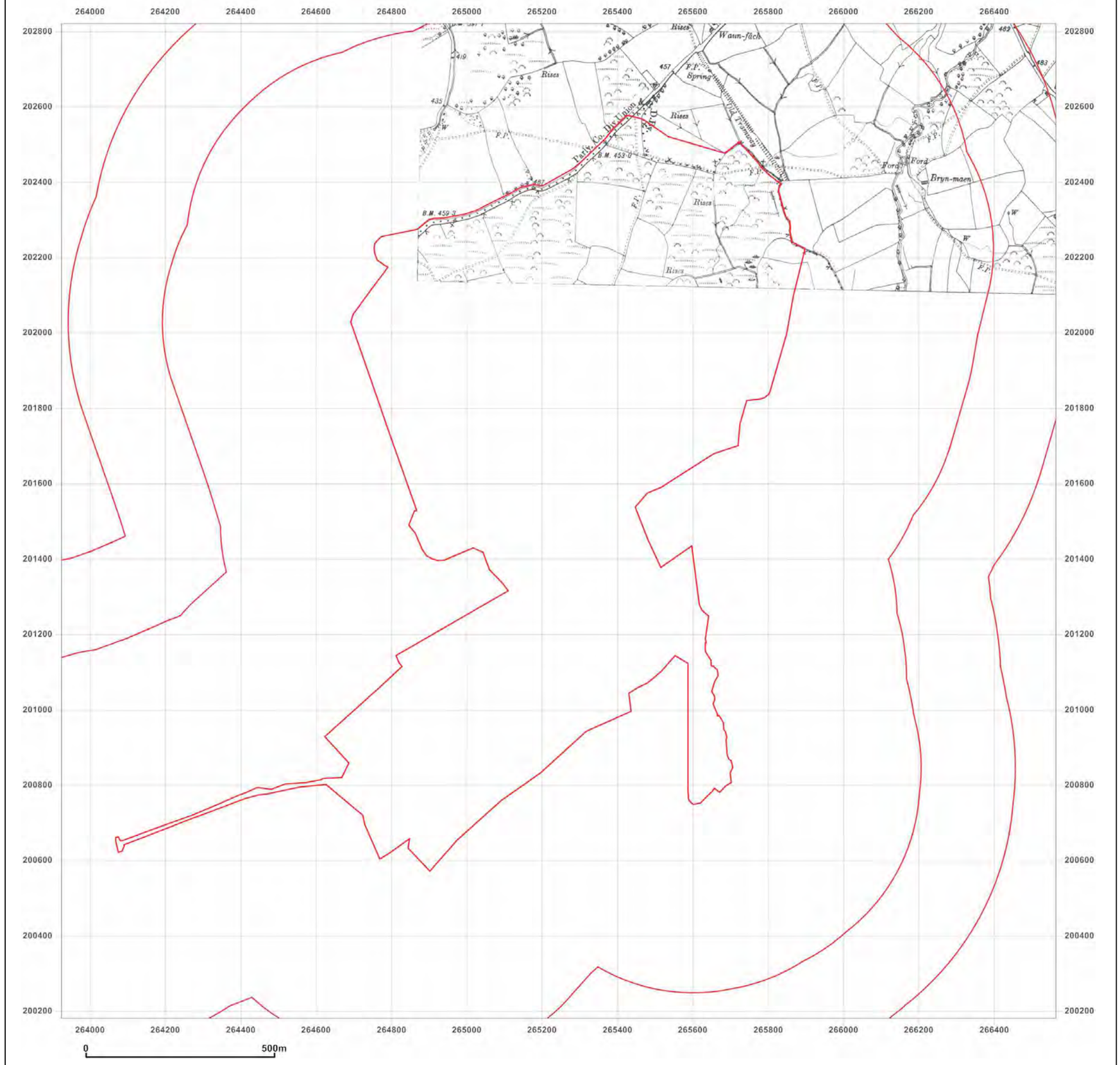

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

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FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1921**

Scale: 1:10,560

Printed at: 1:10,560

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W E
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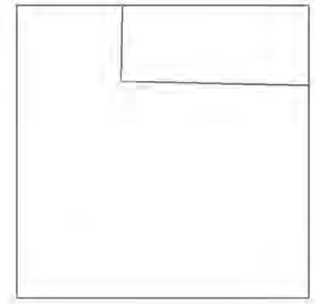
Surveyed 1876
Revised 1921
Edition N/A
Copyright N/A
Levelled N/A



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Production date: 30 July 2014

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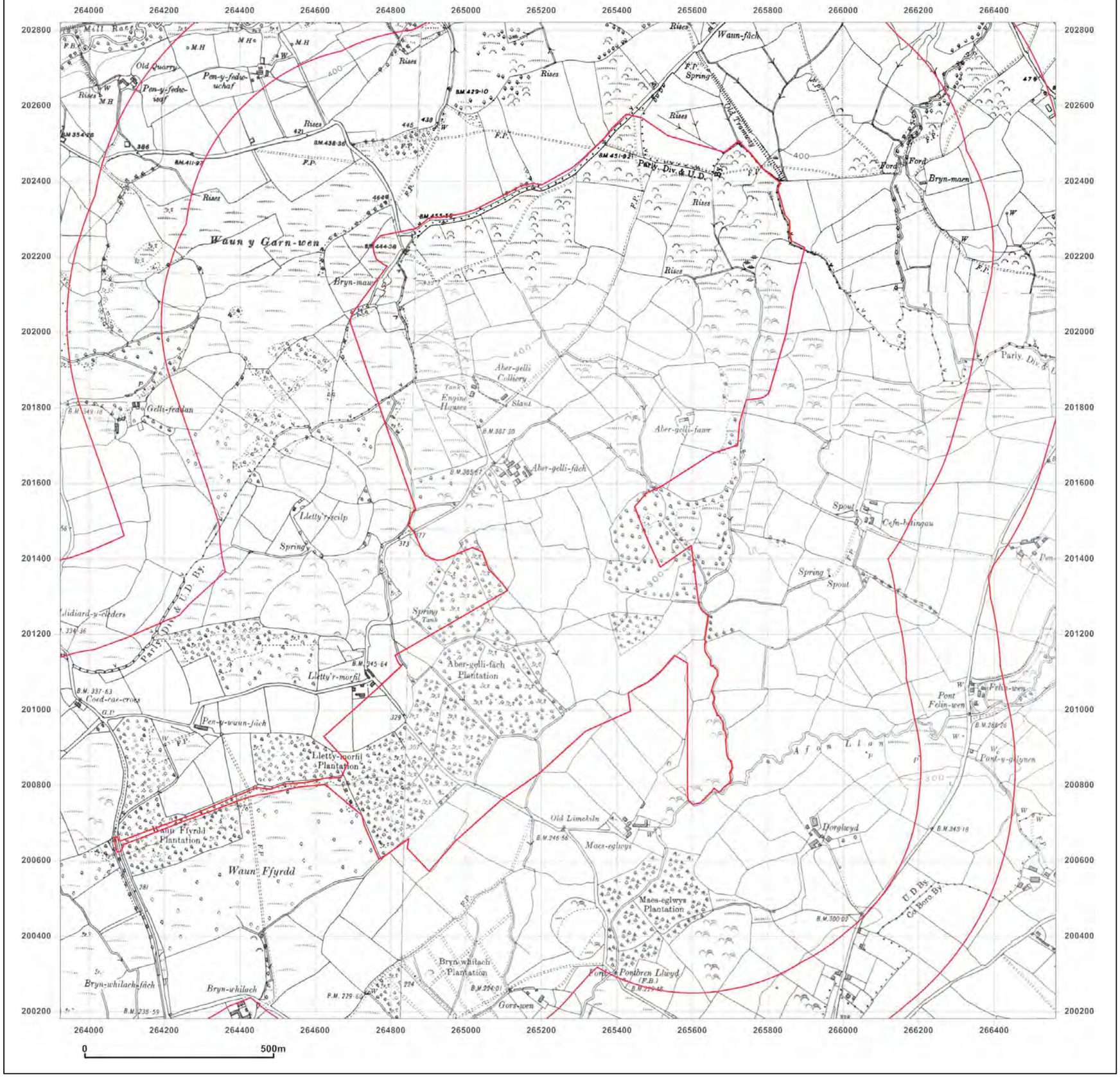

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SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1935-1938**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
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Surveyed 1875
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1935
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1936
Edition N/A
Copyright N/A
Levelled N/A

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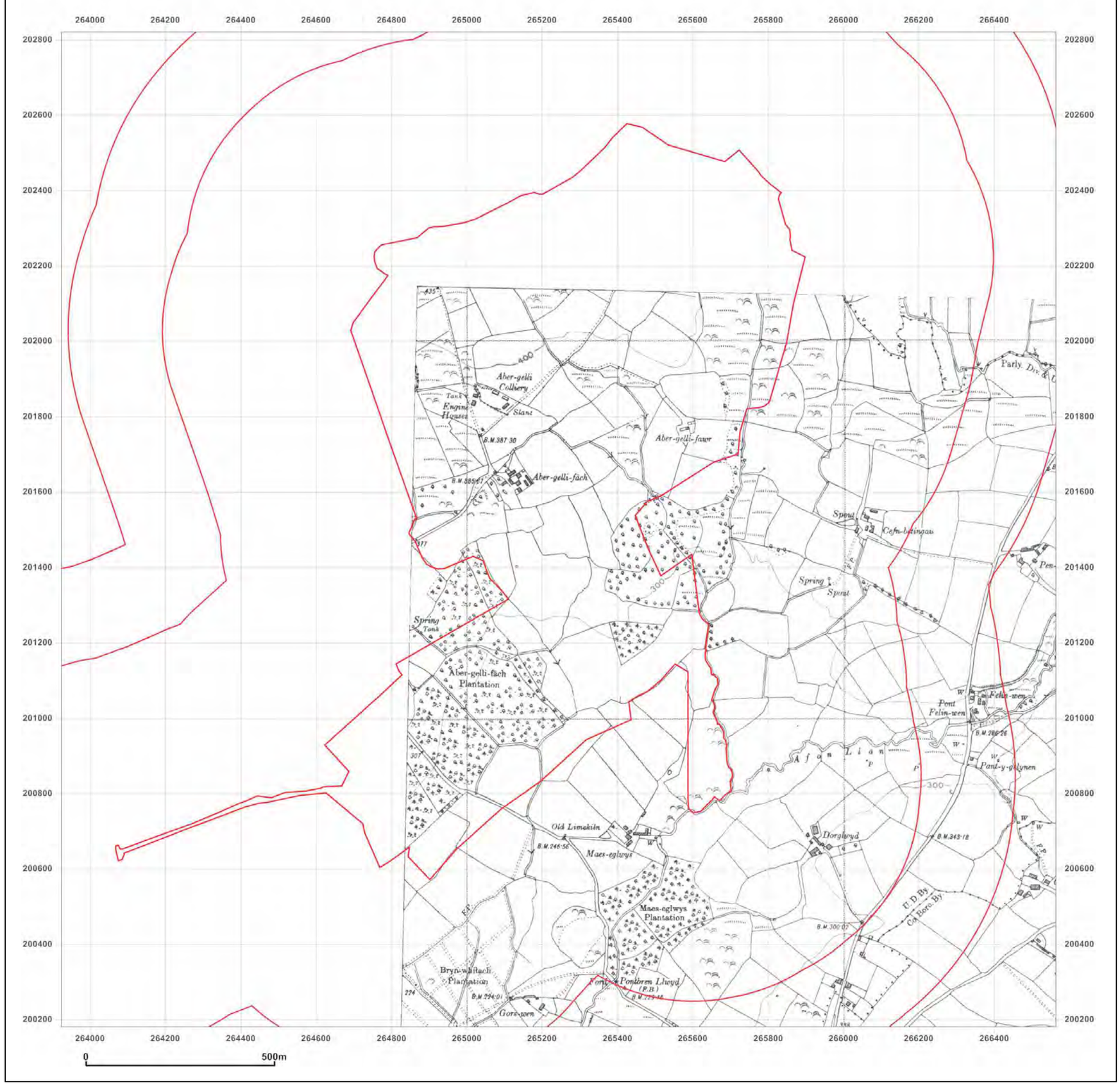

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

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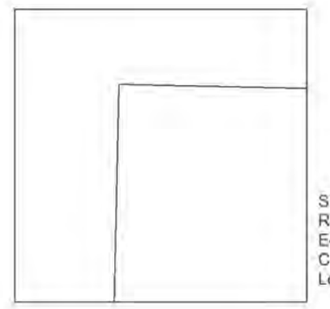

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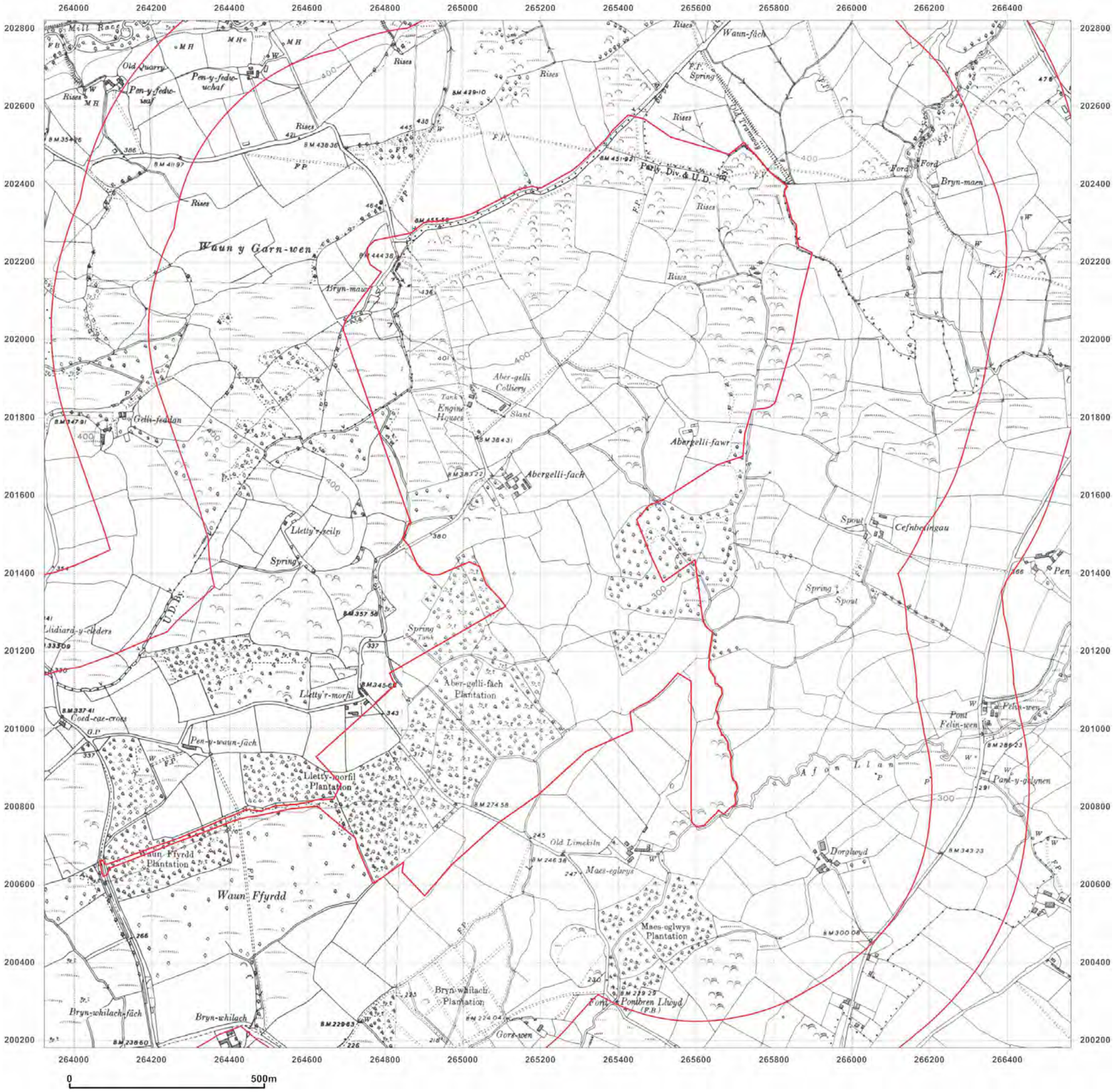

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
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SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1875
Revised 1948
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1948
Edition N/A
Copyright N/A
Levelled 1947

Surveyed 1875
Revised 1948
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1948
Edition N/A
Copyright N/A
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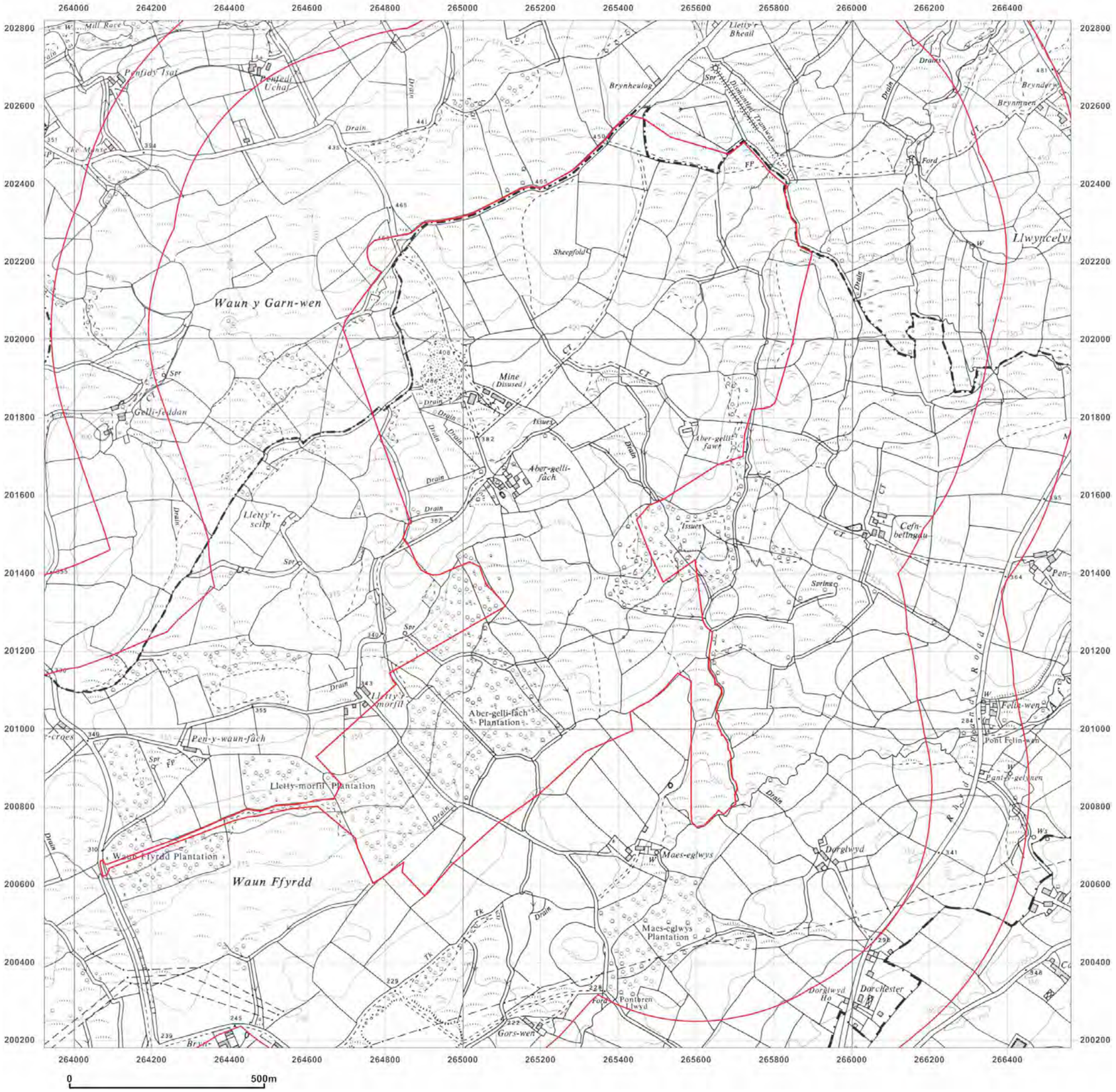

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: Provisional

Map date: **1964**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1964
Revised 1964
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1964
Revised 1964
Edition N/A
Copyright N/A
Levelled N/A

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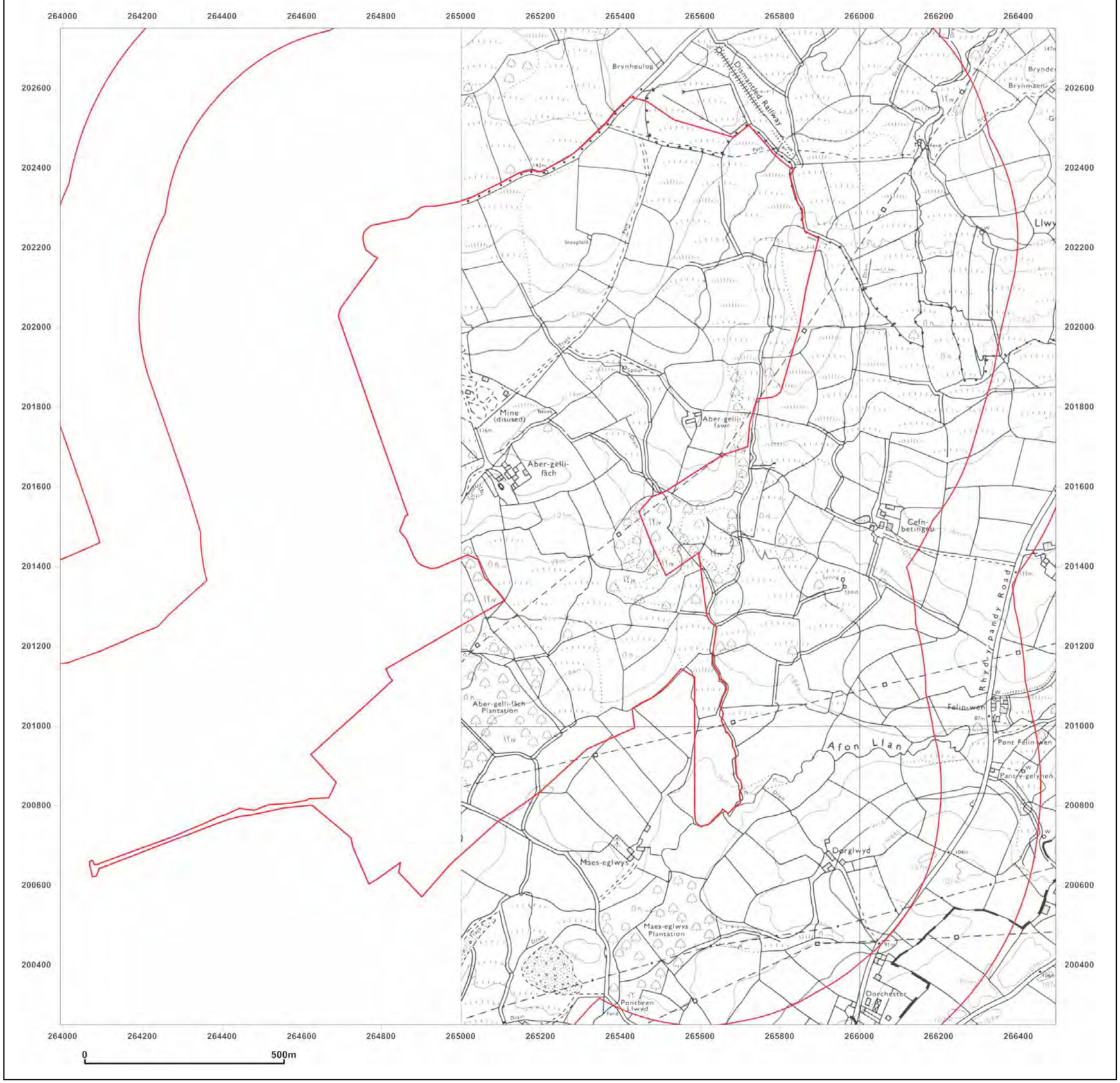
Production date: 30 July 2014

To view map legend click here *Legend*



Surveyed 1974
Revised 1975
Edition N/A
Copyright N/A
Levelled N/A

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: National Grid

Map date: **1975**

Scale: 1:10,000

Printed at: 1:10,000

N
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Production date: 30 July 2014

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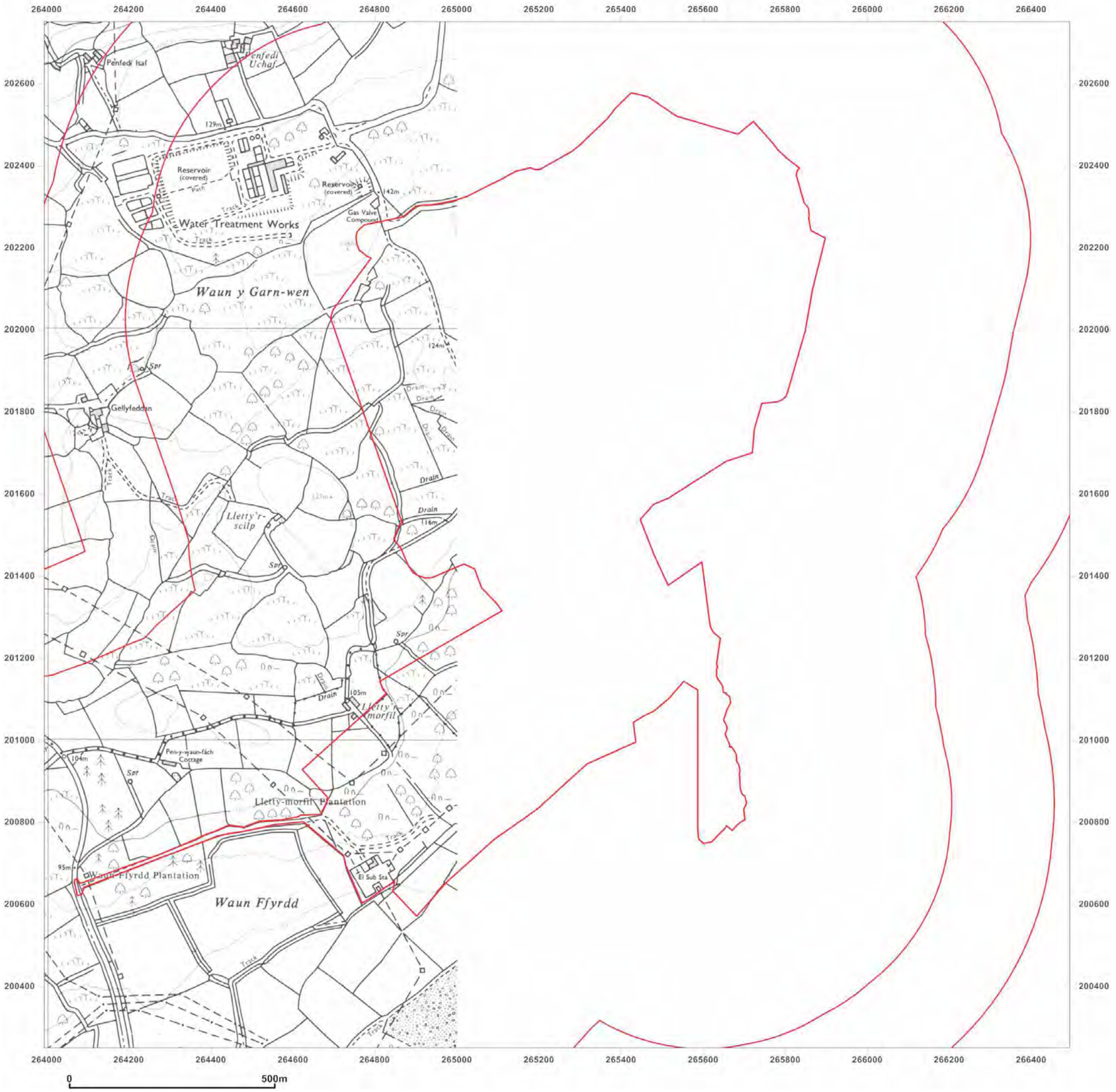

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: National Grid

Map date: **1991**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1990
Revised 1991
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 30 July 2014

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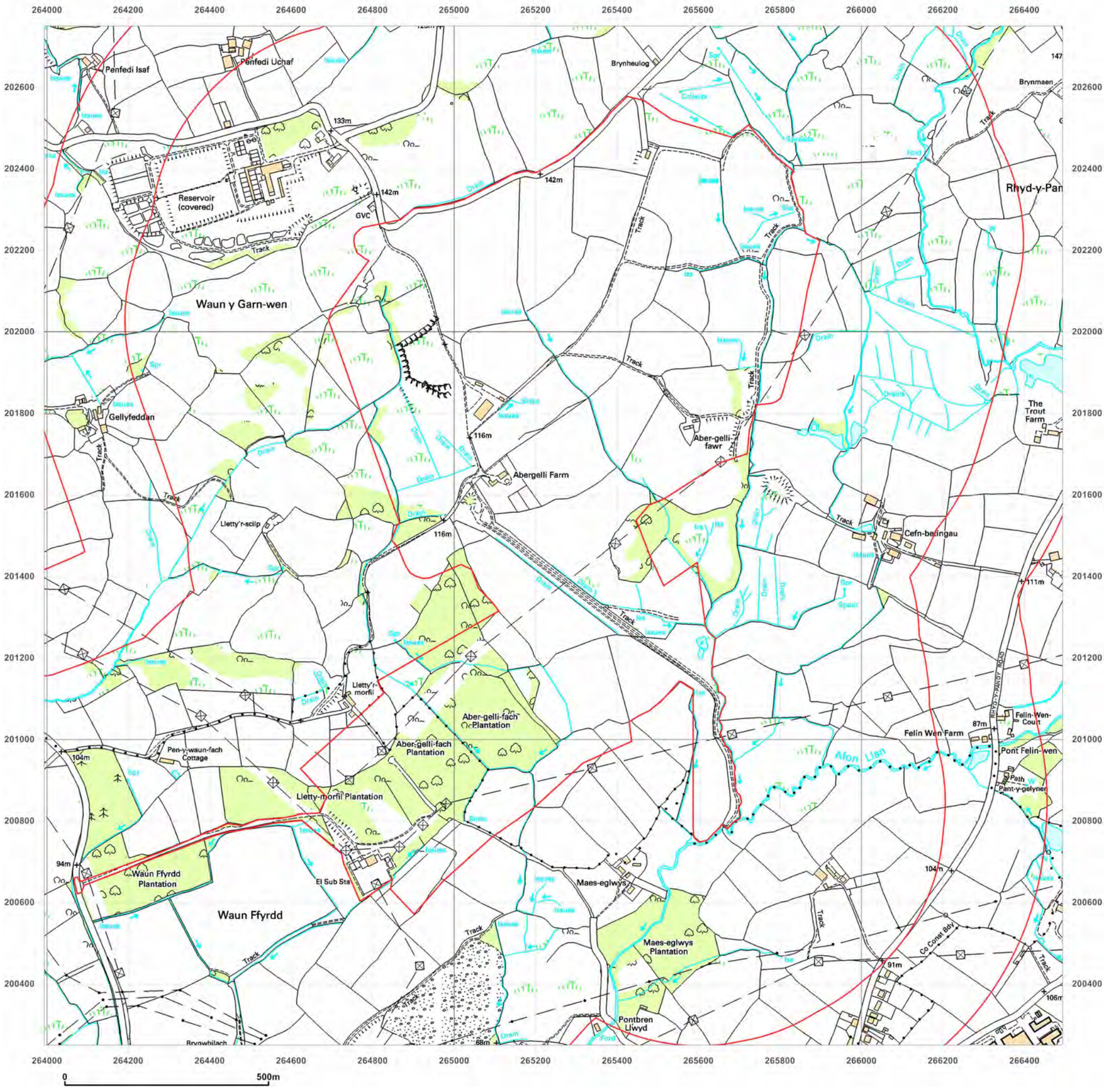

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: 1:10,000 Raster

Map date: **2002**

Scale: 1:10,000

Printed at: 1:10,000

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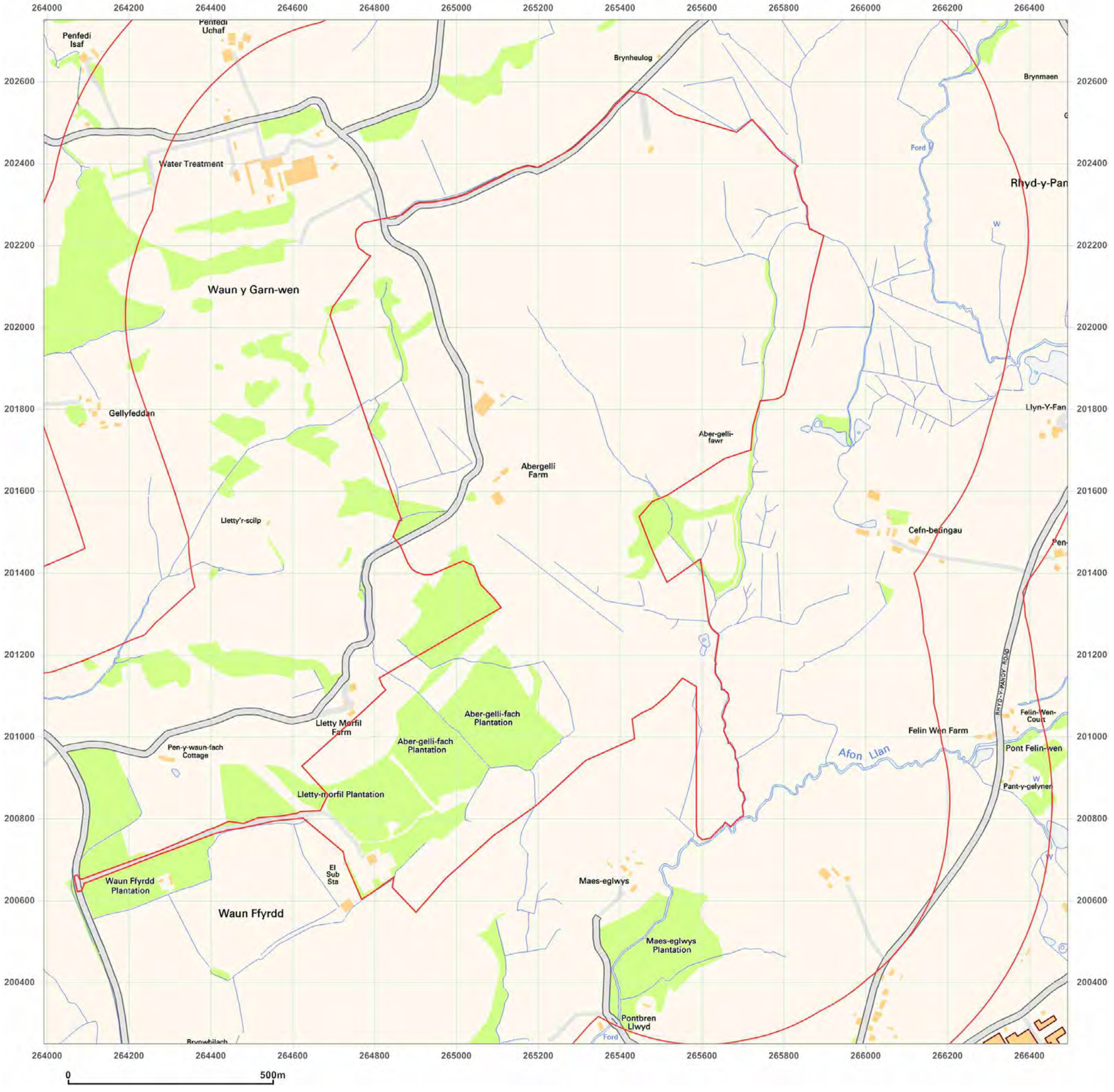
Production date: 30 July 2014

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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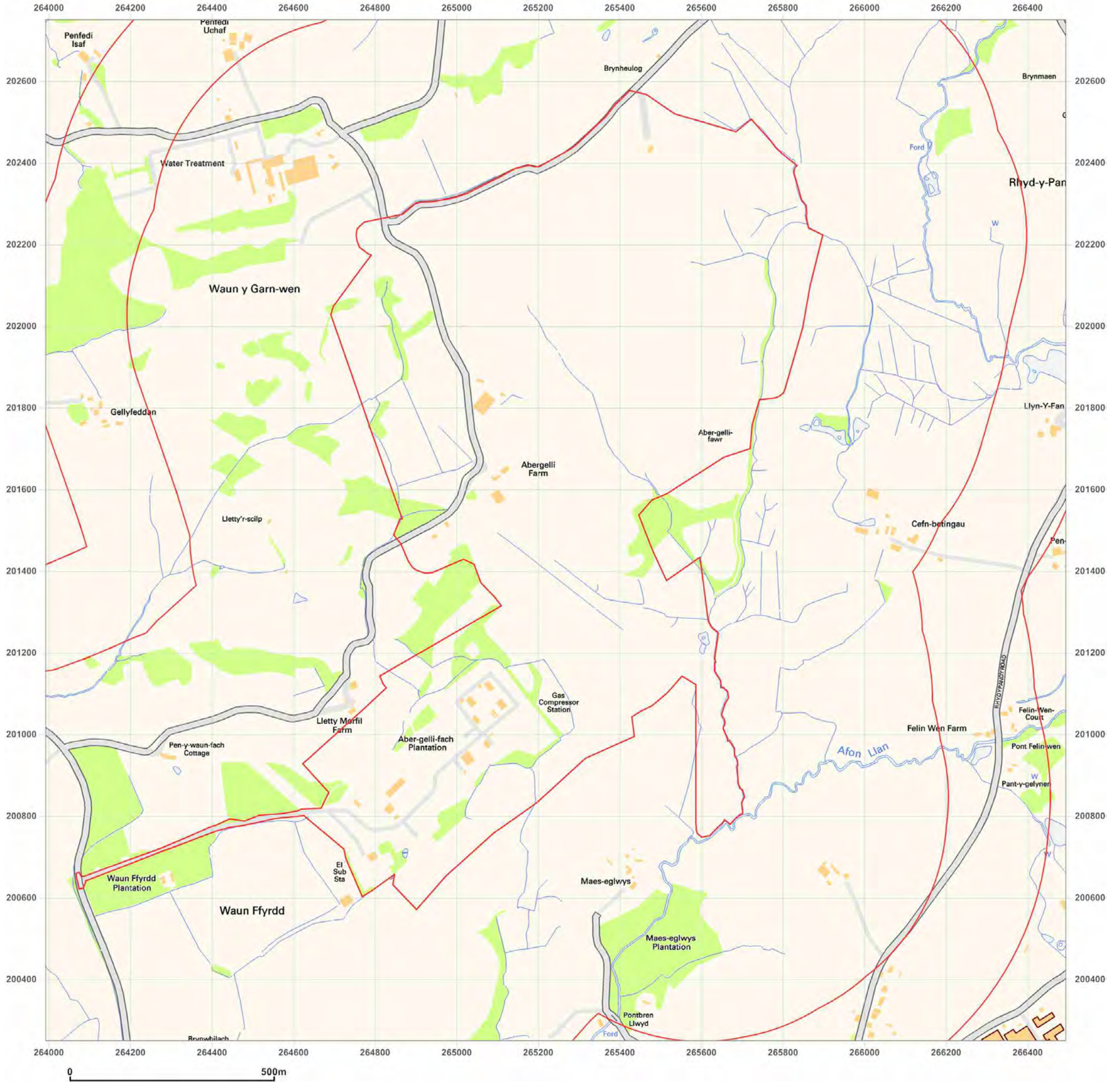
Production date: 30 July 2014

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: National Grid

Map date: **2014**

Scale: 1:10,000

Printed at: 1:10,000

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Produced by
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W: www.groundsure.com

Production date: 30 July 2014

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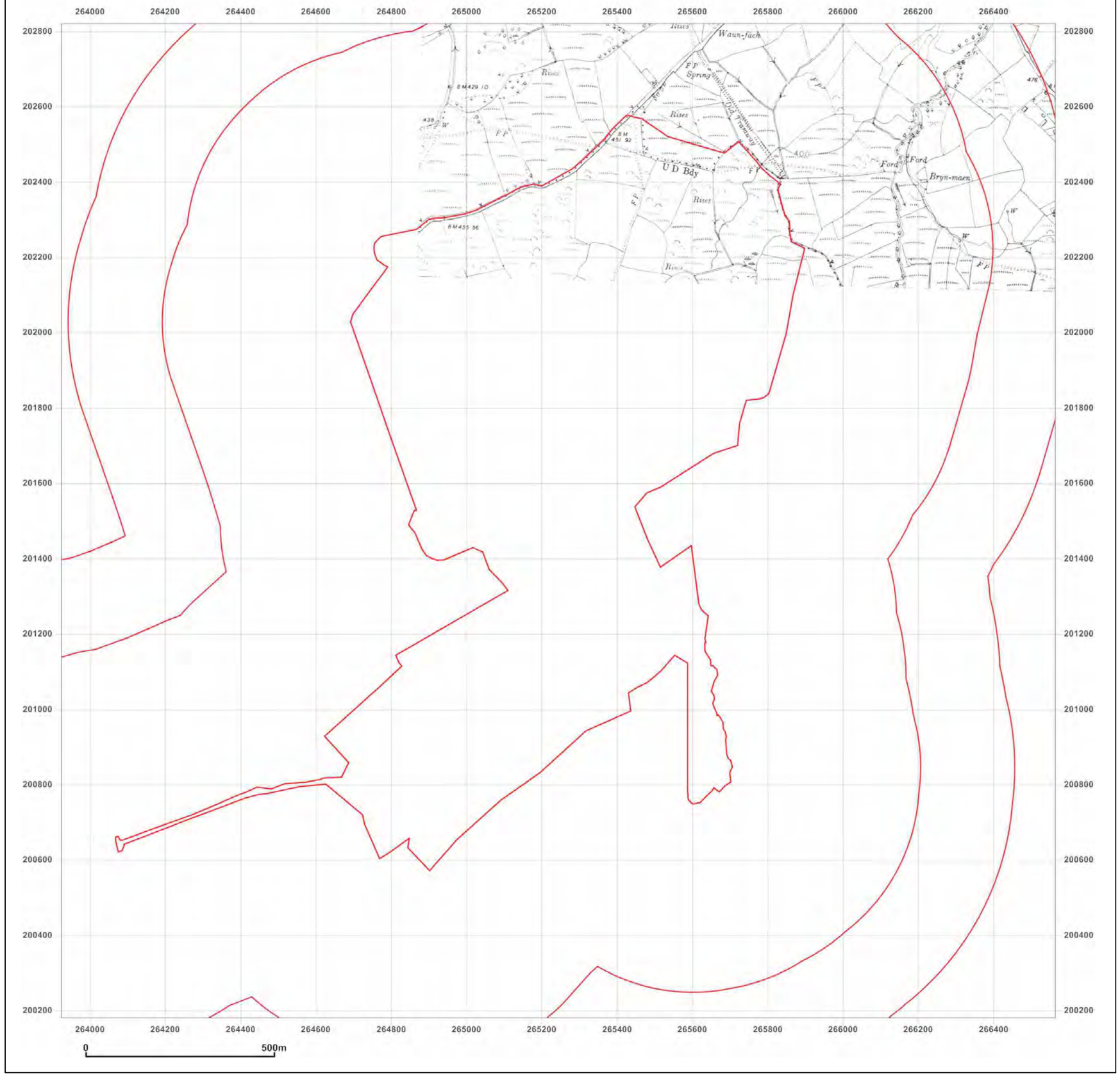

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **9152**

Scale: 1:10,560

Printed at: 1:10,560

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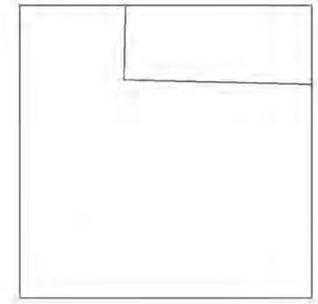
Surveyed 1875
Revised 1952
Edition N/A
Copyright N/A
Levelled 1947



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Produced by
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E: info@groundsure.com
W: www.groundsure.com

Production date: 30 July 2014

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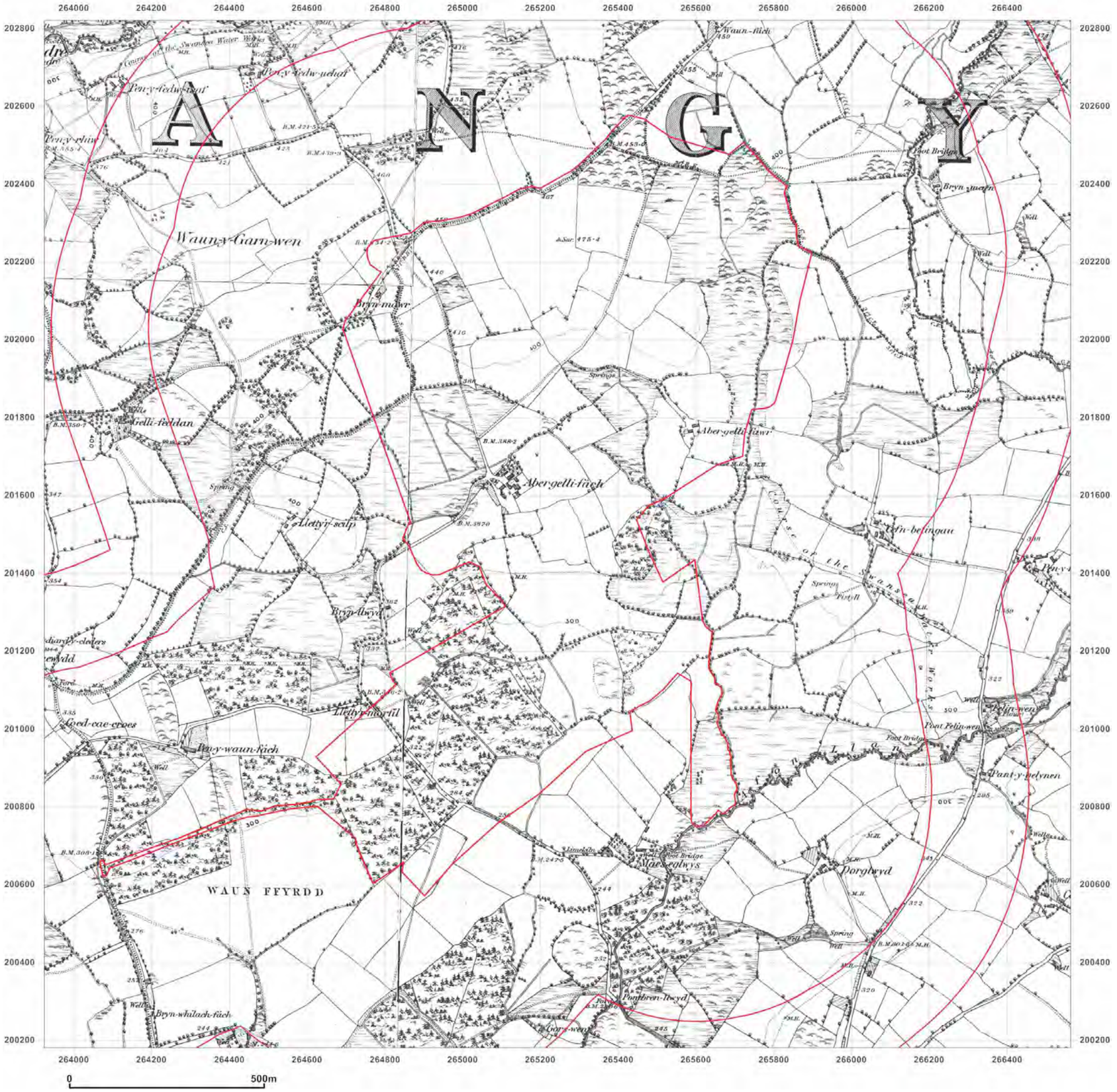

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1876-1878**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

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W: www.groundsure.com

Production date: 30 July 2014

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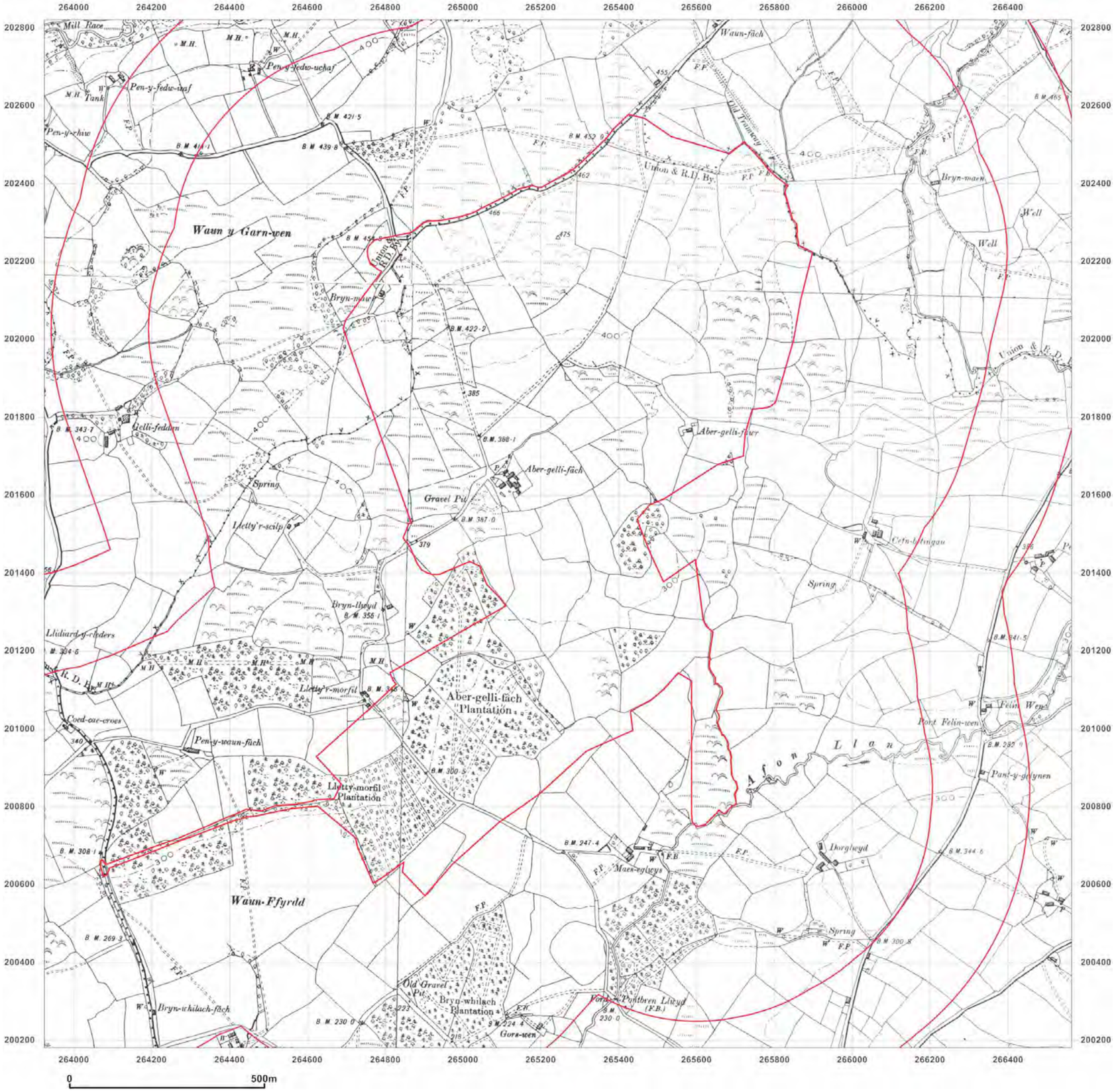

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1896-1897**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1876
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1896
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1897
Edition N/A
Copyright N/A
Levelled N/A

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W: www.groundsure.com

Production date: 30 July 2014

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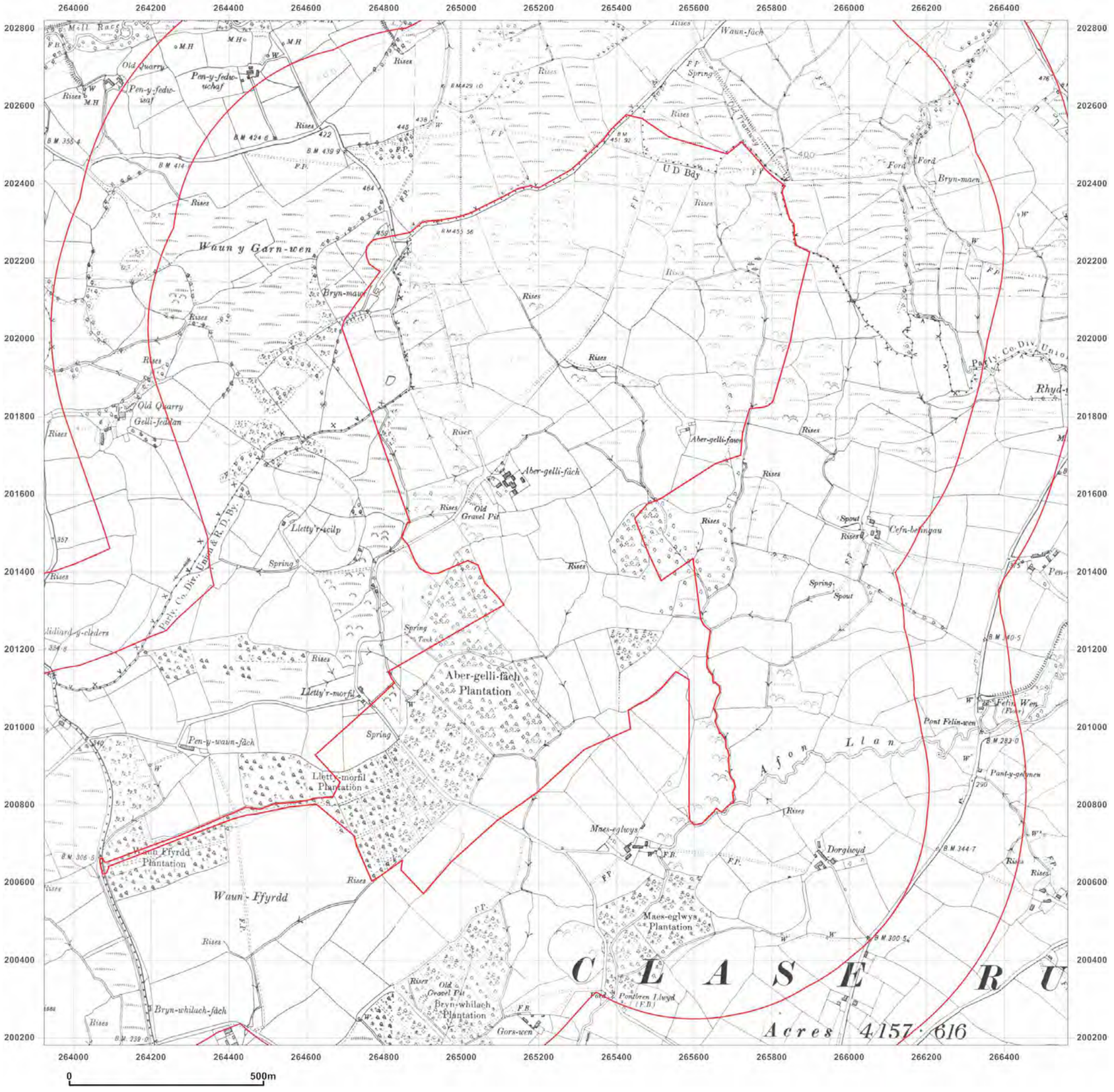

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1913-1914**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed 1875
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1914
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

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Produced by
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Production date: 30 July 2014

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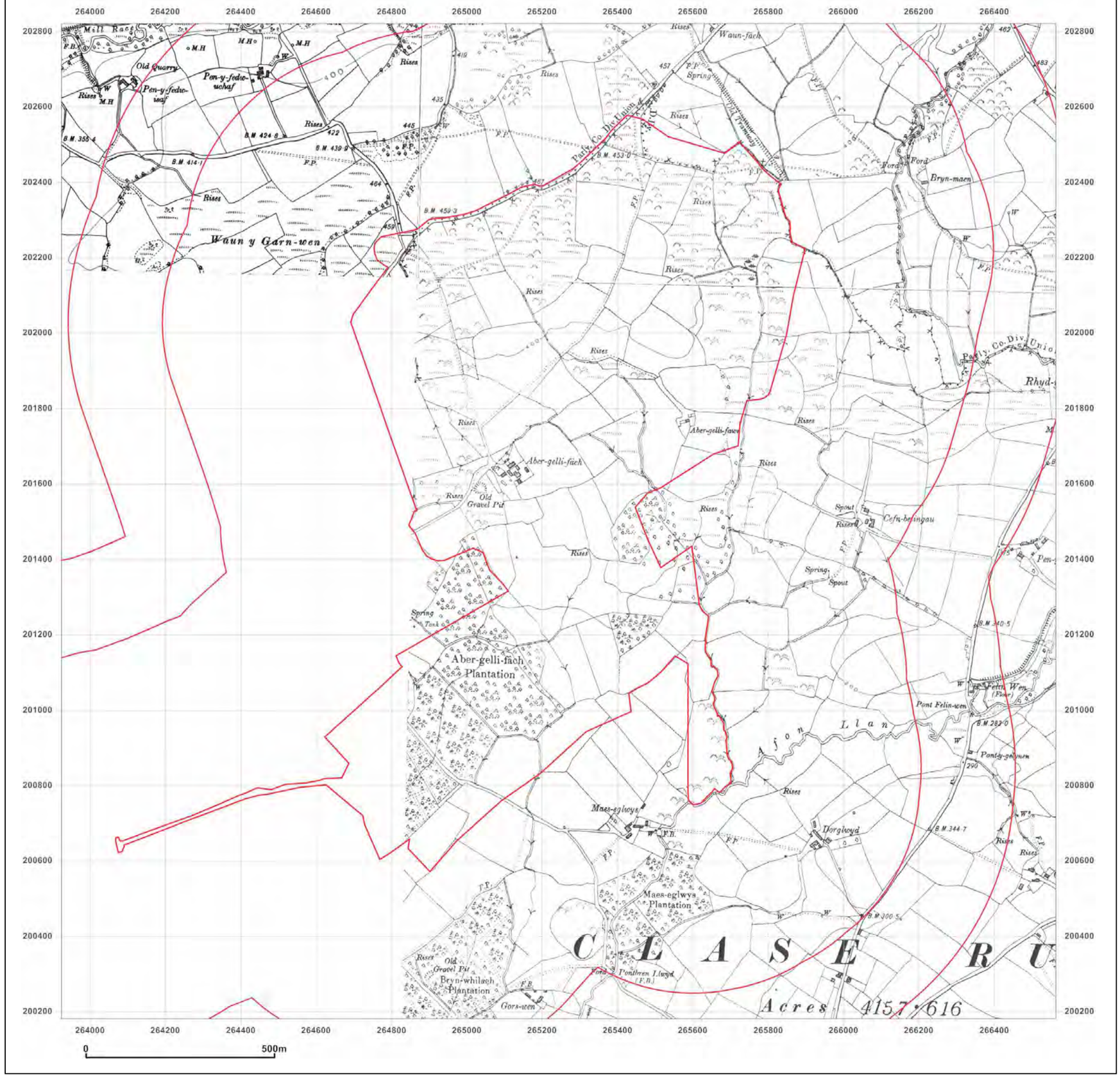


GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1921**

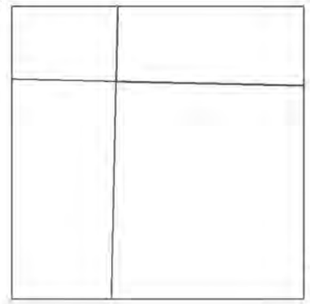
Scale: 1:10,560

Printed at: 1:10,560

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1921
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1877
Revised 1921
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 30 July 2014

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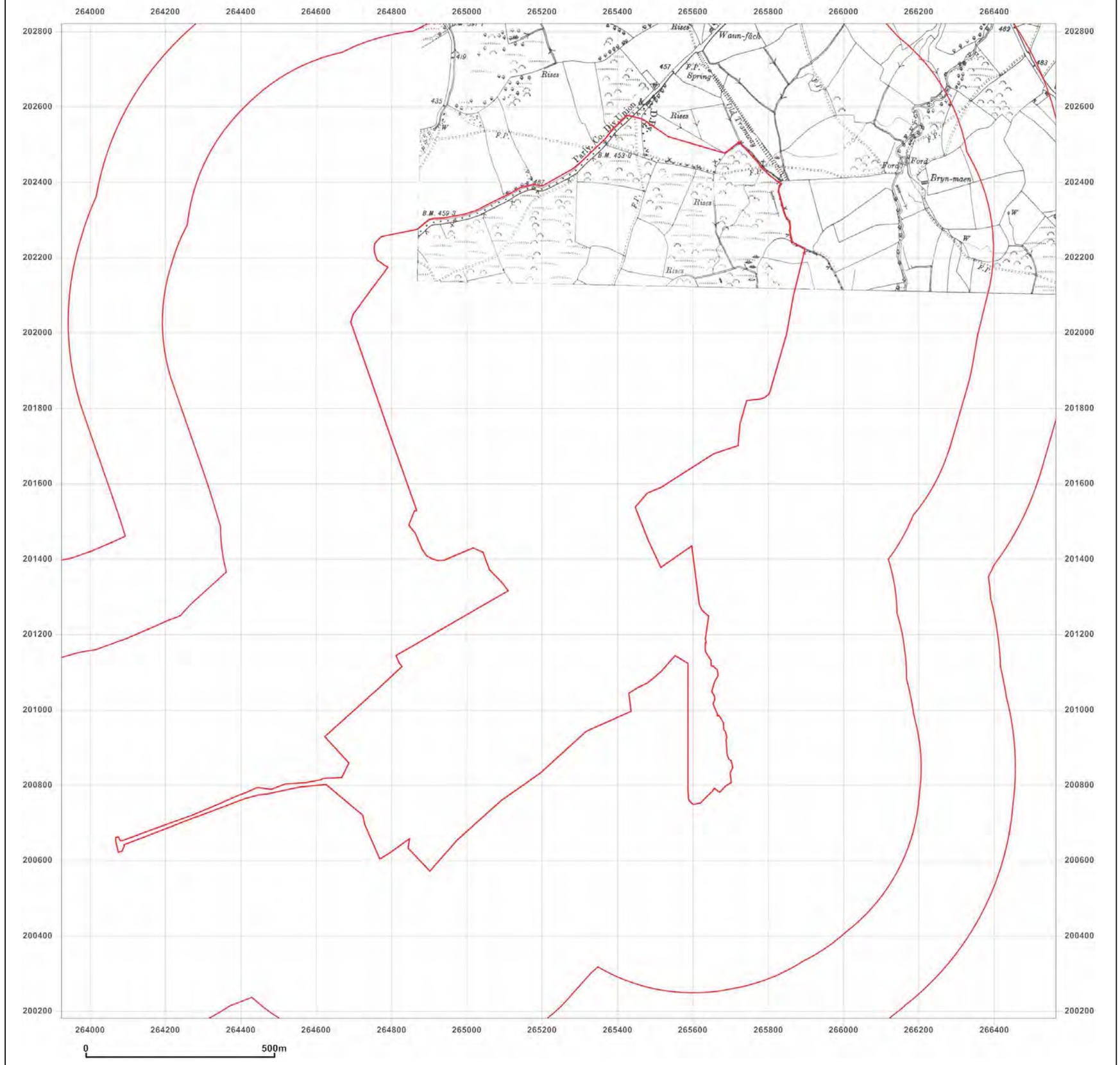

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1921**

Scale: 1:10,560

Printed at: 1:10,560

N
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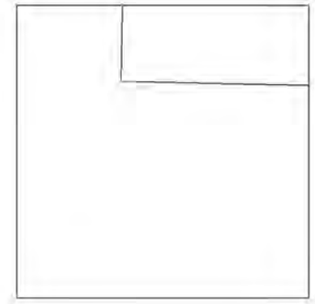
Surveyed 1876
Revised 1921
Edition N/A
Copyright N/A
Levelled N/A



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Production date: 30 July 2014

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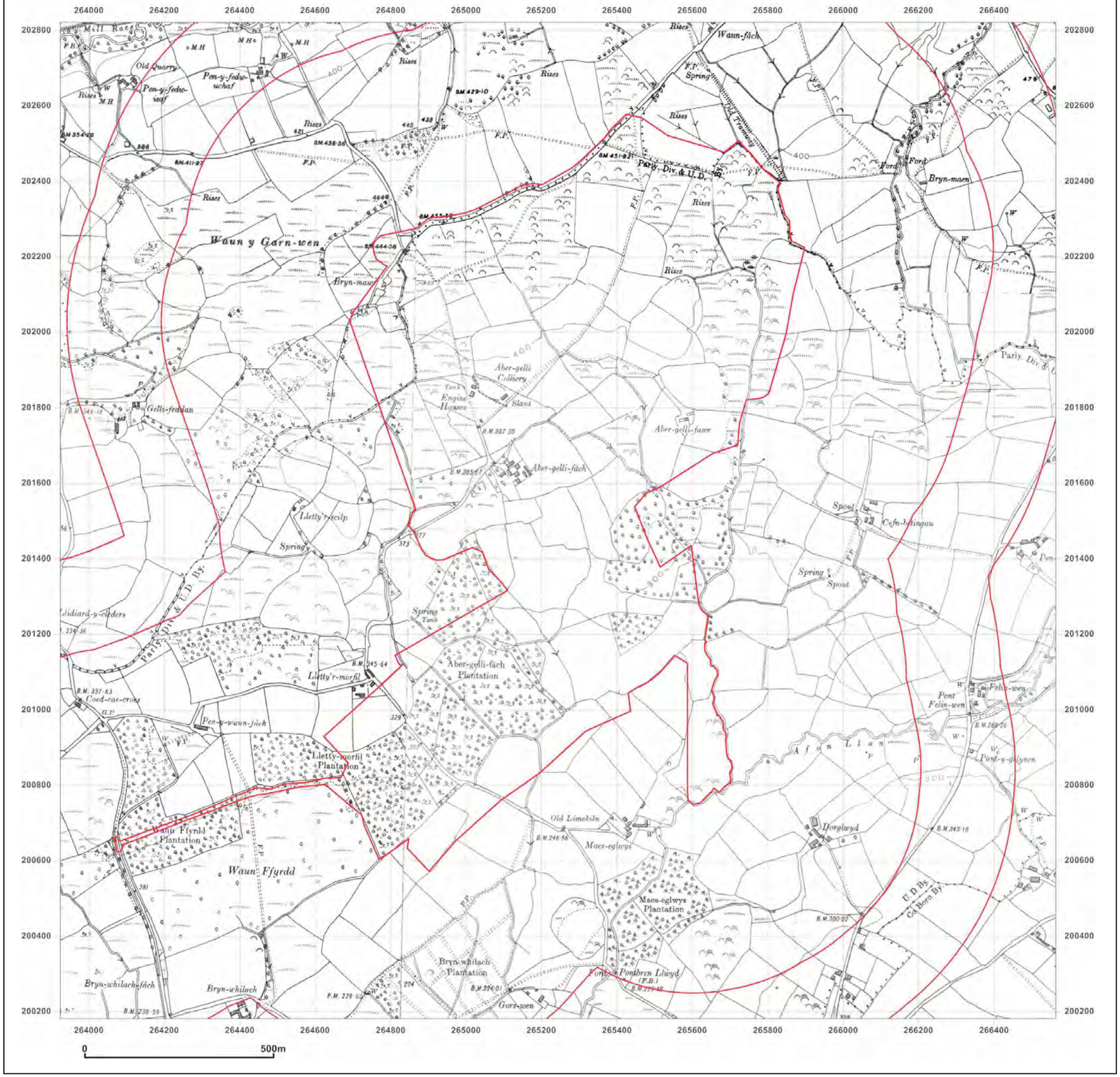

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1935-1938**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1875
Revised 1938
Edition 1938
Copyright N/A
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1875
Revised 1935
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1936
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 30 July 2014

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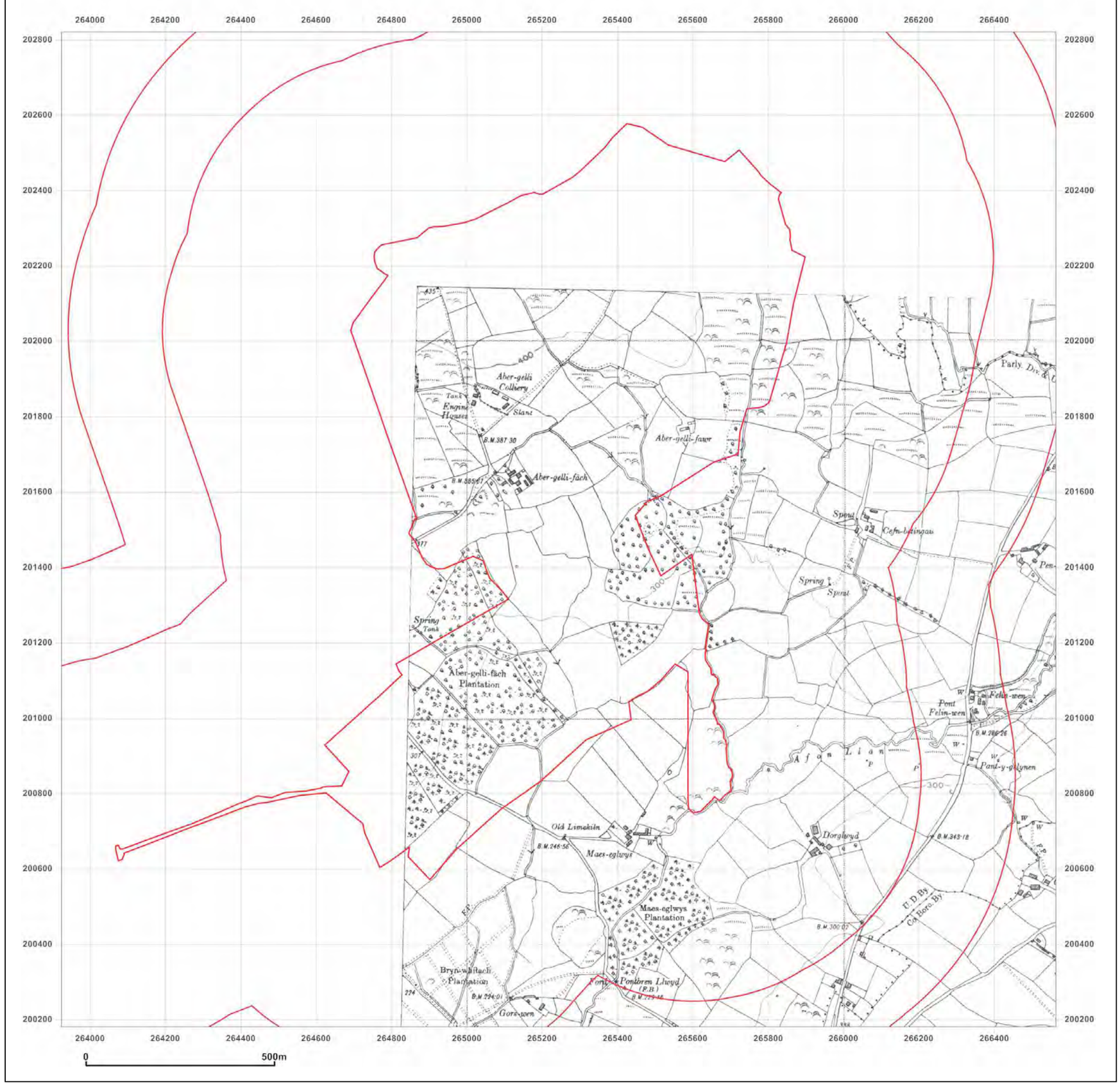

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

Printed at: 1:10,560

N
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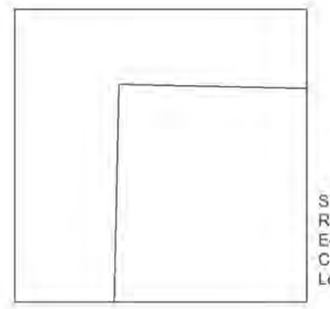

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Production date: 30 July 2014

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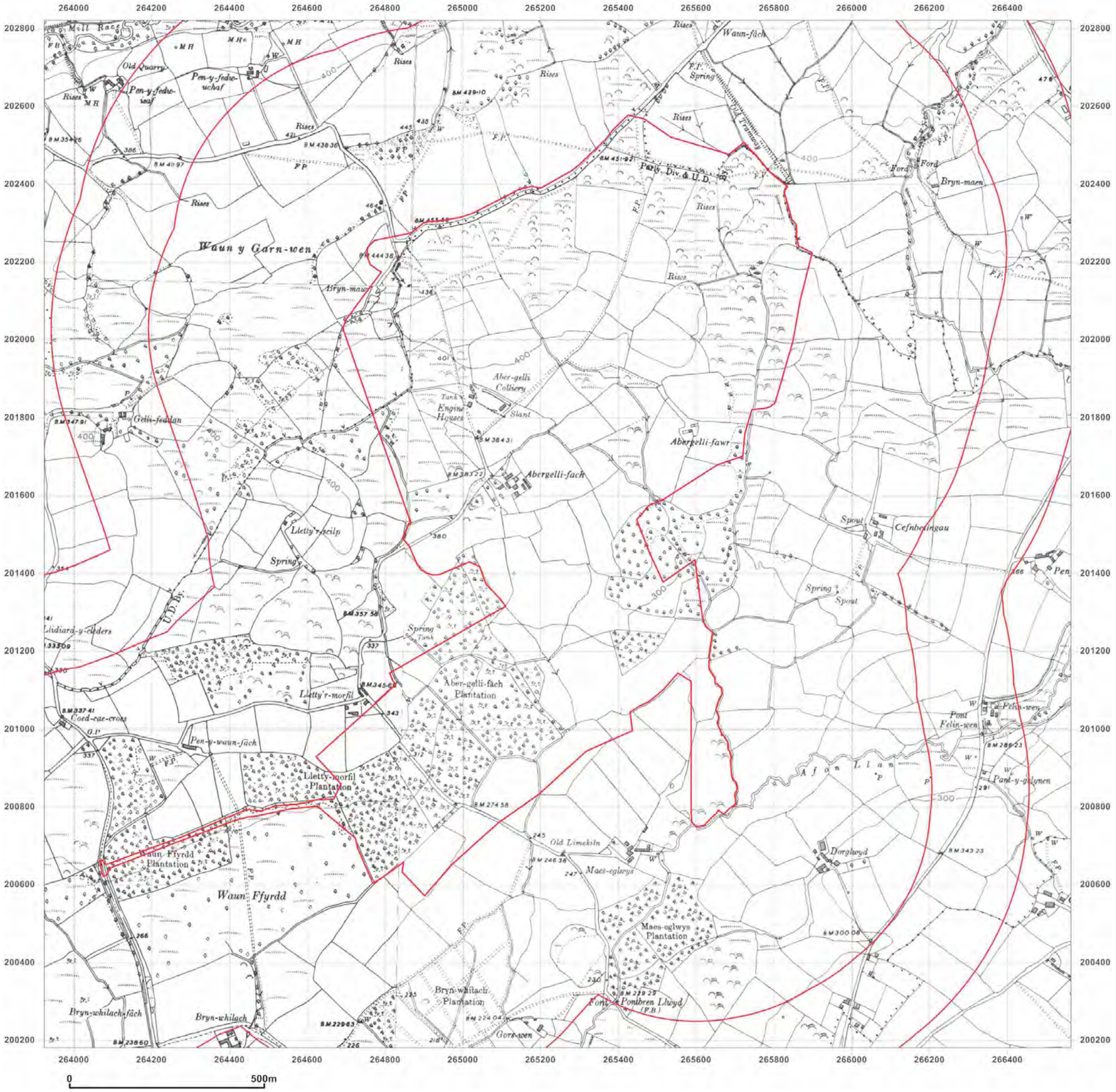

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1875
Revised 1948
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1948
Edition N/A
Copyright N/A
Levelled 1947

Surveyed 1875
Revised 1948
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1948
Edition N/A
Copyright N/A
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Production date: 30 July 2014

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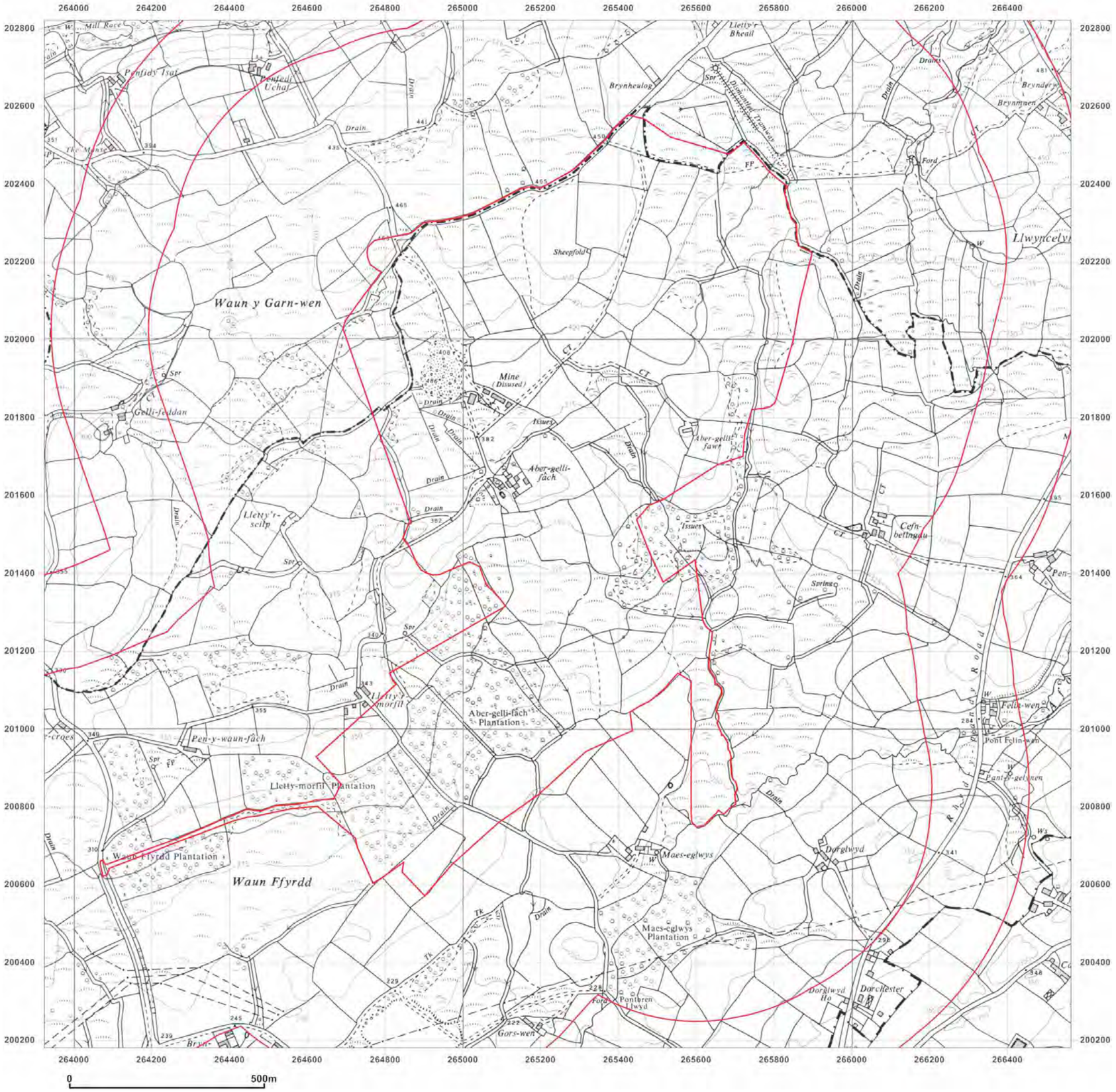

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: Provisional

Map date: **1964**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
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Surveyed 1964
Revised 1964
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1964
Revised 1964
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 30 July 2014

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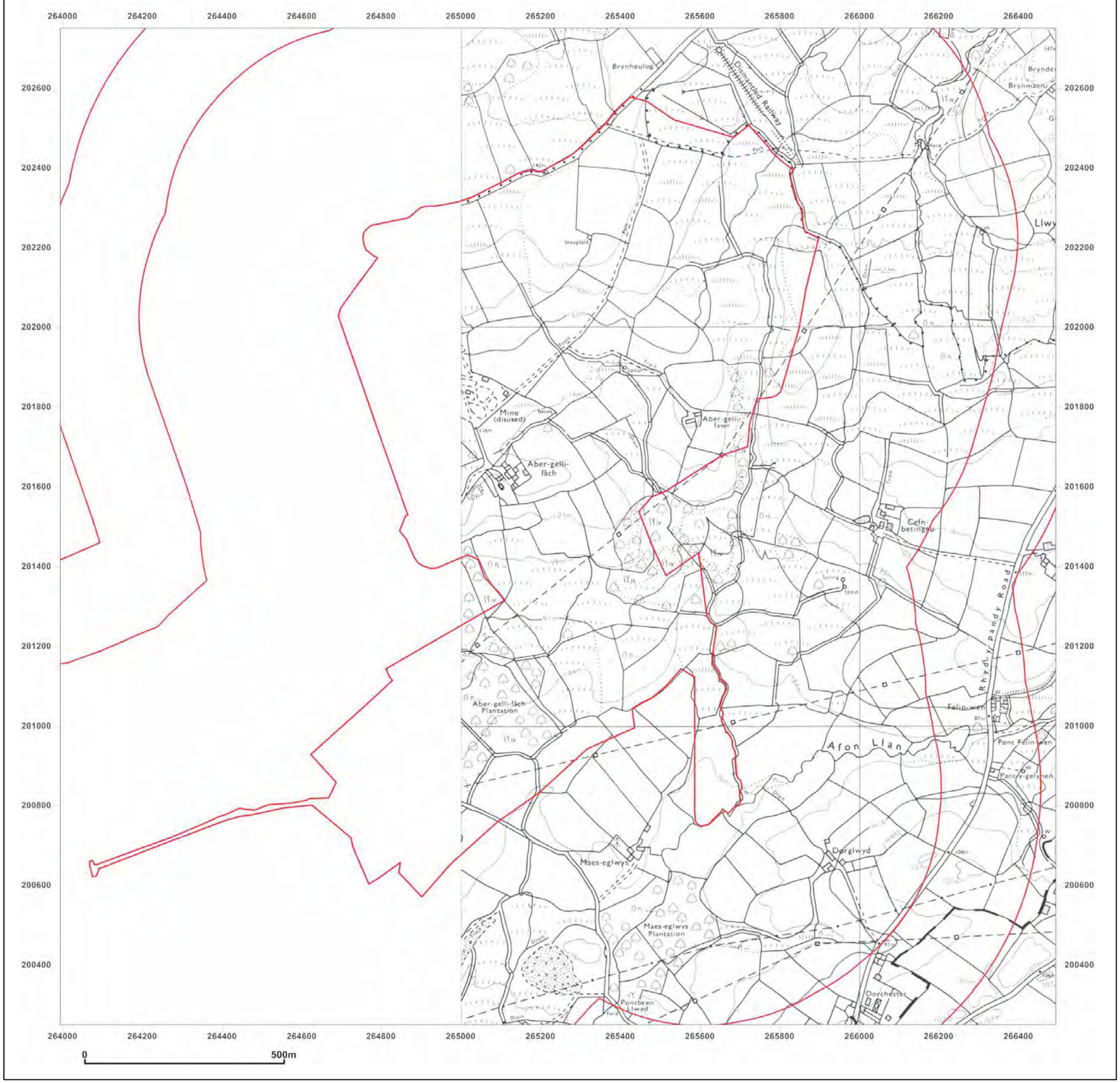

Surveyed 1974
Revised 1975
Edition N/A
Copyright N/A
Levelled N/A

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: National Grid

Map date: **1975**

Scale: 1:10,000

Printed at: 1:10,000

N
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Production date: 30 July 2014

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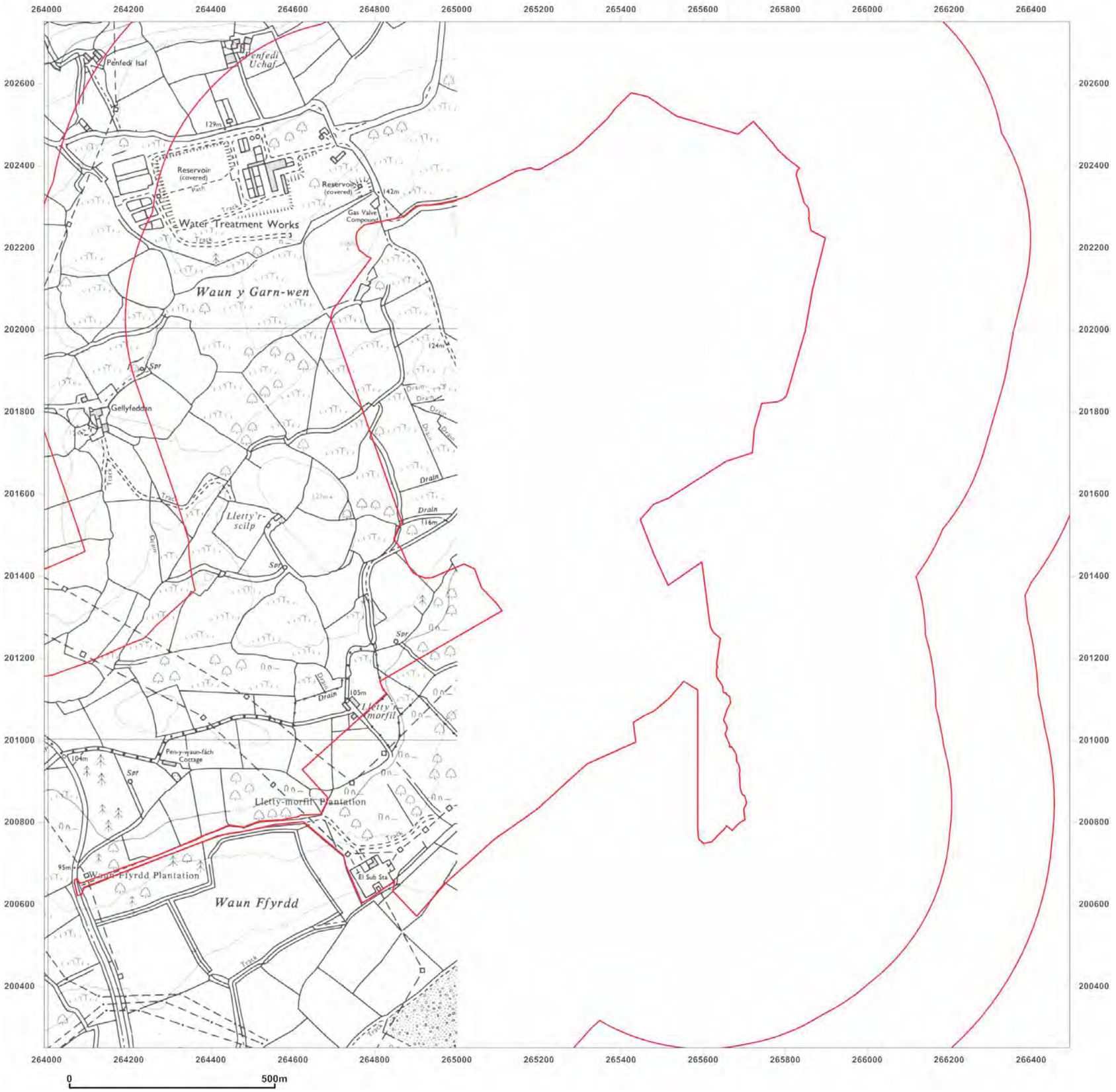

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: National Grid

Map date: **1991**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1990
Revised 1991
Edition N/A
Copyright N/A
Levelled N/A

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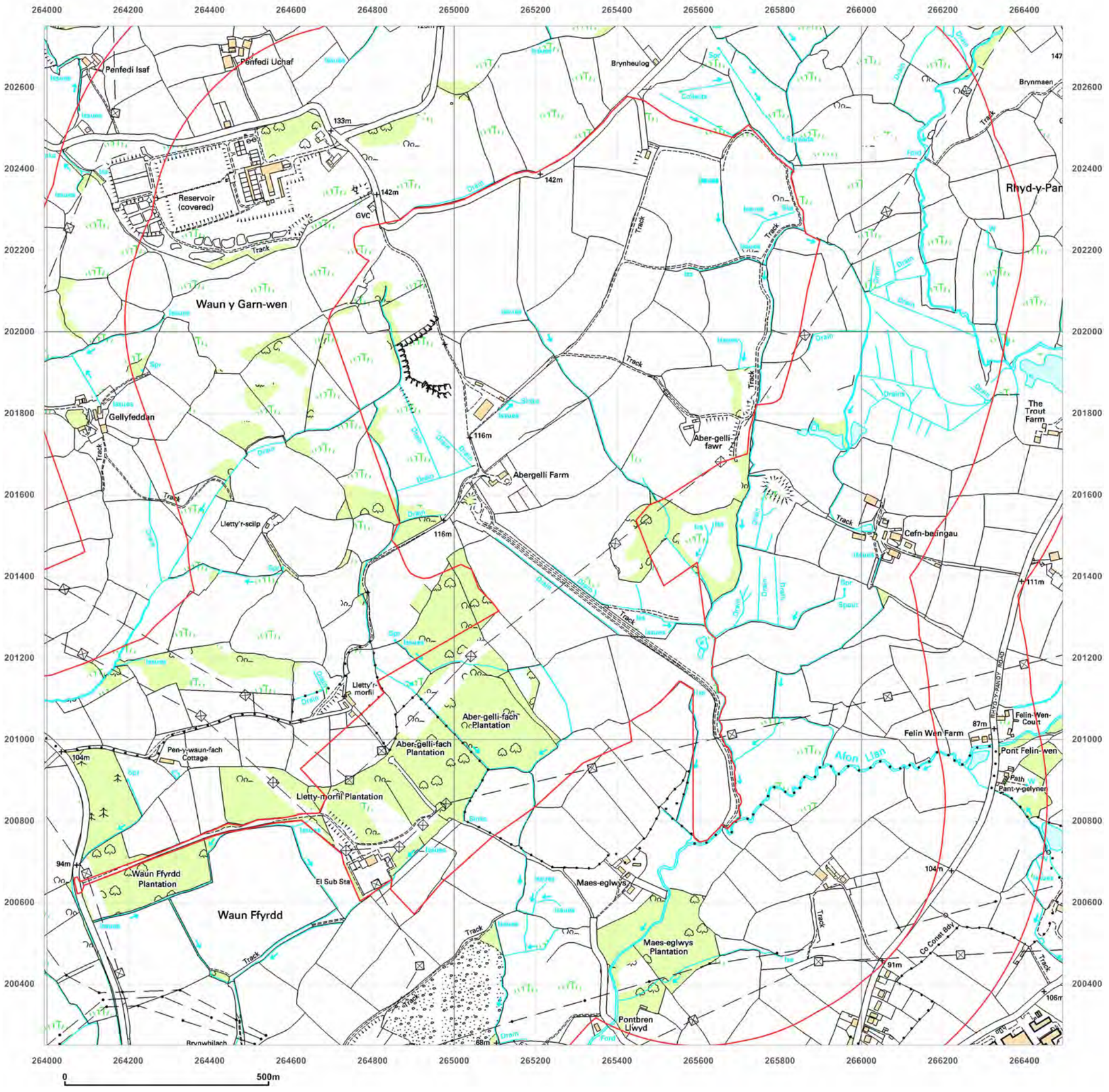

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: 1:10,000 Raster

Map date: **2002**

Scale: 1:10,000

Printed at: 1:10,000

N
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Production date: 30 July 2014

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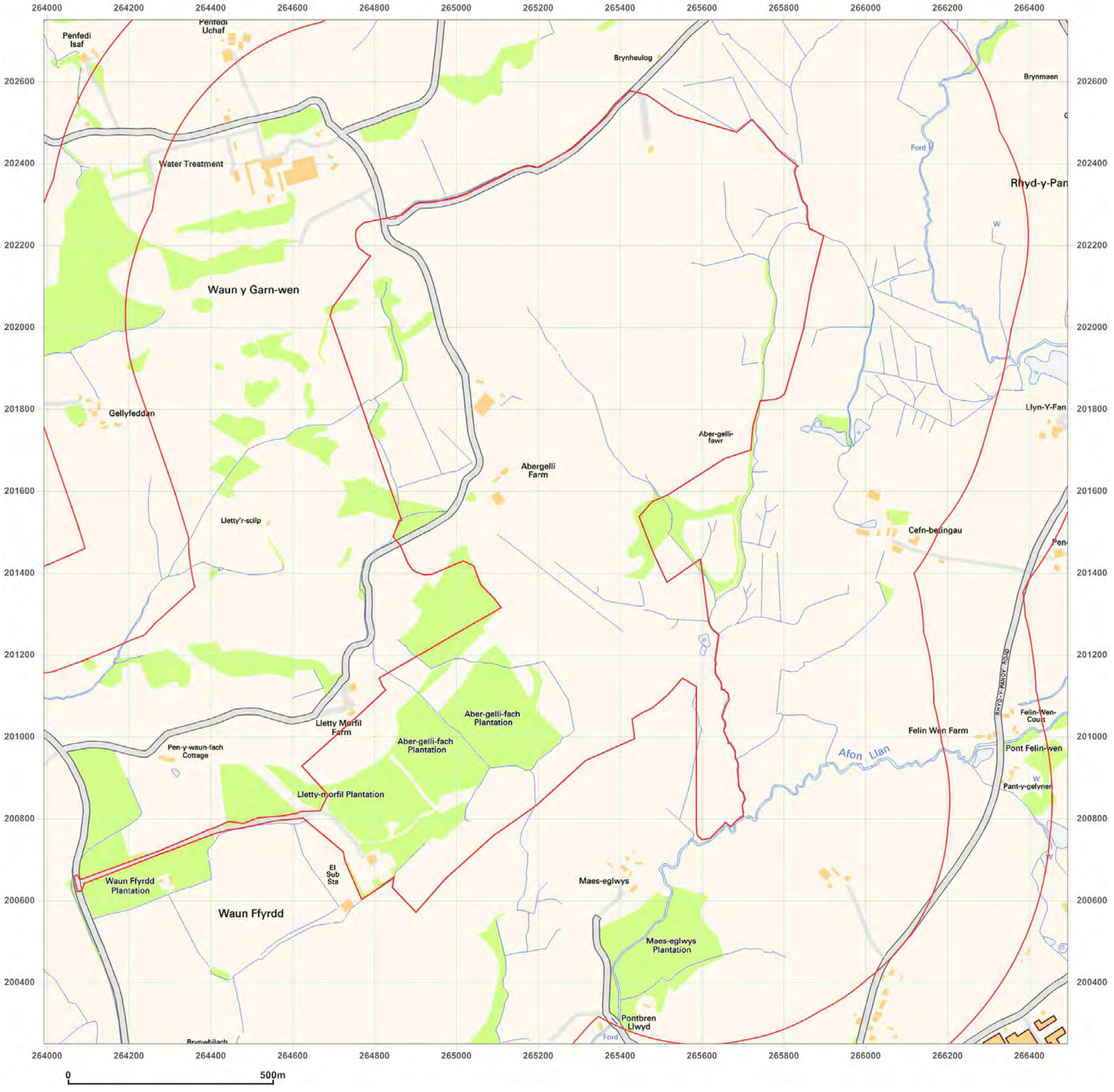

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

N
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Production date: 30 July 2014

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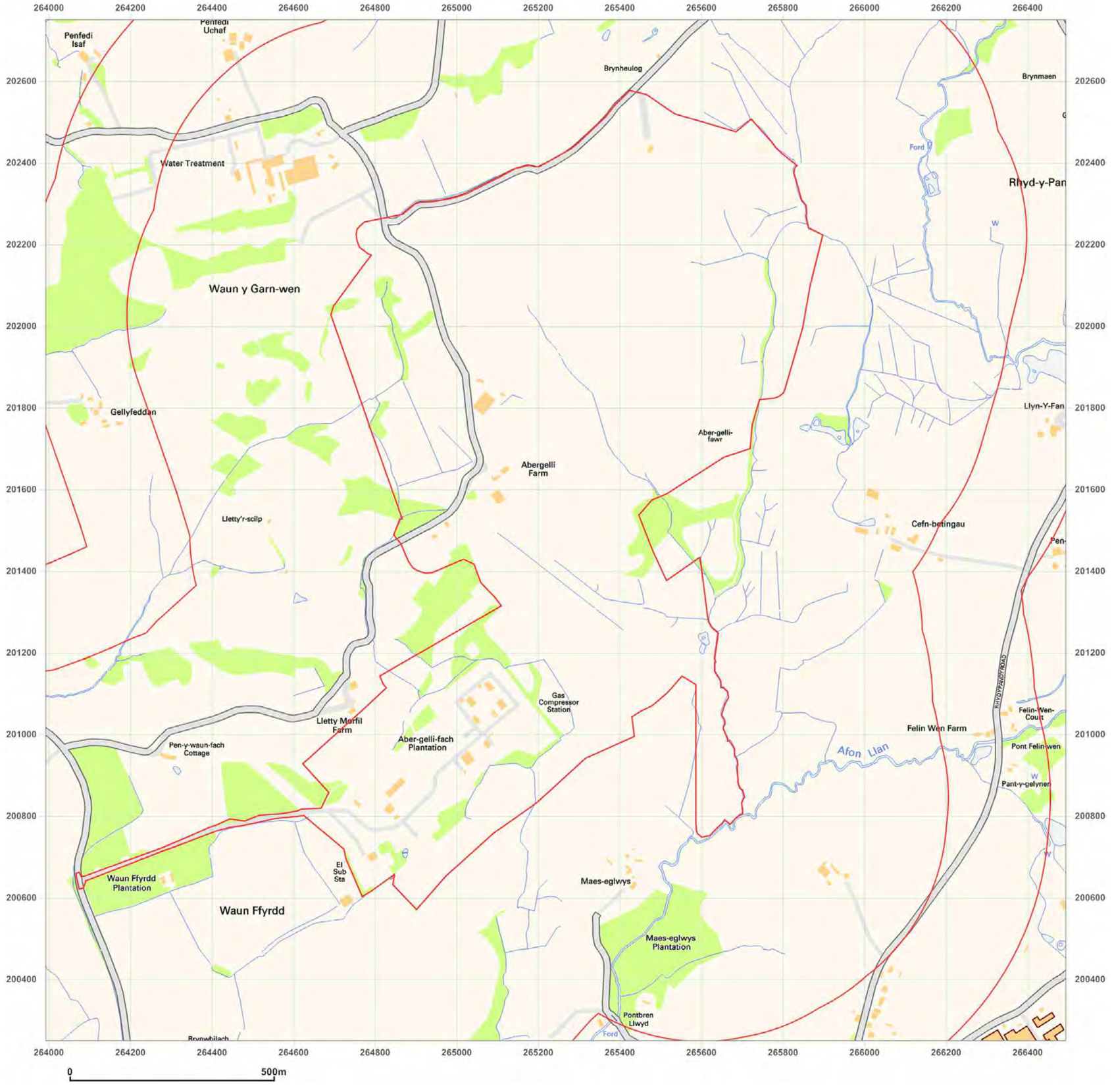

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: National Grid

Map date: **2014**

Scale: 1:10,000

Printed at: 1:10,000

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Production date: 30 July 2014

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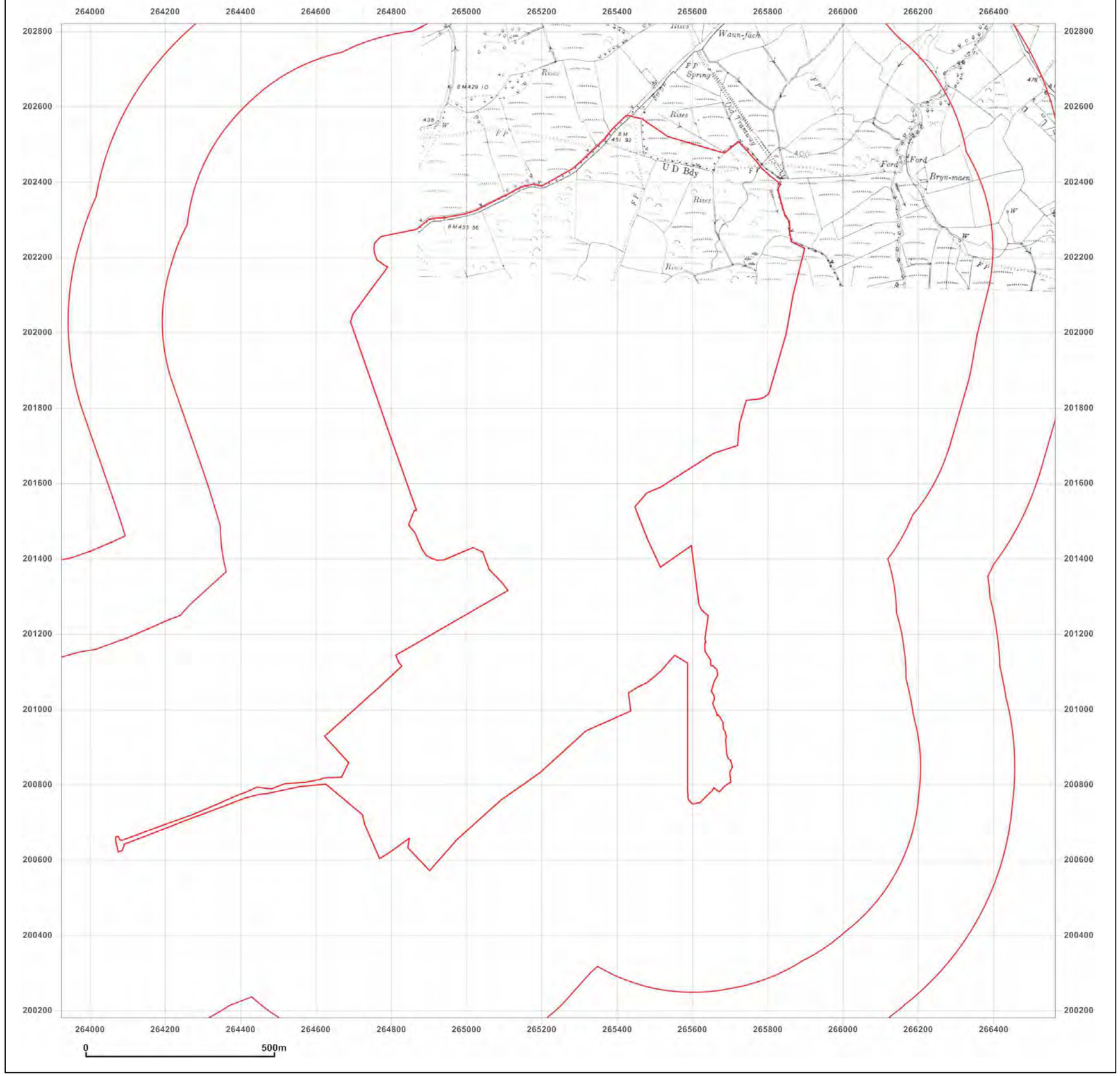

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646
Grid Ref: 265243, 201500

Map Name: County Series

Map date: **9152**

Scale: 1:10,560

Printed at: 1:10,560

N
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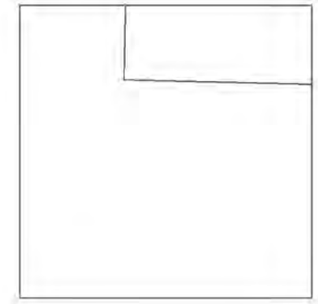
Surveyed 1875
Revised 1952
Edition N/A
Copyright N/A
Levelled 1947



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Production date: 30 July 2014

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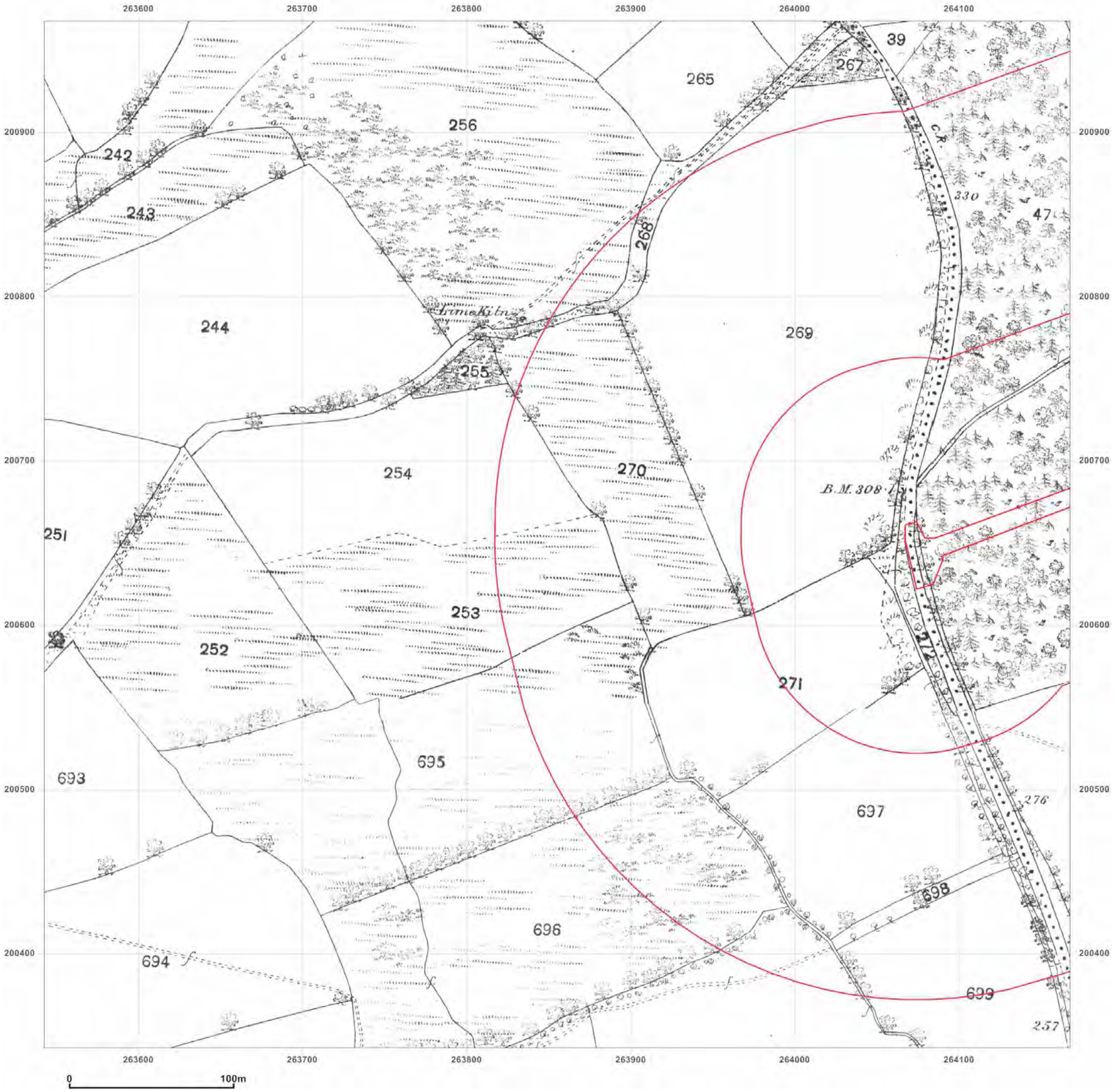

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: County Series

Map date: **1876-1878**

Scale: 1:2,500

Printed at: 1:2,500

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Production date: 30 July 2014

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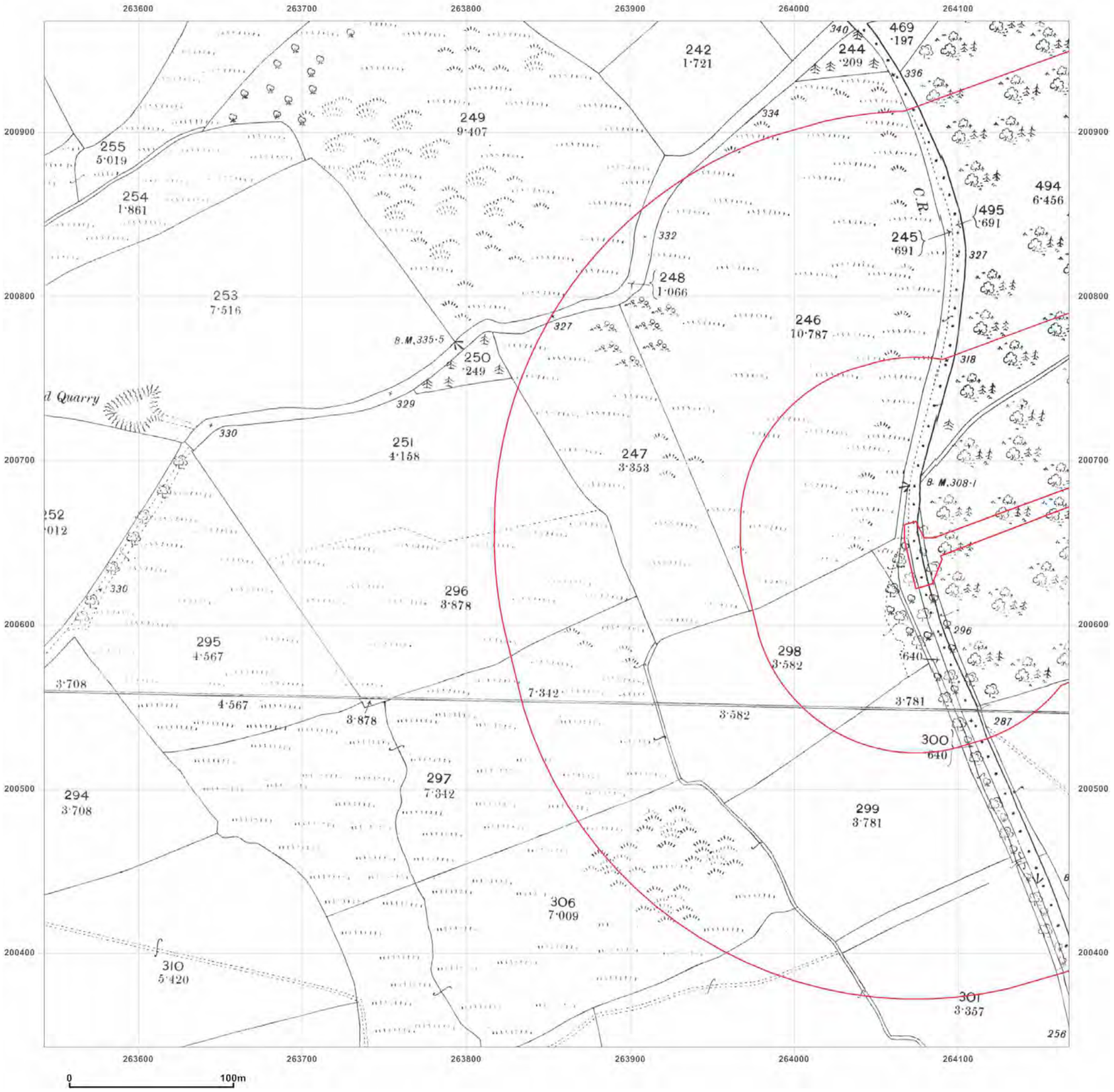

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: County Series

Map date: **1898**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

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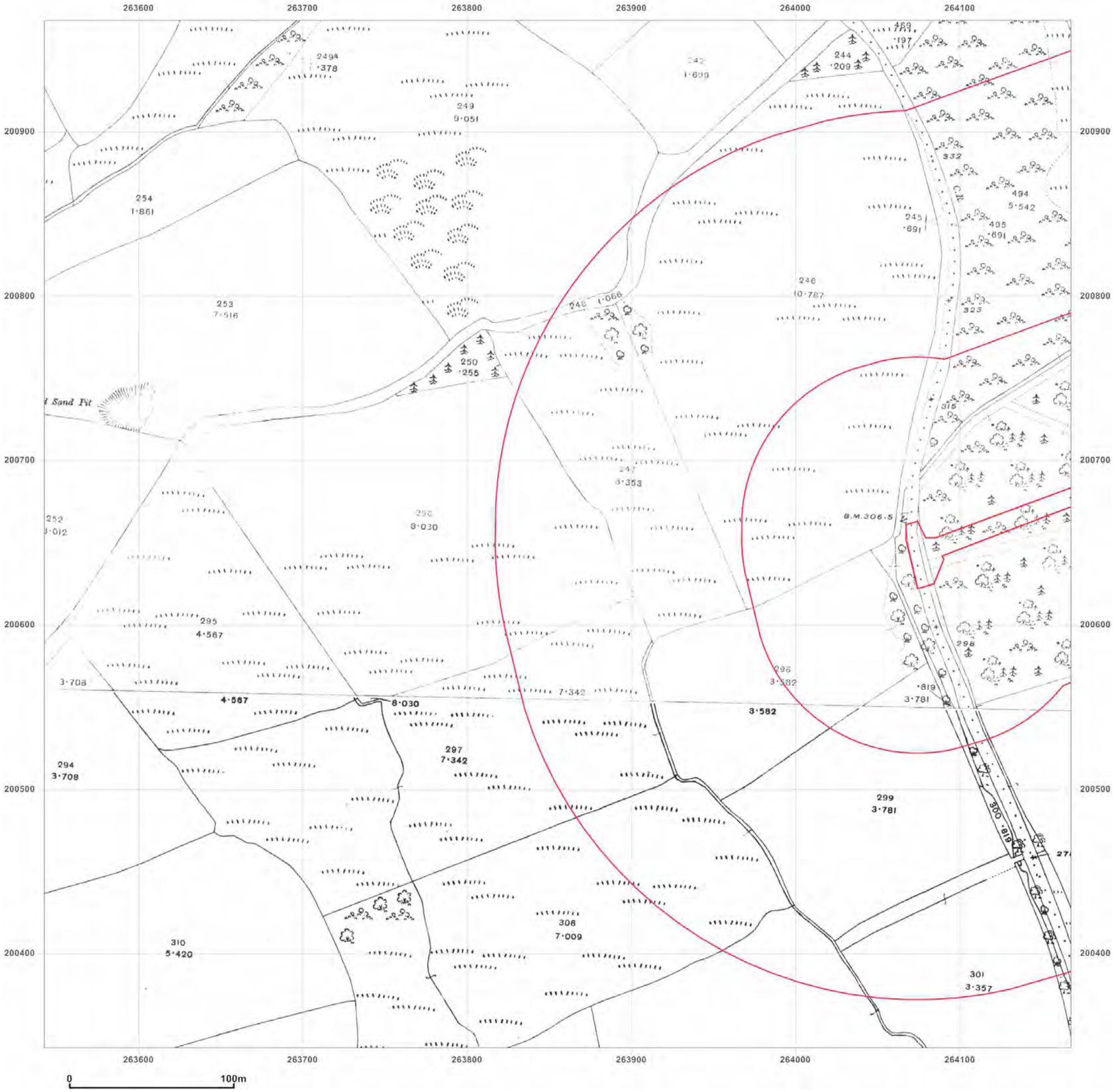

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: County Series

Map date: **1916**

Scale: 1:2,500

Printed at: 1:2,500

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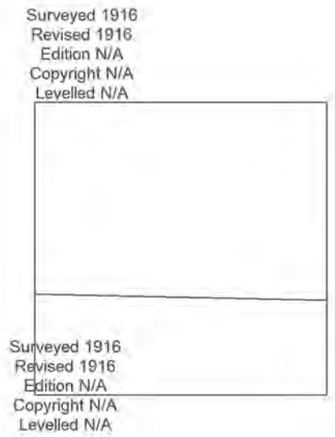

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Production date: 30 July 2014

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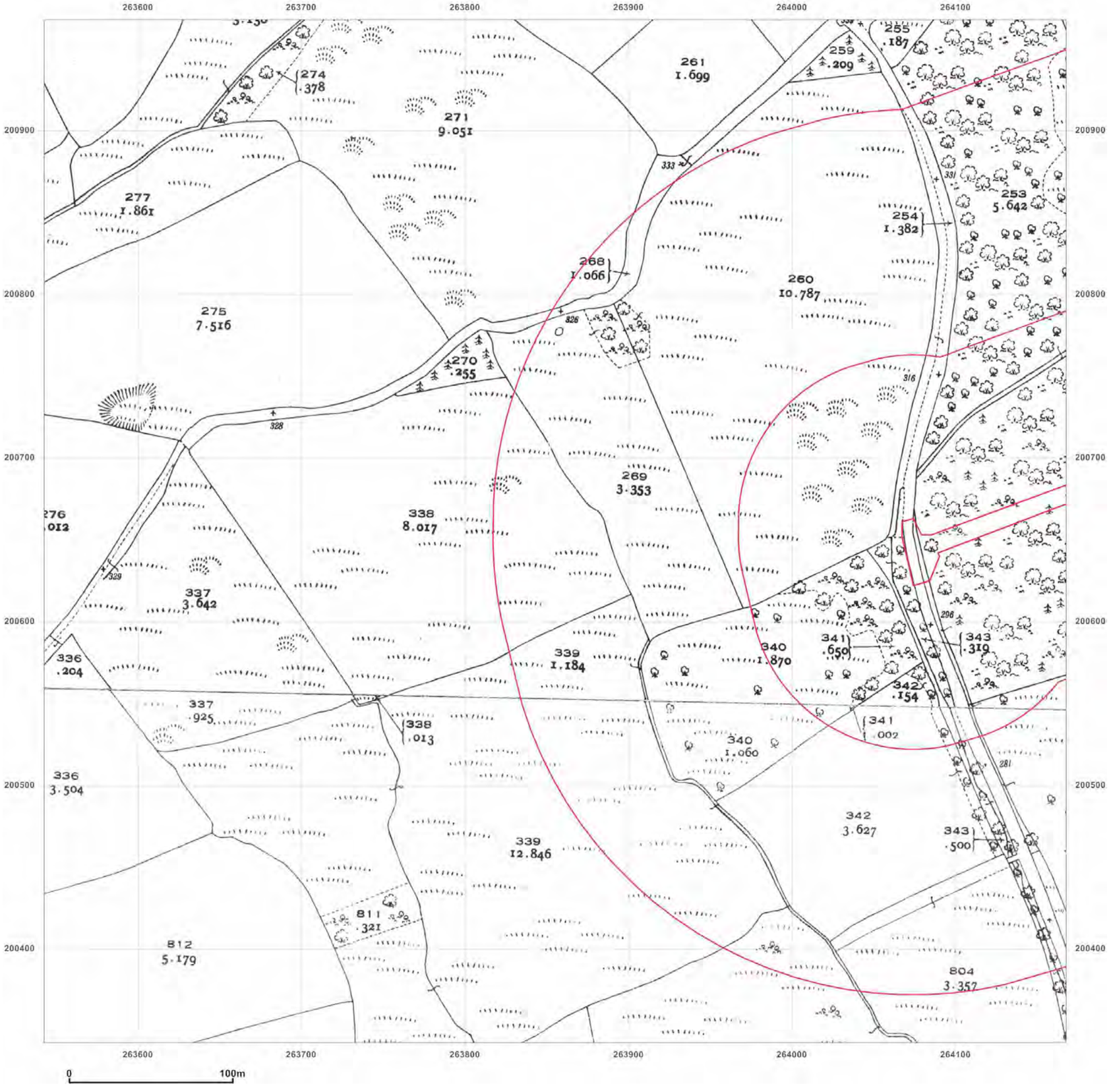

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ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: County Series

Map date: **1935**

Scale: 1:2,500

Printed at: 1:2,500

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Production date: 30 July 2014

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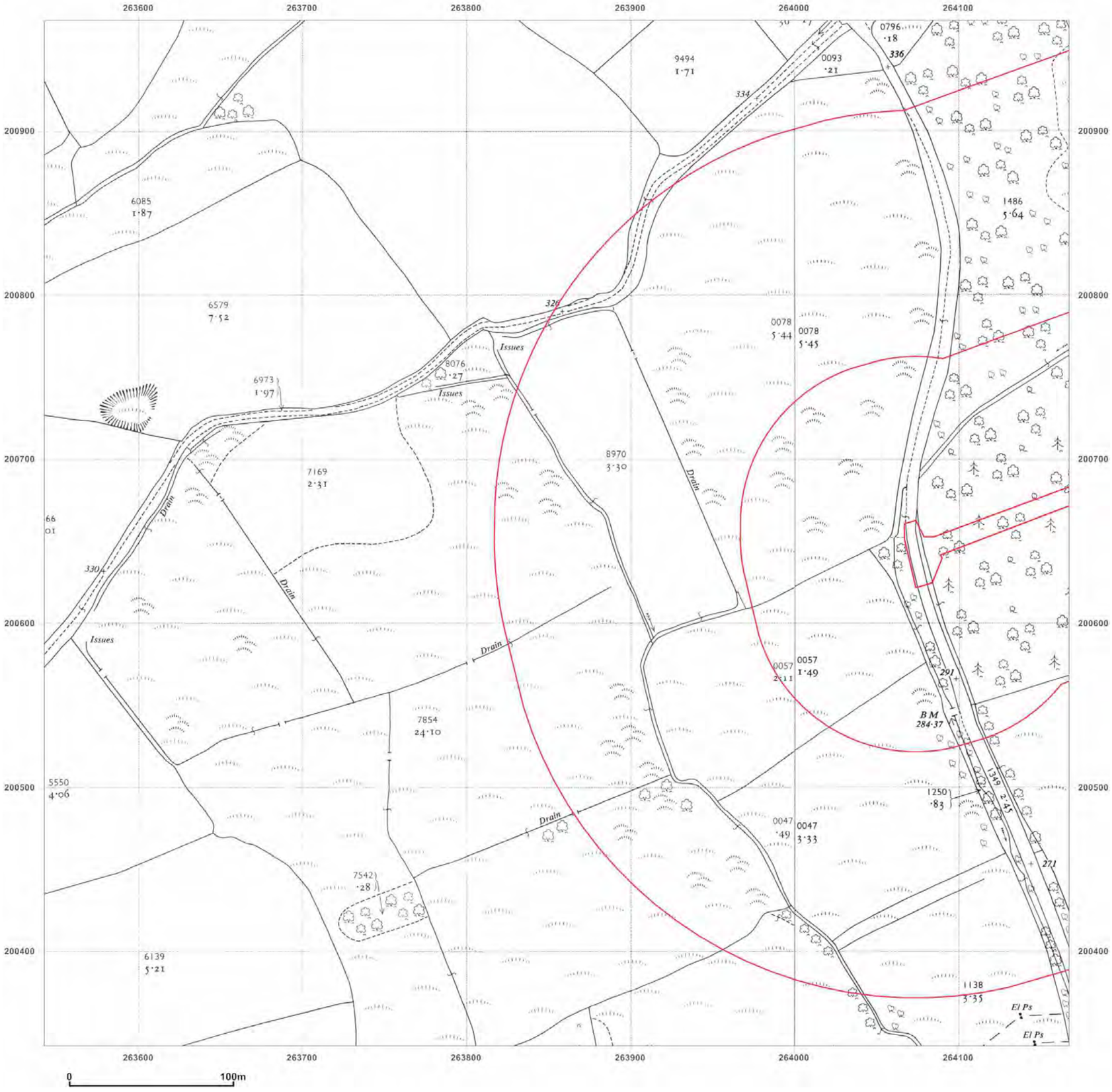

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: National Grid

Map date: **1958**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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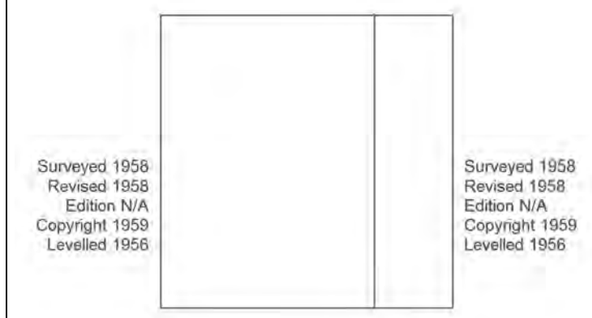

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Production date: 30 July 2014

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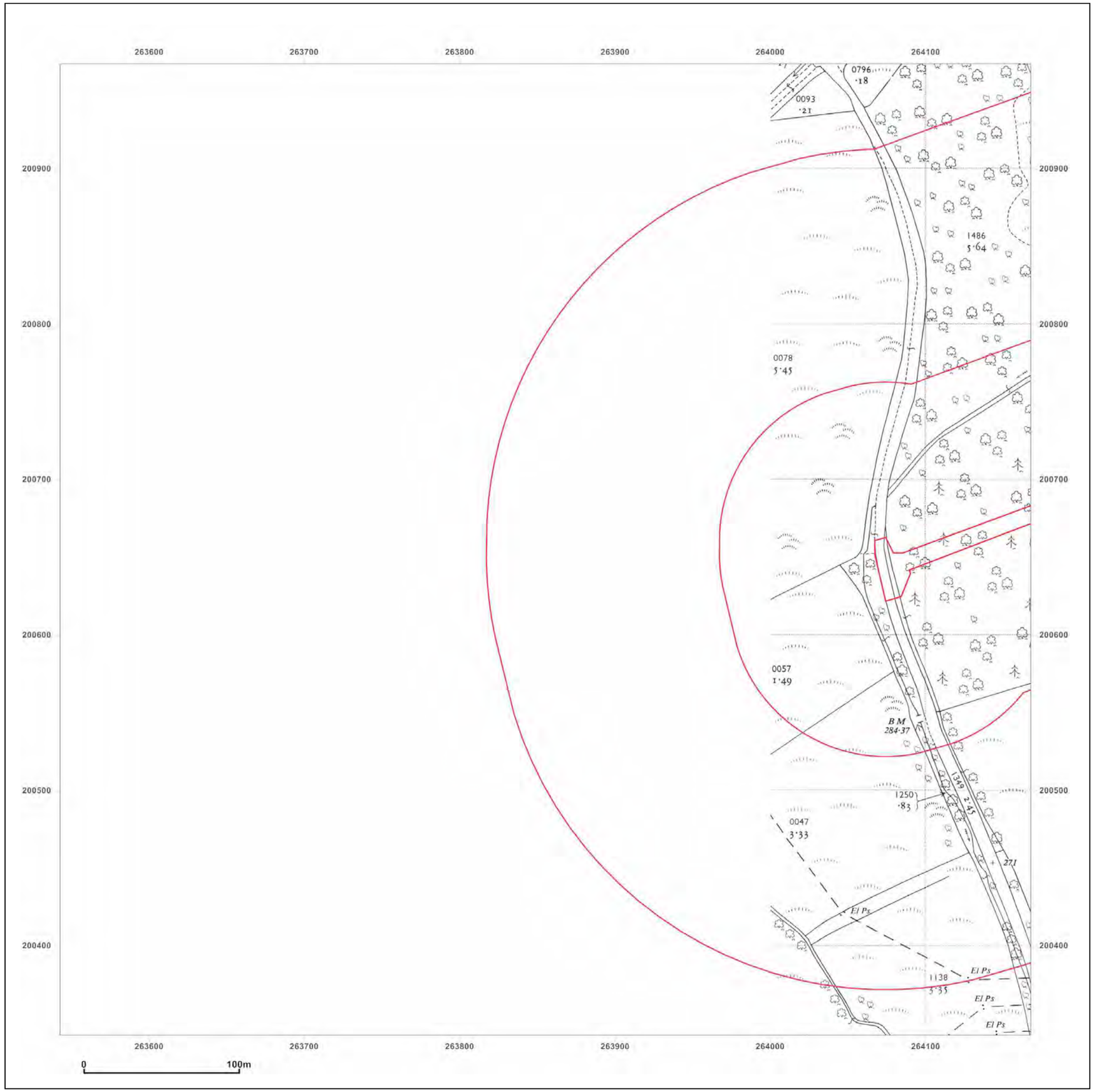


GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

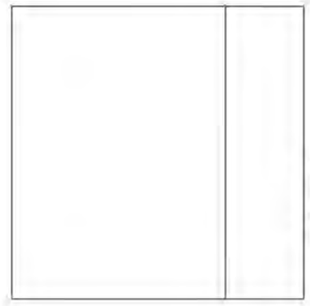
Map Name: National Grid

Map date: **1960**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



Surveyed 1960
Revised 1960
Edition N/A
Copyright 1962
Levelled 1956

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Production date: 30 July 2014

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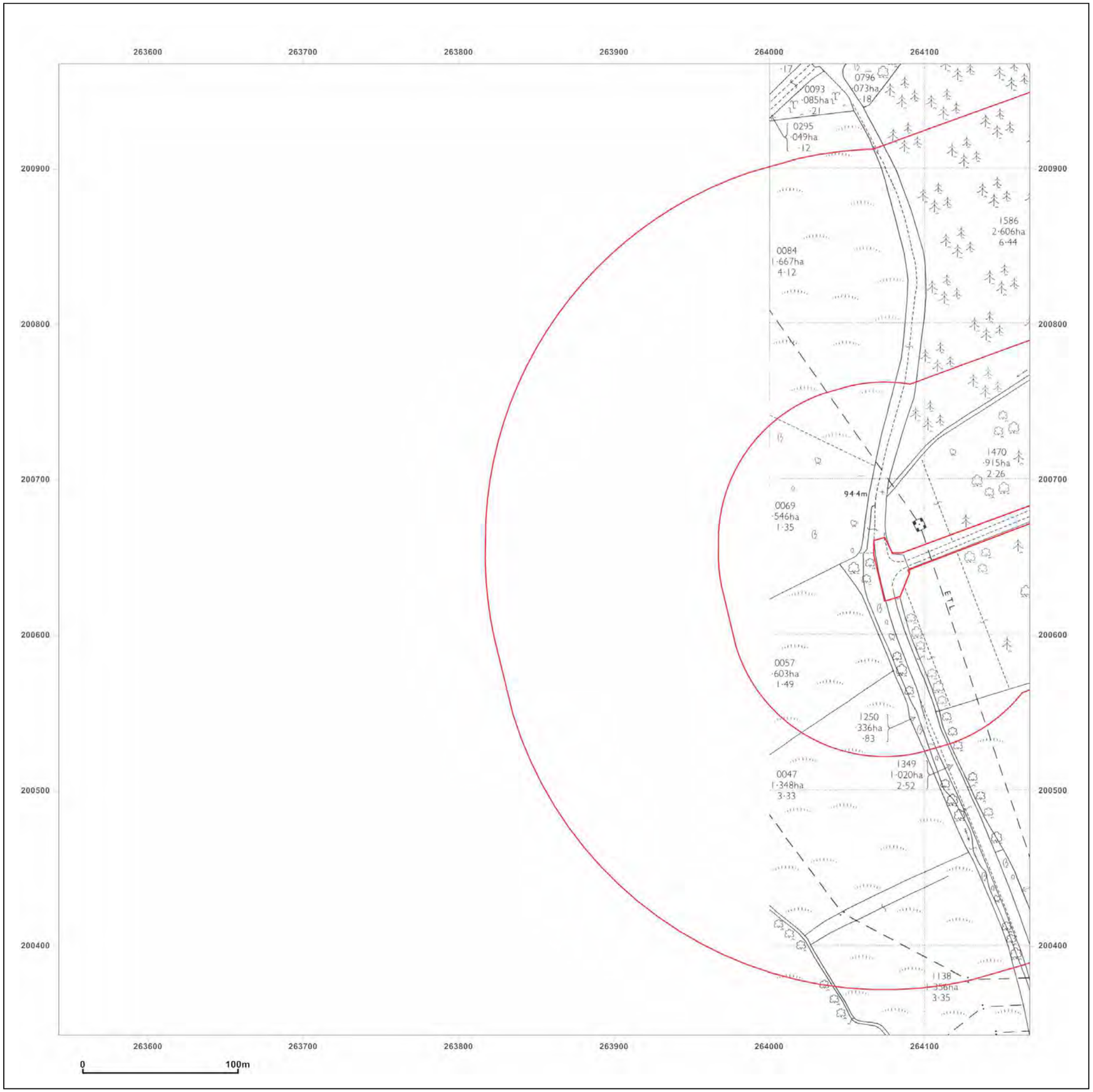


GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

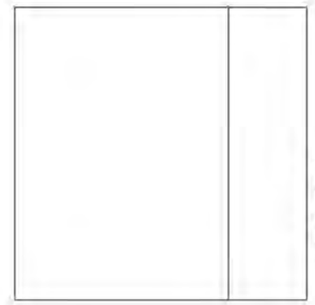
Map Name: National Grid

Map date: **1974**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



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Production date: 30 July 2014

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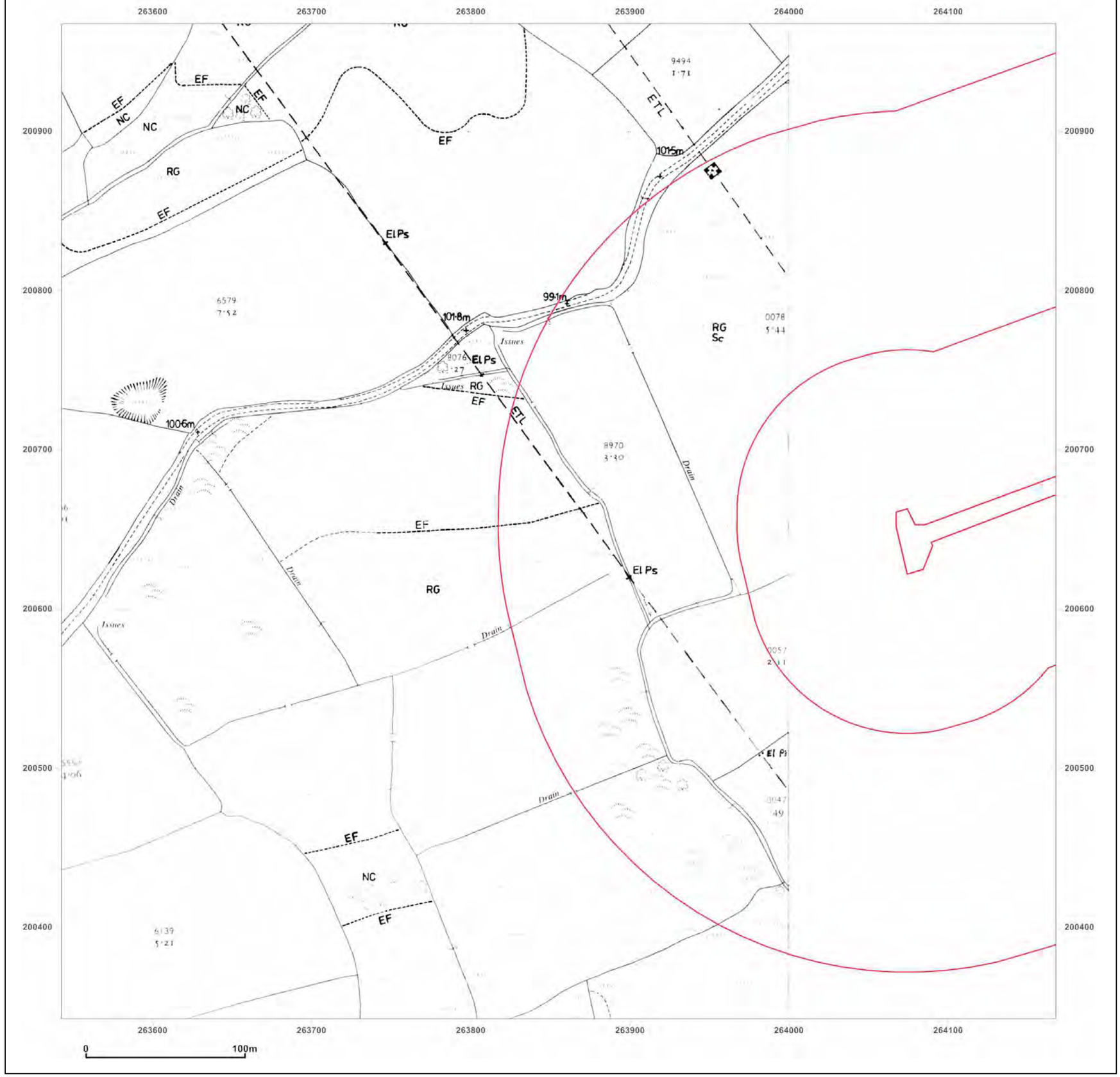

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: National Grid

Map date: **1989**

Scale: 1:2,500

Printed at: 1:2,500

N
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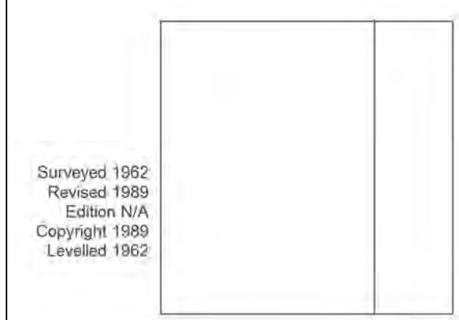

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Production date: 30 July 2014

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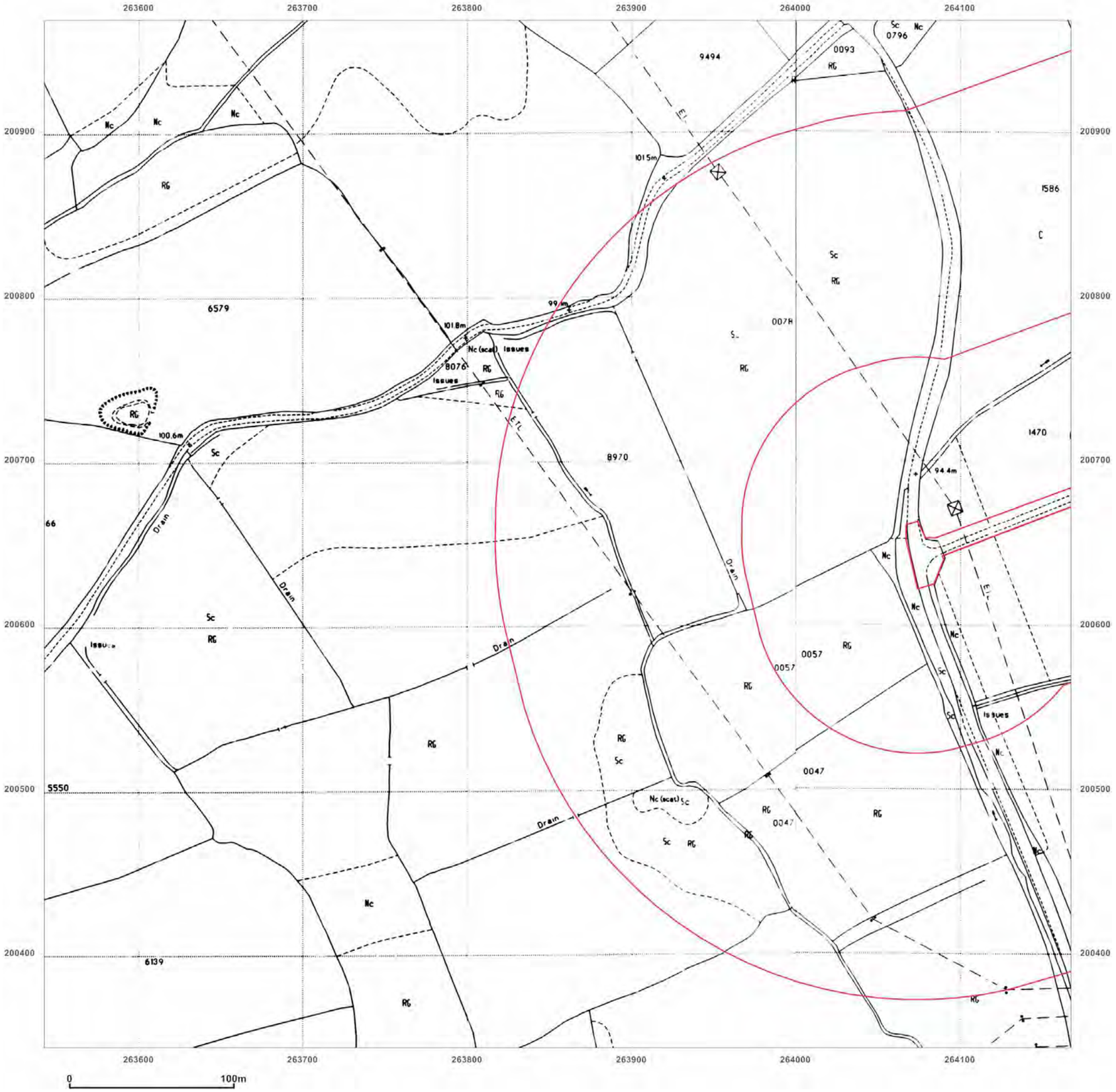

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ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_2_2
Grid Ref: 263855, 200655

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

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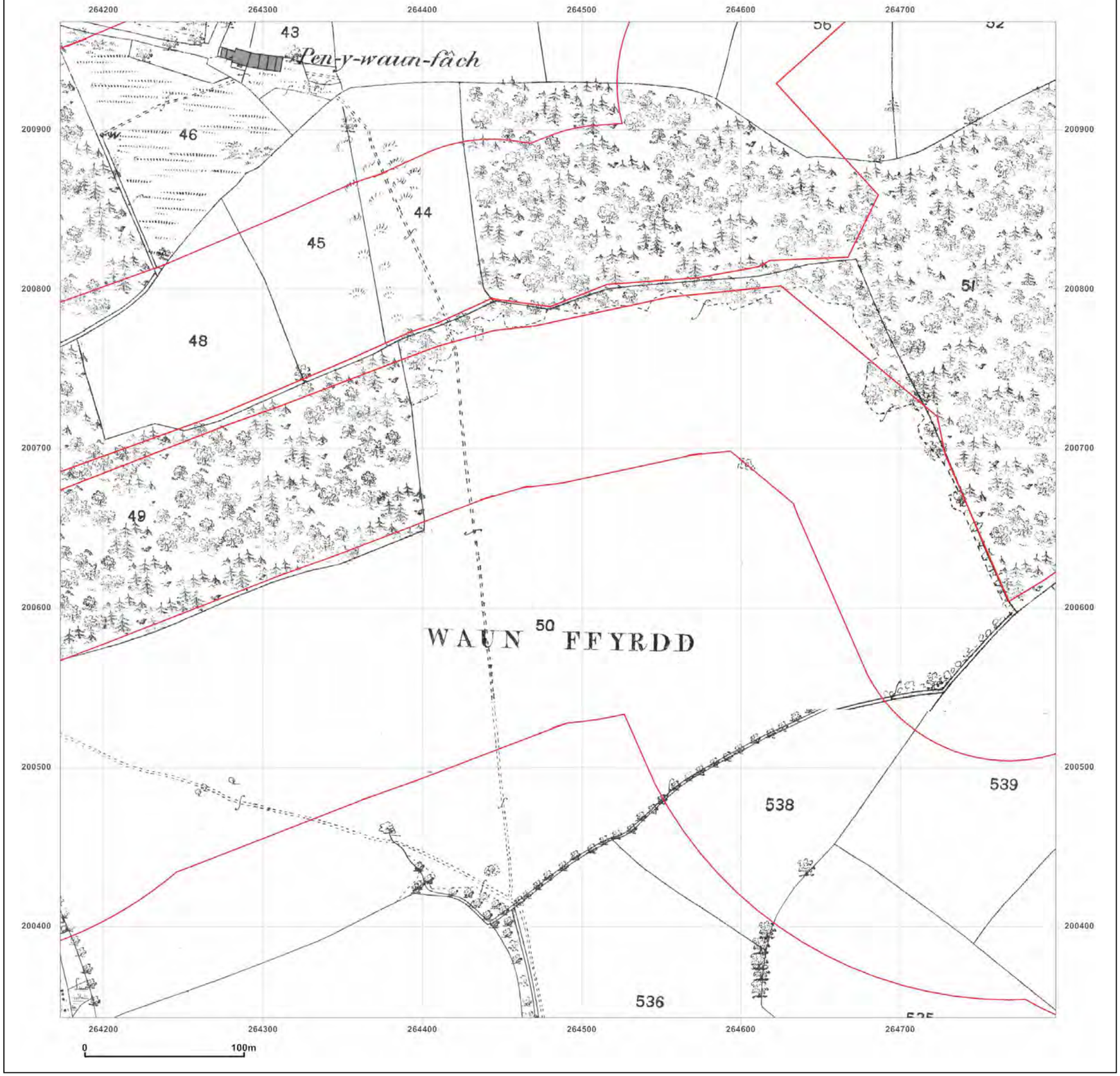


GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: County Series

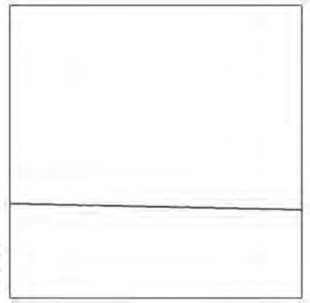
Map date: **1876-1878**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1878
Revised 1878
Edition N/A
Copyright N/A
Levelled N/A

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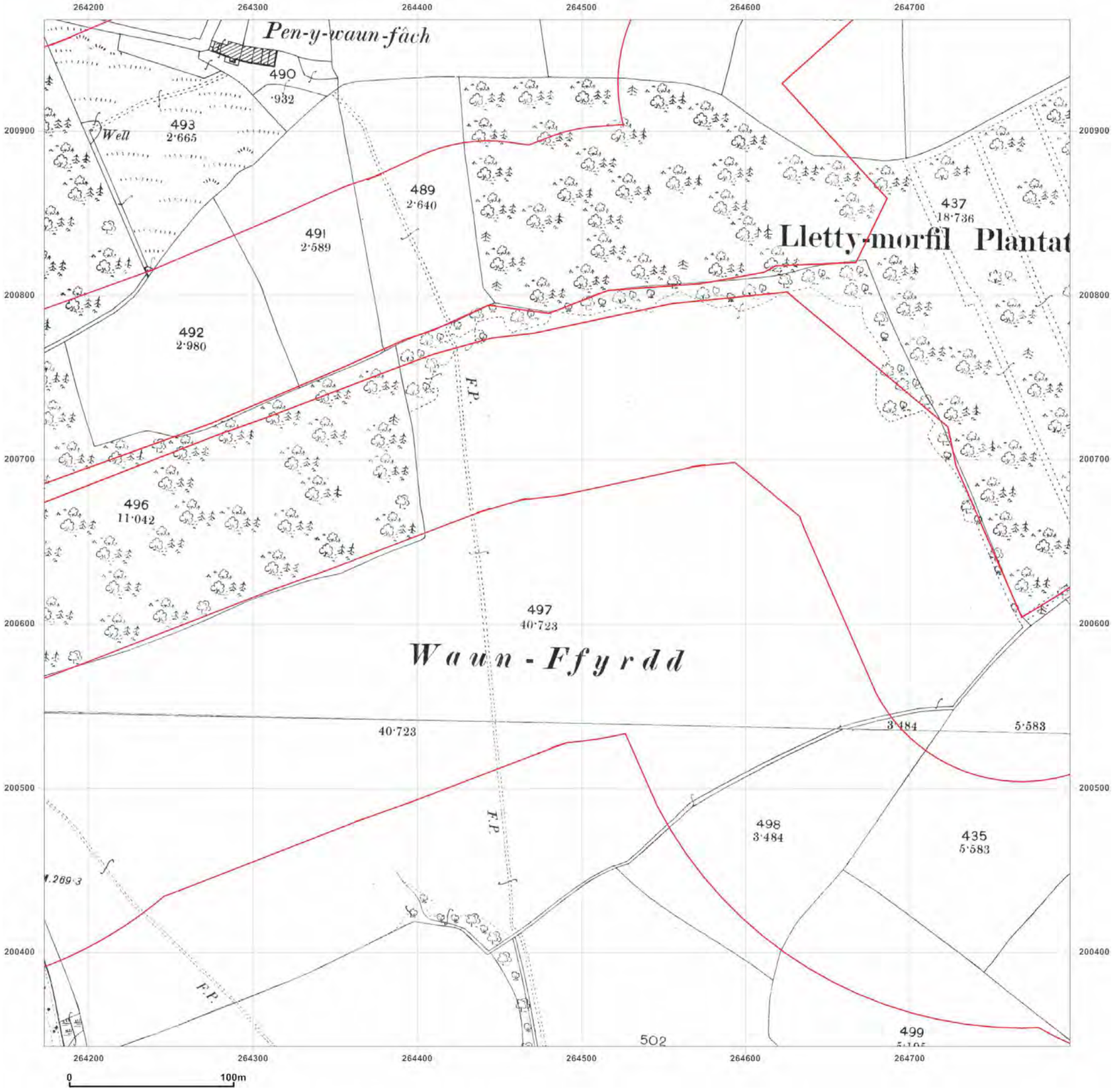


GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

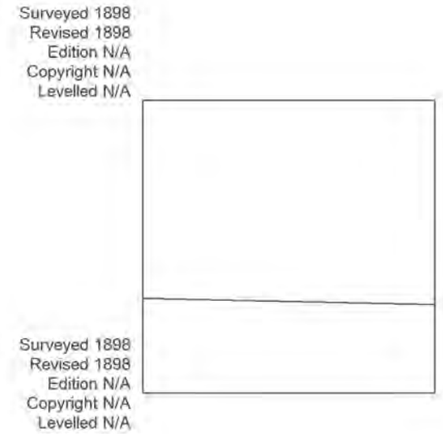
Map Name: County Series

Map date: **1898**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



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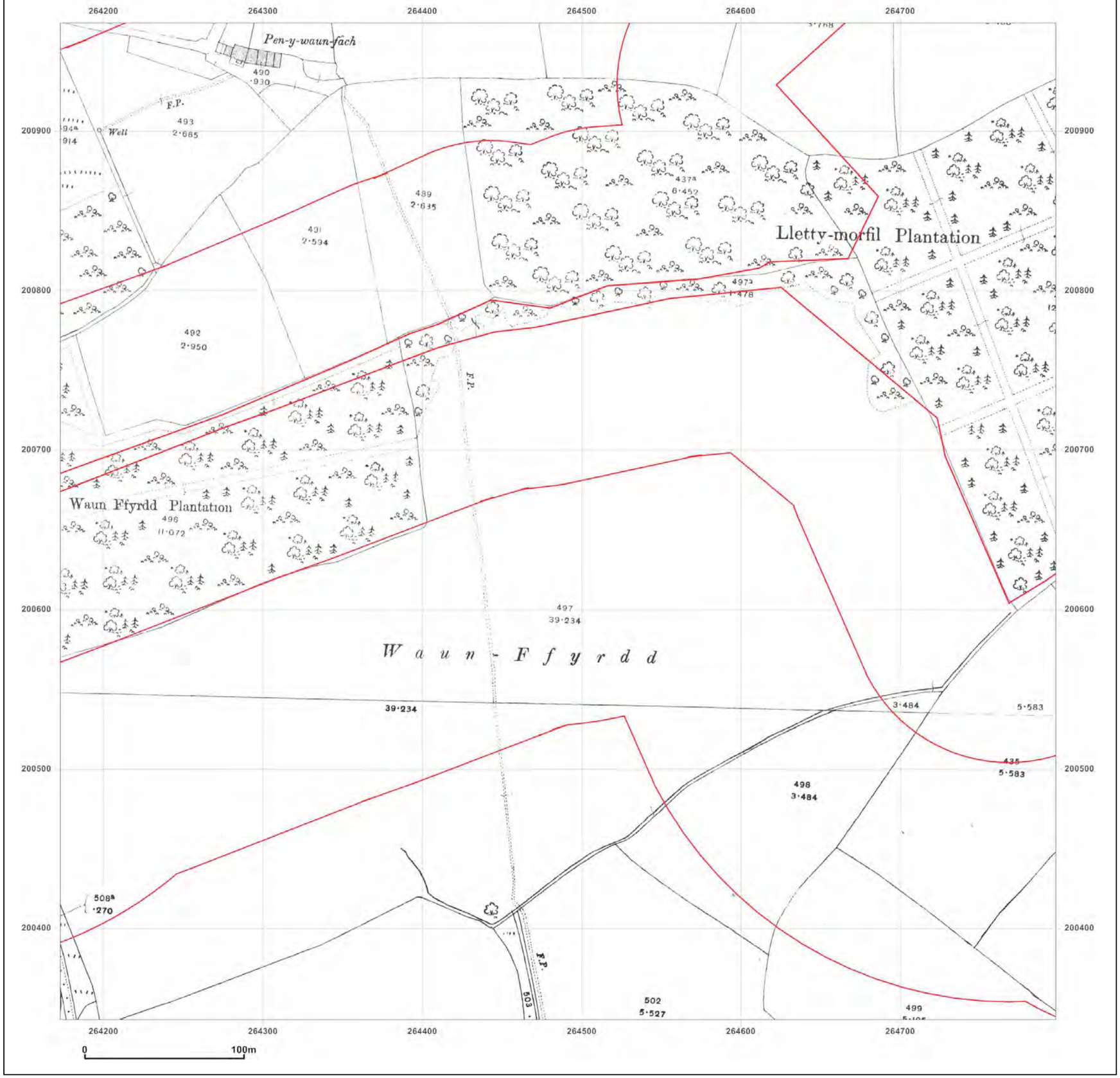
Production date: 30 July 2014

To view map legend click here *Legend*



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ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: County Series

Map date: **1916**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
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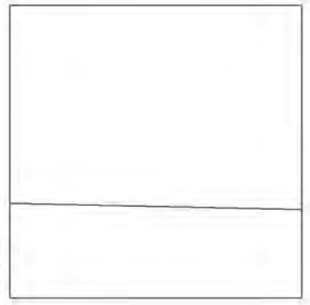
Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 30 July 2014

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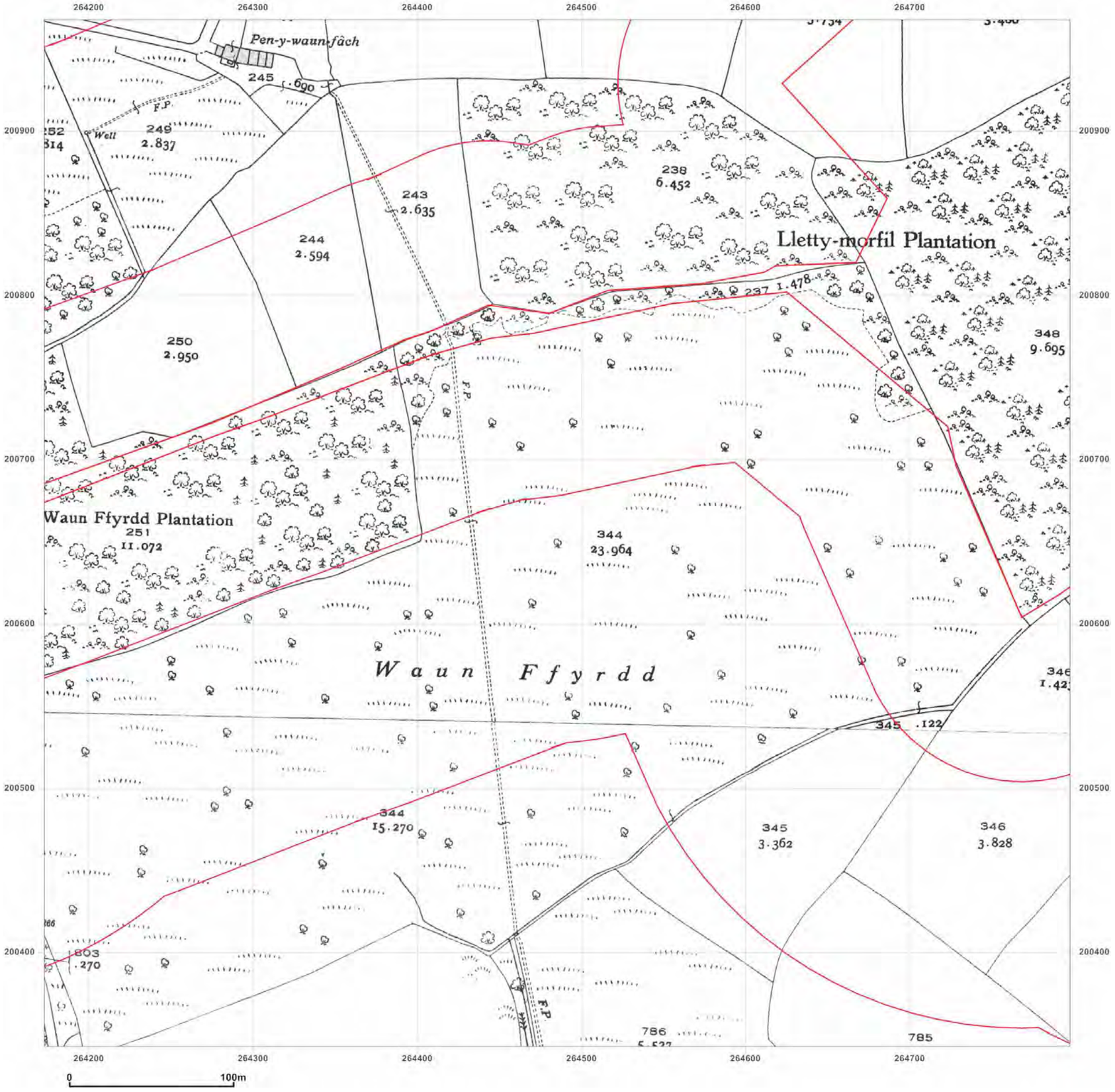


GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

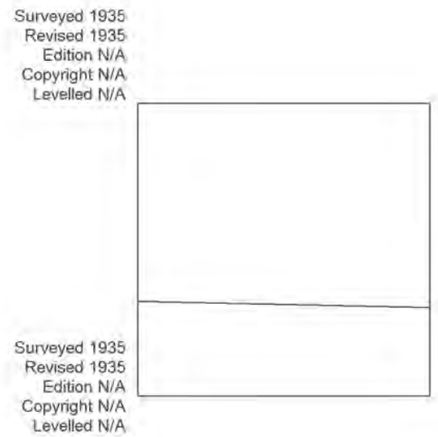
Map Name: County Series

Map date: **1935**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



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Production date: 30 July 2014

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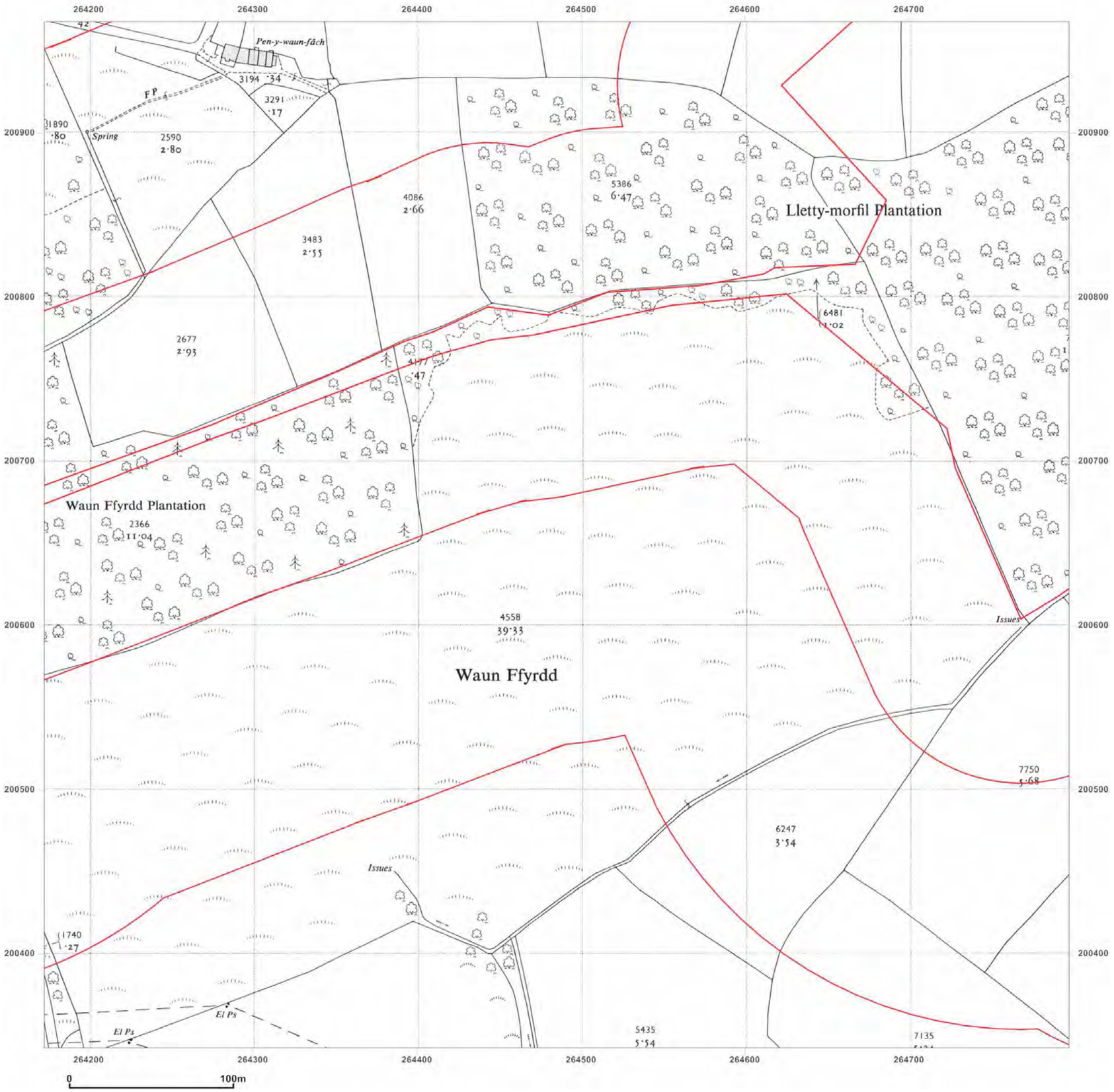

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: National Grid

Map date: **1958**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1956

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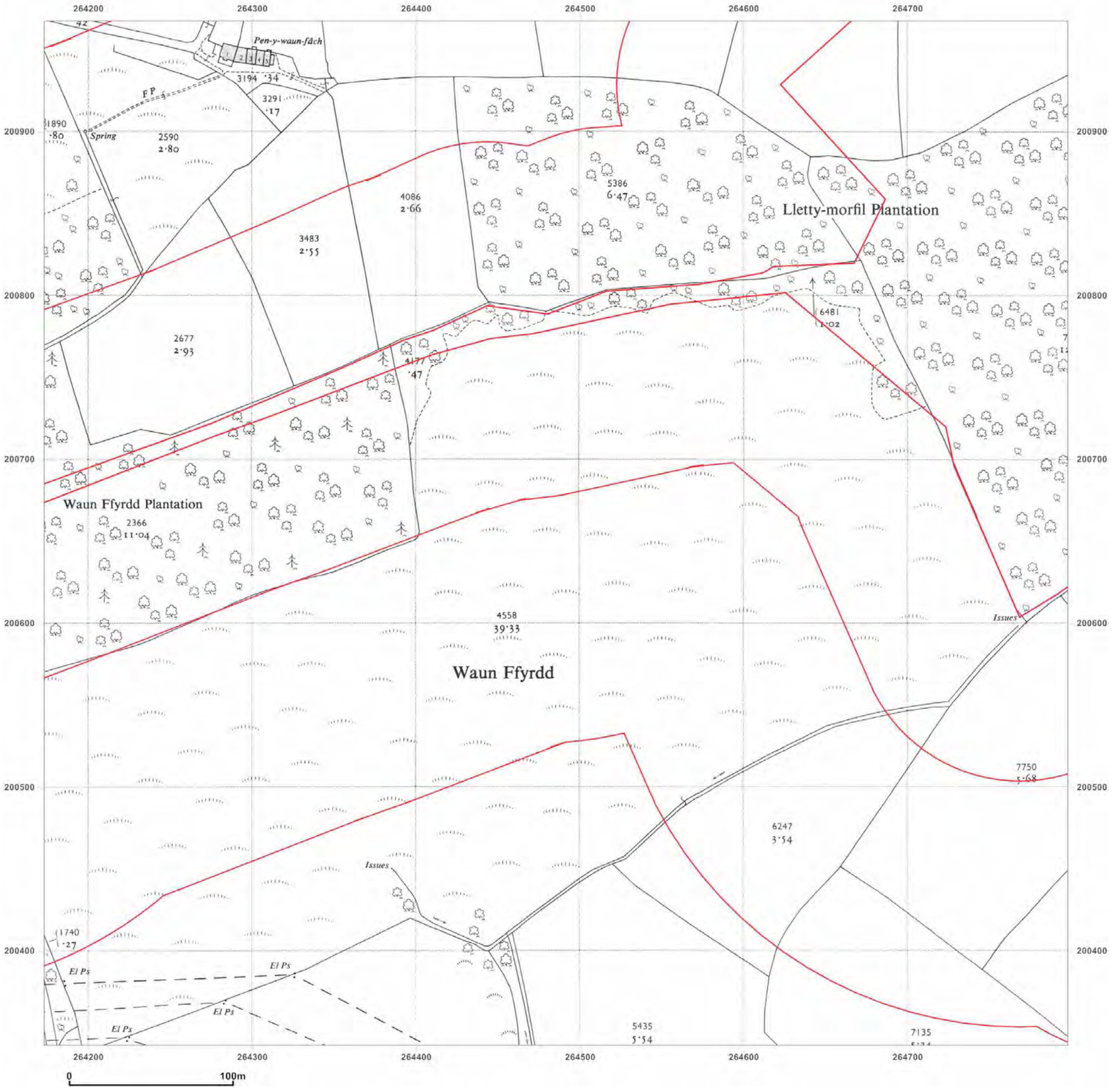
W: www.groundsure.com

Production date: 30 July 2014

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: National Grid

Map date: **1960**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1960
Revised 1960
Edition N/A
Copyright 1962
Levelled 1956

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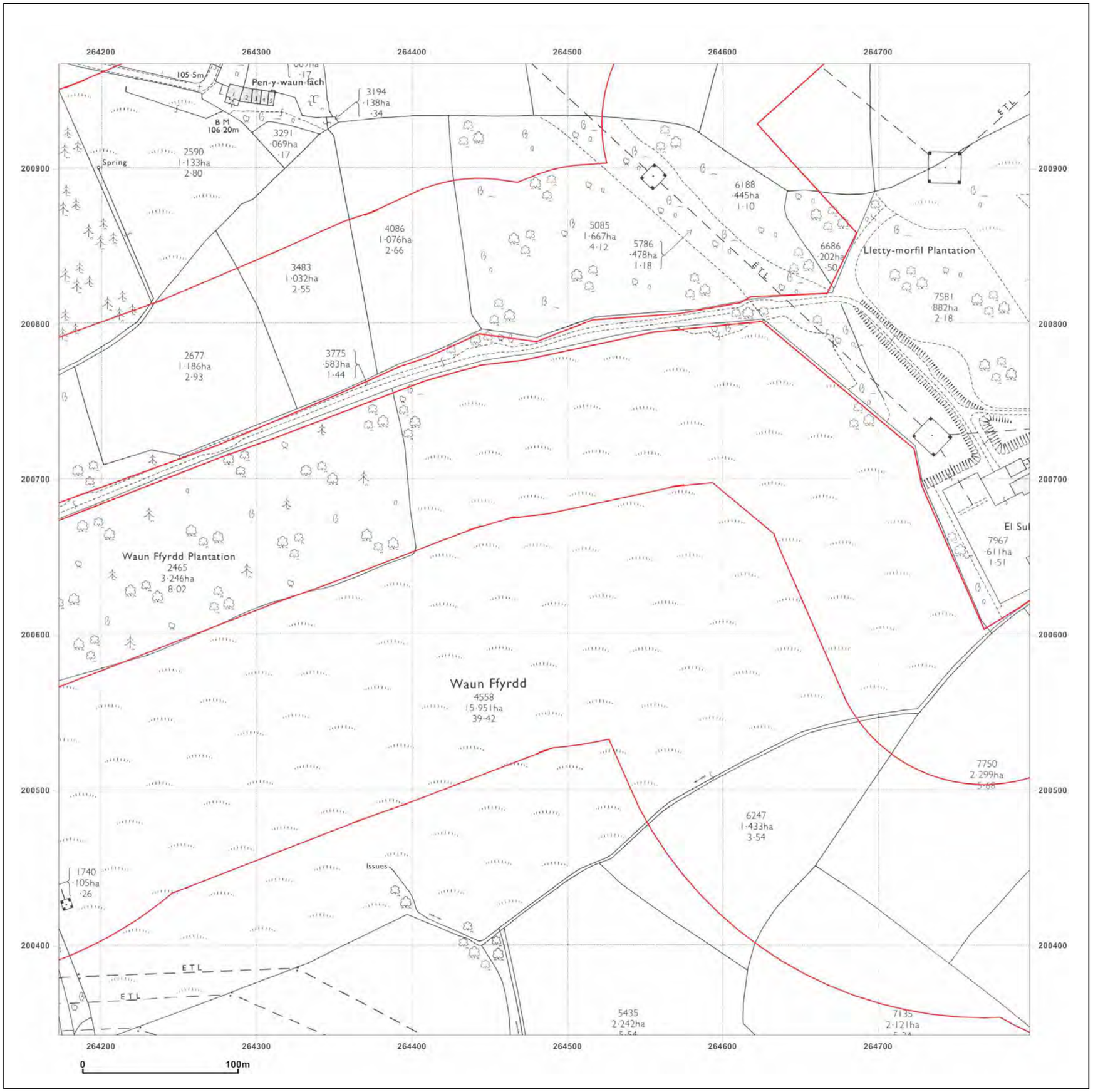
W: www.groundsure.com

Production date: 30 July 2014

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

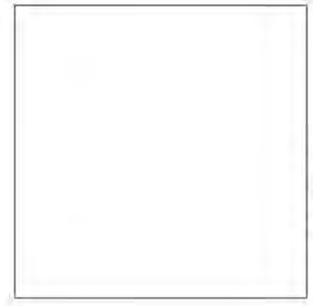
Map Name: National Grid

Map date: **1974**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1983

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Production date: 30 July 2014

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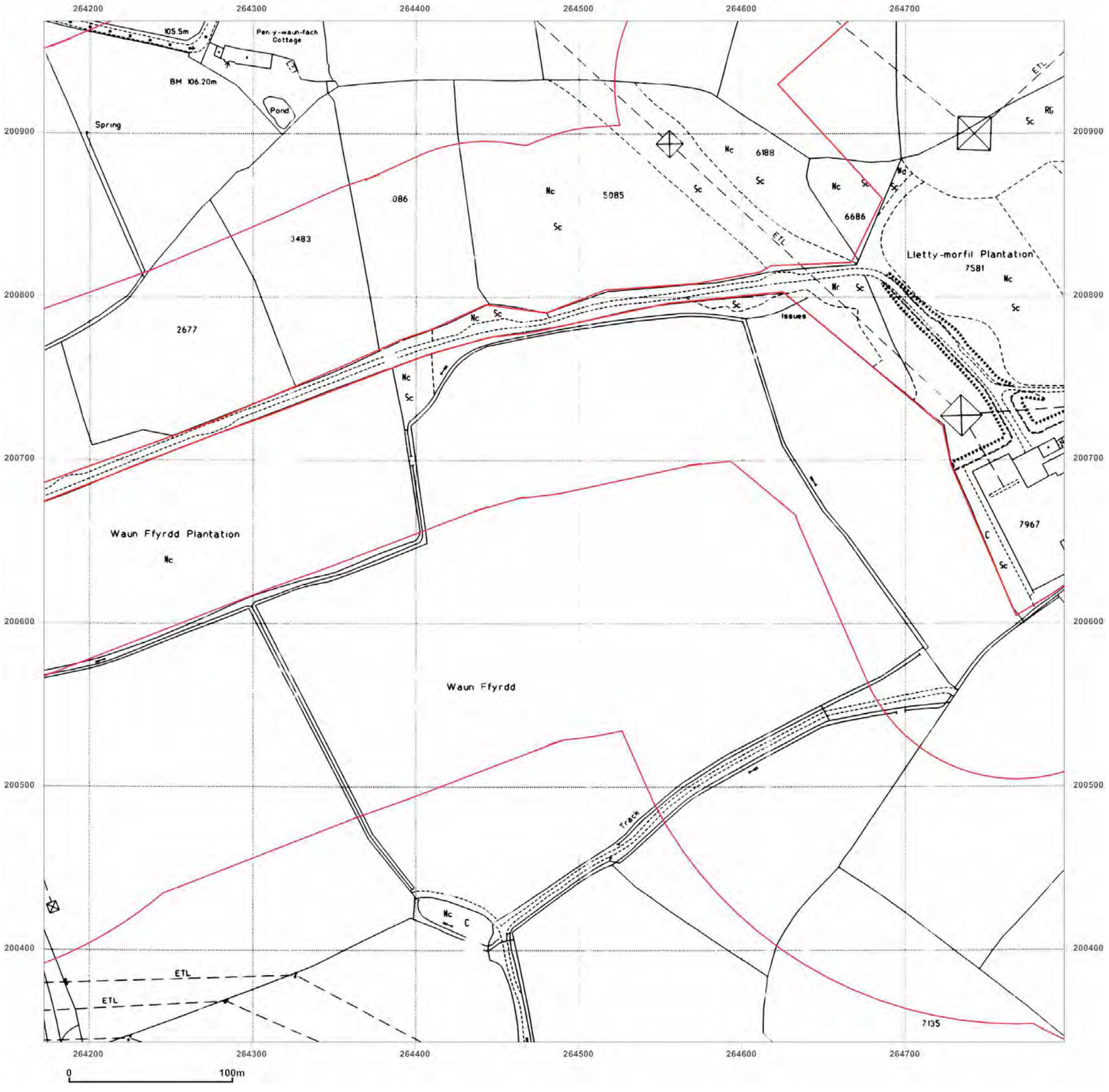

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_2
Grid Ref: 264485, 200655

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

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Production date: 30 July 2014

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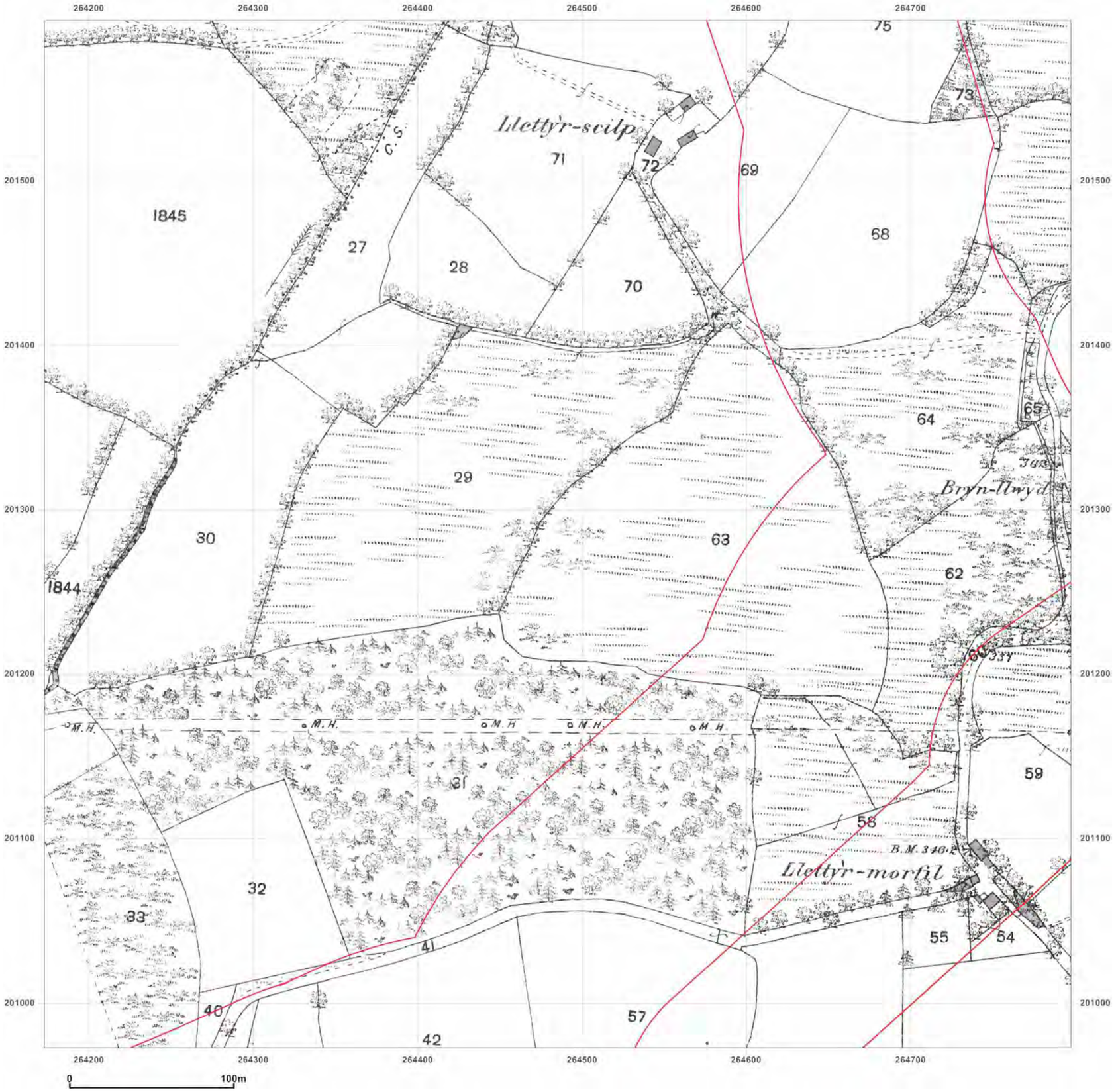

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: County Series

Map date: **1876**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 30 July 2014

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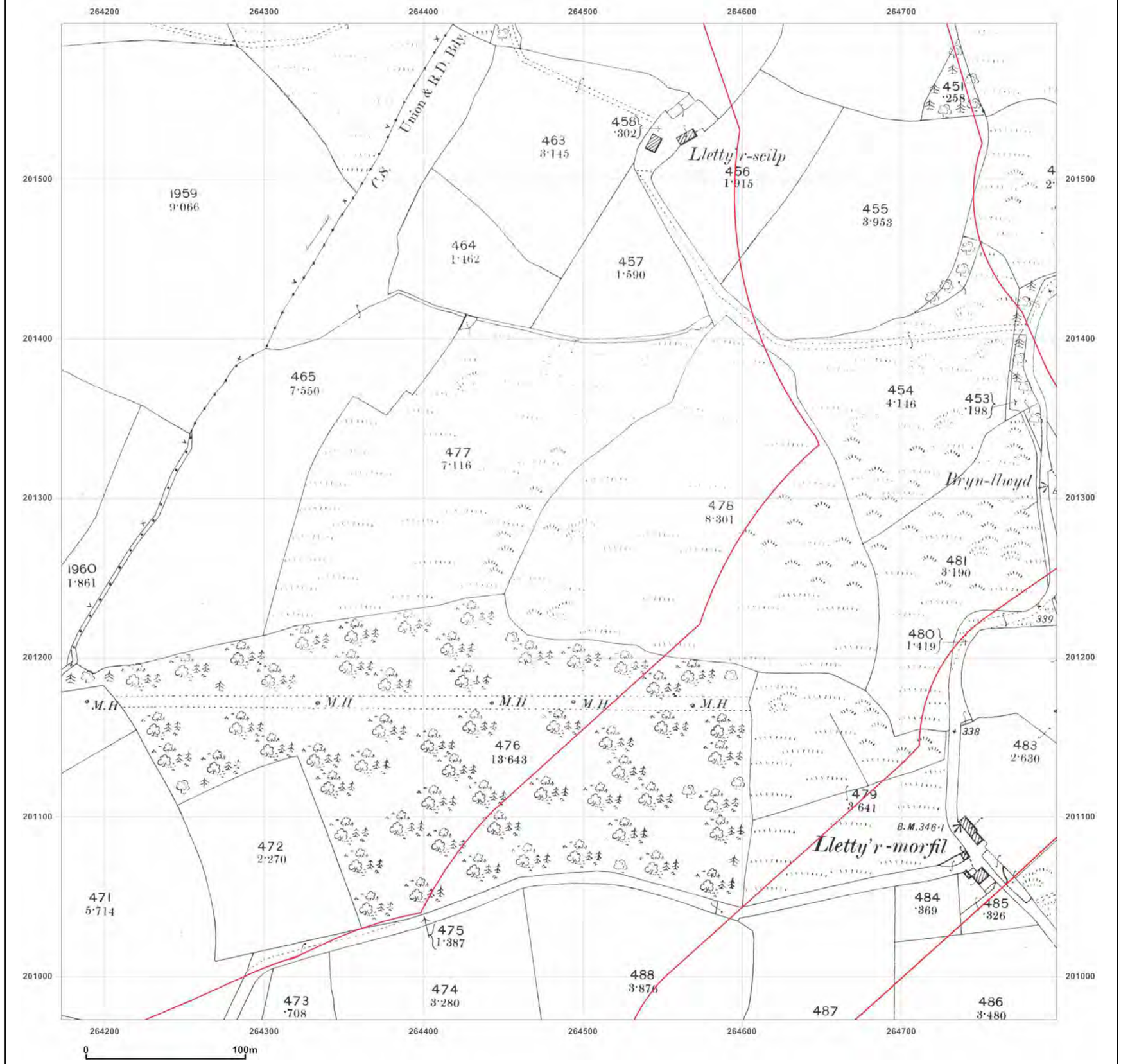

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: County Series

Map date: **1898**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1898
Revised 1898
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 30 July 2014

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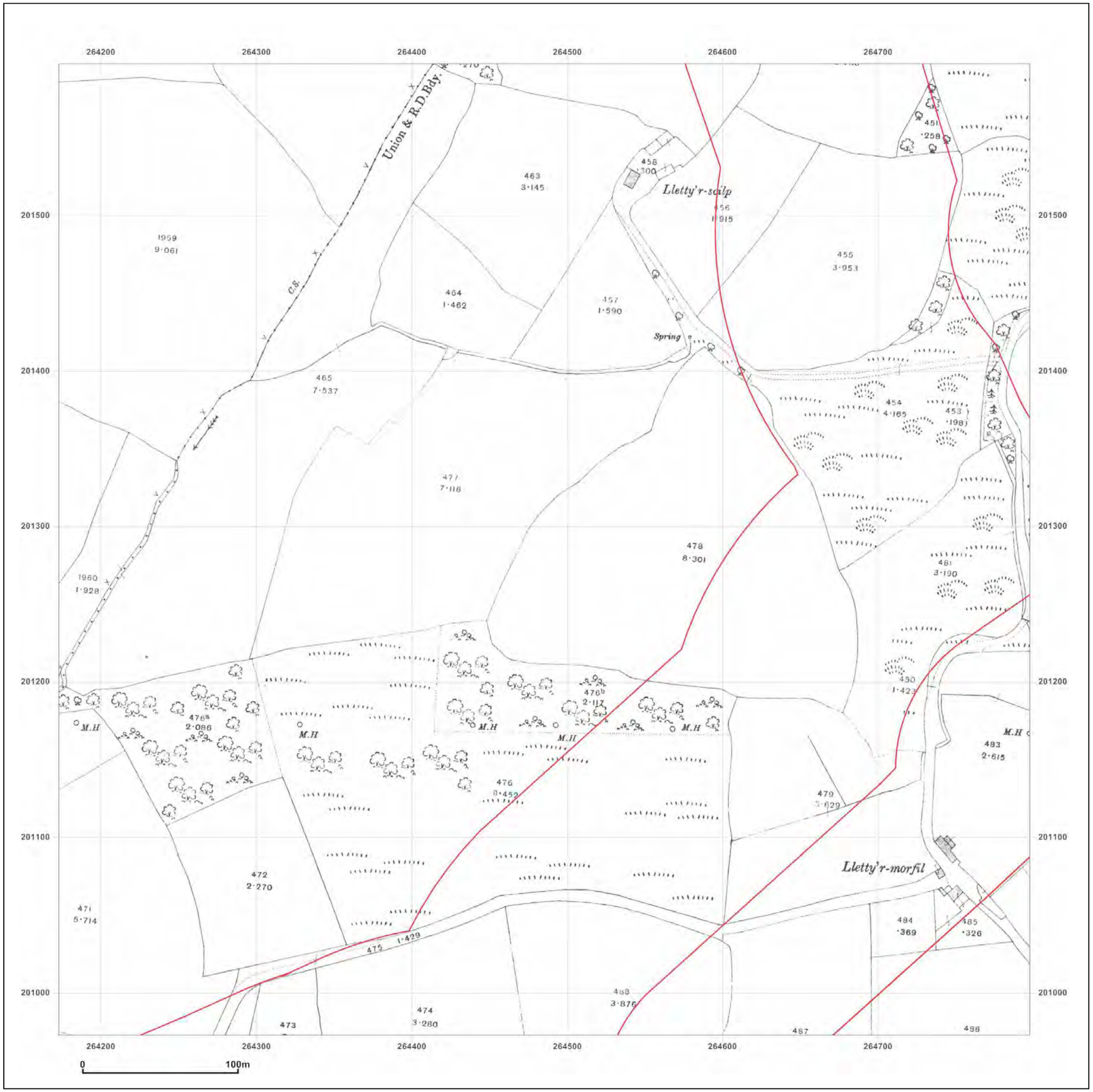

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: County Series

Map date: **1916**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1916
Revised 1916
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 30 July 2014

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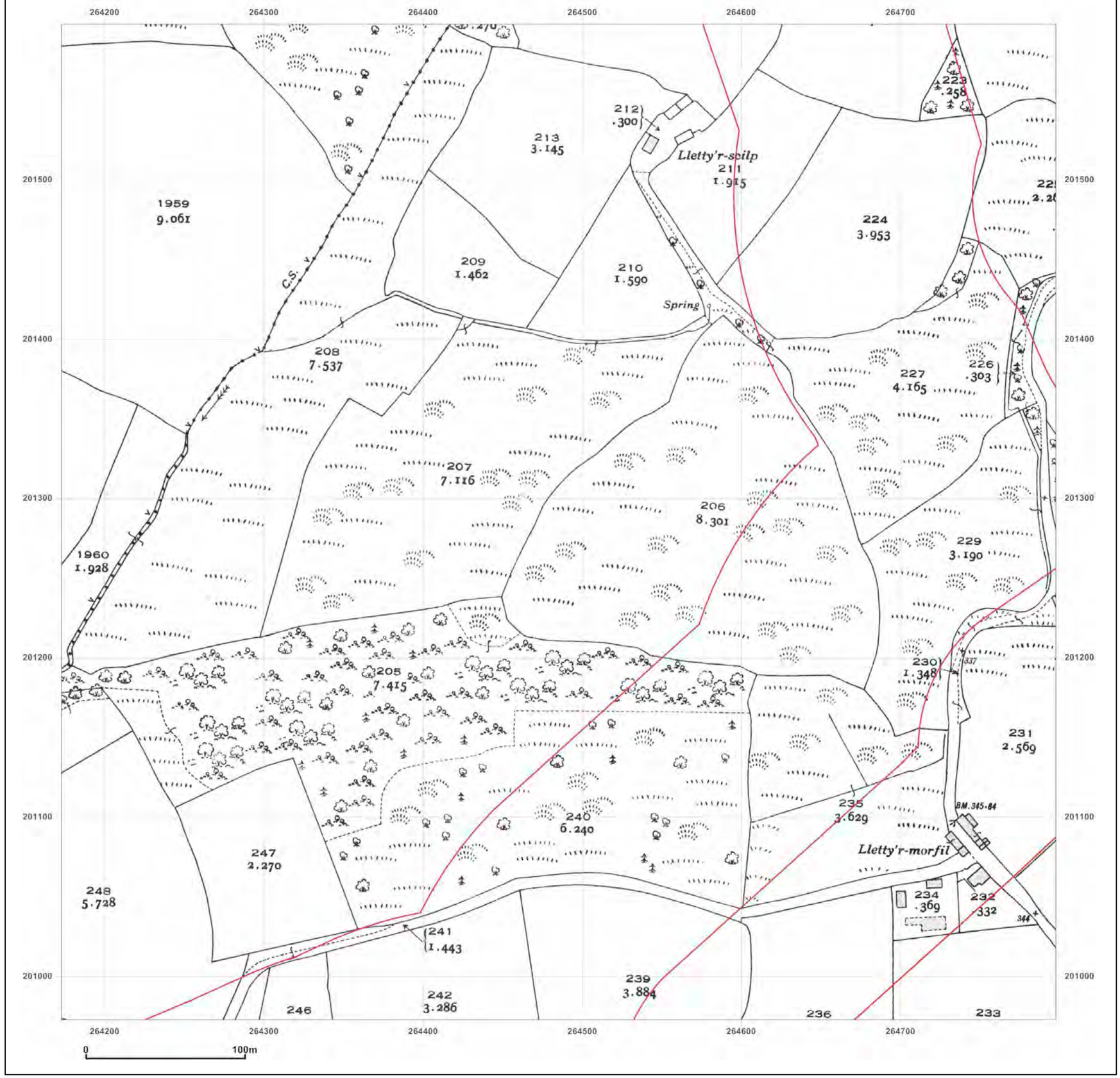

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: County Series

Map date: **1935**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1935
Revised 1935
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 30 July 2014

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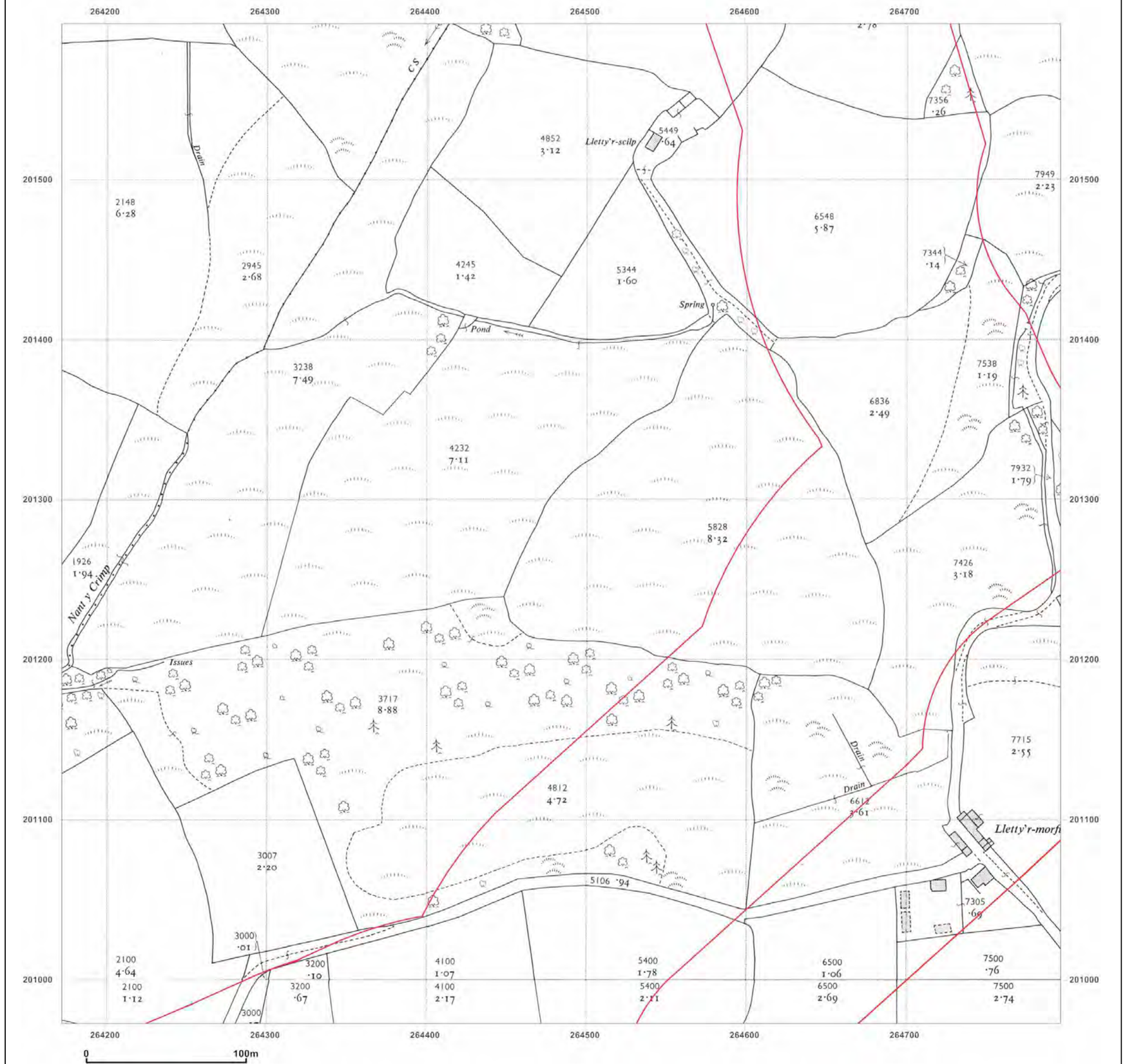

GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: National Grid

Map date: **1958**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1946

Surveyed 1958
Revised 1958
Edition N/A
Copyright 1959
Levelled 1956

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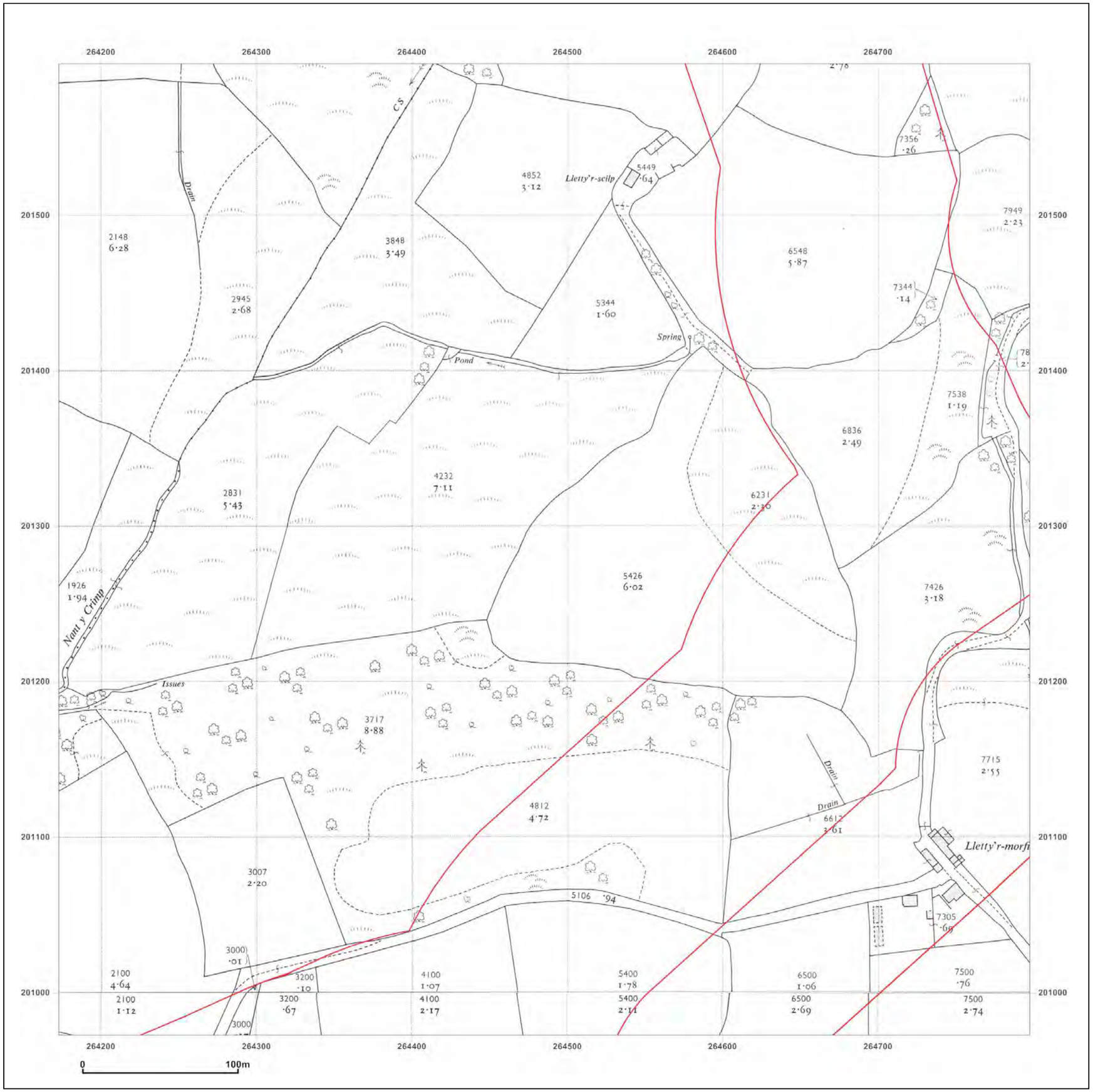


GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

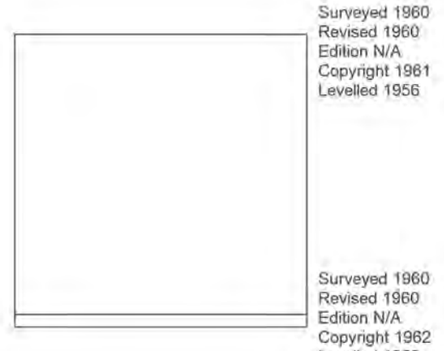
Map Name: National Grid

Map date: **1960**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



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Production date: 30 July 2014

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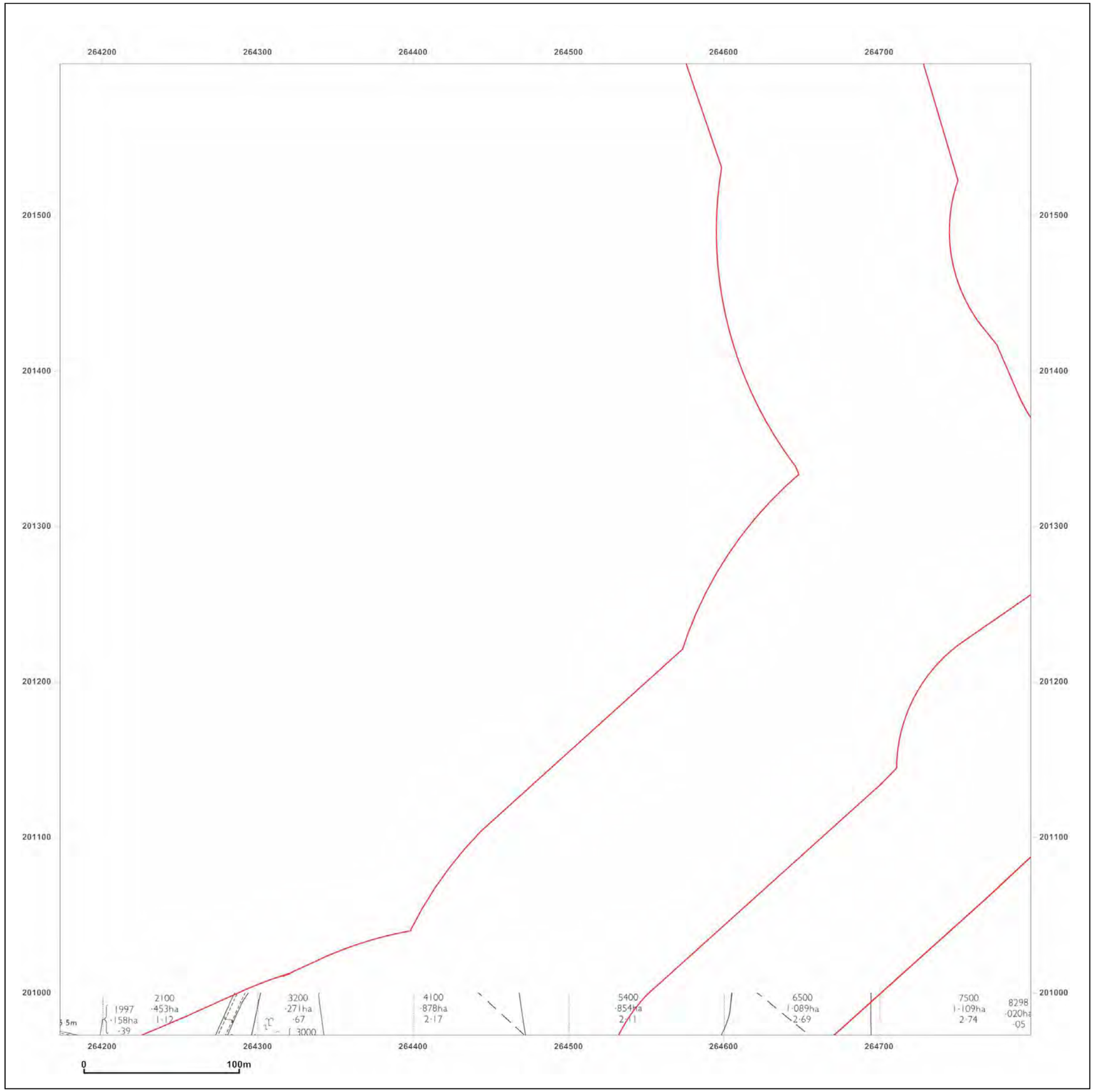


GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

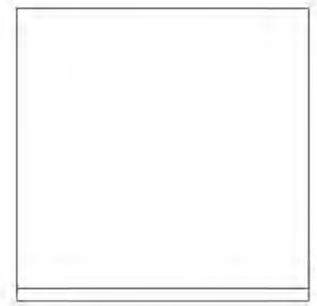
Map Name: National Grid

Map date: **1974**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S



Surveyed 1974
Revised 1974
Edition N/A
Copyright 1975
Levelled 1963

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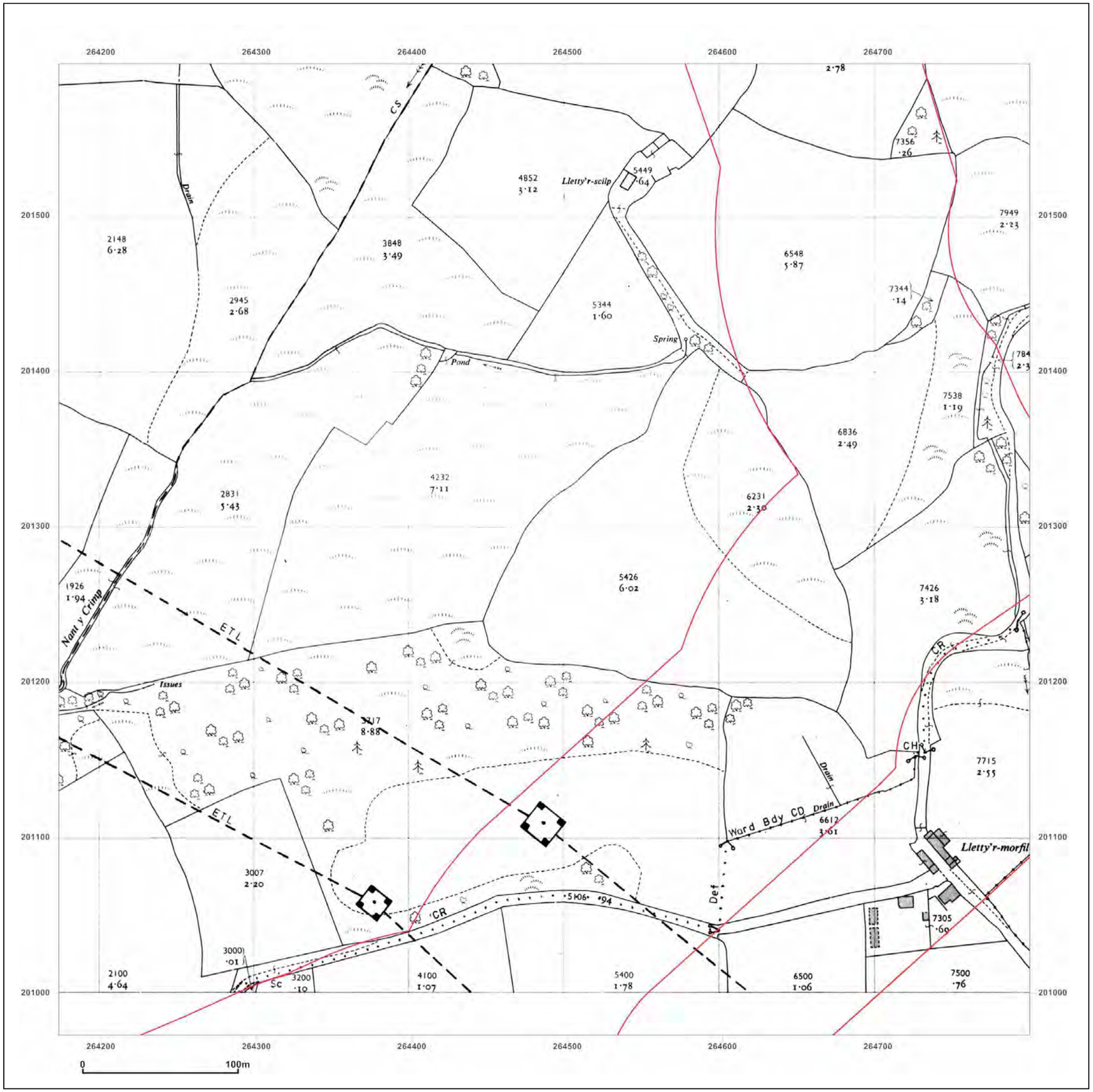
Production date: 30 July 2014

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: National Grid

Map date: **1989**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed 1956
Revised 1989
Edition N/A
Copyright 1989
Levelled 1956

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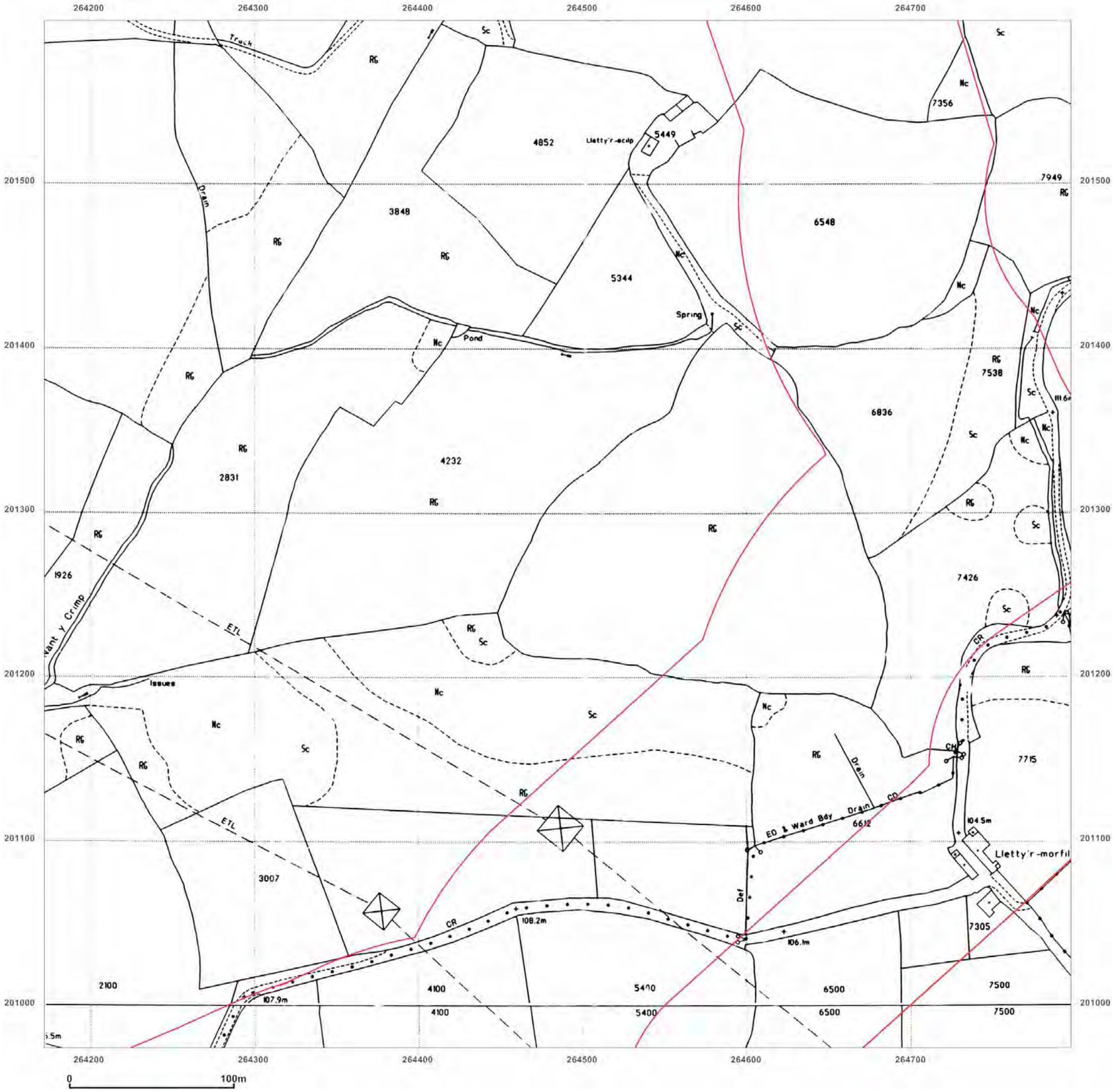
Production date: 30 July 2014

To view map legend click here *Legend*



GroundSure
ENVIRONMENTAL INSIGHT

Site Details:

ABERGELLI FACH
FARM,FELINDRE,ABERTAWE,
SA5 7NN

Client Ref: PB84891
Report Ref: GS-1587646_LS_3_3
Grid Ref: 264485, 201285

Map Name: National Grid

Map date: **1993**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright 1993
Levelled N/A

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Production date: 30 July 2014

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APPENDIX B

BGS BOREHOLE LOG

Engineering Geology Unit
Department of Earth Sciences
University of Liverpool

BOREHOLE RECORD

BOREHOLE NUMBER P4

Contract :	S Wales Sand and Gravel Assessment	Locality:	Aber-gelli-fach Farm
Client :	Welsh Office and Dept of Environment	Grid Ref:	SN 65200160
Drilling Contractor :	Exploration Associates	Ground Level:	113 m
Drilling Method :	Shell and Auger 200 mm	Date Commenced	07 : 10 : 91

SN60SE 24

GL	WATER LEVEL	DEPTH (M)	THICKNESS (M)	SAMPLES FROM	SAMPLES TO	REF NO	DESCRIPTION	LEGEND
		0.3	0.3				Brown sandy clayey TOPSOIL	
1							Firm yellow brown sandy very gravelly CLAY with occasional cobbles	
2								
3								
			6.1					
4								
5								
6		6.4						
		6.5	0.1	6.4	6.5	P4/01	Grey brown very clayey SAND	
				6.5	7.4	P4/02	Grey brown very clayey pebbly fine SAND	
7			1.5					
				7.4	8.4	P4/03	Grey brown very clayey fine SAND	
8		8.0						
				8.4	9.7	P4/04	Grey brown clayey gravelly SAND	
9			1.7					
		9.7						
10							Grey brown clayey SAND	

▽ WATER STRIKE ▼ WATER LEVEL

ENGINEER NCH

Engineering Geology Unit
Department of Earth Sciences
University of Liverpool

BOREHOLE RECORD

BOREHOLE NUMBER P4

Contract :	S Wales Sand and Gravel Assessment	Locality:	Aber-gelli-fach Farm
Client :	Welsh Office and Dept of Environment	Grid Ref:	SN 65200160
Drilling Contractor :	Exploration Associates	Ground Level	113 m
Drilling Method :	Shell and Auger 200 mm	Date Commenced	07 : 10 : 91

SN60SE 24

GL	WATER LEVEL	DEPTH (M)	THICKNESS (M)	SAMPLES FROM	SAMPLES TO	REF NO	DESCRIPTION	LEGEND
	▽	10.7	1.0					
11				10.7	11.7	P4/05	Grey brown very clayey fine SAND. Trace of coal	
12				12.0	13.0	P4/06	Grey brown very clayey fine SAND	
			3.3				grading into	
13				13.0	14.0	P4/07	Grey brown sandy CLAY	
14		14.0						
				14.0	15.0	P4/08	Grey brown clayey fine SAND	
			1.1					
15		15.1						
			0.7				Grey brown sandy CLAY	
		15.8						
16			1.0				Firm yellow CLAY becoming stiff grey gravelly CLAY (possible BOULDER CLAY)	
		16.8						
17							End of hole	
18								
19								
20								

▽ WATER STRIKE ▼ WATER LEVEL

ENGINEER NCH

APPENDIX C

COAL AUTHORITY MINING REPORT - see ES Appendix 10.4

APPENDIX D

LANDFILL WORKING PLAN RECORDS FROM NRW

Proposed Inert Landfill, Abergelli Farm, Felindre

WORKING PLAN

WORKING PLAN

Mr. W.B. Llewellyn,
Aberfelli Fach Farm,
Felindre,
Swansea
West Glam

17 March, 1994

099

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1 INTRODUCTION

This statement forms part of the outline working/operational plan, relating to proposed landfilling operations at Abergelli Farm, Felindre, Swansea. The various other details referenced within this operational statement are contained in the appendices to this Statement.

The licence application relates to approximately 1.9 ha of land located adjacent to Abergelli Farm, near the village of Felindre, Swansea. The location of the site is indicated in the Ordnance Survey extract at Figure 1. The land is generally low-lying and in its lowermost parts is poorly drained, with gentle cross-falls. Approximately three quarters of the site was at one time covered by a mine spoil dump from the nearby Abergelli Colliery. The mine waste has now been removed leaving a layer of well compacted mine waste over the majority of the site. The area of ground currently covered by mine spoil has been used for the drying out of water treatment (aluminium sulphate) sludges though with the development of the landfill this operation will cease.

It is proposed to import inert, "Category A" waste material, and deposit it on the site, in the manner indicated in the accompanying plans and sections. The proposed after use is agricultural with phased restoration returning the landfill area to grazing land.

Planning permission for the proposed tipping operations is currently being determined. Planning Permission documents will be forwarded to the Disposal Authority when permission has been granted.

The site approaches overhead electricity services but sufficient stand-off has been allowed to comply with SWALEC's conditions. No other services cross the site.

2 INFRASTRUCTURE

2.1 Site Access

Access to the site will be via an unclassified road leading northwards from Llangafelach to the village of Felindre. Approximately 2km north of the junction of the unclassified road with the A48 the site road bears off to the east. The site road which measures 1.4km will be an upgrade of the existing access track to Abergelli Fach Farm. The site road is to be surfaced with tarmacadam for its entire length and single track incorporates passing places at 100m intervals. Further details on the nature and design of the access road can be found at Appendix I.

2.2 Fencing

The landfill site does not have a boundary that is common with any public access area, the site lying entirely within the land holding of Abergelli Fach Farm. However, in recognising that vehicles can gain relatively easy access to the landfill, it is proposed to construct a 1.2m agricultural 'pigwire' type fence along the landfill's boundary with the access road. The fence will be topped with a double strand of plain wire, and will extend over the length shown on the attached plan (Figure 5).

2.3 Gates

The existing access road passes through landfilling area and continues to meet the Felindre to Tyronnen Road. At the junction of the site access road with the public highway, the entrance gate will be permanently locked. In order that security can be maintained if this gate were to be secondvented by travelling through Welsh Water Authority Plant, a new security gate will be installed at the Felindre side of the site to form a secure boundary when the gate is closed against the existing hedgeline and fenceline (Figure 5). With alternative access to the landfill closed, all vehicles will have to pass Abergelli Fach Farm and from there travel to the site control office. Beside the site control office, a lockable gate will be installed to provide out of hours security. The gates will be traditional five bar agricultural gates, fabricated from galvanised steel. When the site is not manned, all gates will be padlocked.

2.4 Car Parking

An area immediately adjacent to the gatehouse will be surfaced with hardcore and reserved for visitor and operator parking. Two spaces will be provided and these will be indicated to by appropriate signs.

2.5 Gatehouse

A gatehouse comprising a portacabin type building will be situated adjacent to the access track close to the site entrance, so that incoming and outgoing vehicles can be controlled. There will be no facilities at the gatehouse other than portable (gas) lighting and heating, as comfort facilities are available at Abergelli Fach Farm. A first aid box will be clearly identified in the cabin.

2.6 Site Notice

The site notice board will be situated immediately adjacent to the site gate. It will display the following information:-

- Name of Facility
- Categories of Acceptable Wastes
- Name, Address and Telephone number of site operator

- Emergency Telephone number of site operator
- Hours of Operation
- Name, Address and Telephone number of Waste Regulatory Authority

2.7 Hardstanding

An area of hardstanding will be provided for lorries to turn and queue at the position shown on the Operational Plans (Figure 5).

2.8 Lorry Parking

An area of hardstanding will be provided for lorry parking, immediately adjacent to the gatehouse.

2.9 Haul Roads

Haul roads will be constructed during tipping operations by selectively using free draining materials delivered to the site. The site roads will be maintained to a standard to prevent vehicle bogging and to ensure access to the tipping face under all weather conditions. The site roads will be inspected during each working day, to ensure their operational standard. The Phase I haul road will be ripped up and incorporated into the Phase II wastes immediately prior to Phase I restoration. With progressive restoration envisaged, Phase I restoration will be completed prior to Phase II tipping completion.

2.10 Wheelwashing Facilities

The use of properly designed site haul roads should minimise the requirement for wheelwashing. However, a portable jet wash system will be kept on site so that any vehicles that require cleaning prior to using the 1.4km site access road can be washed down. Waste water arising from the wheel cleaning operation will be picked up in the perimeter drain and taken along this for settlement prior to discharge.

2.11 Compactor/Grader Parking

When not in use the dozer will be parked in the designated lorry parking area.

3 LANDFILLING OPERATIONS

3.1 Preparation Works

Prior to landfilling the site access and waste reception facilities will be provided, as shown on the Operational Plans (Figure 5) and the site will be enclosed within a security fence. In accordance with the good surface water management practice, settling lagoons will be constructed at the locations shown on the Phase I diagram.

3.2 Phasing

The site will operate as a phased landfill, with each phase running concurrently with the restoration of the previous phase. The site has been divided into three phases which each phase being bounded by permanent or temporary drainage ditches.

3.3 Void Space

The void space of the site has been calculated by integrating the existing ground surface (Figure 2) and the restoration surface (Figure 3). The void space of the site is summarised below:-

Total Void	75,000m^3	Total Tonnage	142,500t
Phase 1 Void	16,600m^3	Phase 1 Tonnage	31,540t
Phase 2 Void	33,300m^3	Phase 2 Tonnage	63,270t
Phase 3 Void	25,100m^3	Phase 3 Tonnage	47,690t

3.4 Acceptable Wastes

The site will accept only Category A wastes, as designated by the South West Wales Waste Management Group Classification.

3.5 Phase 1

Phase 1 operations will commence with the excavation of a perimeter drain and temporary drain which will contain all waters arising from operations within Phase 1. Both drains will discharge into a settling lagoon before final discharge into the existing drainage ditch. Preparation works will comprise the removal of any sludge wastes that are currently drying out to expose a formation of either compact colliery shale or peat.

Tipping operations will commence with the construction of the access road, formed of selected hardcore. The tipping face, which will achieve a maximum height of approximately 4m will be bladed out with a small dozer to maintain a gradient of 1 in 3 or less. During the tipping operations imported topsoil will be selectively deposited against the access road to await final spreading over the completed phase. The tipping face will advance downslope.

3.6 Phase 2

Phase 2 operations will commence with the excavation of a temporary drain which will trap surface water runoff from the operational phase. The phase will be bounded by two temporary drains with the one bounding Phase 1 progressively overtipped as the tipping face advances. Both drains will continue to discharge to settling lagoons. The site haul road will be moved to provide easy access for Phase 2 and like Phase 1 the tipping face will advance downslope. During the operational phase, topsoil will be selectively stored

adjacent to the main site road used during the progressive restoration of Phase 2. Whilst Phase 2 is being actively tipped, Phase 1 will be regraded to final profile and restored.

3.7 Phase 3

The infilling of Phase 3 completes the site operations. Access to the area will be made by a diverted haul road as shown on Figure 5. Operations will commence with the excavation of a perimeter surface water drain so that the phase is completely encircled by drainage ditches discharging to settling lagoons. The tipping face will advance downhill as it does for Phase 1 and 2. During the tipping operations existing ditches will be overtipped but dirty water arising from these operations will be settled out in the lagoon.

3.8 Restoration Phase

When the importation of Category A materials is complete, the phase will be restored and the site will be decommissioned, having changed virtually unuseable marshy area into suitable agricultural land.

3.9 Tipping Operations

Vehicles depositing wastes at the site will pass through the reception area and travel along the site roads to the tipping face. They will back up toward the tipping face under the direction of a member of site staff. When the vehicle has discharged its load and left the face area the wastes will be pushed over with a small dozer. The tipping face will have an angle no steeper than 1:3, which is the maximum practical gradient for dozer operations.

4 WASTE RECEPTION PROCEDURES

4.1 Entry to Site

The site entrance will be securely locked outside normal opening hours. During opening hours vehicles will enter the site by the only entrance and immediately report to the site office, which is located adjacent to the entrance and site identification board (Figure 5).

4.2 Hours of Operation

The landfill will be operational between 08.30 and 16.30 during weekdays, and between 08.30 and 13.30 during Saturday. There will be no Sunday working.

4.3 Daily Input

A daily maximum of 35 vehicle movements is anticipated depositing a daily maximum of 490 tonnes (272m^3 per day). This amounts to 1 tipping cycle per 14 minutes. A normal

days operation is likely to involve 10 vehicle movements depositing 140 tonnes (78m^3) of wastes, with a turnaround time of 45 minutes.

4.4 Inspection

All site users will be aware of the acceptable wastes having read the site identification board. Despite this the site supervisor will make a visual inspection of loads entering the site to see that the wastes fall within the licensed waste category.

4.5 Deposition of Wastes

When the wastes are confirmed to be acceptable by the visual inspection the details of the waste consignment will be recorded in the site diary. This will log the following details:-

i) Transferring Company/Organisation
ii) Vehicle Registration
iii) General Origin of Wastes
iv) Date and Time of Delivery
v) Volume/Tonnage of Waste
vi) Drivers Signature

Copies of transfer notes raised by the depositing organisation will also be kept.

4.6 3 Monthly Returns

At 3 monthly intervals the licensing authority will be supplied with void use returns. An equivalent tonnage will also be supplied. The returns can be 'audited' annually by land survey if required.

4.7 Unacceptable Wastes

In the event that a consignment of waste arrives which contains or is composed of wastes outside the licensed category the load will be refused entry to the site. The location of nearby sites which can accept other categories of waste will be kept on record at the site office to assist the driver of the rejected load.

4.8 Identification of Unacceptable Wastes at the Tipping Face

Should unacceptable wastes pass through the checking-in system their composition will be clearly identifiable at the tipping face. The site supervisor will collect the wastes and load them into an appropriate receptacle for transport to a suitably licensed facility. The WRA will be informed of all such events and they will be recorded in the site diary.

5 THE CONTROL OF MUD, DUST AND WATER

5.1 Mud

A daily inspection will be made to evaluate the need for wheel washing. If mud is picked up from the tipping face and has not been shaken off within the site (early stages of Phase I and 2) wheelwashing facilities will be used. The decision on wheelwashing will be made daily by the site operator.

If mud has been deposited on the public highway the site operator will ensure a road sweeper is used to remove all traces.

5.2 Dust

In very dry weather certain inert wastes generate significant amounts of dust when being tipped and bladed. Under these circumstances water suppression will be used to keep dust levels down. The water will be provided by bowser brought to the tipping face for damping down. Site roads will be sprayed at regular intervals to suppress dust.

5.3 Surface Water Control

Surface water will be controlled by the provision of perimeter drains and temporary internal drains. The perimeter will be retained to take direct surface runoff from the restored landfill.

6 MANNING

The site will be manned by three employees of the licence holder during is opening hours. The three members of staff will have the following responsibilities:-

6.1 Site Supervisor

Daily inspection of infrastructure
Routine maintenance of plant and equipment
Load Inspections
Liaison with WRA
Inspection of Mud and Dust suppression
Water Quality Monitoring

6.2 Machine Driver/Banksman

Directing lorries at the tipping face
Maintaining face and site road in usable condition
General maintenance

6.3 Records Clerk

Recording of waste input and transfer note filing
Liasion with Waste Regulation Authority

6.4 Licence Holder

Overall co-ordination of disposal activities

6.5 Out of Hours Manning

The licence applicant lives at Abergelli Fach Farm which lies immediately adjacent to the site. The supervisor will be at hand to deal with any out of hours emergency. The telephone number displayed on the Site Identification Board will be the telephone number of Abergelli Fach Farm.

7 MONITORING

The only routine monitoring envisaged at the site will be surface water quality monitoring.

7.1 Surface Water Monitoring

The surface water settling lagoon outfall to be constructed will be formed so as to allow surface water sampling. The sampling routine will comprise suspended solids monitoring only, initially at 2 monthly intervals. Analytical results will be forwarded to the WRA when available.

8 RESTORATION

Progressive restoration will ensure that only a single phase is operational at any one time. Selected topsoil, stockpiled at the edge of each phase will be pulled over the profiled wastes to a depth of 150mm as the tipping face progresses. Before topsoiling the wastes will be compacted to give an even surface profile.

When placed to the appropriate level the topsoil will be fertilised and seeded, following guidelines published by the Countryside Commission.

Typical Restoration Seeding Plan

Meadow Grass	30%
Fesce	40%
White Clover	15%
Ryegrass	15%

Sown at a density of 80 kg/ha

The restored landfill is slightly domed to allow surface water runoff into the perimeter drains and drainage ditches (Figure 3). The landfill will be used for general agricultural purposes.

APPENDIX 1 - SITE ACCESS ROAD DETAILS

TOWN AND COUNTRY PLANNING ACT 1990
APPLICATION FOR PLANNING PERMISSION

APPLICATION BY:-

Mr W B Llewellyn for land-fill tipping at Abergelli Fach Farm, Felindre, Swansea

ACCESS ROUTE PROPOSALS

Our Ref: CN/ELN/92/108 — CARLISLE, DAVIES & NORTH

Local Planning Authority Ref: 2/2/93/0231/03 — DECEMBER 1993

1. Access to the application site is to be derived via the existing private access road, from the public highway near "Coed-cae-croes", as indicated on the 1:10000 scale O.S extract which accompanied the original planning application. The route is shown in greater detail, in the 1:2500 scale plan attached to this statement at Appendix 1.

2. The existing road currently serves as the principal means of access to Penywaun Fach Cottage and to Lletty'r Morfil Farm, and is a secondary access to Abergelli Fach Farm. The road was, in fact, the main access to the former Abergelli Colliery, the surface area of which was located on and adjacent to the present application site. In its heyday, the colliery access road daily carried coal-lorries and buses transporting miners to and from work. In recognition of its usage, the road was constructed with a substantial sub-base of well-compacted, graded stone and hardcore.

3. From its junction with the public highway to the Lletty'r Morfil farm-yard, the general condition of the existing road remains excellent. For part of its length beyond Lletty'r Morfil, its condition has deteriorated in more recent times, due mainly to the fact that it has been little used and, thus, only infrequently maintained. The vast bulk of the sub-base, however, remains, and it is proposed to utilise this along the complete length of the access, in conjunction with works of repair and improvement, to provide the access route for the application site.

4. It is proposed, in the first instance, to clean the surface of the existing road for the whole of its length, and this will include, where necessary, the blading of extraneous material, to create a clean surface and expose the top layer of the existing sub-base. All irregularities in the existing road, in terms of its surface condition, carriageway width, etc., will be made good by filling and levelling with imported stone and hardcore. Existing road-side ditches and culverts passing alongside or under the roadway will be cleaned, checked and repaired as necessary, to maintain the existing storm-water regime.

5. The developer's original intention had been to then surface the complete route in concrete or hard bituminous material, laid to suitable falls, to direct surface-water run-off to the existing drainage channels. He is still prepared to do this if the local planning authority requires it. In any event, it is still proposed that the first 240 metres of the route (between points A and B on the plan), should be constructed in this way, and that the proposed diverted length of roadway in the vicinity of Lletty'r Morfil (between points C and D) should be similarly constructed. A typical cross-section is illustrated in Appendix 2 herewith.

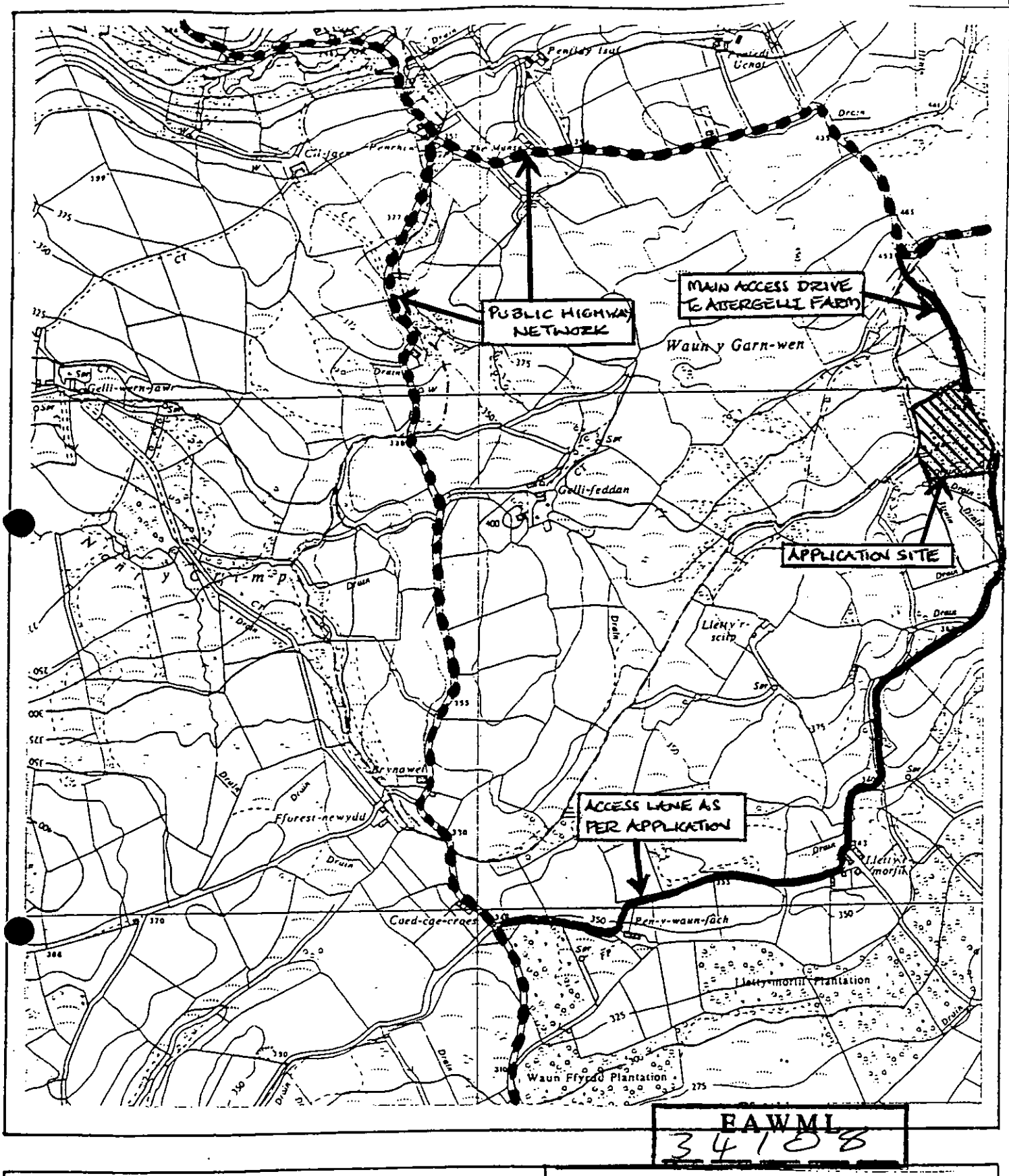
6. However, as an alternative option, it is suggested that for the remaining lengths of the route (B to C, and D to E), a suitable road-surface can be provided by topping with a 100 mm blinding layer of graded stone/dust, as shown in the typical sections at Appendix 3. This method of construction may well be considered to be more acceptable and also, of course, would be self-draining.

7. It is also proposed to provide purpose-built passing bays at various locations along the route, as illustrated in the plan at Appendix 1. The positions indicated have been selected so as to avoid any necessity for tree-removal and are, for the most part, in situations where they can be accommodated within verge areas, so that excessive intrusion into adjacent land is avoided. There are other locations along the route where additional bays can be constructed, if it should be considered necessary. The bays will, of course, be constructed to the same specification as the carriageway.

8. Where any drainage channels pass under the route, or the bays, they will be piped in accordance with the details shown at Appendix 4 to this statement. As indicated above, existing open channels will be initially cleaned out and thereafter maintained in functionable condition.

9. It is not considered that any trees need to be lost, in using the route shown. The length of new road that will provide the diversion by-passing the Lletty'r Morfil farm-yard (C to D), has been positioned so as to, firstly, facilitate a route between existing trees flanking the road to the north of the farm buildings and, secondly, to avoid the existing telegraph poles in field parcel number 6612 and give the necessary clearance under the overhead phone-wires.

CHARLES NORTH
CARLISLE, DAVIES & NORTH
CN/ELN/92/108
DECEMBER 1993



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Dated:- 21/4/93

Access plan Scale 1:10000

Carlisle, Davies & North

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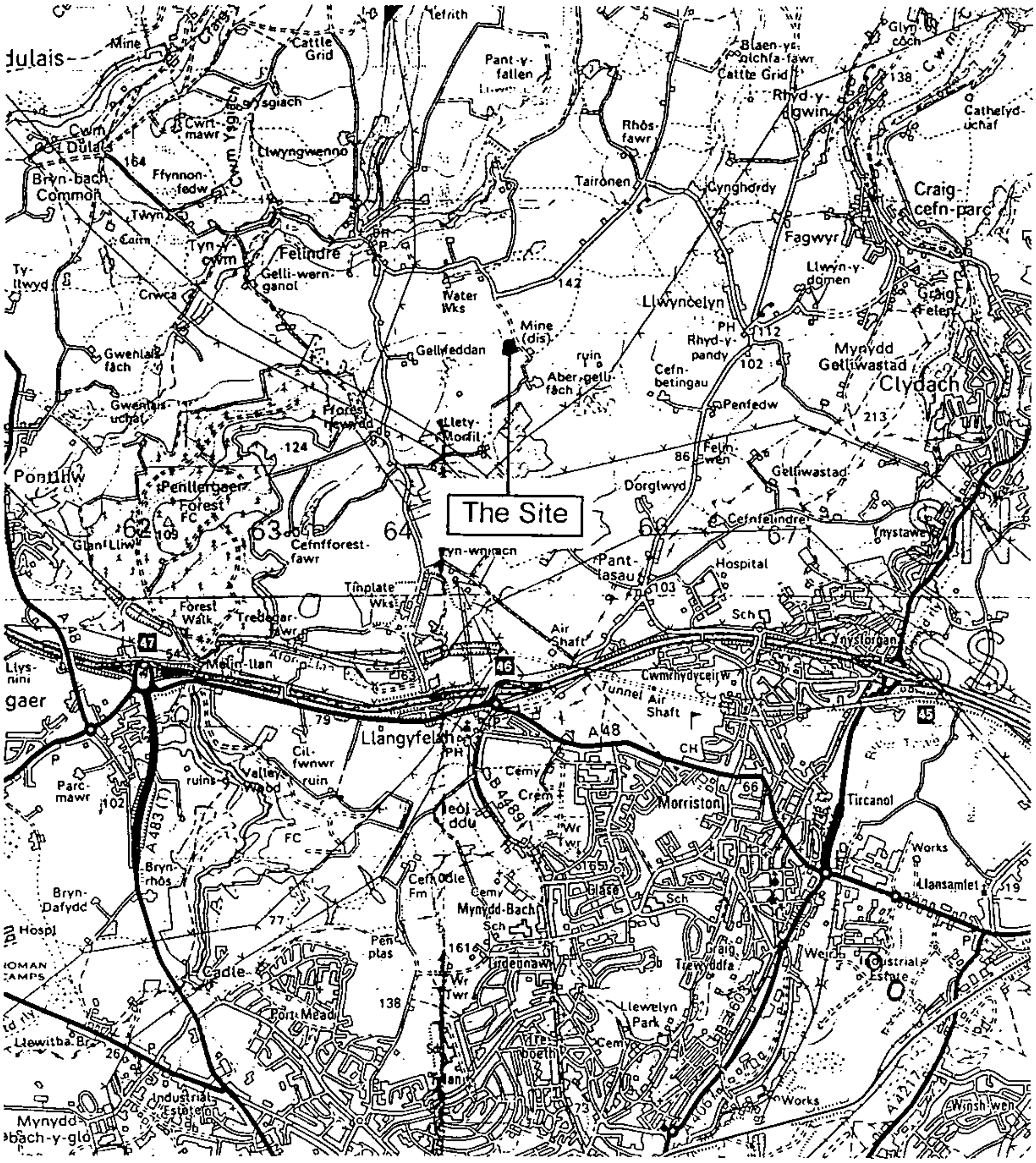
SITE LOCATION PLAN

099 1



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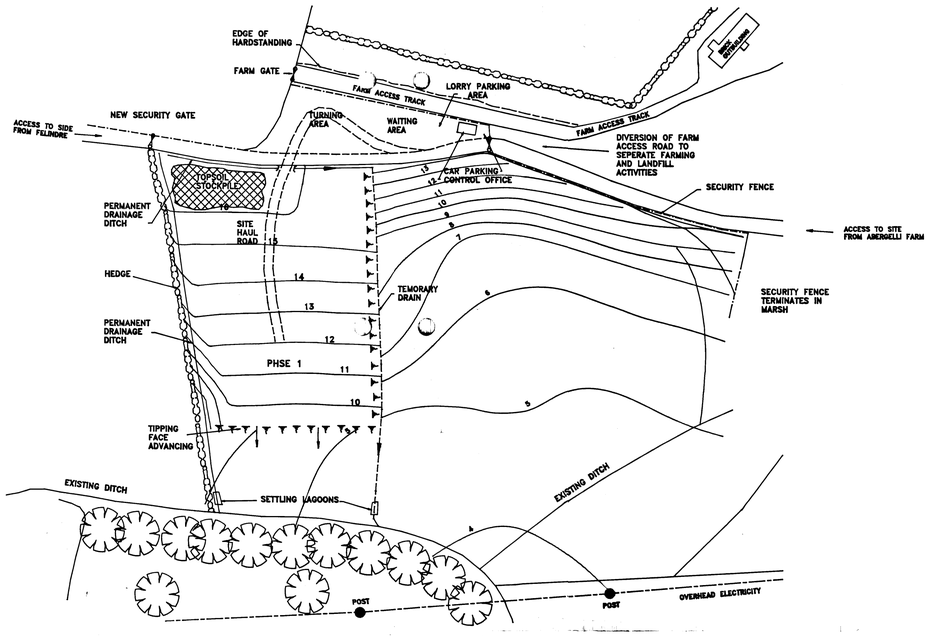

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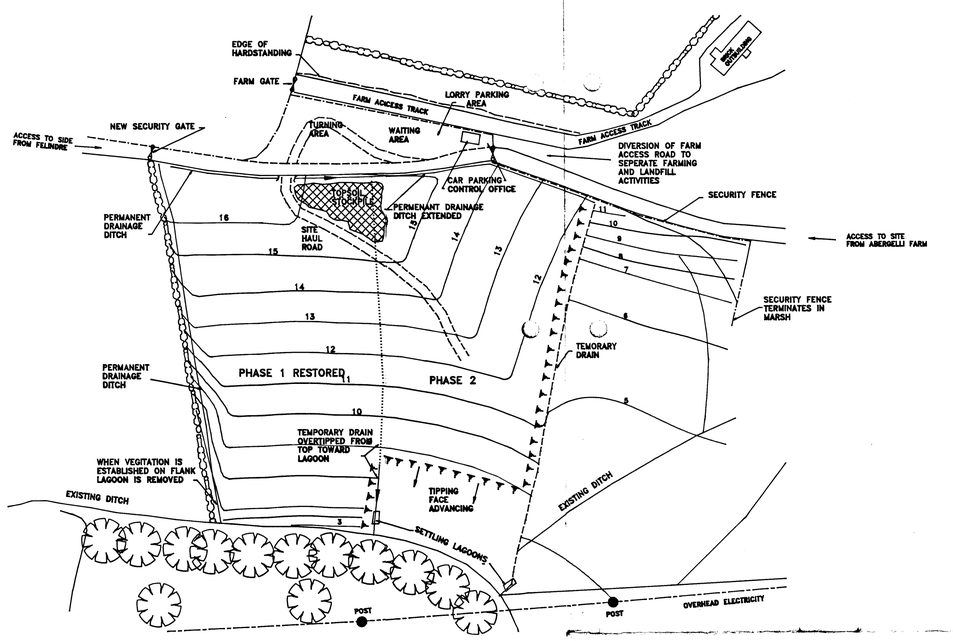

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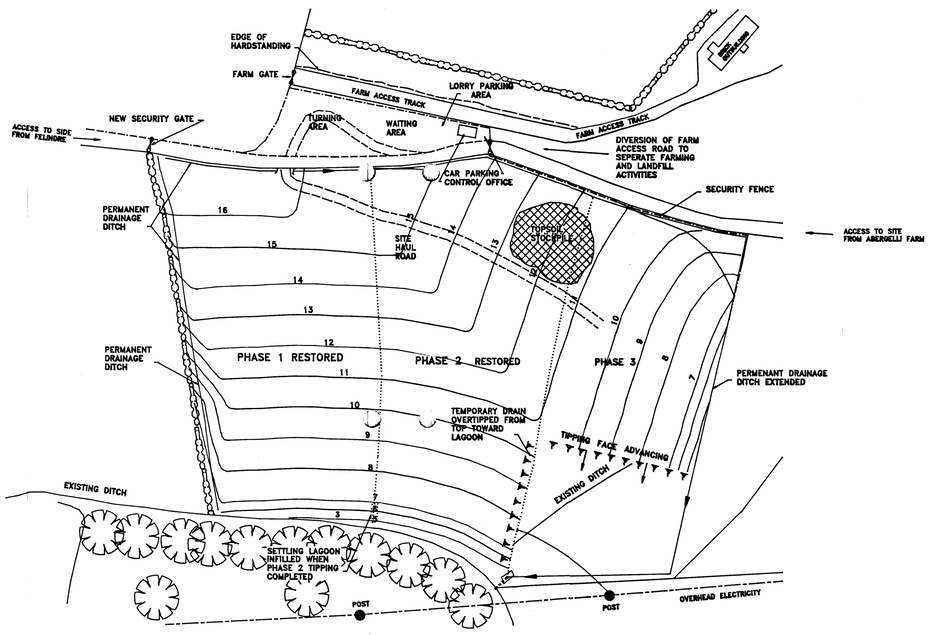

PHASE 3

SCALE 1:1000

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A:099FIG5.DWG REV:0 099 5

WORKING PLAN

PROPOSED LANDFILL, FELINDRE

MR B LLEWELYN

geo ANALYSIS
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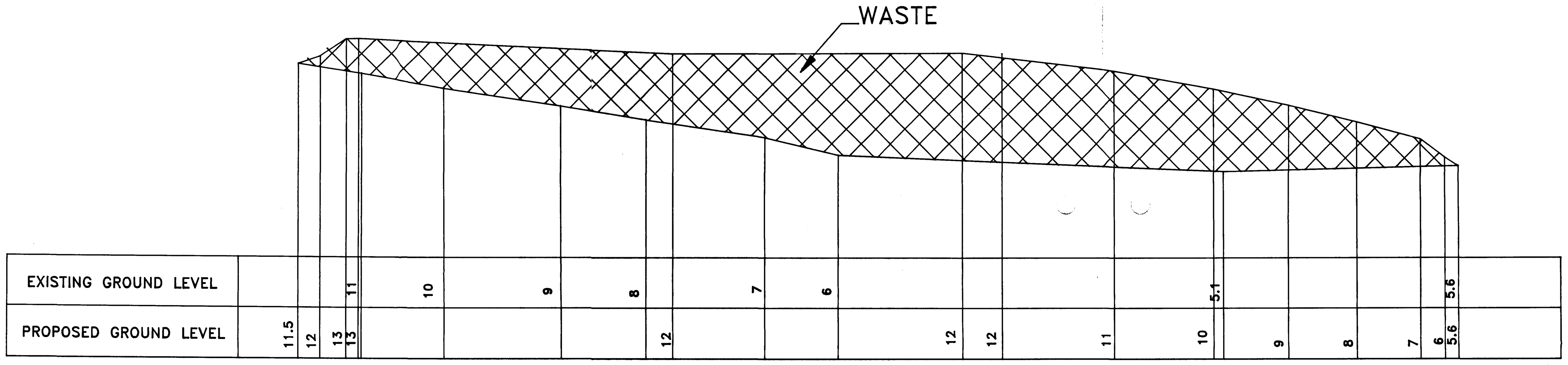

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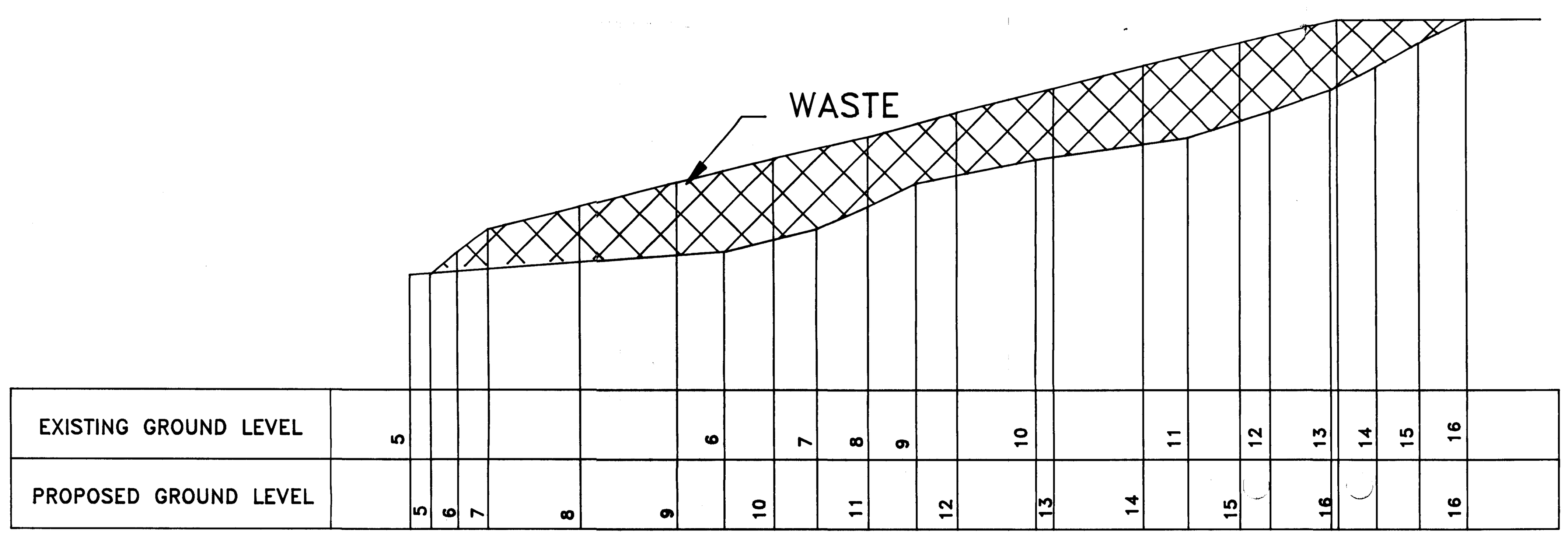

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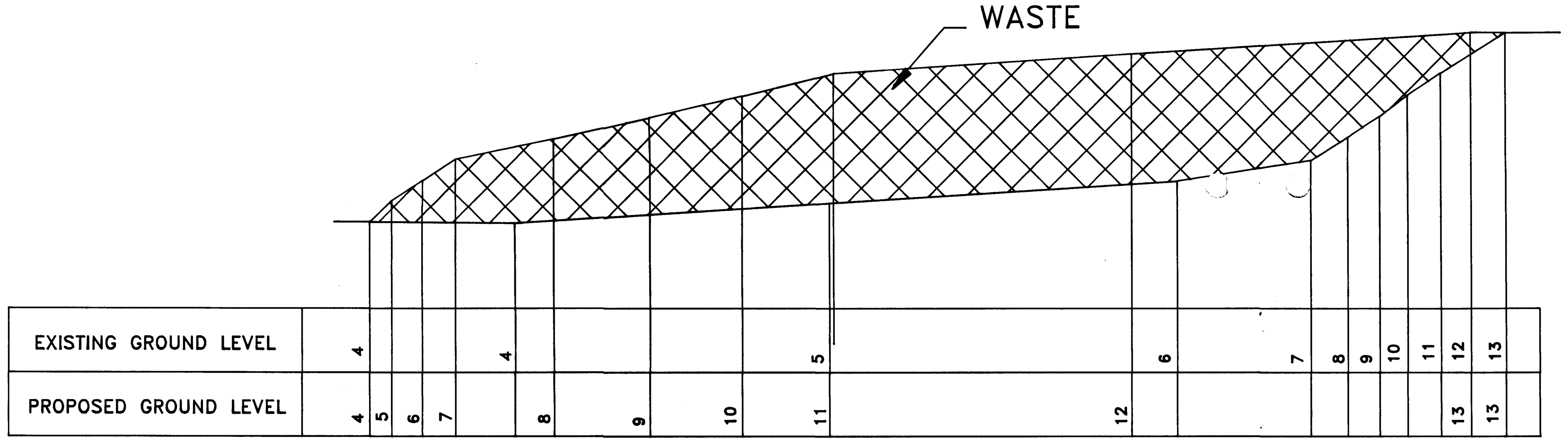

SECTION C:C

VERTICAL SCALE 1:200
HORIZONTAL SCALE 1:500

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A:099FIG4.DWG REV:0 099 4

CROSS SECTIONS

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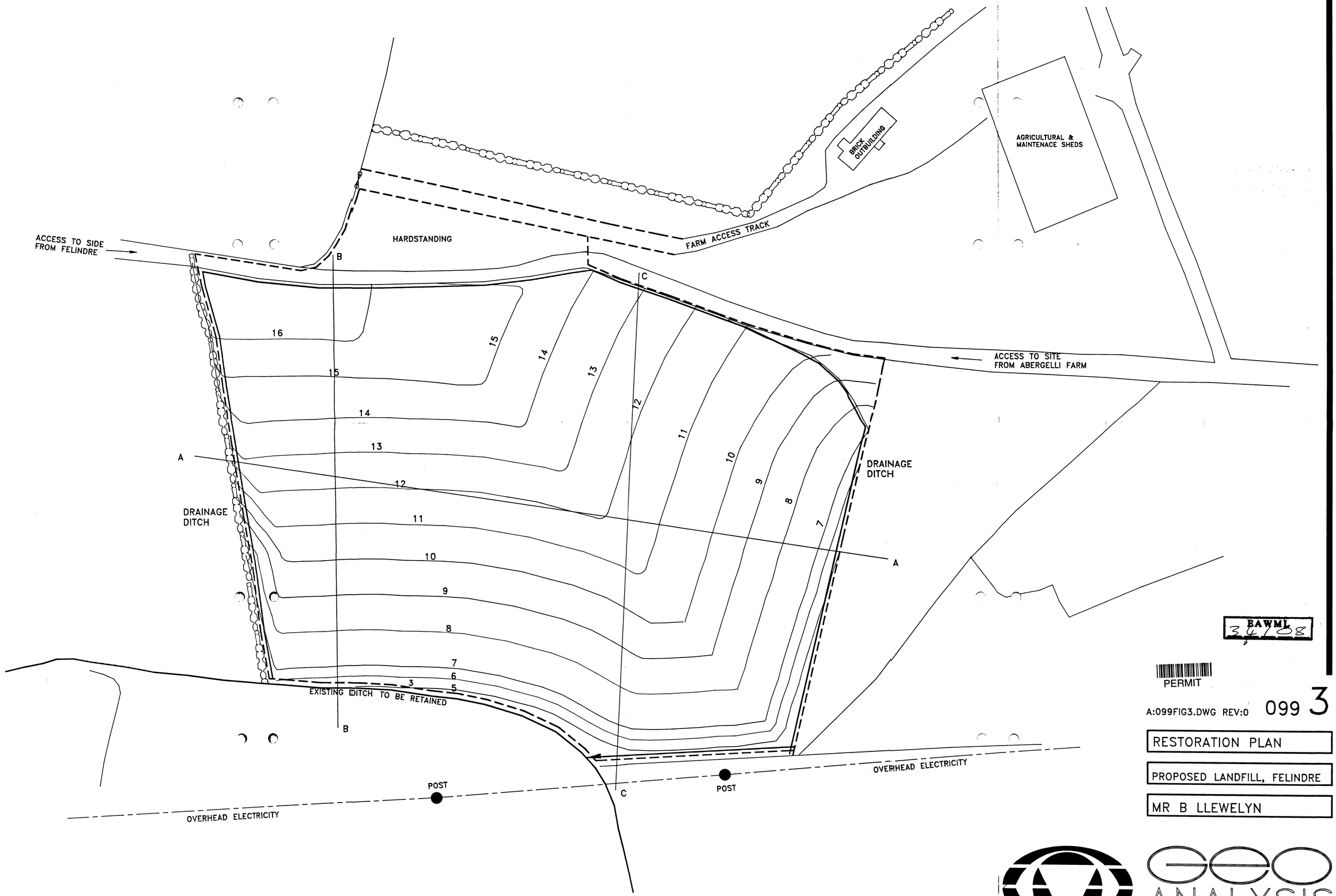

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A:099FIG3.DWG REV:0 099 3

RESTORATION PLAN

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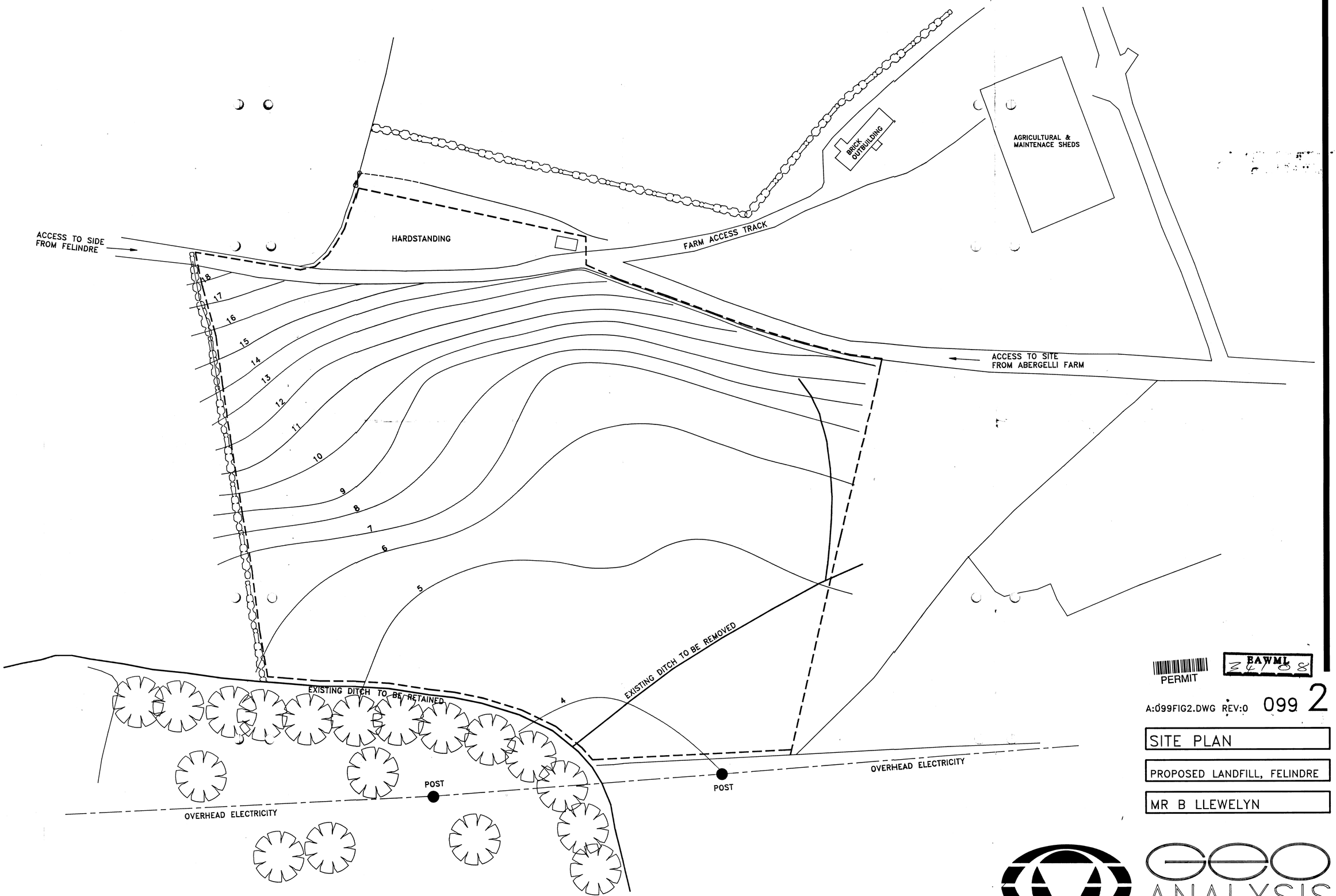

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099 2

SITE PLAN

PROPOSED LANDFILL, FELINDRE

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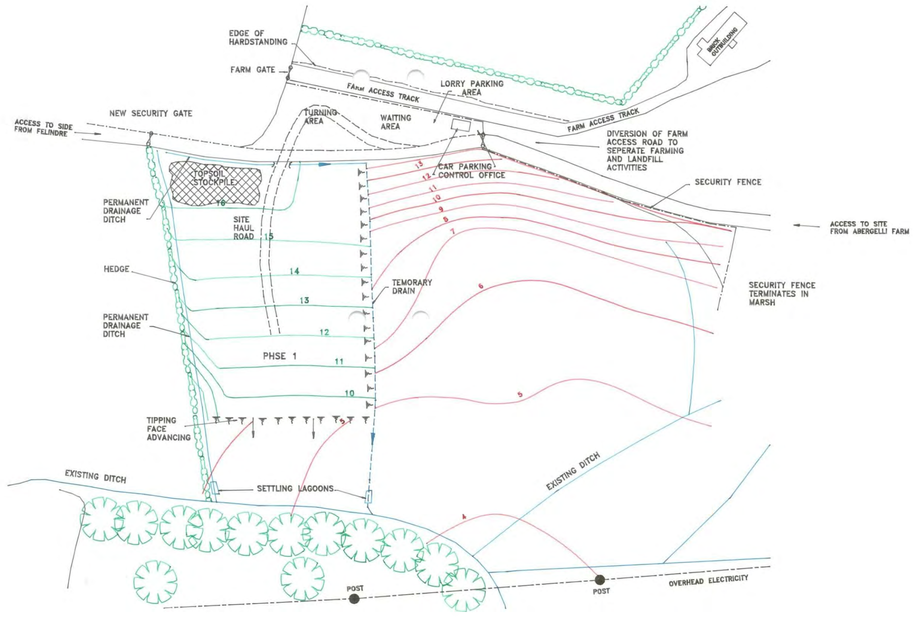

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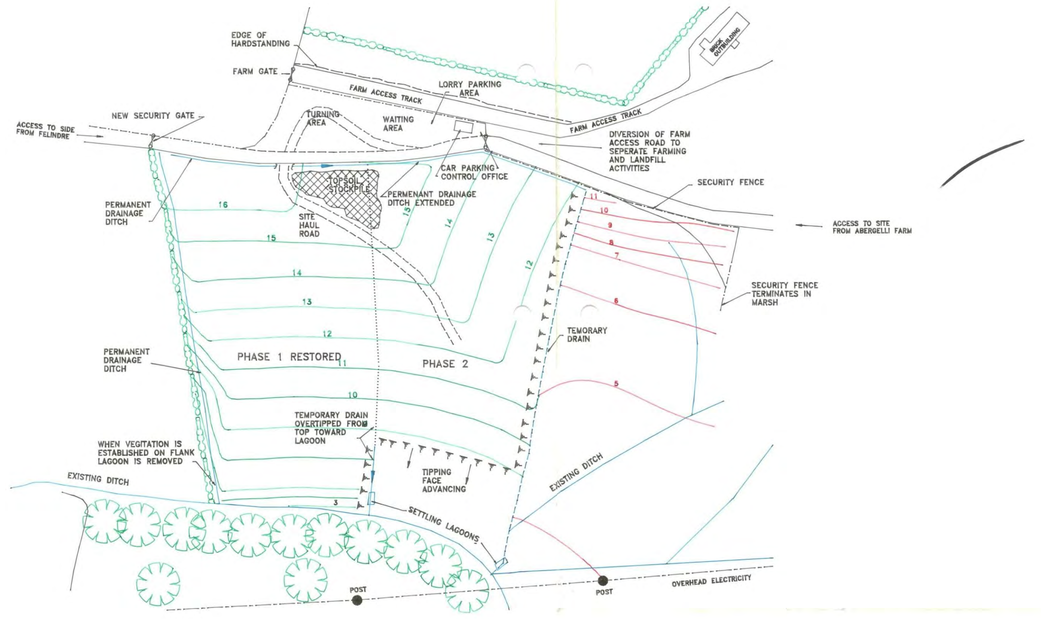

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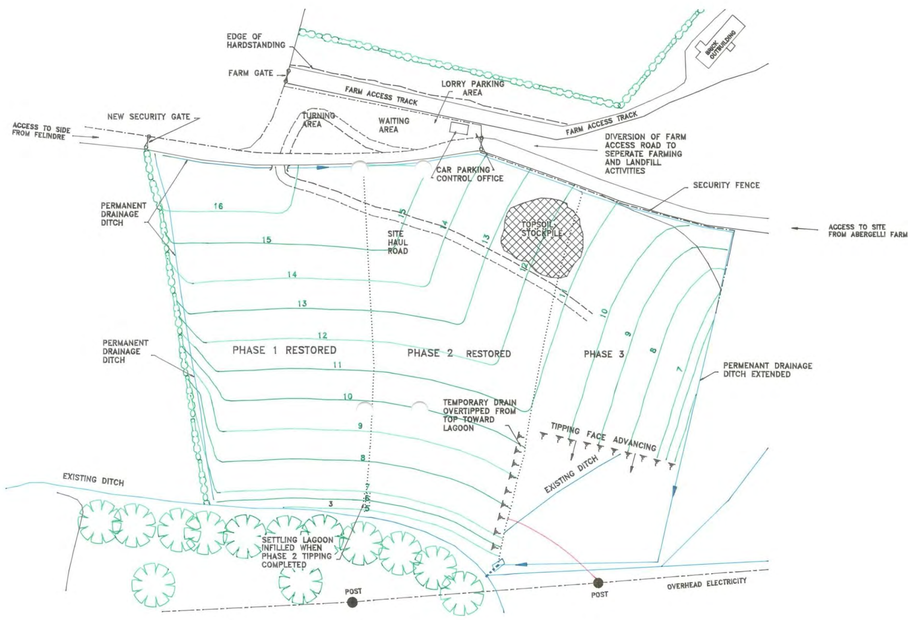

PHASE 3

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099 5

WORKING PLAN

PROPOSED LANDFILL, FELINDRE

MR B LLEWELYN

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Abergelli Farm Landfill

WORKING PLAN

Report Number 058.1/0/0298

Commisioned by
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LIST OF APPENDICES

1. INTRODUCTION

This statement forms part of the outline working/operational plan, relating to a proposed extension to current landfilling operations at Abergelli Farm, Felindre, Swansea. Various other details referenced to within this operational statement are contained in the appendices.

The licence application relates to approximately 1.4 ha of land located adjacent to Abergelli Farm, near the village of Felindre, Swansea. This is in addition to the current licensed landfill which covers an area of approximately 1.9 ha. The location of the site is indicated in the Ordnance Survey extract at Figure 1. The land is generally low-lying and in its lowermost parts is poorly drained, with gentle cross-falls. The extension area as with the current landfill is owned by Mr. W.B. Llewellyn.

It is proposed to import inert waste material, and deposit it on the proposed site extension indicated in the accompanying plans and sections. The proposed after use for the extension area is agricultural with phased restoration returning the landfill area to grazing land.

Planning permission for the proposed extension area was determined on 8th December, 1997 and a copy of the Planning Consent No. 97/1065 is included as Appendix 1.

The site approaches overhead electricity services but sufficient stand-off has been allowed to comply with SWALEC's conditions. No other services cross the site.

The proposed licenced area boundary is indicated as a red line on the site plan in Appendix 2.

2. INFRASTRUCTURE

2.1 Site Access

Access to the site will be via an unclassified road leading northwards from Llangafelach to the village of Felindre. Approximately 2km north of the junction of the unclassified road with the A48 the site road bears off to the east. The site road which measures 1.4km is an upgrade of the existing access track to Abergelli Fach Farm. The site road is surfaced with asphalt along its entire length and incorporates passing places at 100m intervals.

2.2 Fencing

The extension area landfill site does not have a boundary that is common with any public access area, the site lying entirely within the land holding of Abergelli Fach Farm. However, as with the existing landfill, it is proposed to construct a 1.2m agricultural 'pigwire' type fence along the landfill's boundary with the access road. The fence will be topped with a double strand of plain wire, and will extend over the length shown on the attached plan (Figure 5).

2.3 Gates

The existing access road passes through landfilling area and continues to meet the Felindre to Tyronnen Road. At the junction of the site access road with the public highway, the entrance gate as is now will be permanently locked. In order that security can be maintained if this gate were to be circumvented by travelling through the Welsh Water Authority Plant, the new security gate installed at the Felindre side of the site forms a secure boundary when the gate is closed against the existing hedgeline and fenceline (Figure 5). With alternative access to the landfill closed, all vehicles as now will have to pass Abergelli Fach Farm and from there travel to the site control office. Beside the site control office, the lockable gate will provide out of hours security. The gates are traditional five bar agricultural gates, fabricated from galvanised steel. When the site is not manned, all gates will be padlocked.

2.4 Car Parking

An area immediately adjacent to the gatehouse is surfaced with hardcore and reserved for visitor and operator parking. Two spaces are provided and these will be indicated by appropriate signs. The existing car parking spaces will also be used by the extension area landfilling operation.

2.5 Gatehouse

The current gatehouse comprising a portacabin type building which is situated adjacent to the access track close to the site entrance, will as with the existing landfill control vehicle movements. There are no facilities at the gatehouse other than portable (gas) lighting and heating, as comfort facilities are available at Abergelli Fach Farm. A first aid box is clearly identified in the cabin. These facilities will be used for the extension area.

2.6 Site Notice

The site notice board is be situated immediately adjacent to the site gate and displays the following information:-

- Name of Facility
- Categories of Acceptable Wastes
- Name, Address and Telephone number of site operator
- Emergency Telephone number of site operator
- Hours of Operation
- Name, Address and Telephone number of Waste Regulatory Authority

2.7 Hardstanding

An area of hardstanding will be provided for lorries to turn and queue at the position shown on the Phasing Plans (Figure 5).

2.8 Lorry Parking

An area of hardstanding is already provided for lorry parking, immediately adjacent to the gatehouse.

2.9 Haul Roads

Haul roads will be constructed during tipping operations by selectively using free draining materials delivered to the site. The site roads will be maintained to a standard to prevent vehicle bogging and to ensure access to the tipping face under all weather conditions. The site roads will be inspected during each working day, to ensure their operational standard. The Phase I haul road will be ripped up and incorporated into the Phase II wastes immediately prior to Phase I restoration. With progressive restoration envisaged, Phase I restoration will be completed prior to Phase II tipping completion.

2.10 Wheelwashing Facilities

The use of properly designed site haul roads should minimise the requirement for wheelwashing. However, as per the existing landfill site practice a portable jet wash system will be kept on site so that any vehicles that require cleaning prior to using the 1.4km site access road can be washed down. Waste water arising from the wheel cleaning operation will be picked up in the perimeter drain and taken along this for settlement prior to discharge.

2.11 Compactor/Grader Parking

When not in use the dozer will be parked in the designated lorry parking area.

2.12 Maintenance and Refuelling Facilities

All plant and machinery will be maintained and refuelled off site in the agricultural maintenance sheds nearby.

3. LANDFILLING OPERATIONS

3.1 Preparation Works

Prior to landfilling the site access and waste reception facilities will be provided, as shown on the Operational Plans (Figure 5) and the site will be enclosed within a security fence. In accordance with the good surface water management practice, settling lagoons will be constructed at the locations shown on the Phase I diagram.

3.2 Phasing

The site will operate as a phased landfill, with each phase running concurrently with the restoration of the previous phase. The site has been divided into two phases which each phase being bounded by permanent or temporary drainage ditches.

3.3 Void Space

The void space of the site has been calculated by integrating the existing ground surface (Figure 2) and the restoration surface (Figure 3). The void space of the site is summarised below:-

Total Void	99,898m^3	Total Tonnage	179,816t
Phase 1 Void	49,909m^3	Phase 1 Tonnage	89,836t
Phase 2 Void	49,989m^3	Phase 2 Tonnage	89,980t

3.4 Acceptable Wastes

The site will accept only inert wastes, as designated by the South West Wales Waste Management Group Classification. The site will not accept liquid wastes or wastes containing liquids.

3.5 Waste Placement

Wastes will be deposited on the working layer close to the top edge of the working face, but no closer than 5m. The tip will have two layers, with each of these achieving a maximum height of 3m. Wastes deposited on the working layer will be bladed over the working face by site plant. Generally, the face will achieve a slope of no greater than 1:3.

3.6 Phase 1

Once all operatives associated with the existing landfill are completed Phase 1 operations will commence with the excavation of a perimeter drain and temporary drain which will contain all waters arising from operations within Phase 1. Both drains will discharge into a temporary settling lagoon before final discharge into the existing drainage ditch. Preparation works will also involve the removal of in-

situ peat which will also be included into Phase 1. A total tonnage of 15,412t of peat will be incorporated.

Tipping operations will commence with the continuation of the haul road, formed of selected hardcore. The tipping face, which will achieve a maximum height of approximately 4m will be bladed out with a small dozer to maintain a gradient of 1 in 3 or less. During the tipping operations imported topsoil will be selectively deposited against the access road to await final spreading over the completed phase. The tipping face will advance downslope.

3.7 Phase 2

Phase 2 operations will commence with the excavation of a temporary drain which will trap surface water runoff from the Phase 2 operation. The phase will be bounded by two temporary drains with the one bounding Phase 1 progressively overtipped as the tipping face advances. Both drains will continue to discharge to settling lagoons until the first phase lagoon is infilled. All discharges will then be diverted into the Phase 2 settling lagoon. The site haul road will be moved to provide easy access for Phase 2 and like Phase 1 the tipping face will advance downslope. During the operational phase, topsoil will be selectively stored adjacent to the main site road used during the progressive restoration of Phase 2. Whilst Phase 2 is being actively tipped, Phase 1 will be re-graded to final profile and restored. The infilling of Phase 2 completes the site operations.

3.8 Restoration Phase

When the importation of inert materials is complete, the phase will be restored and the site will be decommissioned, having changed virtually unusable marshy area into suitable agricultural land. Provision will be made to ensure that as previously all run off from the restored landfill is diverted into the existing drainage ditches.

3.9 Restoration Soils

Soils which are brought to the site for disposal but are deemed to be suitable to form a restoration topsoil will be spread directly onto the completed parts of the landfill. Should any surplus soils be delivered these will be stored on the most recently restored parts of the landfill to depths of no greater than 1m to avoid overcompaction. If it is anticipated that the soil stockpile will be in being for longer than 1 month it will be lightly compacted by tracking to reduce rainwater infiltration and saturation. It is not anticipated that peat would be stripped in advance of the landfilling to provide a topsoil.

3.10 Tipping Operations

Vehicles depositing wastes at the site will pass through the current reception area and travel along the site roads to the tipping face. They will back up toward the tipping face under the direction of a member of site staff. When the vehicle has discharged its load and left the face area the wastes will be pushed over with a small dozer. The tipping face will have an angle no steeper than 1:3, which is the maximum practical gradient for dozer operations.

4. WASTE RECEPTION PROCEDURES

4.1 Entry to Site

The site entrance will be securely locked outside normal opening hours. During opening hours vehicles will enter the site by the only entrance and immediately report to the site office, which is located adjacent to the entrance and site identification board (Figure 5).

4.2 Hours of Operation

The landfill will be operational between 08.30 and 16.30 during weekdays, and between 08.30 and 13.30 during Saturday. There will be no Sunday working.

4.3 Daily Input

As with the existing licensed landfill a daily maximum of 35 vehicle movements is anticipated depositing a daily maximum of 490 tonnes ($257m^3$ per day). This amounts to 1 tipping cycle per 14 minutes. A normal days operation is likely to involve 10 vehicle movements depositing 140 tonnes ($74m^3$) of wastes, with a turnaround time of 45 minutes.

4.4 Inspection

All site users will be aware of the acceptable wastes having read the site identification board. Despite this the site supervisor will make a visual inspection of loads entering the site to see that the wastes fall within the licensed waste category.

4.5 Unauthorised Wastes

It is possible that even with the most rigorous inspection system small amounts of waste materials falling outside the permissible categories will be deposited and subsequently identified at the working face. If these wastes are easily picked from the waste mass they will be removed by hand and loaded into a skip kept at the working face. The unauthorised waste skip will be removed to a suitably licenced landfill when full or at fortnightly intervals, whichever is the soonest.

Where the unauthorised wastes are disseminated throughout an incoming load, making hand picking too time consuming the entire load will be re-loaded onto the delivery wagon and sent to a suitably licenced landfill. The site record book will record these facts.

Where the unauthorised wastes has a particular potential for environmental harm, the following procedures will be followed:

1. Visually examine objects or materials.
2. Contact Waste Regulator for handling and disposal advice.

3. If the materials can be moved safely to secure storage don appropriate PPE for the substance or materials and transfer these from the waste mass into a secure container.
4. If the materials cannot be moved safely, isolate the area and act upon external agency (EA, Fire Service, HSE) advice.
5. Materials placed into secure storage should be removed to a disposal site with the consent of the Waste Regulators.

4.6 Deposition of Wastes

When the wastes are confirmed to be acceptable by the visual inspection the details of the waste consignment will be recorded in the site diary. This will log the following details:-

i) Transferring Company/Organisation
ii) Vehicle Registration
iii) General Origin of Wastes
iv) Date and Time of Delivery
v) Volume/Tonnage of Waste
vi) Drivers Signature

Copies of transfer notes raised by the depositing organisation will also be kept.

4.7 Waste Input Recording

As the site is without a weighbridge, waste input will be recorded either by multiplying vehicle volumes by 1.5 tonnes/m^3 or by taking maximum net load of the vehicle. These methods comply with Appendix B of " A General Guide to Landfill Tax" published by HM Customs & Excise, 1997.

4.8 3 Monthly Returns

At 3 monthly intervals the licensing authority will be supplied with void use returns. An equivalent tonnage will also be supplied. The returns can be 'audited' annually by land survey if required.

4.9 Unacceptable Wastes

In the event that a consignment of waste arrives which contains or is composed of wastes outside the licensed category the load will be refused entry to the site. The location of nearby sites which can accept other categories of waste will be kept on record at the site office to assist the driver of the rejected load.

4.10 Identification of Unacceptable Wastes at the Tipping Face

Should unacceptable wastes pass through the checking-in system their composition will be clearly identifiable at the tipping face. The site supervisor will collect the wastes and load them into an appropriate receptacle for transport to a suitably licensed facility. The WRA will be informed of all such events and they will be recorded in the site diary.

4.11 Record Keeping

All of the records kept at the site, including transfer notes, tipping records, visitor and accident books together with environmental monitoring and site inspection notices will be kept at the site office and will be available for inspection by the Agency during normal working hours.

5. THE CONTROL OF MUD, DUST AND WATER

5.1 Mud

A daily inspection will be made to evaluate the need for wheel washing. If mud is picked up from the tipping face and has not been shaken off within the site (early stages of Phase I and 2) wheelwashing facilities will be used. The decision on wheelwashing will be made daily by the site operator.

If mud has been deposited on the public highway the site operator will ensure a road sweeper is used to remove all traces.

5.2 Dust

In very dry weather certain inert wastes generate significant amounts of dust when being tipped and bladed. Under these circumstances water suppression will be used to keep dust levels down. The water will be provided by bowser brought to the tipping face for damping down. Site roads will be sprayed at regular intervals to suppress dust.

5.3 Surface Water Control

Surface water will be controlled by the provision of perimeter drains and temporary internal drains. The perimeter will be retained to take direct surface runoff from the restored landfill. Contaminated water running directly off the landfill will be diverted to temporary settlement lagoons. The calculation of settling lagoon dimensions and attenuation pond dimensions has been undertaken in accordance with "Technical Management of Water in the Coal Mining Industry" published by NCB, 1982. Calculations can be found at Appendix 3.

The effectiveness of the attenuation and settling pond system will be monitored by visual observation on a daily basis. Each of the perimeter drains will be inspected daily to ensure they remain free flowing.

6. MANNING

The site will be manned by three employees of the licence holder during is opening hours. The three members of staff will have the following responsibilities:-

6.1 Site Supervisor

Daily inspection of infrastructure
Routine maintenance of plant and equipment
Load Inspections
Liaison with WRA
Inspection of Mud and Dust suppression
Water Quality Monitoring

6.2 Machine Driver/Banksman

Directing lorries at the tipping face
Maintaining face and site road in usable condition
General maintenance

6.3 Records Clerk

Recording of waste input and transfer note filing
Liaison with Waste Regulation Authority

6.4 Licence Holder

Overall co-ordination of disposal activities

6.5 Out of Hours Manning

The licence applicant lives at Abergelli Fach Farm which lies immediately adjacent to the site. The supervisor will be at hand to deal with any out of hours emergency. The telephone number displayed on the Site Identification Board will be the telephone number of Abergelli Fach Farm.

6.6 Technically Competent Site Management

The site falls outside the scope of the WAMITAB scheme as it is an inert site with a capacity of below 50,000m^3. The management, comprising the licence holder and an employee will be assessed for technical competence by the Environment Agency. One of these two site managers will be available at all times, and holiday cover will be scheduled between them.

7. MONITORING

A programme of environmental monitoring will take place at the site commencing before the site accepts wastes and terminating when agreement has been reached with the Agency that completion criteria have been met. The monitoring programme can be broken into three elements, as detailed below:

7.1 Pre-Construction Monitoring

Landfill gas will be sampled at the locations shown on Figure 6. The natural background levels of methane, carbon dioxide, oxygen and hydrogen sulphide will be measured at ten locations across the site of the proposed landfill. Gas concentrations will be measured using an Analox 1200 portable infra-red gas analyser connected to a 1m perforated steel gas spike. As the site is underlain by peat deposits it is possible that methane gas will be detectable before filling commences.

Surface water will be sampled at the location shown on Figure 6. The sample will be submitted to a NAMAS accredited laboratory for the determination of:

> pH, Conductivity, Suspended Solids, Ammonical Nitrogen, COD, Cu, Cr, Cd, Ni, Pb, Zn, Fe and As

Pre-construction monitoring will be undertaken twice before the commencement of filling, but in the event of a significant difference between concentrations a third series of tests will be undertaken.

7.2 Operational Monitoring

Monitoring during the operational phase of the landfill will comprise of the same determinands as described in section 7.1 for pre-construction monitoring and at the same locations for both gas and surface water. The frequency during the operational phase will however be on a quarterly basis. The operational monitoring will continue during the landfilling period.

7.3 Post Closure Monitoring

Post closure monitoring will comprise of the same determinands as for both the pre-construction and operational phases, again at the same locations. The frequency of the monitoring will be 6 monthly for a period of two years. Once this is completed the data will be scrutinised to see whether completion criterion will be met for the landfill.

8. RESTORATION

Progressive restoration will ensure that only a single phase is operational at any one time. Selected topsoil, stockpiled at the edge of each phase will be pulled over the profiled wastes to a depth of 150mm as the tipping face progresses. Before topsoiling the wastes will be compacted to give an even surface profile.

When placed to the appropriate level the topsoil will be fertilised and seeded, following guidelines published by the Countryside Commission.

Typical Restoration Seeding Plan

Meadow Grass	30%
Fescue	40%
White Clover	15%
Ryegrass	15%

Sown at a density of 80 kg/ha

The restored landfill is slightly domed to allow surface water runoff into the perimeter drains and drainage ditches (Figure 3). The landfill will be used for general agricultural purposes.

9. COMPLETION AND LICENCE SURRENDER

When tipping operations have ceased and the restoration has become established the licence holder will wish to surrender his Waste Management Licence. The Environment Agency will require substantiated evidence that the site is not and will not pose a risk to the environment or to human health. The general strategy in demonstrating that completion criteria have been met is to provide a sequence of monitoring data over an appropriately long timescale. Monitoring will generally commence before landfilling operations begin (background monitoring), will continue through the operational period of the landfill and will conclude sometime after restoration is complete when the data shows that the site poses no further risk.

This landfill is sited in a low lying area which is known to be underlain by several metres of peat. The near surface deposits have been partly obscured by overtipping which was undertaken when the site was used as a coal mining waste dump. Beneath the peat the ground is believed to comprise colluvial clays which give way at depth to boulder clay.

The solid geology beneath the site comprises fine grained sedimentary strata belonging to the Grovesend Beds of the Upper Coal Measures. The strata contain undifferentiated siltstones and mudstones and a number of workable coal seams which dip gently towards the south. Several north-south trending faults are indicated on the published geological plans with one projected to run directly beneath the site.

Surface water from the vicinity of the site drains westwards to eventually join Nant y Crimp which drains into Afon Lliw. The landfill will encroach into the eastern edge of a peat bog which has a standing water level approximately 700mm below ground level. The peat bog drains into a stream which runs approximately 400m to the west of the site.

Currently, there are two potential sources of methane gas at the site, these being biodegradation in the peat bog and coal bed methane from the underlying strata. If completion criteria are to be met the applicant will have to demonstrate that the waste materials are not contributing methane due to the degradation of organic materials. This will be achieved by undertaking a series of gas tests at monthly intervals. The tests will comprise measuring the concentration of methane, oxygen carbon dioxide and atmospheric pressure in accordance with Waste Management Paper No. 27 at four locations as shown on Figure 6. The gas monitoring installations will be simple gas spikes. Gas monitoring will commence prior to landfilling and will continue until the Agency is satisfied that completion criteria have been met.

Background water quality monitoring will commence prior to landfilling and will continue until the Agency is satisfied that completion criteria have been met.

It is anticipated that two years of post-closure monitoring will be required to demonstrate completion.

10. EMERGENCY PLAN

This emergency plan is generic and covers emergencies which could occur at Abergelli Landfill falling within three broad categories, medical, fire and environmental emergencies.

10.1 Medical

In the event of medical emergency –

1. Check and maintain airway.
2. Establish breathing.
3. Control bleeding.
4. If possible send for help and remain with casualty. If not go to site cabin, call 999 ask for ambulance. State the following:

   Emergency at Abergelli Farm Landfill Site.
   Describe the nature of the emergency.
   Describe the cause of the emergency.
   Give the site telephone number and directions to the site off the A48.
   Inform whether the telephone will be manned.

In the event of requiring medical treatment when the casualty is capable of being moved safely and comfortably the nearest accident and emergency hospital is Morriston Hospital. In the event that the site supervisor leaves the site the landfill must be secured to prevent disposal of loads which have not been inspected.

10.2 Fire

In the event of fire within the site cabin it should be immediately evacuated if an initial attempt at fire fighting within an extinguisher is unsuccessful. The fire service should be called and the following information should be stated:

Fire at Abergelli Farm Landfill Site.
Describe the nature of the fire.
Inform the service that bottled gas is used within the site cabin.
Give the site telephone number and directions to the site off the A48.
Inform whether the telephone will be manned.

In the event of a fire on the landfill site all personnel should be moved to a mustering point close to the site cabins. If the fire is small the site dozer should cover it over by pushing soils to smother it. If the fire is too large to safely extinguish the fire service should be called and the information above should be stated, with the exception of the bottled gas details.

In the event of a fire within the unauthorised waste skip an attempt should be made to extinguish it by either soil covering or using the site extinguisher. As the skip is water-tight residue from the burning will remain contained, and will be disposed in the normal way. The Environment Agency shall be informed as soon as is practical and in any event within 1 hour of the fire.

In the event of a fire at the base of the tip which could potentially ignite peat deposits the fire service shall be called immediately, as shall the Environment Agency.

There are two fire extinguishers kept at the site, these being behind the door and on the far wall of the site office. These extinguishers will be inspected at the frequency recommended by the manufacturer/supplier and will be certified as such on the extinguisher.

10.3 Environmental

An environmental emergency at this inert landfill site is extremely unlikely due to the benign nature of the waste materials. Excess suspended solids if discharged would not immediately impact upon surface water courses but would be retained in the peat bog for some considerable time.

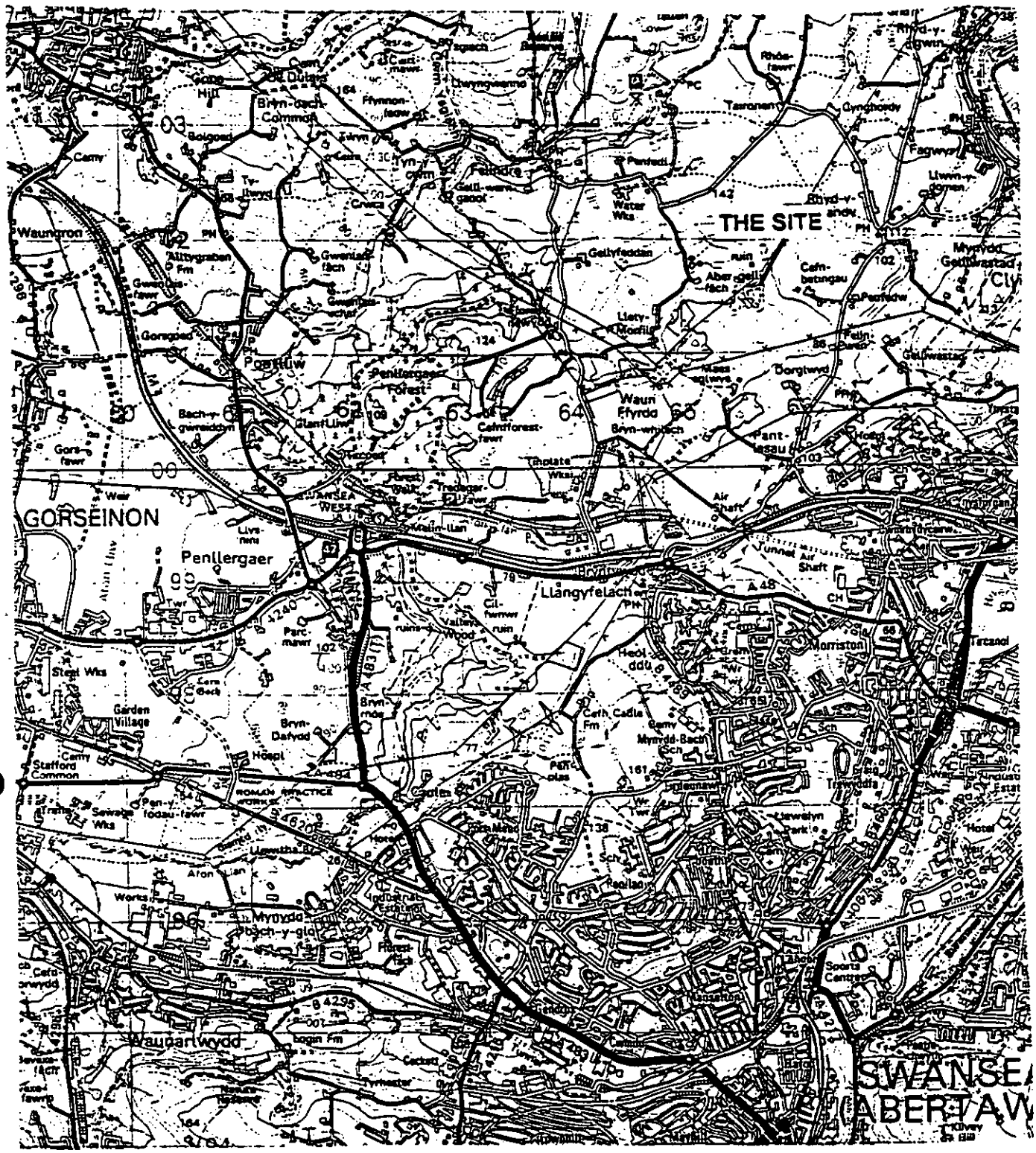
Refuelling and maintenance will occur off site and liquids are specifically prohibited by the terms of the licence. Any conceivable liquid spillage at the site therefore would be from a vehicle breakdown and would comprise lubricant oils leaking from the vehicles. In the event of such a breakdown the site plant will recover the vehicle to a safe position and will immediately scrape up the contaminated soil and load this into the unauthorised waste skip. A record of this operation will be made in the site diary.

In the event that an unidentifiable substance is present within an incoming load, the load shall be treated as being out of compliance with the licence. The Environment Agency shall be consulted so that the substance can be identified and can be re-routed to an appropriately licenced landfill site. The vehicle carrying the load shall be held on the yard in front of the site office and will not be permitted to move onto the landfill site.

GEO TECHNOLOGY

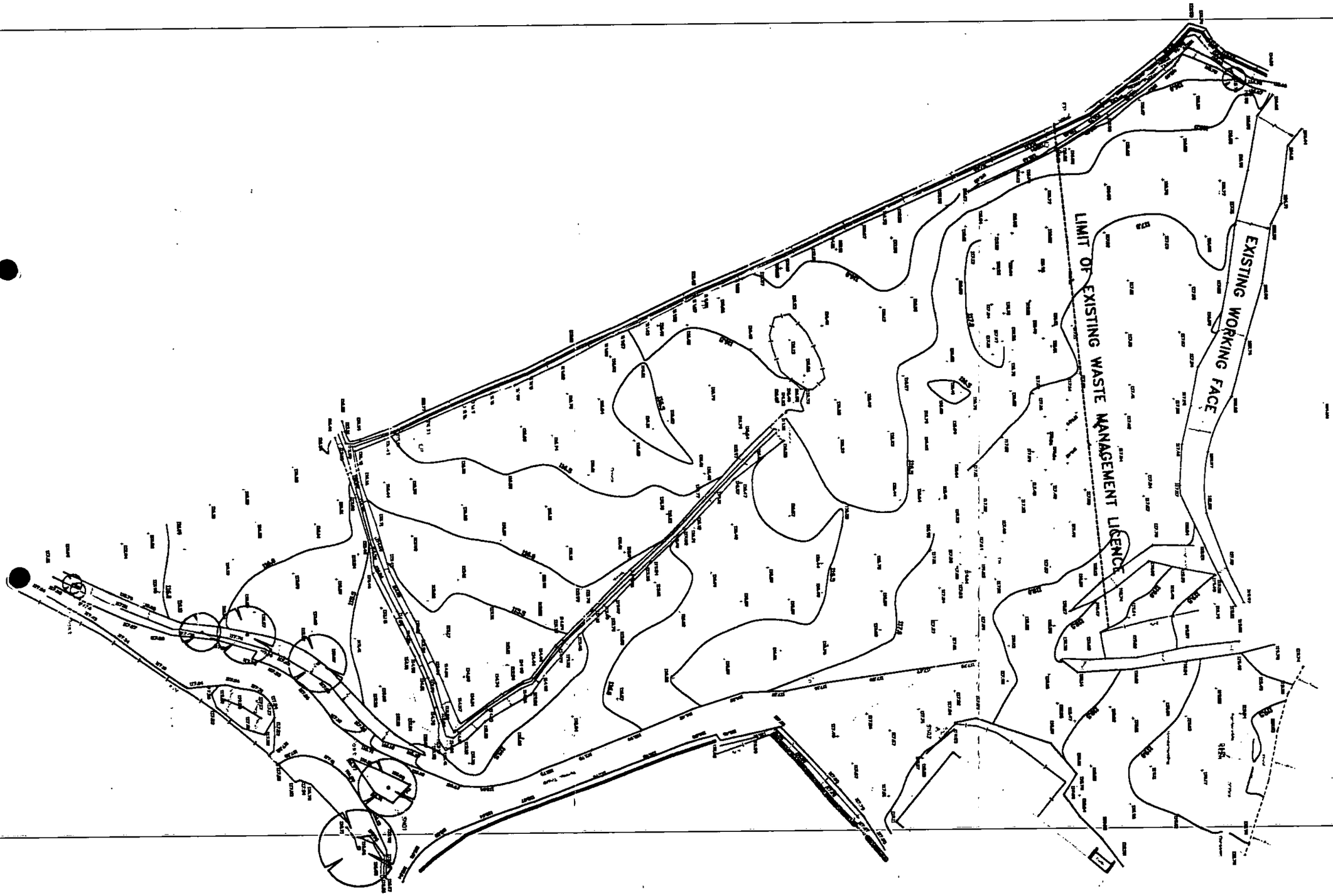
Figure 1 Site Location Plan

SCALE 1:50,000 at A4



GEO TECHNOLOGY

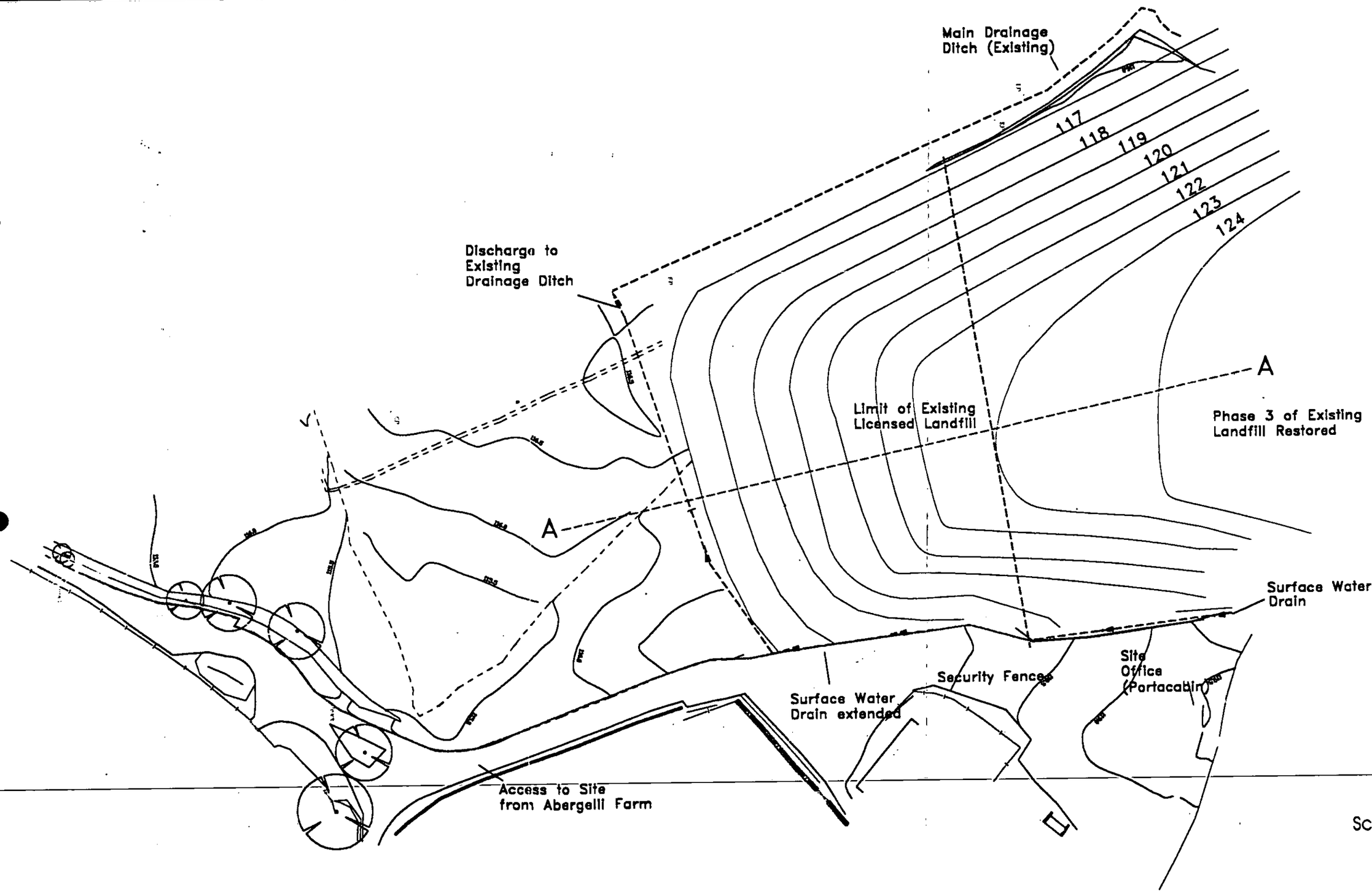
Figure 2 Existing Site Plan



Scale 1:1000

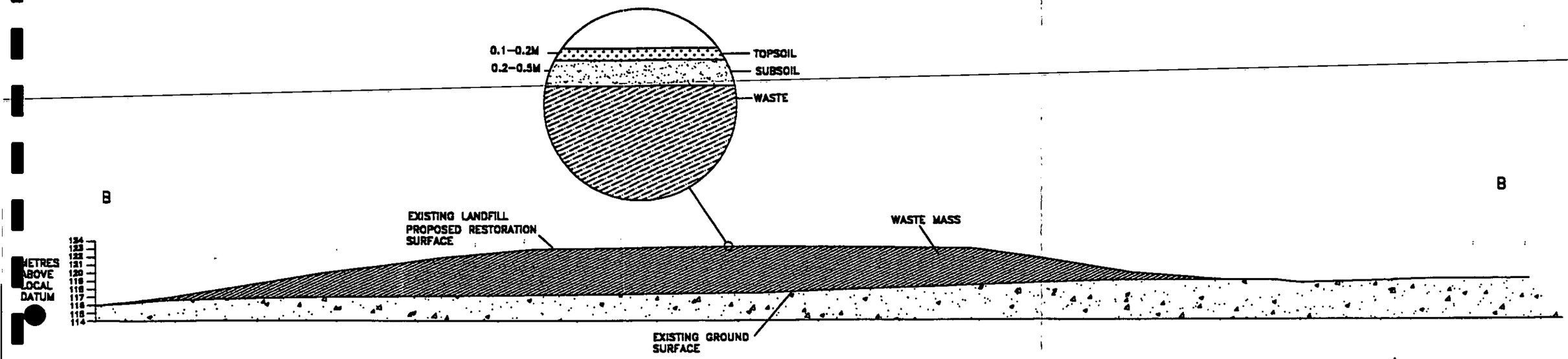
GEO TECHNOLOGY

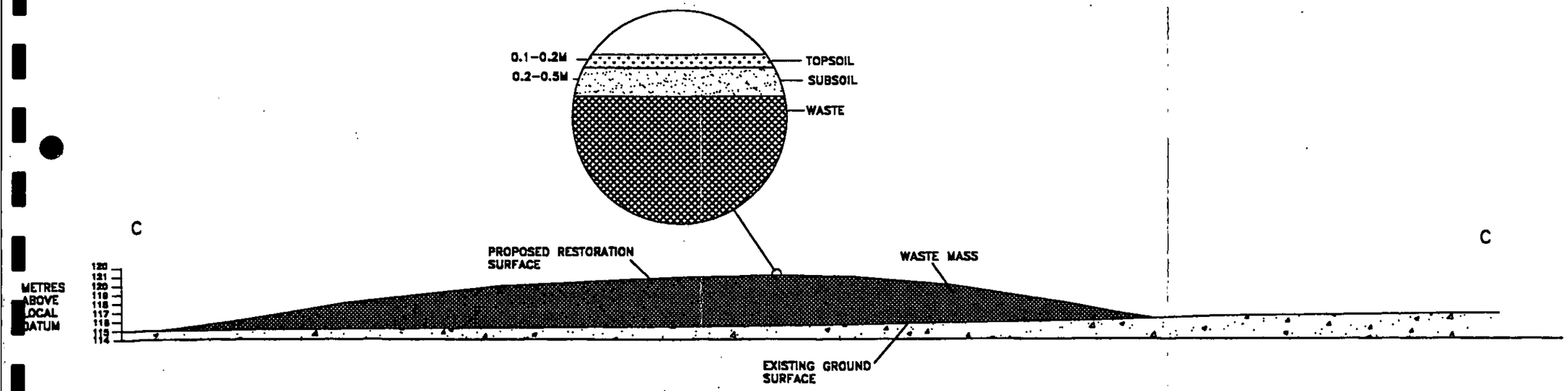
Figure 3 Restoration Plan



GEO TECHNOLOGY

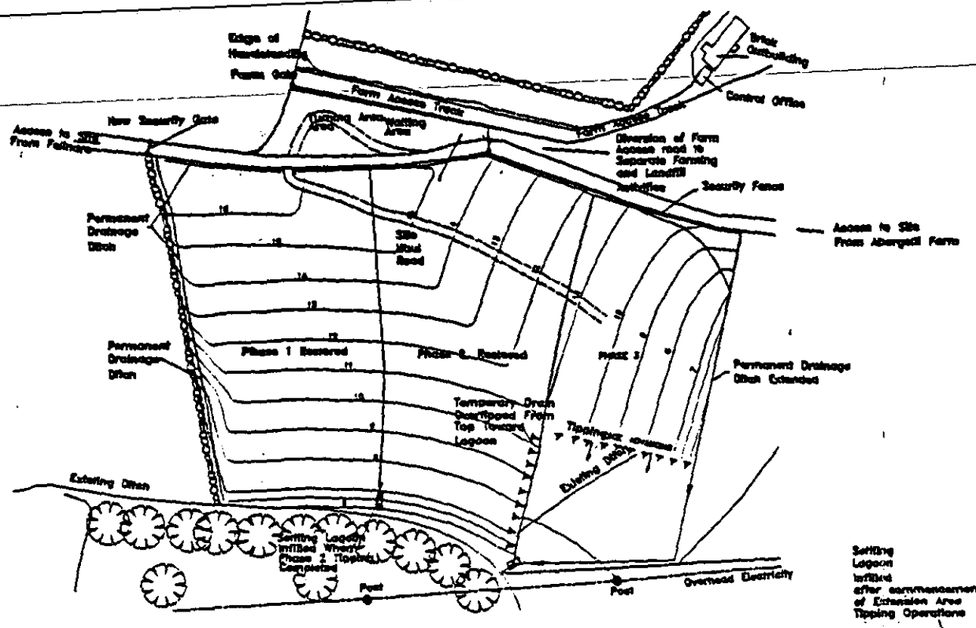
Figure 4b Cross Sections B and C



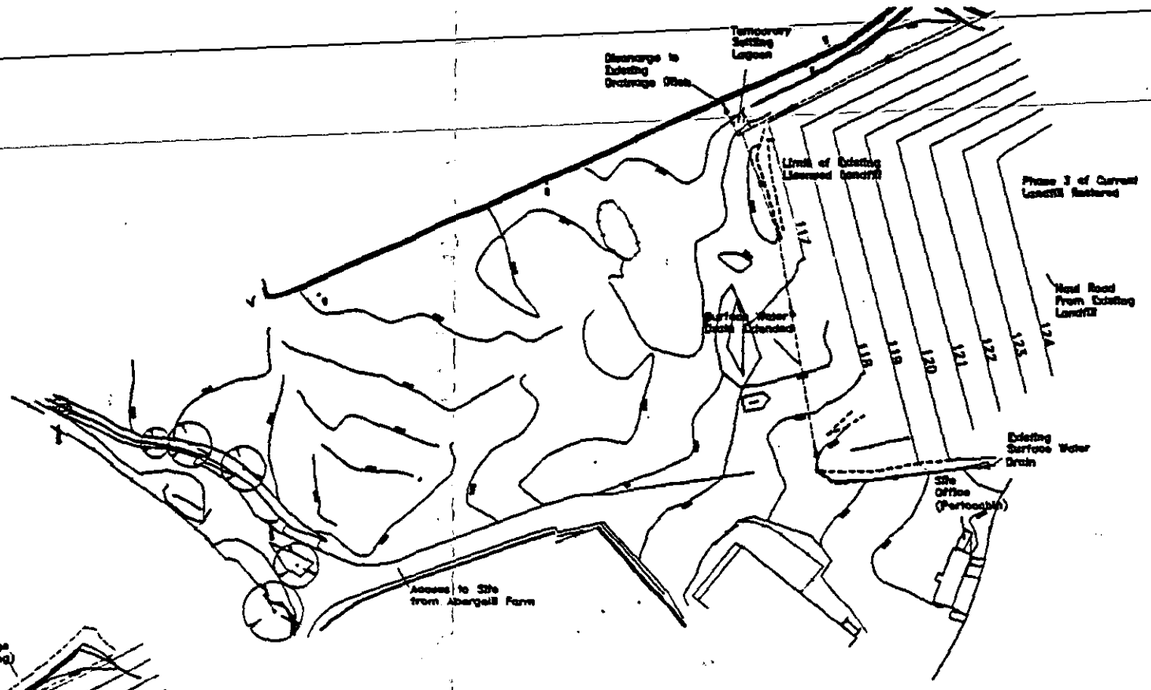


Horizontal Scale 1:500

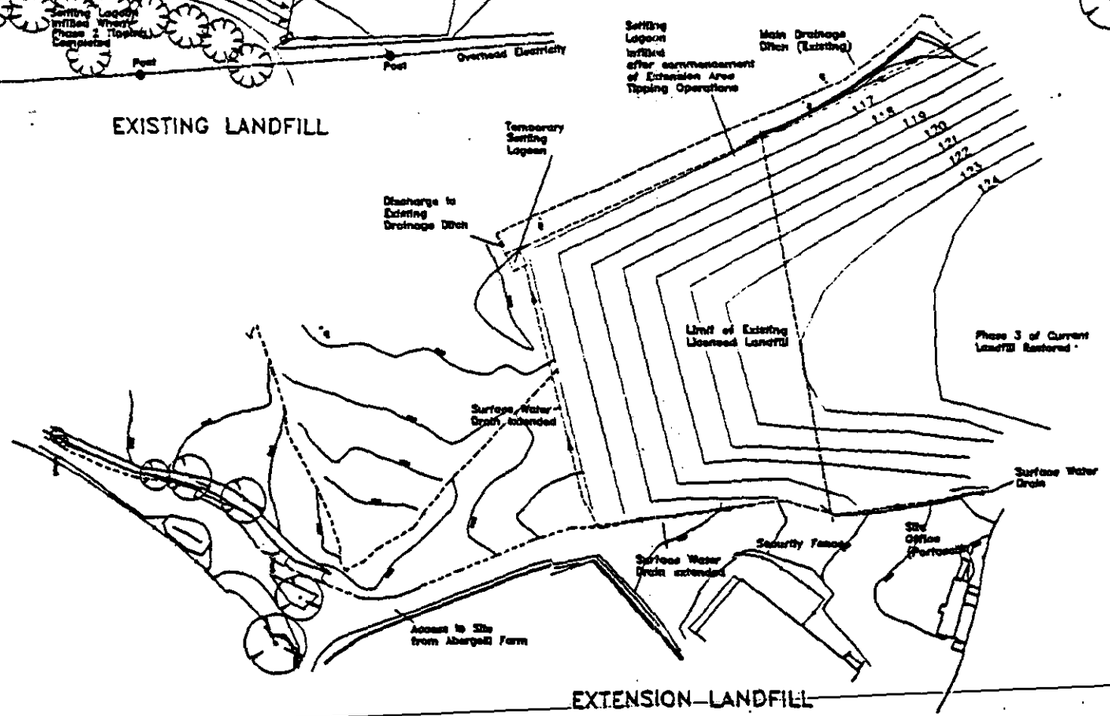
Figure 5 Phasing Plan



EXISTING LANDFILL



COMPLETION OF EXISTING LANDFILL

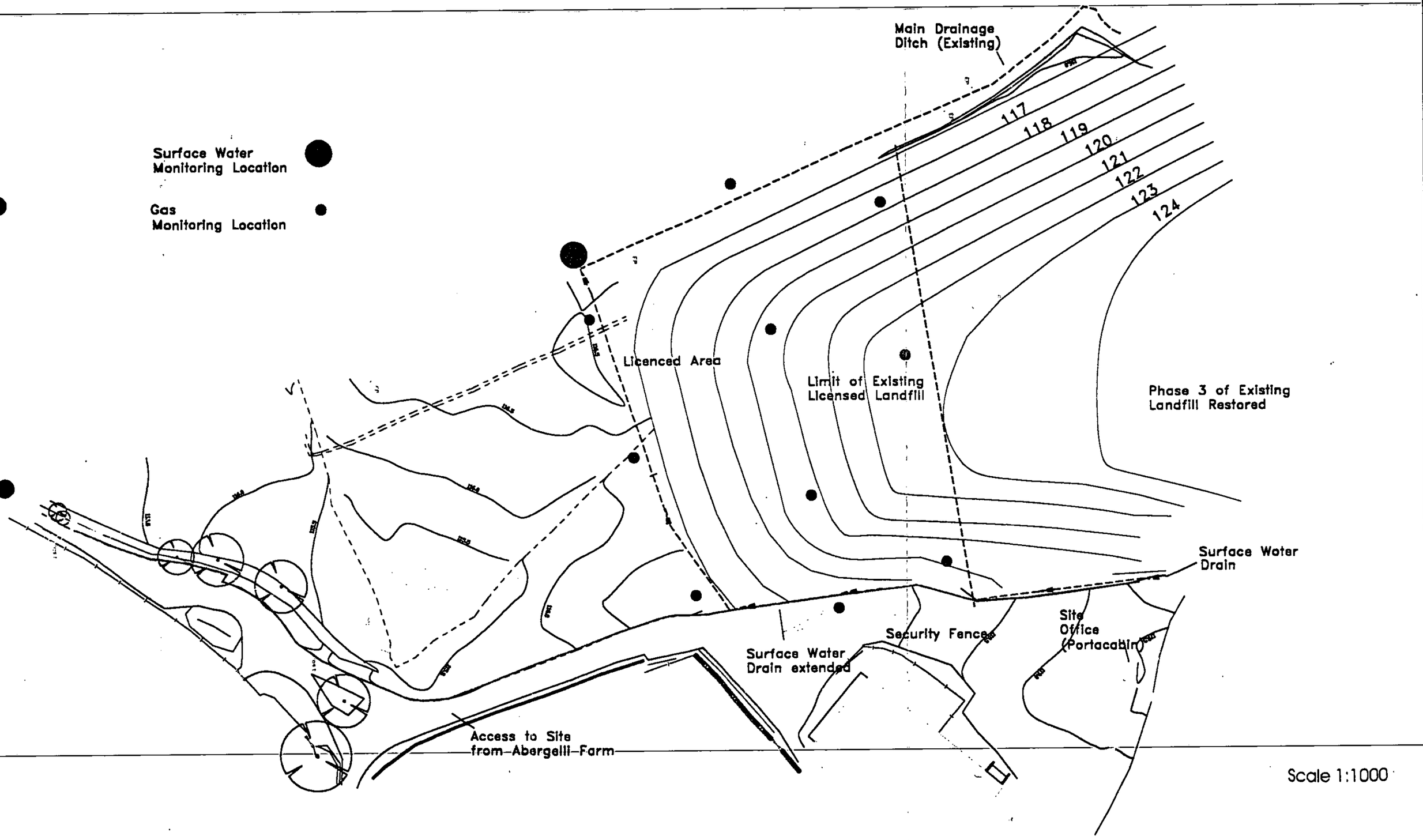


EXTENSION—LANDFILL

Scale 1:1000

GEO TECHNOLOGY

Figure 6 Monitoring Plan



Appendix 1

PLANNING CONSENT

CITY AND COUNTY OF SWANSEA

15 DEC 1997

TOWN AND COUNTRY PLANNING ACT 1990

GRANT OF PLANNING PERMISSION

To:

CARLISLE DAVIES & NORTH
77, HERBERT STREET
PONTARDAWE
SWANSEA
SA8 4ED

PLANNING APPLICATION NO. 97/1065

DATE REGISTERED: 30th July 1997

APPLICANT: R W B LLEWELLYN

The **City and County of Swansea**, in exercise of its powers under the above ACT, hereby **GRANTS** planning permission for:-

EXTENSION TO INERT LANDFILL TIPPING SITE FOR AGRICULTURAL LAND RECLAMATION

at:-

ABERGELLI FARM - FELINDRE SWANSEA SA5 7NN

as referred to in your application and shown on the accompanying plan(s), subject to the following condition(s):-

01
This consent shall enure for a period of 5 years only from the date of this consent. At the expiration of 5 years, the tipping operations shall have ceased and the landscaping of the site completed.

02
No development shall take place without the prior written approval of the Local Planning Authority of a scheme for the phased landscaping of the site. The landscaping scheme shall be carried out within 12 months from the cessation of tipping. Any trees or shrubs planted in accordance with this condition which are removed, die, become seriously diseased within two years of planting shall be replaced by trees or shrubs of similar size and species to those originally required to be planted.

03
Access and egress to the application site, for vehicles tipping at the site, shall be via the existing access road approved under previous planning permission 2/2/93/0231/03 only. No access for vehicles using the tip shall be obtained via the existing northern access to Abergelli Farm.

04
Inert waste only must be used as fill material (see definition at Informative No. 02).

05
Prior to any development being commenced in respect of this proposal, details of a lagoon system must be submitted to the Local Planning Authority for consideration. The approved system must be installed prior to any tipping being commenced in respect of this proposal.

06
Within one month of the completion of the landscaping operations, the site control office shall be removed from the site and the area reinstated in accordance with a scheme to be submitted to and approved in writing by the Local Planning Authority.

07
There shall be no crushing or screening of any materials on the site whatsoever.

08

No processing, sorting or re-excavation of any waste shall take place within the application site without the prior written consent of the Local Planning Authority.

09
No materials shall be burnt within the boundaries of application site whatsoever.

10
Details of wheel washing equipment shall be submitted to the Local Planning Authority prior to any tipping operations on this site being commenced. The approval details shall be installed prior to the tipping operations commencing.

11
All vehicles leaving the waste facility shall use the wheel cleaning apparatus required by condition 10 above.

The reasons for the Council's decision to GRANT permission for the development, subject to compliance with the conditions specified are:-

01
The Local Planning Authority considers that a 5 year period is appropriate in this instance in order to complete the works referred to in the application.

02
To ensure that the site is satisfactorily landscaped having regard to its location and the nature of the proposed development and to accord with Section 197 of the Town and Country Planning act 1990.

03
To prevent heavy lorries using the narrow roads in the Felindre area.

04
To prevent pollution.

05
To prevent pollution.

06
In the interests of visual amenity.

07
Permission is granted for landfill operations only.

08
To ensure that the minimum amount of processing, sorting or re-excabation is undertaken and to prevent the creation of a waste transfer station being established at the facility.

09
In the interest of environmental amenity.

10
To ensure no mud or other debris is carried onto public highways.

11
To ensure no mud or other debris is carried onto public highways.

INFORMATIVES:

01
The drawing numbers/description to which this decision refers are as follows:

Drawing(s) No(s): Figs. 2, 3.1, 3.2, 4a.1, 4a.2, 4b1, 4b2, 5.1, 5.2 dated/received 25th July 1997.

02

INERT WASTE shall mean solid or granular dry materials, free from any naxious, poisonous or polluting substances, which does not decompose or for which the environmental impact of decompositiion is less than, or comparable with, that of topsoil and is virtually insoluable in water. It includes such inert wastes as topsoil, subsoil, brickwork, stone, concrete, clay, sand, silica (excluding finely powdered waste) glass.

03
The site operator should ensure that there is no possibility of contaminated water entering and polluting surface or underground waters.

04
Any culverting of a watercourse requires the prior written approval of the Local Authority under the terms of the Public Health Act 1936, and the prior written consent of the Agency under the terms of the Land Drainage Act 1991/Water Resources Act 1991. The Agency seeks to avoid culverting, and its consent for such works will not normally be granted except for access crossings.

05
The developer must not, in any way, create an obstruction or a restriction to the flow of a watercourse under normal or flood flow conditions.

06
The Agency and the Local Authority have permissive powers to maintain watercourses depending on the watercourse's definition as 'Main River' or 'Ordinary Watercourse'. The responsibility for general maintenance of the river and its banks rests with the riparian owners.

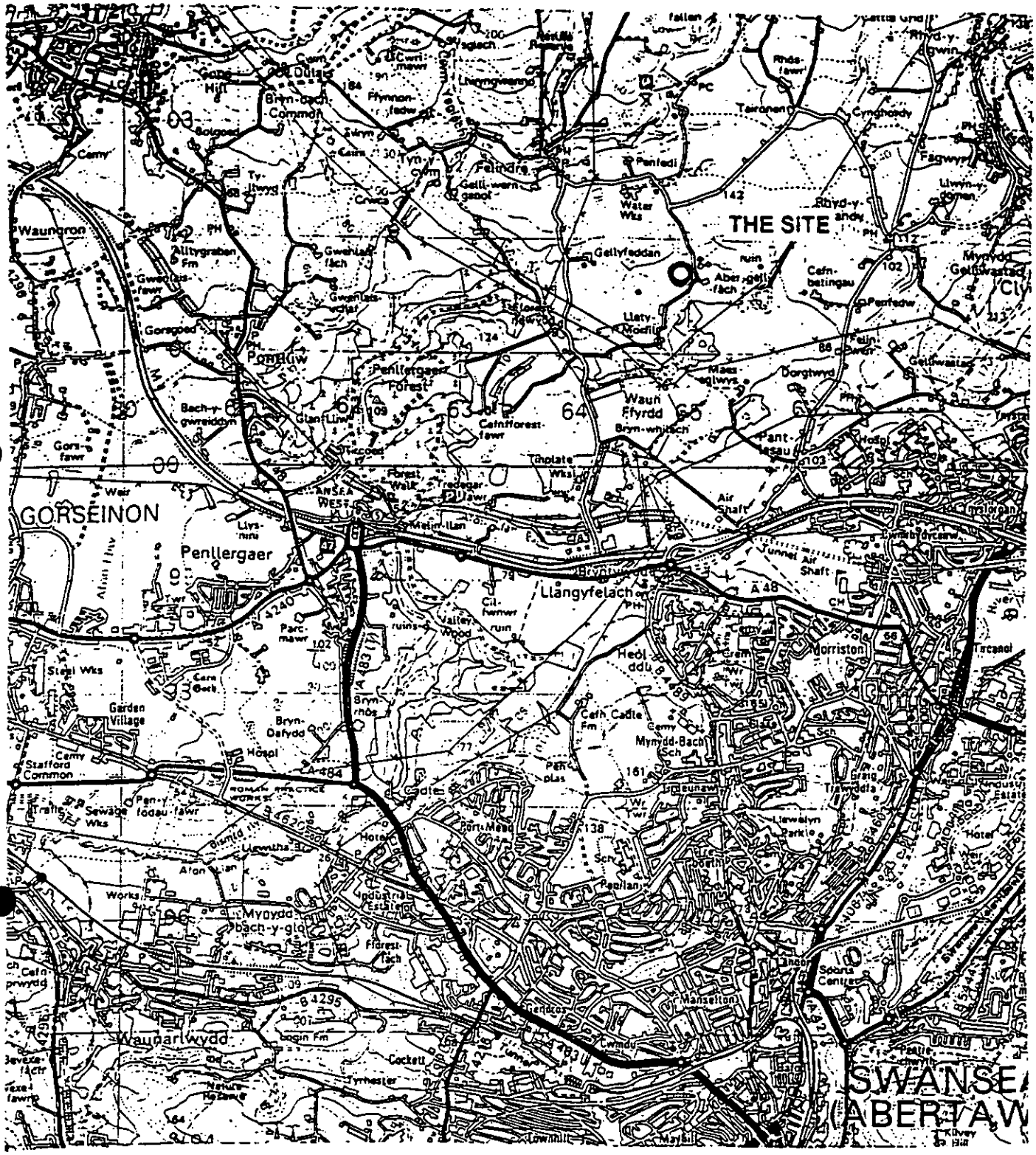
07
Any modification to the working plan agreed with the Waste Regulation Authority which constitutes development shall be subject to a further planning application to the Local Planning Authority, which will be considered on its individual merits at that time.

08
The applicant is requested to investigate the possibility of installing a direction sign to the site from the public highway.

Dated: 8th December 1997

DIRECTOR OF PLANNING
The Guildhall, Swansea

PLEASE NOTE - *Your attention is drawn to the attached notes which explain, amongst other things, your right of appeal against this decision.*



Based upon the Ordnance Survey's 1:50,000 map of 1995 with the permission of the Controller of Her Majesty's Stationary Office, (c) Crown copyright.

GEOANALYSIS LTD
GROVE HOUSE
GROVE PLACE
PORT TALBOT
SA13 1XA

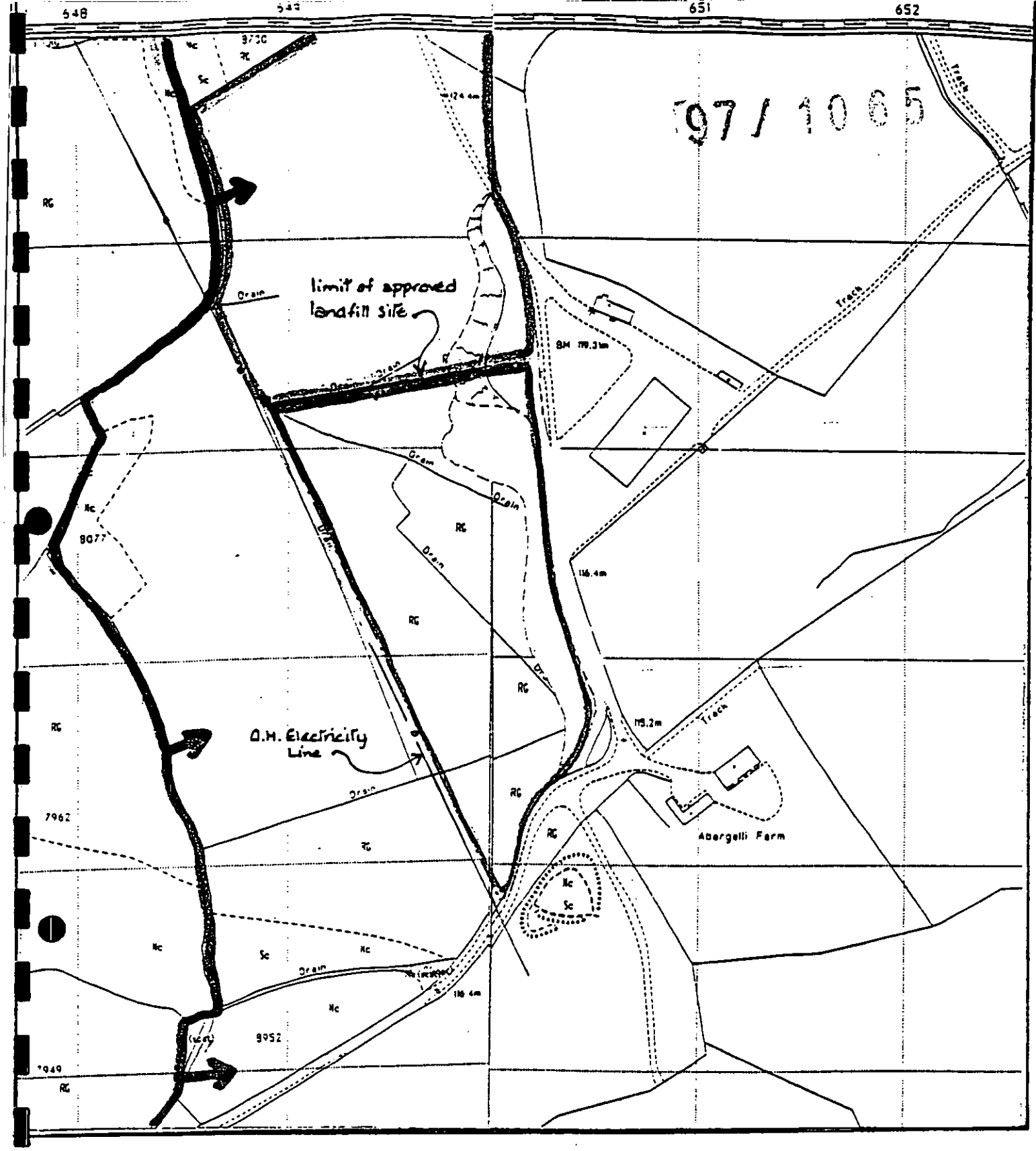
PROJ No: 276

SCALE 1: 50,000

SITE LOCATION PLAN

PROJECT: ABERGELLI FARM, PHASE II

FIG 1



PROPOSED EXTENSION TO LANDFILL TIPPING OPERATIONS AT ABERGELLI FARM, FELINDRE, SWANSEA, FOR MR. W.B. LLEWELLYN.

SITE IDENTIFICATION PLAN – Scale 1: 2500

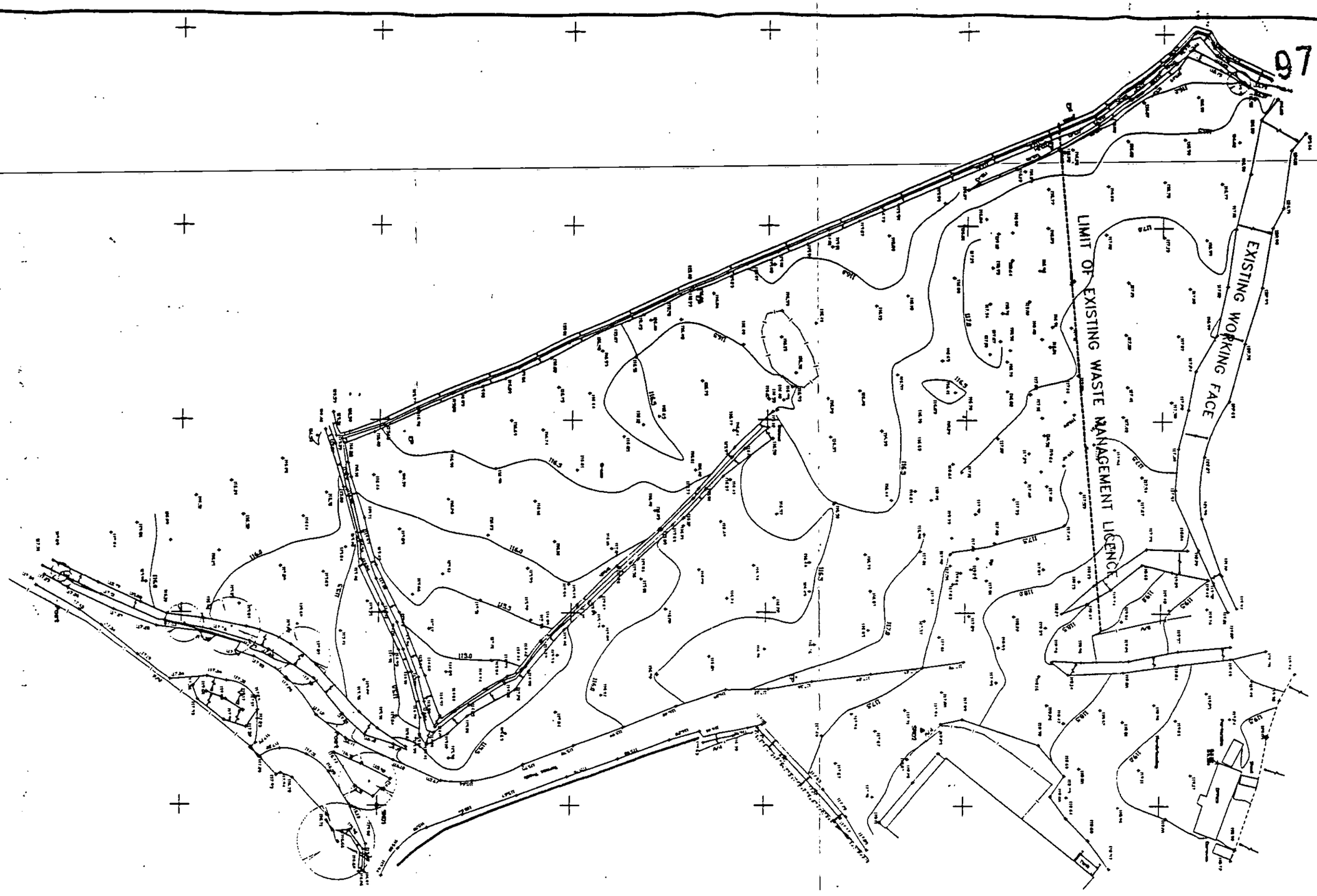
Carlisle, Davies & North
CHARTERED TOWN PLANNERS AND DEVELOPMENT CONSULTANTS
YMGYNGHORWYR CYNLLUNIO A DATBLYGU

77 Stryd Herbert
Pontardawe
Abertawe
Gorllewin Morgannwg
SA8 4ED
Ffôn: 0792 830338 (2 lin)
Ffacs: 0792 863855

77 Herbert Street
Pontardawe
Swansea
West Glamorgan
SA8 4ED
Tel: 0792 830338 (2 lines)
Fax: 0792 863855

FIG 1A

97/1065



GEOANALYSIS LTD GROVE HOUSE GROVE PLACE PORT TALBOT SA13 1XA	PROJECT: PROPOSED EXTENSION TO INERT LANDFILL ABERGELLI FARM, FELINDRE CLIENT: MR. W.B. LLEWELLYN PROJ. No: 276 SCALE: 1:1,000	EXISTING SITE PLAN	GEO ANALYSIS	FIG 2

97/1065

Main Drainage Ditch (Existing)

B

C

117

118

119

120

121

122

123

124

Discharge to Existing Drainage Ditch

A

Limit of Existing Licensed Landfill

Phase 3 of Existing Landfill Restored

Surface Water Drain

Security Fence

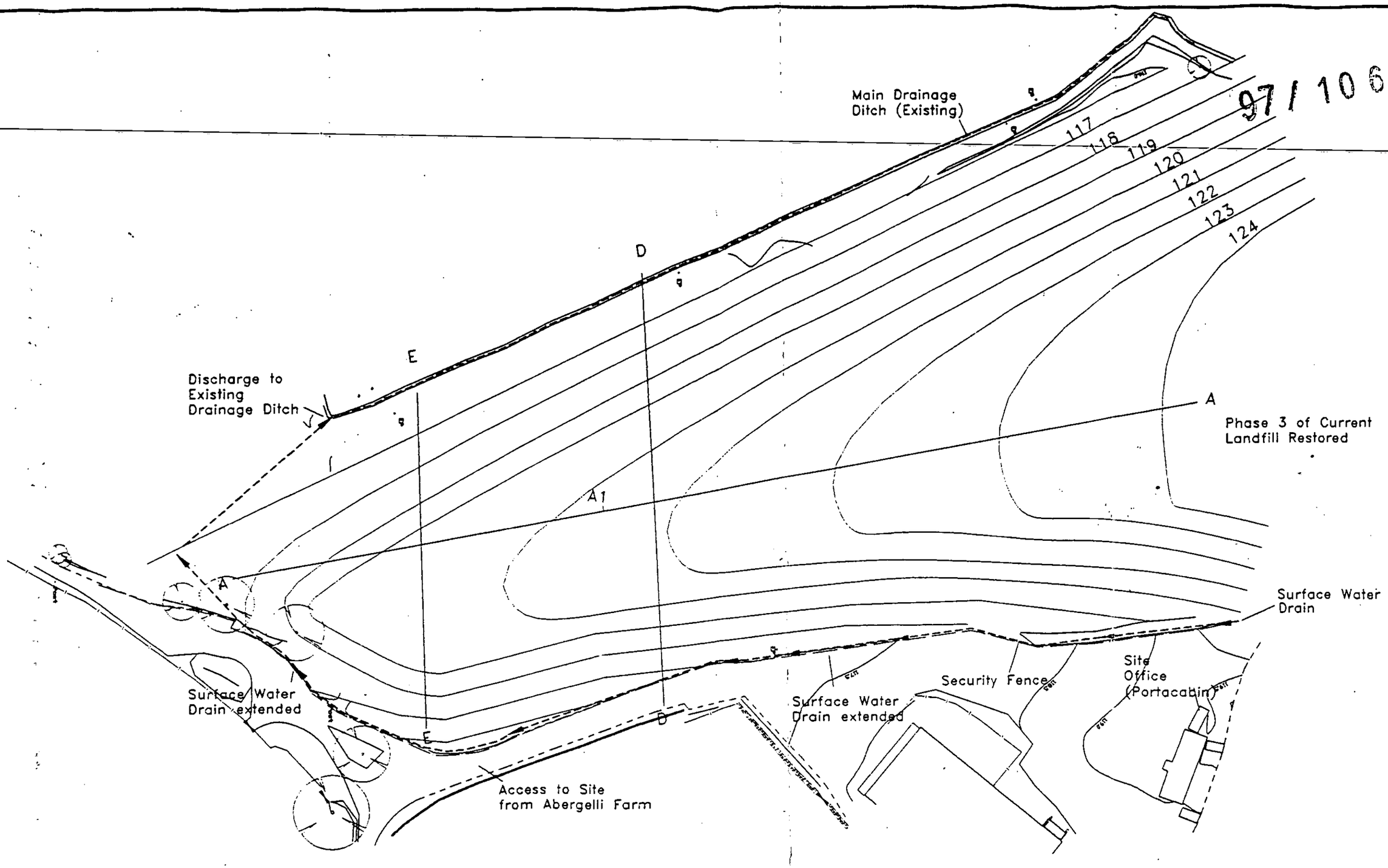
Site Office (Portacabin)

Surface, Water Drain extended

Access to Site from Abergelli Farm

GEOANALYSIS LTD GROVE HOUSE GROVE PLACE PORT TALBOT SA13 1XA	PROJECT: PROPOSED EXTENSION TO INERT LANDFILL ABERGELLI FARM, FELINDRE CLIENT: MR. W.B. LLEWELLYN PROJ No: 276 SCALE: 1:1,000	RESTORATION PLAN Phase 1	GEO ANALYSIS	FIG 3.1

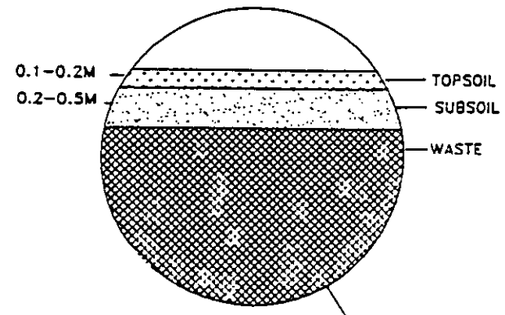
97/1065



GEOANALYSIS LTD GROVE HOUSE GROVE PLACE RT TALBOT 13 1XA	PROJECT: PROPOSED EXTENSION TO INERT LANDFILL ABERGELLI FARM, FELINDRE CLIENT: MR. W.B. LLEWELLYN PROJ No: 282 SCALE: 1:1,000	RESTORATION PLAN Phase 2	GEO ANALYSIS	FIG 3.2

97/1065

A



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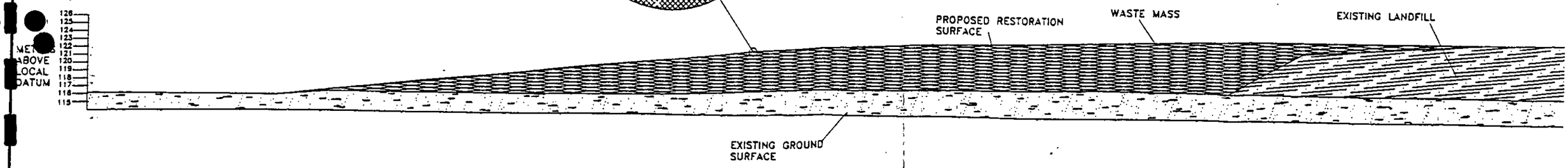
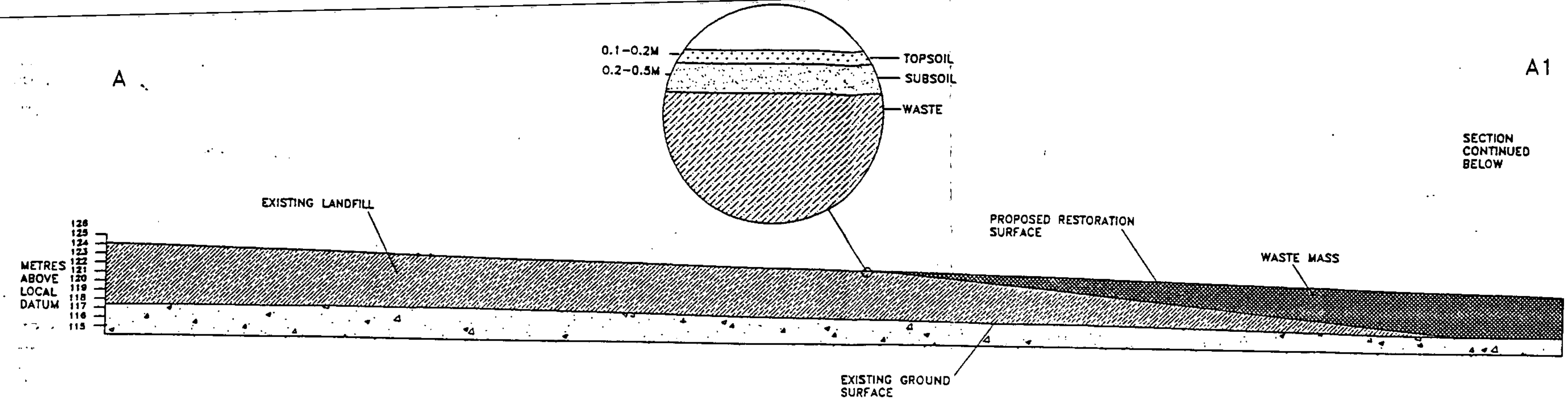
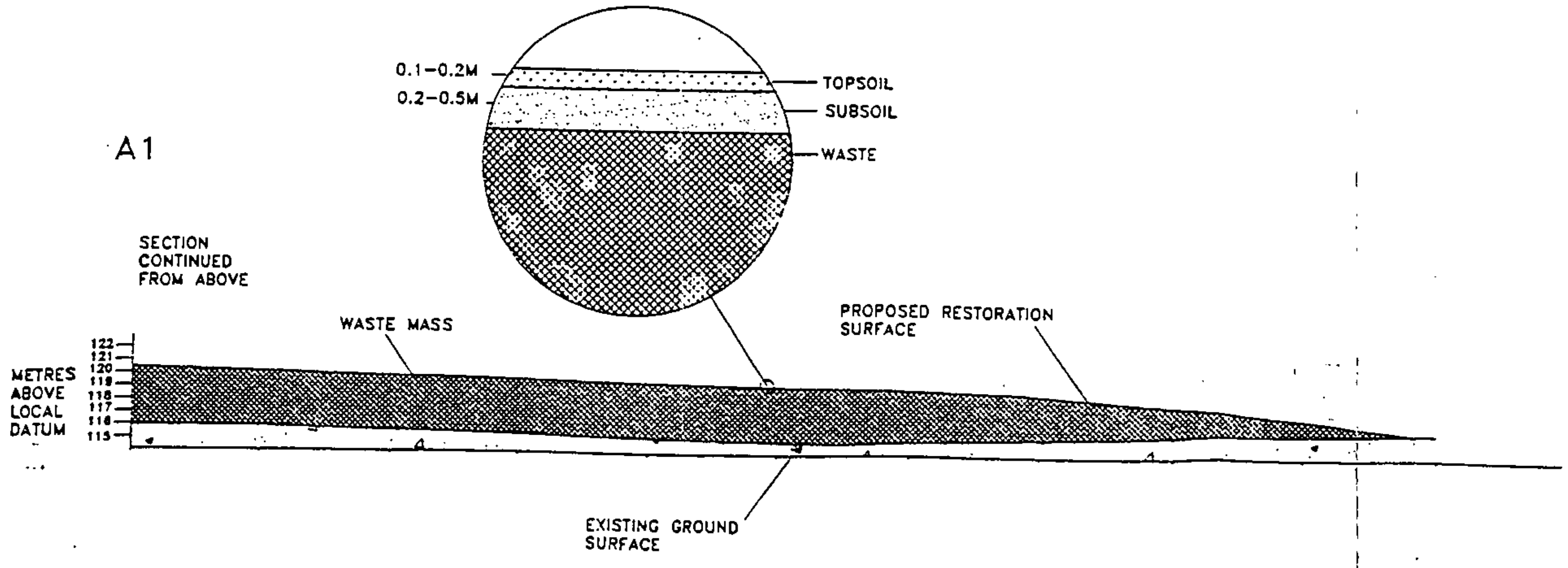


GEOANALYSIS LTD GROVE HOUSE GROVE PLACE PORT TALBOT SA13 1YA	PROJECT: PROPOSED EXTENSION TO INERT LANDFILL ABERGELLI FARM, FELINDRE CLIENT: MR. W.B. LLEWELLYN PROJ No: 276 SCALE: 1:500	CROSS SECTION A Phase1	GEO ANALYSIS	FIG 4a.1

97 / 1065





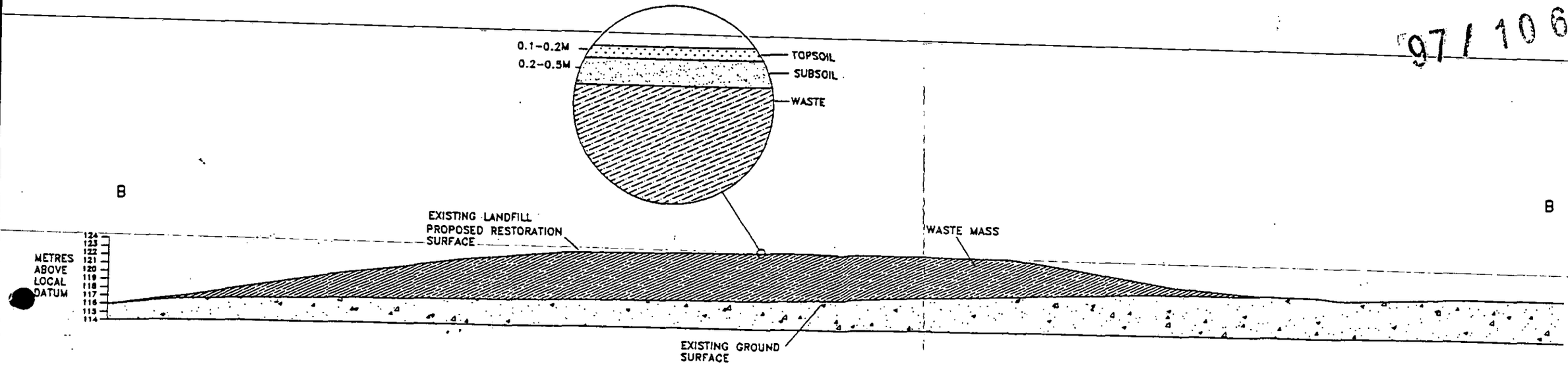
PROJECT	~~PROPOSED EXTENSION TO INERT LANDFILL~~
	ABERGELU FARM, FELINDRE
CLIENT	MR. W.B. LLEWELLYN
PROJ NO	282 SCALE 1:500

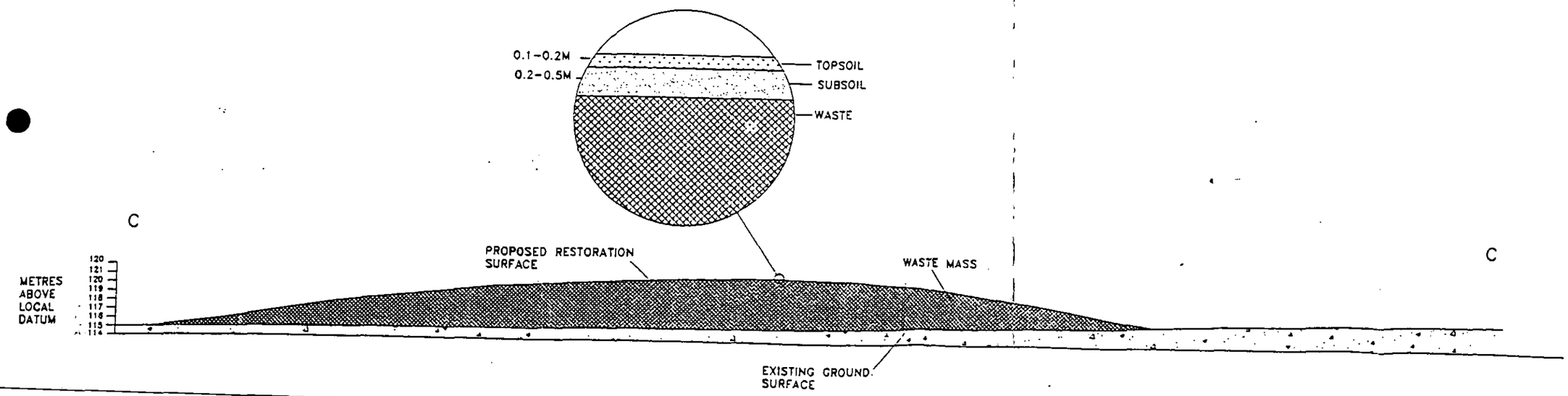
CROSS SECTION A
Phase 2

GEO ANALYSIS

FIG 4a2

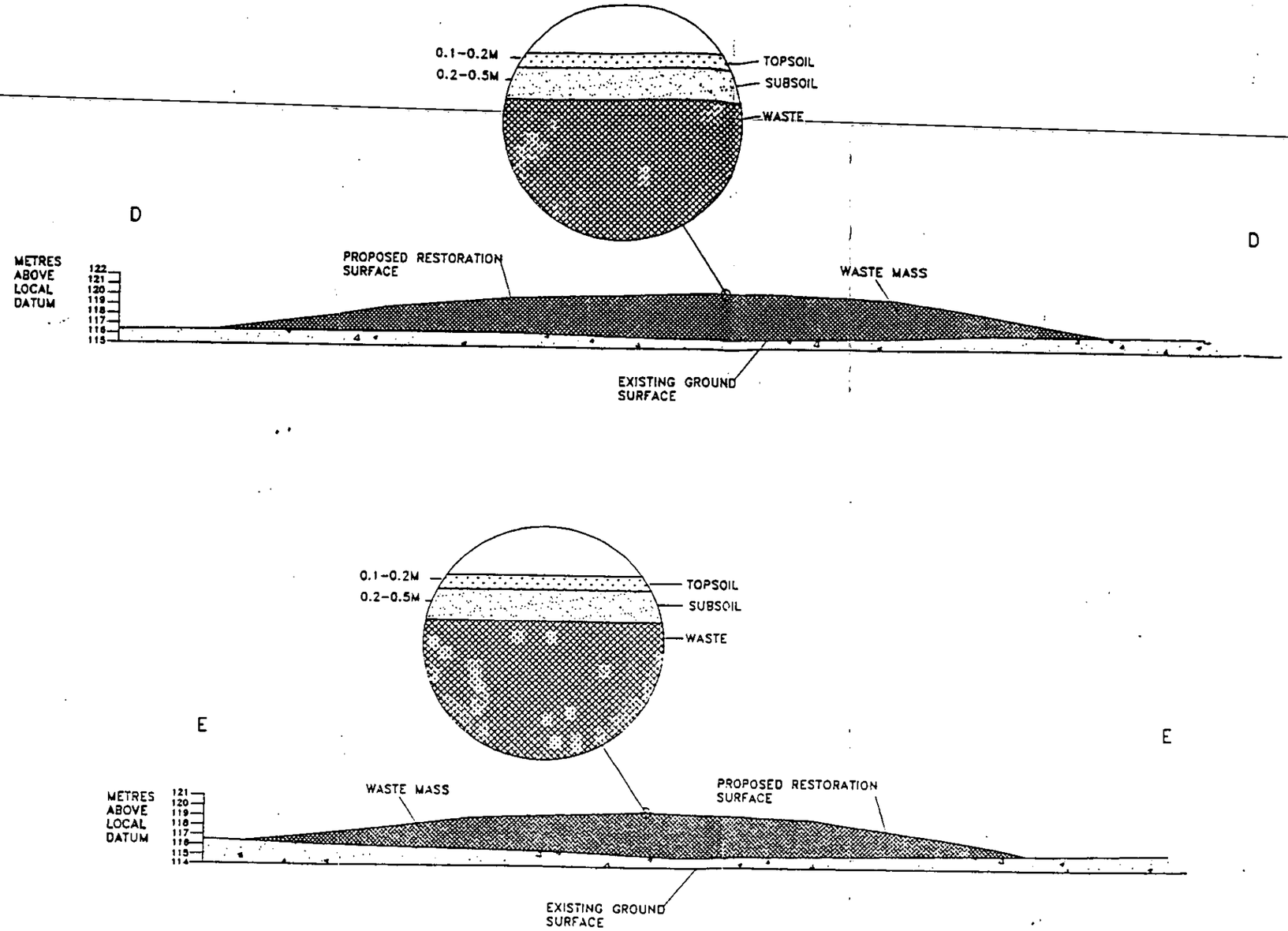
97/1065





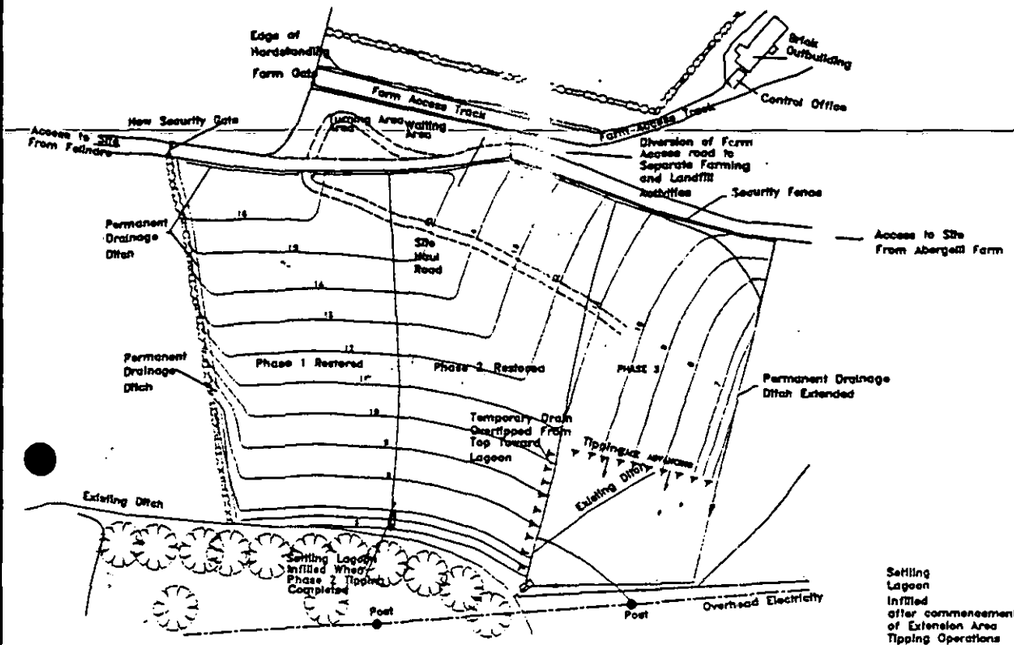
GEOANALYSIS LTD GROVE HOUSE GROVE PLACE PORT TALBOT SA13 1XA	PROJECT: PROPOSED EXTENSION TO INERT LANDFILL ABERGELLI FARM, FELINDRE CLIENT: MR. W.B. LLEWELLYN PROJ No: 276 SCALE: 1:500	CROSS SECTIONS B - C Phase 1	geo ANALYSIS	FIG 4b.1

97 / 1065

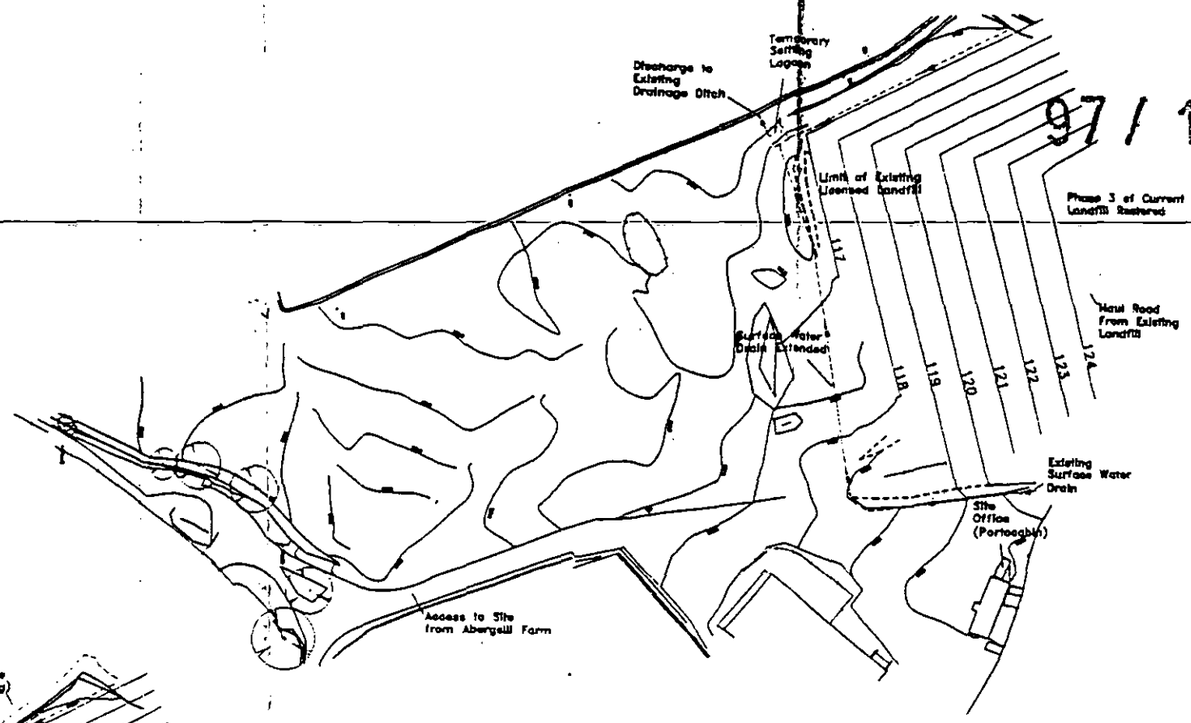


ANALYSIS LTD OVE HOUSE ROVE PLACE ORT TALBOT A13 1XA	PROJECT: PROPOSED EXTENSION TO INERT LANDFILL ABERGELLI FARM, FELINDRE CLIENT: MR. W.B. LLEWELLYN PROJ No: 282 SCALE: 1:500	CROSS SECTIONS D - E Phase 2	geo ANALYSIS	FIG 4b2

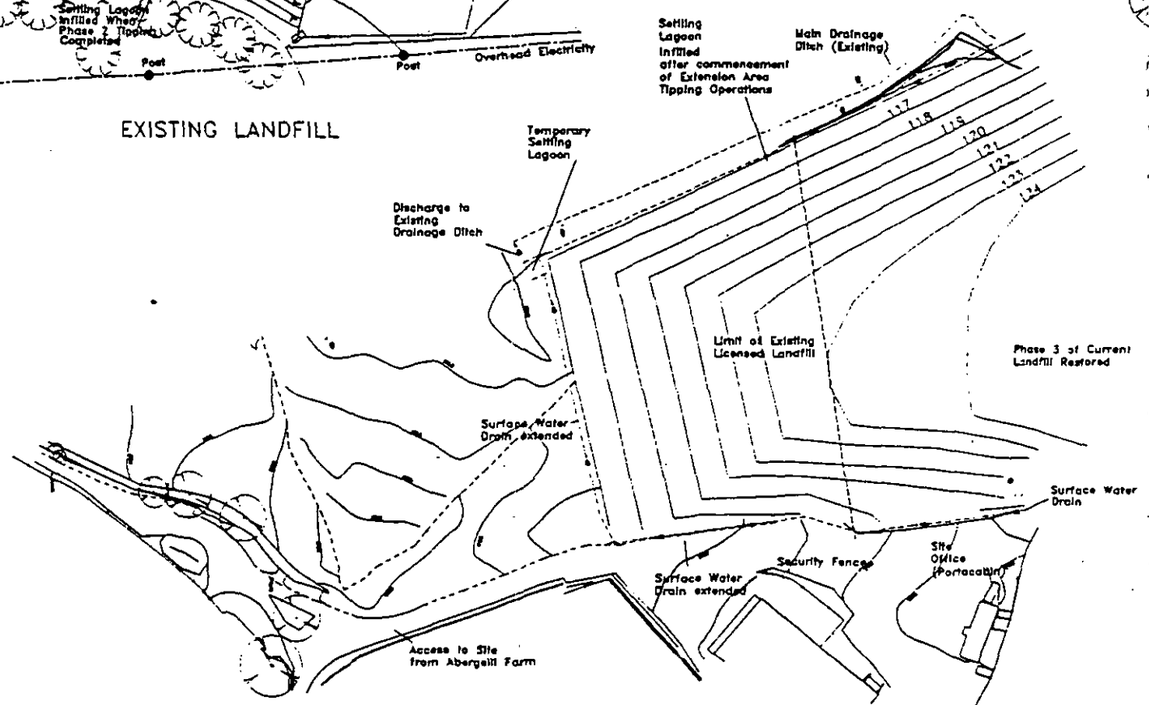
97 / 1065



EXISTING LANDFILL



COMPLETION OF EXISTING LANDFILL



EXTENSION LANDFILL

GEOANALYSIS LTD
GROVE HOUSE
GROVE PLACE
PORT TALBOT
SA13 1XA

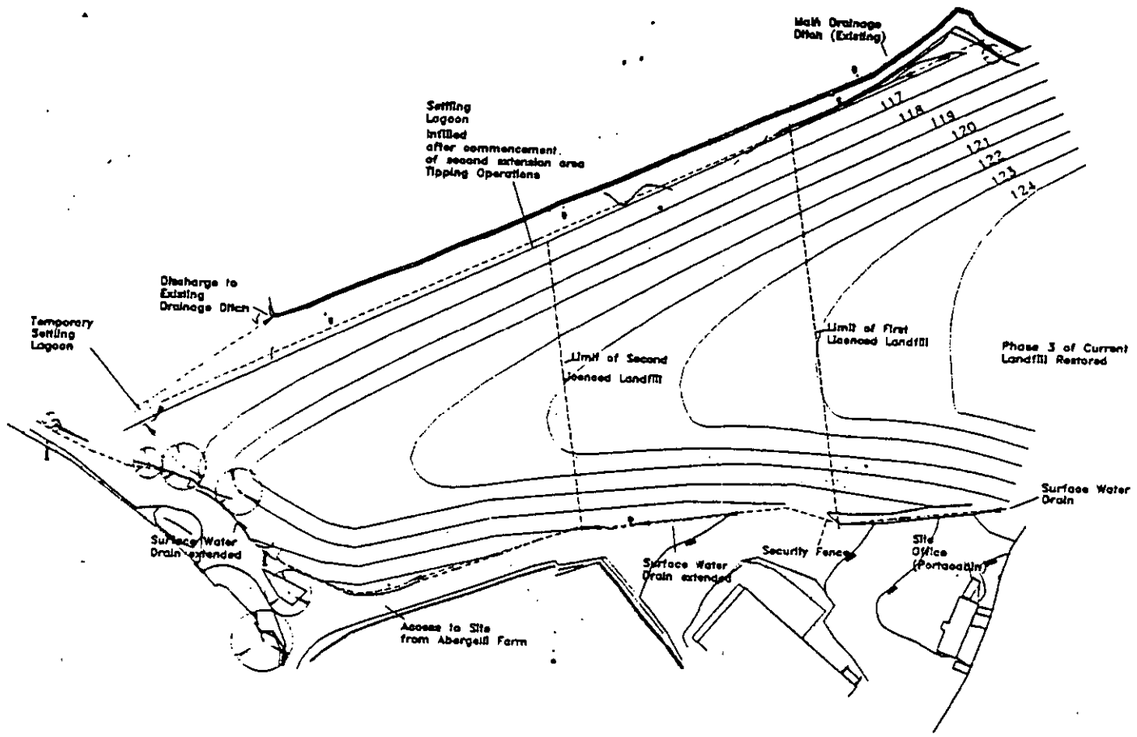
PROJECT PROPOSED EXTENSION TO INERT LANDFILL
ABERGELLI FARM, FELINDRE
CLIENT MR. W.B. LLEWELLYN
PROJ No 276 SCALE 1:2000

OPERATIONAL PLAN
Phase 1

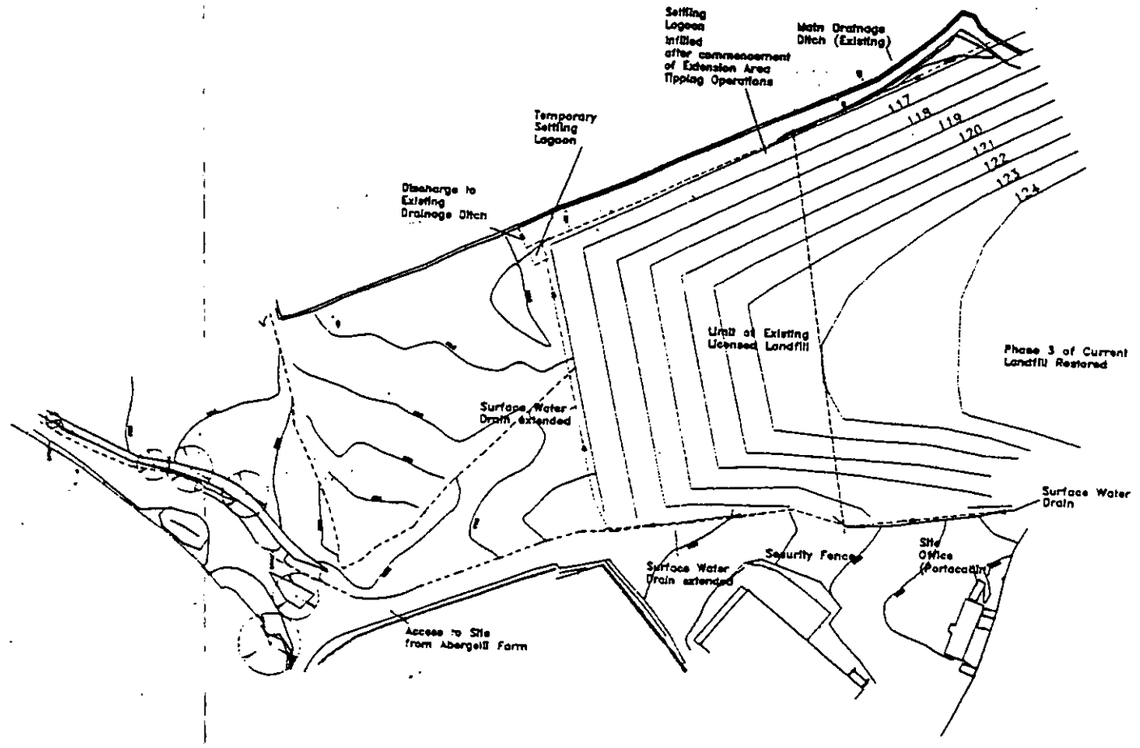
GEO ANALYSIS

FIG 5.1

97/1065



EXTENSION LANDFILL



EXISTING LANDFILL

WALYSIS LTD
E HOUSE
PLACE
LBOT

PROJECT	PROPOSED EXTENSION TO INERT LANDFILL ABERGELLI FARM, FELINDRE
CLIENT	MR. W.B. LLEWELLYN
PROJ No	282
SCALE	1:2,000

OPERATIONAL PLAN
Phase 2

GEO ANALYSIS

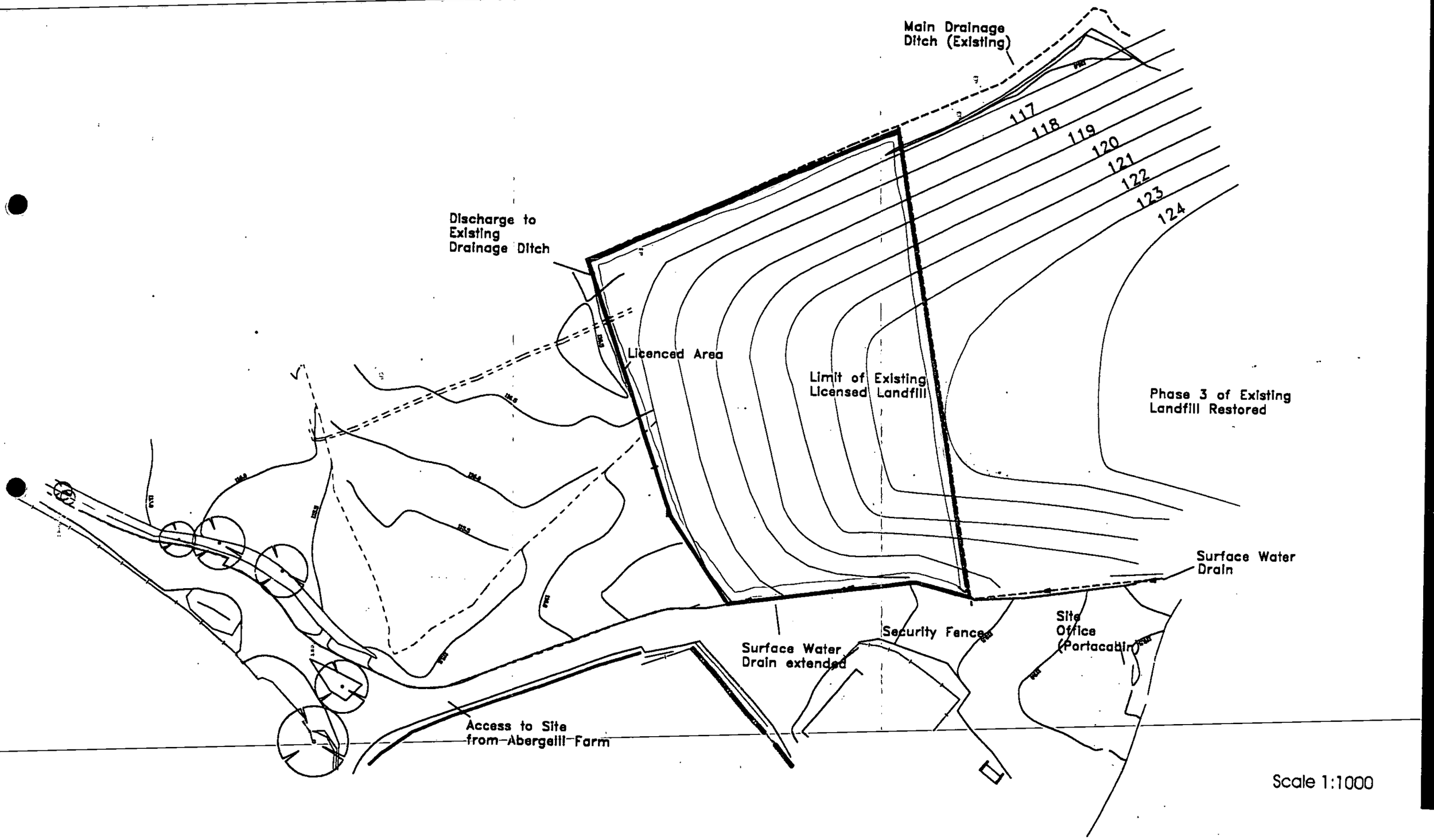
FIG 5.2

Appendix 2

LICENCED AREA LIMITS

GEO TECHNOLOGY

Appendix 2 - L1



Appendix 3

SURFACE WATER MANAGEMENT CALCULATIONS

ABERGELLI FARM 1/4.
PROPOSED EXTENSION TO INERT LANDFILLING.

DRAINAGE/SETTLEMENT LAGOON CALCULATIONS.

Reference :- Technical Management of water in the Coal Mining Industry.

A. First phase of extension (See attached figure)

Area of extension 8.800 m²
Restoration slopes 1 in 10 (0.1)
Drainage channel slope 0.05.
Maximum Drainage care ~80M overland flow and 60M channel flow to reach settlement lagoon.

Runoff Coefficient Sandy loam soils representative of inert landfilled materials ;
K = 0.55.

Peak rate of discharge taken place when the whole area contributes to the flow ie duration of storm is sufficiently long to allow water from the furthest point of the catchment to reach the discharge point ie Time of Concentration (te)

$$te = 7(Ln)^{0.6} S^{-0.3} I^{-0.4}$$

te : time of overland flow
L : length of overland flow
n : Manning Roughness coefficient
S : Overland Flow Slope
I : Rainfall Intensity

te for overland flow is solved iteratively using the rainfall intensity/duration/frequency relationship.

Phase 1 extension overland flow t_e = 4 minutes.

Manning equation is subsequently used to calculate the additional time of flow in the drainage ditch:

$$V = \frac{R^{0.67} S^{0.5}}{n}$$

V: Vel. of flow
R: Hydraulic Mean Depth
S: Slope of overland flow
n: Manning Roughness Coef.

V = 4.39 m/sec
which over a 60m length ~ 1 minute.

Total time of concentration ∴ ~ 5 minutes
for design rainfall intensity of 38 mm/hour.

Peak flow rate $Q = 2.78\ A\ K\ I$ (Rational formula).
$= 51$ l/second.

Outflow/discharge from lagoon = 2 l/sec.
Therefore Required Storage Volume :-

Storm Duration (h)	Return Period (yr)	Rainfall Intensity (mm/h)	Runoff coeff	Area (ha)	Vol of Rfall runoff (m^3)	outflow at 2 l/sec (m^3)	Storage Required (m^3)
0·5	12	20	0·55	0·88	48	3·6	44·4
1	12	12	0·55	0·88	58	7·2	50·8
2	12	7·5	0·55	0·88	73	14·4	58·6
4	12	3·5	0·55	0·88	68	28·8	39·2

Max storage Required 58 m^3 for storm of 2 hr duration.

Lagoon ∴ 6m x 6m x 1·6m deep.

B/ Phase 2 Extension

Area 10,700 m^2

Maximum overland drainage ~ 60m and 110m channel flow.

Based on same site parameters as detailed above, the time of concentration is calculated as 4 minutes in total with the same velocity of flow of 4·39 m/sec within the drainage channel.

Design rainfall intensity for 4 minute duration on a 4 year return period ~ 55 mm / hour.

Peak flow Rate then ⇒ Q = 90 l/second.

Maximum storage requirement occurs again with a

storm duration of 2 hours (I 7.5mm/hr).
Volume of rainfall runoff = 88 M³
Outflow from lagoon = 2 l/sec
Therefore storage of 74 M³ required.

Lagoon proposed at 7m x 7m x 1.5m deep.

SUMMARY

Phase 1 Extension.

Area 0.88 ha
Slopes 1:10 (overland drainage), 1:20 (drainage channel)
Time of Concentration ... 5 minutes
Peak Flow 58 l/sec
Outflow of lagoon restricted to 2 l/sec.
Storage / volume required for lagoon / settlement pond 58 M³.
Lagoon :- 6m x 6m x 1.6m

Phase 2 Extension.

Area 1.07 ha.
Slopes : as above
Total time of concentration 4 minutes
Peak flow 90 l/sec
Outflow 2 l/sec
Volume required for settlement lagoon to accomodate peak flow of annual return period storm 74 m³.
Lagoon 7m x 7m x 1.5m.

Sedimentation Lagoons.

Research from the United States (US EPA - 600/2-76-117, 1976) recommends that providing the overflow rate does not exceed 1×10^{-5} m/s, 95% of influent solids are removed.

Overflow rate is defined as outflow from the lagoon (m^3/s) divided by the pond surface area (m^2). It is analogous to using a settling rate of 1×10^{-5} m/s which from Stoke's Law is the rate at which a 4 µm diameter particle would settle.

Phase 1 / Phase 2.

In both phases the attenuation lagoons allow an outflow of 2 l/sec (0.002 m^3/s)

$$1 \times 10^{-5} \text{ m/s} = \frac{0.002 \text{ m}^3/\text{s}}{\text{AREA m}^2}$$

Required area = 200 m^2 i.e. 20m x 10m.

The settlement/sedimentation lagoons will be constructed downstream of the attenuation lagoons.