Phase I Land Quality Appraisal
Westfield Farm, Caldercruix, ML6 7RY

Client: Forestry Commission Scotland

Date: 11th June 2012

Forestry Commission
Scotland

QUALITY MANAGEMENT

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Status	Final			
Date	11th June 2012			
Prepared by	Roisin Lindsay			
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Signature				
Project number	00031309			
File reference	001			

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LIMITATIONS

Our report summarises information provided from a number of external sources, WSPE cannot offer any guarantees or warranties for the completeness or accuracy of information relied upon. This information can only be broadly indicative of potential costs and will require to be defined more accurately over time and at the time the works are to be undertaken. Any cost estimates, whilst intended to be helpful at this stage of the project cannot be relied upon.

Executive Summary

Site Ref	00031309-001
Site Name and Address	Land near Westfield Farm, Caldercruix, ML6 7RY
Site Owner	FCS
Leaseholder	Freehold
Grid Reference	286368, 667858
Area (Ha)	131.52

Environmental Risk Summary
Low (see section 1.2 for definitions)

Geotechnical Risk Summary
Low to Moderate (see section 1.2 for definitions)

Environmental Risk Assessment Summary	The site comprises two lots of land, referred to as Lot 2 and Lot 3 consisting of 131.52Ha of agricultural land from pre 1856 until present used for grazing cattle and includes areas of woodland and bog. The current nor past site use is not considered to act as a significant source of contamination. Areas of made ground presumed to be associated with West Westertoun Farm (which was demolished pre 1980) were observed on the east of Lot 3. Other small areas of construction debris of unknown provenance are present within field 24. These areas of made ground may present a source of contaminants. Potential contaminants could include asbestos, heavy metals, non-metals and hydrocarbons, however their distribution appears limited. In summary based on the available information it is perceived that risks to the water environment and to human health are considered as **negligible to low.**
Mineral Stability Risk Assessment Summary	A historical mine entry is identified within the southern area of the site. Land stability issues have also been identified within the area surrounding the site. These issues may present a localised **low to moderate** risk of instability.
Status Under Part IIA, the Environmental Protection Act 1990	Unlikely to be designated as Contaminated Land under Part IIA of EPA 1990, based on the information available.
Other Considerations	Some areas of the site are poorly drained with evidence of peat deposits, and may not be appropriate for sustaining tree growth. WSPE could not access all site areas during the walkover, but did observe that the area identified as “Field 14” appears to be predominately a poorly drained area of peat, and that other smaller areas may be similarly affected. WSPE would recommend further survey of these areas if not already progressed by FCS. SEPA’s flood map indicates a potential for limited flooding of the North Calder Water along the west boundary of field 7 (Plot 3).

Recommendation (all costs Indicative only)	Optional and precautionary investigation to protect proposed future heavy plant in areas of mine entry or simple avoidance of the area of the mine entry. WSPE estimates such investigations would indicatively be **£5,000-10,000**, if FCS wish to progress this.

Please Note: This summary forms part of WSP Environmental and Energy Ltd (WSPE) Ltd. Phase I Environmental Assessment (ref.: 00031309-001). Under no circumstances is it to be used as an independent document.

1 Introduction

WSP Environmental and Energy Ltd (WSPE) were commissioned by Forestry Commission Scotland on 25th May 2012 to undertake a Phase I Land Quality Appraisal of a site at Westfield Farm, Caldercruix in accordance with our proposal dated 8th May 2012 (the site).

This desk study is an interpretation of historical, archival and current information. Its aim has been to review the available information regarding site history and those existing site conditions that may potentially have an impact regarding constraints to its proposed development.

Preparation of this report has been in accordance with the conditions stated under WSPE's agreed scope of services.

For further information and clarity please contact Dr Alexander Lee on 0131 344 2310.

Please refer to Appendix E for WSPE's Methodology and Limitations.

1.1 SITE APPRECIATION

WSPE understands that the site is to be developed for woodland establishment.

Please note that any substantial changes to the proposed development may require a reassessment of the hazards identified i.e. a change towards a more sensitive land use or health exposure model.

1.2 UNDERSTANDING RISK

To aid reader understanding the following risk categories are used:

- Very High It is almost a certainty that either:
  - Significant harm is being caused (or will be caused) to one or more receptors by contamination source(s) identified or significant material geotechnical risks are currently evident (witnessed or recorded).
- High It is likely that either:
  - Significant harm is being caused (or will be caused) to one or more receptors by contamination source(s) identified or material geotechnical risks may arise in the future with site development.
- Moderate It is possible that either:
  - Harm is being (or will be) caused to one or more receptors by contamination source(s) identified (although this harm is unlikely to be "significant") or geotechnical issues are potentially evident but may not be significantly material.
- Low It is considered unlikely that either:
  - Significant harm is being caused (or will be caused) to one or more receptors by contamination source(s) identified or Low probability geotechnical hazards
- Negligible Either:
  - It is highly unlikely that contamination source(s) identified give rise to significant harm; or
  - No significant contamination sources have been identified; or
  - No sensitive receptors are present; or
  - No pathway exists between source(s) and receptor(s)
  - No geotechnical risks identified of concern.

Noting that environmental risk' here equates to the likelihood of the area constituting Contaminated Land under UK legislation while geotechnical includes consideration of any mineral stability or ground hazard that may affect site safety.

1.3 SOURCES OF INFORMATION, DOCUMENTARY AND OTHERWISE, USED IN GENERATING THIS LQA

A review of the following site data has been made including:

- Historic site operations to identify the nature, extent and behaviour of any contamination that may be present;
- All readily available survey maps and historical maps of the site and its surrounding area;
- Geological maps (drift and solid);
- Surface water quality data and maps;
- Site construction/characterisation historic borehole logs;
- Location and contents of any above and below ground storage tanks, based on site observations and information from the Local Authority's Petroleum Officer;
- Historical plans of the site and any maintenance records;
- Coal Authority and mineral stability database searches;
- Information consultations with regulatory authorities including Local Authority departments and the Scottish Environment Protection Agency for example
  - SEPA has recently updated its classification of the water environment with the introduction of the River Basin Management Planning (RBMP) approach following the Water Framework Directive
  - SEPA with the BGS has also developed tools to assess risks to groundwater. These tools include aquifer and vulnerability classifications that have been used to develop vulnerability maps
- Review of WSPE's internal GIS system with respect to ancillary reporting from surrounding sites that may inform our investigations.

The information collated is extensive and has been prioritised and summarised according to its likely significance. All directions and distances quoted should also be considered as approximate only taken from the site boundary to the centre point of the potential feature.

1.4 SOURCE PATHWAY RECEPTORS[1] UNDER CONSIDERATION

Table 1 of Appendix E denotes those pathways being considered herein.

[1] In order for a site to constitute Contaminated Land, as is defined in the 1990 Environmental Protection Act, a significant pollutant linkage must be identified between the source of contamination and a sensitive receptor via an appropriate environmental pathway.

2 Site Information

2.1 SITE DETAILS

Site Address	Land near Westfield Farm, Caldercruix, ML6 7RY
National Grid Reference	286368, 667858
Size Ha (approximately)	131.52
Tenure	Freehold (subject to leasehold interests)
Site Location	The site is located immediately to the northwest and east of Westfield Farm, Caldercruix. A site location plan is included as Appendix A.
Current Site Use	The subject site is utilised as agricultural land for grazing cattle with some areas of tree and peat cover.
Ground cover	The site comprises approx. 100% moderately permeable topsoil's with grass and peat.

2.2 SITE RECONNAISSANCE

A walk over survey of the site was carried out on by a representative of WSPE dated 6th June 2012. Access was made available to all areas of the site however not all fields were directly accessed due to the presence of cattle on the day of site reconnaissance. A site boundary and a map indicating the boundaries of constituent fields are included in Appendix A and photographs of the site are enclosed in Appendix B.

The following key observations were made during our site reconnaissance:

Site Description

The site is sub-divided into two distinct areas of land referred to herein as Lot 2 and Lot 3.

Lot 2

This area is located within North Lanarkshire and is comprised of fields 1-4 and lies northeast of Lot 3. Forrestfield Road forms the western boundary of the area. An access road runs along the southern boundary. Field drains are present across the northern area (field 3). Overall Lot 2 slopes gradually from north to south. Stooprigg Wood is located within the southeastern area of field 4. All fields are divided by hedges with gaps to allow for access.

Lot 3

Lot 3 is located within West Lothian and comprises fields 7 to 28 and lies east of Westfield Farm. A track which runs through the northern area of the site and across the eastern boundary provides access to the majority of Lot 3. The majority of the fields were being used as grazing land for cattle on the day of our site reconnaissance..

Lot 3 slopes gradually from north to south. A large pile of tyres were observed in the western area of field 8. The northern area of field 25 is covered by dense mature trees. An area of poorly drained peat is contained within field 14. Field drains are present along the boundaries of most fields and along either side of the track.

A field drain which emerges from the southern end of field 23 and runs under the track and into the field drain along field 24 was noted to have discolouration indicative of iron oxide presence. This discolouration was observed for approximately 20m along the field drain (photos contained in Appendix B) after which water in the field drains runs clear.

The track itself is constructed of gravel, broken pieces of tarmac and blaes. Large piles of manure were observed within fields 24 and 25. Piles of construction debris of unknown provenance which include worked granite slabs, slate,

tarmac and concrete was also noted within field 24. Areas of levelled made ground were present along the eastern area of field 25 and part of field 22. This is presumed to be the footprint of the West Westertoun Farm buildings which are understood to have been located in this area.

Based on site observations, WSPE considers the following should be noted:

- Access gates are present to all fields;
- A track is present which gives access to most fields within Lot 3 however road conditions deteriorate on the eastern portion of the road, a 4x4 vehicle may be necessary;
- 4x4 vehicles and tracked excavators will be required due to the soft ground and waterlogged conditions present over the majority of the site; and
- Tracking boards may also be required.

Bulk Hazardous Materials Storage

- No evidence of Above Ground Storage Tanks (ASTs) or Underground Storage Tanks (USTs) was noted during our site reconnaissance.

Other Hazardous Materials

- No significant quantities of potentially contaminative substances are observed to be stored on-site.

Polychlorinated Biphenyls (PCBs) in electrical plant[2]

- No electricity sub stations are noted to be present on site.

Ozone Depleting Substances (ODS)[3]

- No ozone depleting substance (such as are contained in air conditioning units) are understood to be present on site.

Material Storage

- The majority of the target site is used as grazing land for cattle. Piles of manure were noted to be stored at two locations across the site (within fields 24 and 25). These piles appear to consist of manure and bedding from winter cattle sheds.

Drainage Descriptions

No formal drainage survey or drainage plans were available for review during our site visit however OS maps indicate the location of field drains.

-Surface Water

[2] Polychlorinated biphenyls have properties that once favoured their use as a coolant, though concerns over their environmental persistence led to a widespread ban on their use by the Stockholm Convention on Persistent Organic Pollutants in 2001. Upgraded electrical substations now generally use, non-toxic, stable silicone-based oils. Substation transformer oil used to contain polychlorinated biphenyls (PCBs) as intentional oil contaminants. Older substations should be assessed for PCBs spill and removal.

[3] The use of virgin HCFCs when servicing air conditioning systems is now banned and the use of all HCFCs (including recycled/recovered/reclaimed) when servicing systems is banned from January 2015 under the Environmental Protection (Controls on Ozone-Depleting Substances) Regulations 2002. All ODSs used in refrigeration and air conditioning equipment must be recovered prior to dismantling or disposal of equipment (if not already replaced).

- The North Calder Water runs to the north of and along the western boundary of Lot 3. Field drains are present across the site along the majority of individual field boundaries which are presumed to drain to the North Calder Water. Surface water run-off across the site is via these field drains and infiltration. The main field drains run along the southern boundary of field 14 and the southern boundary of field 17 in Lot 3 and along the southern boundary of field 3 in Lot 2.

-Foul Water

- No issues associated with on-site foul water were observed.

-Trade Effluent

- No trade effluent discharges that would require the freeholder to obtain consent to discharge were identified during our site visit.

Asbestos Containing Materials (ACM)

- No asbestos report or asbestos management plan (AMP) was available for inspection on-site yet no ACMs were observed during site reconnaissance. However small piles of construction debris and areas of made ground of unknown provenance were observed which have the potential to contain asbestos.

2.3 SURROUNDING LAND USE

The site is located west of Caldercruix, in a predominantly agricultural area. A residential property is present to the west, and the North Calder Water runs adjacent to the north and west of Lot 3. The A89 and Airdrie–Bathgate railway line runs east-west along the southern boundary of Lot 3. A residential property is present to the northeast of Lot 2 and Forrestfield Road runs along its western boundary.

3 Historical Land Use

3.1 SITE HISTORY

A study of historical Ordnance Survey maps has been undertaken to identify any significant potentially contaminative former land uses. Historical maps indicate that the site comprised agricultural land from pre 1856 until present. West Westertoun Farm was located on the east of Lot 3 from pre 1856 until pre 1987 when it appears to have been demolished. A sheep dip was also present adjacent to this farm pre 1940 after which it no long appears.

A selection of historical map extracts is included as Appendix C.

Land Use On Site	Dates
Agricultural Land	Pre 1856 to Present
West Westertoun Farm	Pre 1856 to Pre 1987
Then cleared	Pre 1987 – Present
Sheep dip	Pre 1940 – Pre 1962
Then cleared	Pre 1962 - Present

3.2 PLANNING INFORMATION

An inspection of the available online planning record held at North Lanarkshire Council and West Lothian Council web portals was carried out on 6th June 2012. No environmentally pertinent information was available for review.

3.3 ANECDOTAL INFORMATION

Previous site owners indicated to WSPE staff that the land has only ever been used as grazing land for cattle. No other supplemental anecdotal information has been made available upon the sites land quality.

3.4 SURROUNDING AREA

A study of historical Ordnance Survey maps has additionally been undertaken to identify any significant potentially contaminative former land uses within a 250m radius of influence of the site. A selection of relevant historical map extracts is included as Appendix C. The following represents a summary of the available mapping information:

Surrounding Features	Distance	Dates	Direction
Mine	225m	Pre 1957 – Pre 1967	North
Then disused		Pre 1967 – Present	
Sandburn Farm	100m	Pre 1864 – Present	West
Airdrie Bathgate railway line	Adjacent	Pre 1864 – Present	South
Raisyhill Farm	75m	Pre 1864 – Present	South
East Westertoun Farm	Adjacent	Pre 1864 – Pre 1980	East
Then cleared		Pre 1980 - Present	

4 Regulatory Information and Consultation

4.1 REGULATORY DATABASE

Reference has been made to the Landmark Information Group data provision service. This includes information and data collated from several organisations, including the Scottish Environment Protection Agency (SEPA), the Local Authority, the British Geological Survey (BGS), and Department for Environment, Food & Rural Affairs (DEFRA), Health & Safety Executive (HSE), the National Radiological Protection Board (NRPB), and the Coal Authority.

	0-249m	250-500m	Details
Contaminated Land register entries and notices	0	0	Not applicable (N/A)
Registered landfills	0	0	N/A
Closed landfill facilities	0	0	N/A
Registered transfer stations/ treatment facilities	0	0	N/A
Closed transfer stations/ treatment facilities	0	0	N/A
Authorised industrial processes[4]	0	0	N/A
Fuel Stations Entries	0	0	N/A
Licensed radioactive substances[5]	0	0	N/A
Enforcements, prohibitions or prosecutions	0	0	N/A
Discharge consents[6]	2	0	The National Coal Board held 2 discharge consents of unknown type into the North Calder Water located 219m and 221m south of the target site. These licences appear to have been surrendered.
Pollution incidents	0	0	N/A
Consents issued under the Planning (Hazardous Substances) Act 1990	0	0	N/A
Control of Major Accident Hazards (COMAH)[7]	0	0	N/A

[4] This data comprise records maintained under the EPA (Prescribed Processes and Substances) Regulations 1991, under Integrated Pollution Control (IPC). These regulations were progressively implemented from 1 April 1991 in England and Wales and 1 April 1992 in Scotland. These are sites where larger, more polluting industries, hold authorisation under IPC must consider the full impact of all releases to air, water and land. This data contains any prosecutions relating to IPC authorised processes, which are brought under Section 23 (1) of the Environmental Protection Act (EPA) 1990.

5 Licences granted under the Radioactive Substances Act (RSA) 1993. This Act controls the storage, use and disposal of radioactive substances, through authorisation and registration systems and provides for access to information regarding sites holding such consents.

[6] Discharge consents were granted under the Control of Pollution Act (COPA) 1974, as amended by the Environment Act 1995, until the introduction of Controlled Activities Regulations (CAR) in 2006.

7 These data relate to sites registered under the Control of Major Accident Hazards (COMAH) Regulations 1999.

4.2 CONSULTEES

The following individuals and organisations have additionally been consulted.

Local Authority Contaminated Land Officer (CLO)	The Contaminated Land Officers (CLOs) at North Lanarkshire and West Lothian Councils have reported that no sites in North Lanarkshire or West Lothian are currently on the Contaminated Land Register, and there is not a formalised system of prioritisation for inspection as yet, although this is under development. The CLO holds digital information showing historical industrial land uses across the Council region, which is used to identify sites which may in future be investigated under the Contaminated Land Strategy. Given the absence of historical industrial land uses on the subject site, it is considered unlikely that the site will be given a high priority in future, for any inspection as potentially Contaminated Land.
Petroleum Officer	No issues identified perceived as warranting consultation.
Scottish Environment Protection Agency (SEPA) Flooding Data	SEPA's Indicative River and Coastal Flood Map (Scotland) shows that there is not an estimated flood risk of 0.5% (1:200) or greater in any given year to the majority of the site. However SEPA's flood map indicates a potential for limited flooding of the North Calder Water along the west boundary of field 7 (Plot 3). A map indicating the extent of this area is contained within Appendix D.
SEPA	No issues have been identified that are considered as having warranted direct consultation with SEPA.
Health Protection Agency **HPA-CRCE-023: Indicative Atlas of Radon in Scotland**	The site is located within an area where less than 1% of homes are above the Action Level for radon gas.
Ministry of Defence	Not applicable at the target location.
Network Rail	Not applicable at the target location.
Scottish Gas	Not applicable at the target location.

4.3 DESIGNATED SITES

The following site designations are observed within perceived influence of the target site.

Feature	Description	Distance	Direction
SAC[8]	Black Loch Moss	180m	North
SSSI[9]	Black Loch Moss (Biological)	180m	North

[8] A Special Area of Conservation (SAC) is defined in the European Union's Habitats Directive (92/43/EEC), also known as the Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora.

5 Other Relevant Information

5.1 POLLUTION INCIDENTS

No known pollution incidents have been reported by North Lanarkshire Council or West Lothian Council.

5.2 PREVIOUS REPORTS

No additional previous land quality reports have been provided for our review.

5.3 ARCHAEOLOGY

An archaeological assessment was not within the scope of this report. However, previous farming and earthworks on the site may have removed any archaeological artefacts present, as these are usually found in the Made Ground. Consultation with a specialist archaeology consultant is recommended should significant intrusive groundwork's be required.

Finally, based however on Royal Commission on the Ancient and Historical monuments (RCAHMS) database information the following may be noted:

- Old Bedlormio House is a 17th Century house located to the southeast of the target site and is listed as a Category B building by Historic Scotland.

5.4 UNEXPLODED ORDNANCE

Following from regional unexploded bomb risk mapping as supplied by the Zetica database the area surrounding the site is understood to be at limited risk from this hazard.

5.5 WSP INTERNAL DATABASE

Following from WSP's own internal databases the following may also be noted on site or within 500m (see figure appended). A map indicating the locations of designated areas is contained within Appendix D.

Designation	Details
Listed Buildings	Old Bedlormio House Grade B present 310m southeast of site.
World Heritage Site	Not present
Ancient Woodland	Various areas present immediately west and southeast of site.
Butterflies	Not present
Great Crested Newt Site	Not present
Lowland Raised Bog	Various areas on the south of the site and within surrounding areas to the west, north and south.
Semi natural Ancient Woodland	Various areas present to immediately west of the site.
Intermediate Bog Inventory	Various areas both on and adjacent to the site to the west and northeast.
Biogenetic reserve	Not present

[9] A site in the UK which is of particular importance because of its geology, topography, or ecology. SSSIs are graded in terms of importance from 1 to 4

Biosphere Reserve	Not present
Council of Europe Diploma Site	Not present
Country Park	Not present
Local Nature Reserve	Not present
Site of Special Scientific Interest	As in section 4.3 above
Special Protection Area	As in section 4.3 above
National Nature Reserve	Not present
Sustrans Route	Not present

6 Environmental Setting

6.1 PUBLISHED GEOLOGY/HYDROGEOLOGY

Geological Maps Sheet number 31 Airdrie 1:50,000 Solid and Drift Editions (1973) indicate that the majority of the site is underlain by glacial till and peat deposits with some areas of alluvium. These deposits are underlain by Lower Scottish Coal Measure Formation.

Those British Geological Survey (BGS) borehole logs (BGS website: www.bgs.ac.uk/data/boreholescans) reviewed by WSPE confirm the general geological description for the site.

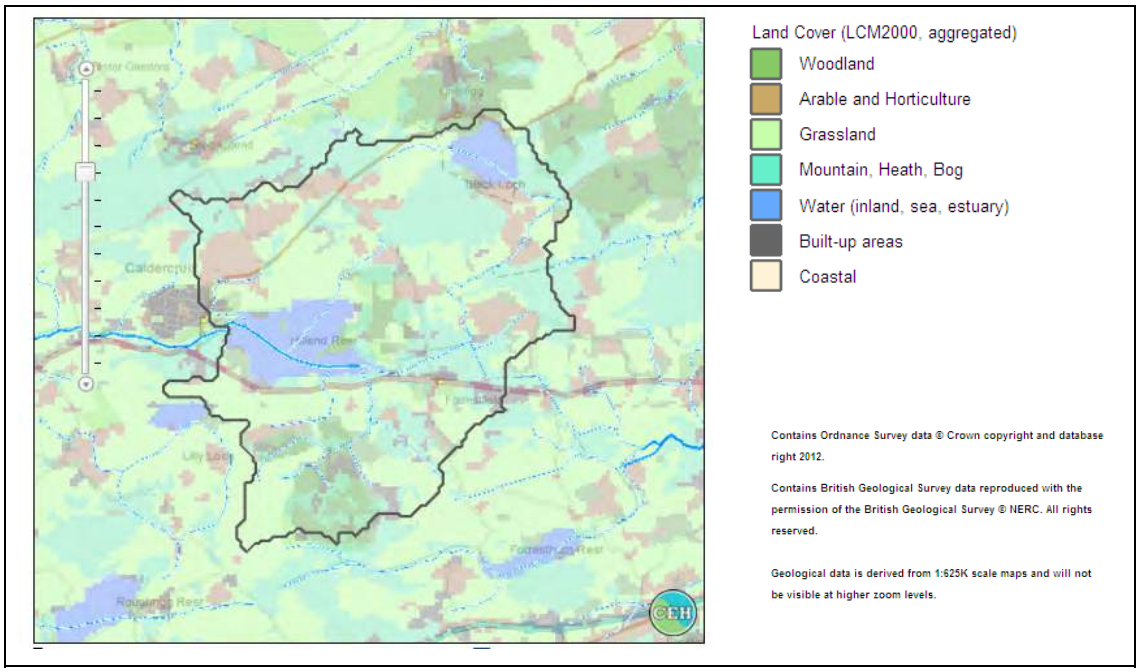
The BGS 1:625,000 Groundwater Vulnerability Map of Scotland (2001) indicates that the strata beneath the site is classified as minor or moderately permeable.

The BGS 1:625,000 Hydrogeological Map of Scotland (1988) indicates that the site is underlain by a Carboniferous locally important aquifer in which flow is dominantly in fissures and other discontinuities.

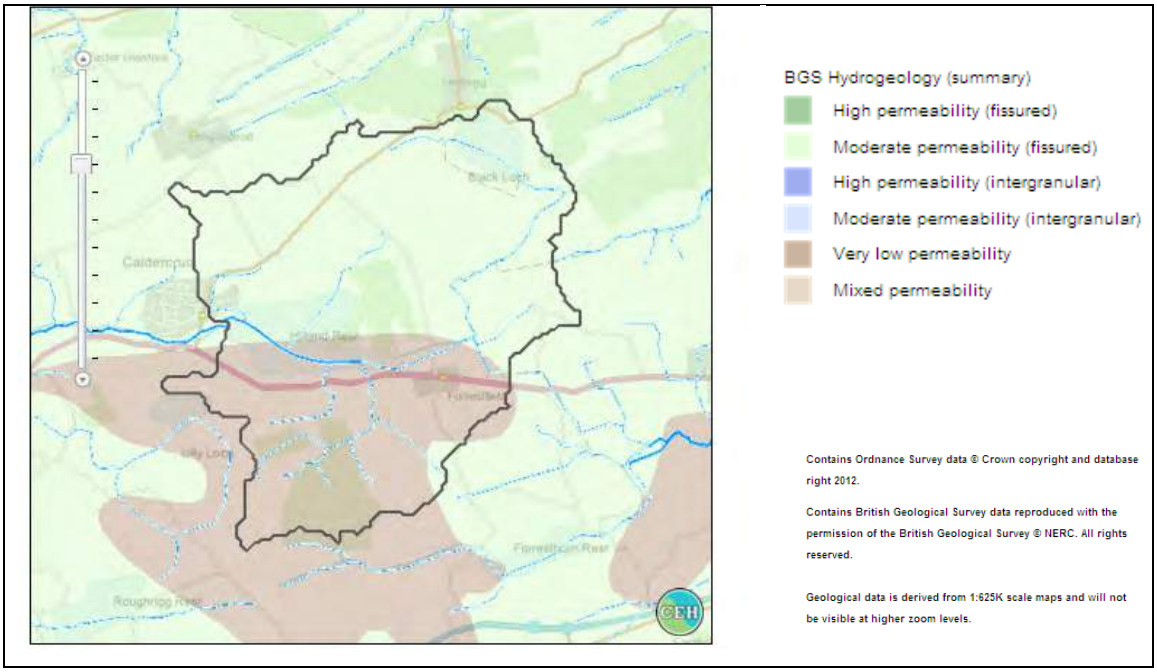
6.2 RIVER CATCHMENT

Following the National Rivers Flood Archive (NFRA the catchment geology and land cover can be confirmed as illustrated in figures below.

Spatial Land Cover Map for North Calder Water at Hillend



Spatial Geological Map for North Calder Water at Hillend



6.3 MADE GROUND

Areas of made ground presumed to be associated with West Westertoun Farm (which was demolished pre 1980) were observed on the east of Lot 3. Other small areas of construction debris of unknown provenance are present within field 24. These areas of made ground may present a source of contaminants. Potential contaminants could include asbestos, heavy metals, non-metals and hydrocarbons.

6.4 SEPA RIVER BASIN MANAGEMENT PLANNING INFORMATION

SEPA has recently updated its classification of the water environment[10] with the introduction of the River Basin Management Planning (RBMP) approach following the Water Framework Directive. The subject site falls within the "Clyde" management area of the "Scotland" River Basin District.

The groundwater body underlying the site are listed as the "Clydesdale bedrock and localised sand and gravel aquifers"; water body number 150218. This groundwater body is noted to be of "poor" status, based on poor quality as well as pressures regarding abstraction. Appendix D includes a summary sheet for this water body outlining the classification, pressures, measures and objectives for the groundwater body. The objectives for this water body are to have the quantitative status as "good" by 2027; however quality status may still be "poor" at this time.

6.5 GROUNDWATER VULNERABILITY

SEPA with the BGS has also developed tools to assess risks to Scotland's groundwater. These tools include aquifer and vulnerability classifications that have been used to develop vulnerability maps.

SEPA was contact regarding the groundwater vulnerability classification for this site but were unable to respond within the timescale of this report. This information will follow by way of an addendum once received.

10 Controlled waters England are termed Water Environment in Scotland. The Contaminated Land (Scotland) Regulations 2000 (S.S.I. 2000/178) ("the 2000 Regulations") make provision in light of the Water Environment and Water Services (Scotland) Act 2003 (asp 3) ("the 2003 Act")). They are fully defined however in Section 104 of the Water Resources Act 1991. They include in summary: 1.Relevant territorial waters which extend seaward for three miles 2.Inland freshwaters(Natural and artificial lakes, ponds, reservoirs, rivers or watercourses, Natural and artificial underground rivers and watercourses, Surface water sewers, ditches and soakaways that discharge to surface or groundwater including those that may be currently dry. 3) Groundwaters i.e. any waters contained in underground strata.

6.6 GROUNDWATER ABSTRACTIONS

No current regulatory licensed groundwater abstractions have been identified within a 1km radius of the subject site.

6.7 COAL AUTHORITY & BRINE REPORT

A Coal Authority Coal and Brine Report, dated 27th April 2012, (see Appendix D) has been reviewed and indicates the following.

- The Coal Authority have identified 1 mine entry within the boundaries of the property. There are no records, if any, of steps taken to treat the mine entry. This mine entry is located within field 27 at the southeastern area of the site.
- The property is not within the zone of likely physical influence on the surface from any past or present underground coal workings, however, reserves of coal exist in the locality, which could be worked at some time in the future subject to feasibility, licences and planning consents.
- In addition, the property lies within the boundary of an opencast site from which coal has been removed by opencast methods. However the site does not lie within 200m of a site from which coal is presently being removed by opencast methods nor within 800m of the boundary of an area for which the Coal Authority is determining whether to grant a licence to removed coal by opencast methods.

6.8 GROUND STABILITY

According to British Geological Survey (BGS) datasets, the site is located within an area where there is a very risk of collapsible ground subsidence hazards; a high risk of compressible ground subsidence hazards; no risk of ground dissolution stability hazards; a very low risk of landslide ground stability hazards; a very low risk of running sand stability hazards, and a very low risk of swelling clay subsidence hazards.

6.9 CAVITIES DATABASE SEACH

Land instability can include both naturally formed cavities and manmade mining cavities a national database of such information is additionally held by Peter Brett Associates LLP. Acquisition of such a specialist search does not form part of our existing scope. Based on the data available (as reported herein) it is not however perceived that such a search would be warranted considering planned future site use.

6.10 HYDROLOGY

Surface water features in the vicinity of the subject site are as follows:

Surface Water Feature	Quality*	Distance	Direction
North Calder Water	Poor	Adjacent	North/West

*Chemical water quality as classified under the EA's General Quality Assessment (GQA) Scheme.

With reference to the Basin Management Planning Classification scheme, the following water quality information has been noted for this surface water body:

- The North Calder Water at the site is the water body "North Calder Water u/s Hillhead Reservoir"; water body number 10063. It is currently classified as being of "poor" status (2008 data). The objectives for the water body are to achieve good status by the 2027 RBM Plan. A summary of data for this water body is provided in Appendix D.

6.11 SURFACE WATER ABSTRACTIONS

No current regulatory licensed surface water abstractions have been identified within a 250m radius of the subject site.

6.12 SURROUNDING FEATURES

Sensitive surrounding land uses within a 250m radius of the subject site are noted as follows:

Sensitive Land Use	Distance	Direction
Residential property with gardens (Westfield Farm)	Adjacent	West
Residential property with gardens (Sandburn Farm)	100m	West
Agricultural land	Adjacent	All directions
Black Loch Moss SSSI and SAC	180m	North
North Calder Water	Adjacent	West and North

6.13 GROUND AND MINE GAS

Based on a review of the geology on site and the Coal Authority report there is the potential for risks associated with historical mine workings or ground gas originating from coal seams or the decomposition of organic matter. The decomposition of organic matter by bacteria can lead to the production of ground gases as a result of respiration. This gas can potentially be hazardous as an asphyxiate or explosive if confined to small spaces.

However, as the planned future site use is of woodland establishment, with no structures or enclosed spaces, then the risk from ground and mine gases to future site users is considered negligible to low.

6.14 ENVIRONMENTAL SENSITIVITY

Considering the planned future use of the site the overall site's setting is considered to have a **low to moderate** environmental sensitivity, based upon:

- The presence of moderately permeable geology (Lower Scottish Coal Measures) overlain by permeable drift deposits;
- The presence of on-site surface water features (North Calder Water and field drains);
- The presence of nearby surface water features (North Calder Water);
- The absence of groundwater surface water abstractions within a 1km radius of the site;
- The absence of groundwater Source Protection Zone(s);
- The residential land uses within the surrounding area;
- The ecologically sensitive nature of the surrounding area (Black Loch Moss SSSI and SAC).

7 Qualitative Risk Assessment

7.1 OUTLINE CONCEPTUAL MODEL[11]

The methods used within this risk assessment follow a risk-based approach, with the potential environmental risk assessed qualitatively using the 'source-pathway-receptor pollutant linkage' concept introduced in the Environmental Protection Act 1990. For a site to be designated as Contaminated Land a plausible linkage between the identified Sources, Pathways and Receptors must be demonstrated. The technical basis for this assessment is further discussed within Appendix E.

Potential Contaminant Sources	On-Site Contaminant Sources	▪ The current site use is not considered to act as a significant source of contamination. ▪ However, localised made ground observed on site (construction debris stockpiles) has the potential to contain asbestos-containing materials or fibres in soil.
	Off-Site Contaminant Sources	▪ Historical maps have indicated an historical mine located 225m north of Lot 3. The Airdrie-Bathgate railway line has been present down gradient of the site to the south of Lot 3 since 1864. However the potential risk for present or future contamination to the target site is considered low.
Potential Receptors	Water Environment	▪ Groundwater[12] in the drift shallow aquifer ▪ Groundwater in the underlying bedrock aquifer ▪ Surface watercourse on and adjacent to the site ▪ Future resource protection value
	Human Health Risks	▪ Third Party neighbours ▪ Site workers in the event of below ground works
	Other	▪ SSSI and SAC sites associated with Black Loch to the north of the site. ▪ Trees associated with future site use.
Potential Contaminant Pathways & Pollutant Linkages	On-site Contaminant Sources	▪ In the event of ground preparation works, site workers may be exposed to asbestos fibres which may be contained within localised areas of made ground observed on site. It should be ensured that future site workers adopt appropriate procedures to manage health and safety risks associated with any asbestos impacts.
	Off-site Contaminant Sources	▪ In the absence of any identified potentially significant contamination sources off-site, no potential pollutant linkages have been identified.

[11] A conceptual model is defined in BS 101752 as: "a textual and/or schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the basis of the information from the preliminary investigation and refined during subsequent phases of investigation and which is an essential part of the risk assessment process".

[12] SEPA's approach seeks to achieve the objectives of relevant European Directives for those regulatory regimes where groundwater quality is, or may be, affected by inputs of polluting substances. The principles described by SEPA are based upon the European Commission Common Implementation Strategy for the Water Framework Directive (WFD) Guidance Document 17, 'Guidance on Preventing or Limiting Inputs in the context of the Groundwater Directive 2006/118/EC and the UK Technical Advisory Group draft technical report 11 b (iii) 'Application of Groundwater Standards to Regulation', where these do not conflict with existing legislation. Both the WFD and GWD define groundwater as 'all water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil'. This definition has no size limit so even small volumes of water in the subsurface maybe considered as being groundwater if the ground or subsoil are saturated i.e. perched waters

7.2 CONTAMINATED LAND RISK ASSESSMENT FUTURE WOODLAND ESTABLISHMENT

Having evaluated the information gathered during this study and described in the previous sections, WSPE has produced the following assessment of risk primarily focused on contaminated land issues, assuming an end use as an area of woodland:

Descriptor	Assessment	Risk Category
Potential for statutory liability and designation as Contaminated Land[13]	No potential significant pollutant linkages have been identified.	**Negligible to Low**
Potential for third party liability	No potentially significant sources of contamination have been identified that are considered likely to impact third party property and therefore result in third party liability.	**Negligible to Low**
Risk of commercial liability on resale	No contamination concerns have been identified which are likely to significantly impact the resale of the property.	**Negligible to Low**
Risk of contaminated land liability for owner	Some areas of made ground have been observed onsite which have the potential to present a source of contamination. However no significant sources of contamination have been identified from current or historical land uses.	**Low**
	CONTAMINATED LAND LIABILITY RISK	**Negligable to Low**

7.3 OTHER ENVIRONMENTAL CONSIDERATIONS

These matters could also require further assessment. This may be during a continuation of the current site use, or in the event of any proposed redevelopment of the site. It should be noted that a detailed assessment of compliance with environmental law lies outside the scope of this assessment.

Ground Stability Issues	The property is located in a former coal mining area; and the Coal Authority have highlighted a former mine entry within the property boundary.
Flooding	According to the SEPA website a small area on the west site is located within an SEPA indicated floodplain of the North Calder Water.
Asbestos Containing Materials (ACMs)	No ACMs were observed on site on the day of site reconnaissance however small areas of made ground of unknown provenance were found on site which have the potential to contain asbestos fibres.
Invasive Plant Species[14]	None were observed on site.

[13] Part IIA classifications are to take into account existing site use only.

[14] Under to the provisions of the Wildlife and Countryside Act 1981, if any person plants, releases or otherwise causes to grow in the wild any plant which is included in Part 11 of Schedule 9 he/she shall be guilty of a criminal offence, this includes spreading the species or transferring polluted ground material from one area to another. Japanese knotweed and giant hogweed are classified under this schedule as injurious plants and are therefore subject to these provisions. Under the Environmental Protection Act 1990, section 34, Japanese knotweed is also classified as a controlled waste. A duty of care is placed on waste producers to ensure that soil containing Japanese knotweed roots and or vegetative waste including stem pieces are disposed of safely at a site specifically licensed and this waste should be accompanied by appropriate Waste Transfer documentation.

8 Summary and Recommendations

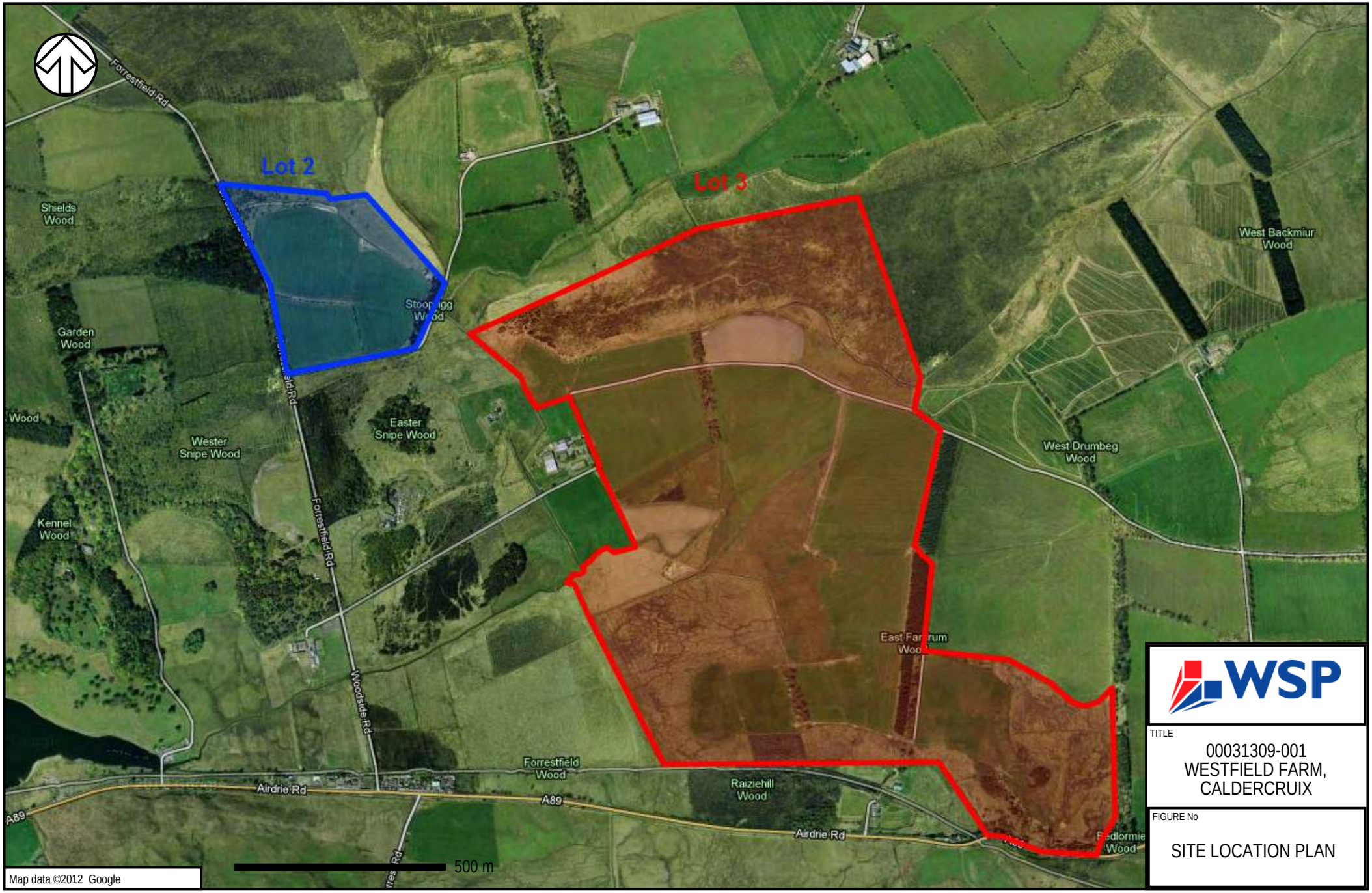
Site Address	Westfield Farm, Caldercruix, ML6 7RY	
Tenure	Freehold (subject to leasehold interests)	
Current Land Use	The subject site is utilised as agricultural land for grazing cattle with some areas of tree and peat cover.	
Historical Land Use	Historical maps indicate that the site was as agricultural land from pre 1856 until present. A sheep dip was present on the east of the site from pre 1940 to pre 1962 in association with West Westertoun Farm which was present from pre 1856 until pre 1987.	
Regulatory Enquiries	The environmental regulators were unable to provide any pertinent information within the timescales of this project (addendum to follow once information is received). However, based on the other information contained within this report, this is not considered to represent a significant concern.	
Other Information	No previous reports or other information has been provided for review.	
Environmental Setting	The site setting is considered to be of low to moderate sensitivity. This is primarily due to the residential properties in the area, nearby Black Loch Moss SSSIs and SAC to the north, the presence of the North Calder Water on and adjacent to the site and the sensitive drift and bedrock aquifers underlying the site.	
Ground Stability Setting	Following review of the provided Coal Authority report, a historical mine entry is identified within the southern area of the site. These issues may present a localised **low to moderate** risk of instability in these limited locations.	
Conclusions	Based on the information contained within this report and with due regard to the planned future use of the site for woodland establishment, it is the opinion of WSPE that the site represents a **low** risk with respect to contaminated land liability issues with a **low to moderate** localised risk associated with ground stability on site. Other environmental considerations include possible ACM's within piles of made ground and flooding on the western area of Lot 3.	
Qualitative Risk ratings	**Environmental Risks** **Low**	**Geotechnical Risks** **Low to Moderate (localised)**
Recommendation(s)	No further contaminated land assessment work is considered necessary for the future use of the site for woodland establishment. However if the Forestry Commission Scotland wishes to follow precautionary principle, consideration could be given to locating the mine entry indicated to be present on the south of the site by the Coal Authority to provide an assessment of ground stability risks in these areas and evaluate the suitability for these areas to be planted with trees and tracked with heavy vehicles. However as this potential mine entry represents an overall low proportion of the site, alternative consideration could be given to avoiding development of this area. Further consideration should also be given to avoiding areas of made ground, such as the site of former West Westertoun Farm or to assess the area for suitability for tree planting.	

Please Note: This summary forms part of WSP Environmental and Energy Ltd (WSPE) Ltd Phase I Environmental Assessment (ref.: 00031309-001). Under no circumstances is it to be used as an independent document.

WSP Environmental and Energy Ltd

Appendices

Appendix A Site Location & Site Boundary Plan



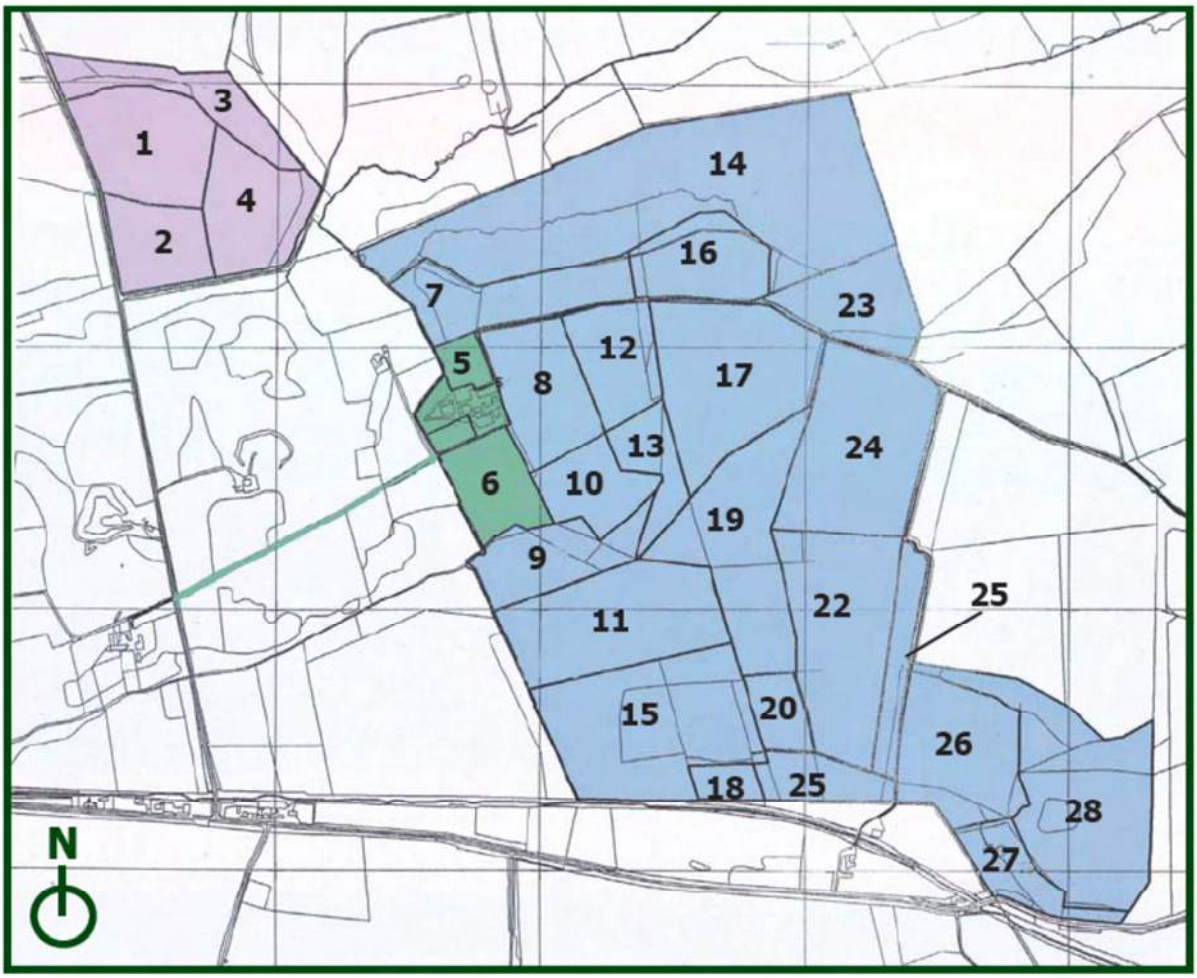
WSP

TITLE

00031309-001
WESTFIELD FARM,
CALDERCRUIX

FIGURE No

SITE LOCATION PLAN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Appendix B Photographic Record

Figure 1 – Pile of tyre on western end of field 8.

Figure 2 – Looking west-east across the north of field 8.

Figure 3 – Looking south-north across western end of field 7.

Figure 4 – Looking south-north along track between fields 7 and 8.

Figure 5 – Looking north-south across field 12.

Figure 6 – Looking southwest-northeast across fields 16 and 14.

Figure 7 – Looking southwest–northeast across field 17 and 24.

Figure 8 – Looking north-south across field 17 and 19.

Figure 9 – Field drain exiting culvert under track at boundary of fields 17 and 24.

Figure 10 – Looking from north-south along field drain (between fields 24 and 17) showing water discolouration.

Figure 11 – Bank of field drain along field 17 showing underlying drift geology.

Figure 12 – Pile of manure and construction debris on track between fields 19 and 24.

Figure 13 – Construction debris between fields 19 and 24.

Figure 14 – Construction debris between fields 19 and 24.

Figure 15 – Looking west-east across field 19.

Figure 16 – Track and trees at field 25.

Figure 17 – Looking east-west along track between fields 23 and 24.

Figure 18 – Field drain at southern end of field 23 showing water discolouration.

Figure 19 – Looking east-west across field 22.

Figure 20 – Looking north-south along western boundary of field 25.

Figure 21 – Looking northwest-southeast across field 26.

Figure 22 – Pile of manure at the side of the track between fields 25 and 26.

Figure 23 – Area of made ground adjacent to pile of manure between fields 25 and 26.

Figure 24 – Area of made ground between fields 25 and 26 at south of site.

Figure 25 – Looking northeast-southwest across southern end of field 25.

Figure 26 – Looking southwest-northeast across field 2.

Figure 27 – Looking west-east along track at southern end of field 2 and field 4.

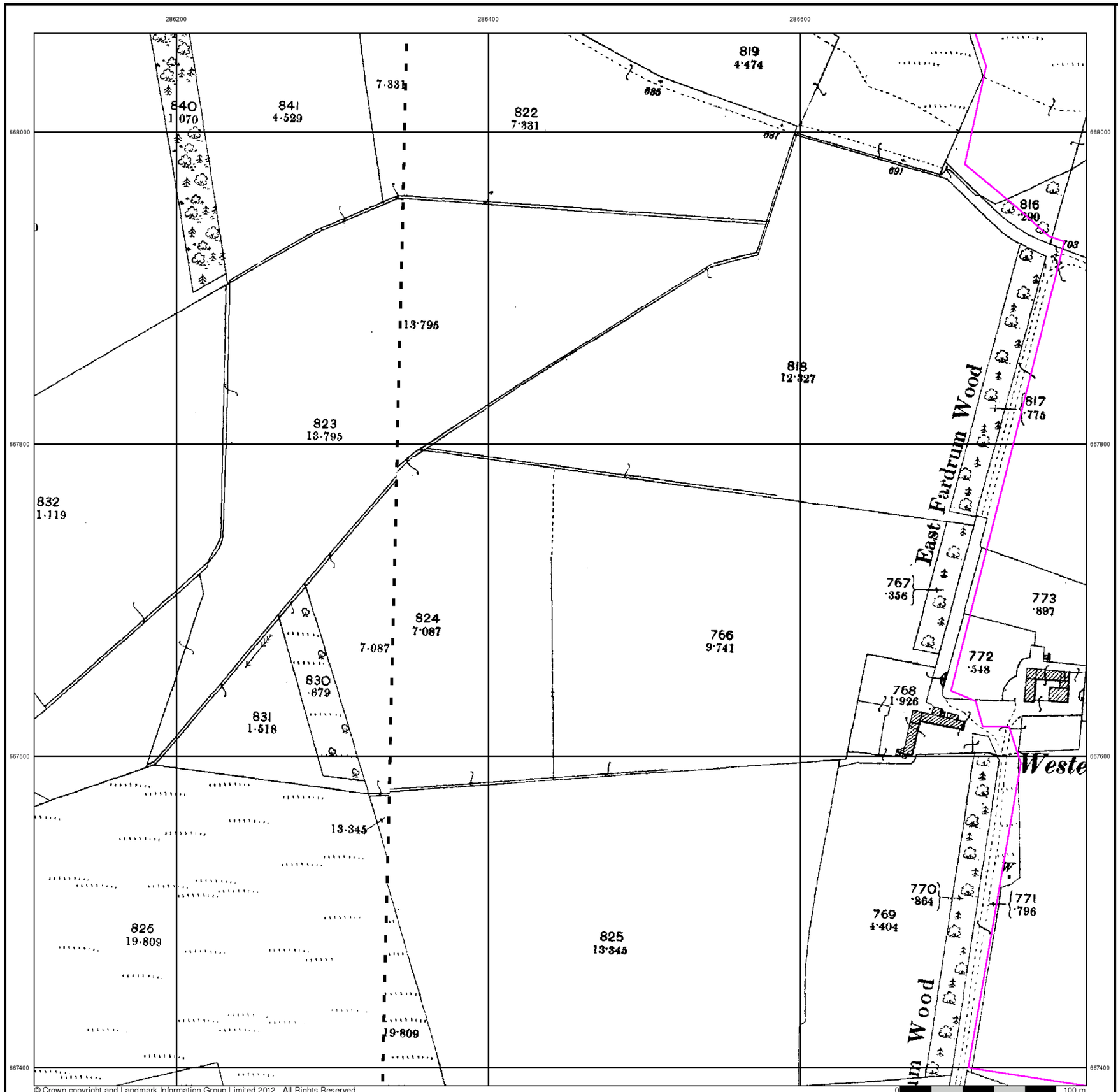
Figure 28 – Small area of trees (Stooprigg Wood) at eastern end of field 4.

Figure 29 – Looking west-east across field 1.

Figure 30 – Looking west-east across boundary between field 1 and 4.

Figure 31 – Looking northwest-southeast across field 1 and 2.

Appendix C Selection of Historical Map Extracts



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Linlithgowshire

Published 1898

Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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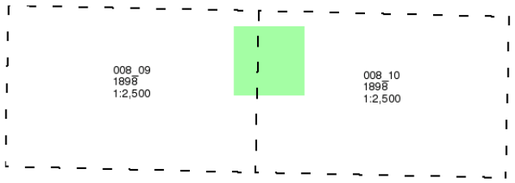

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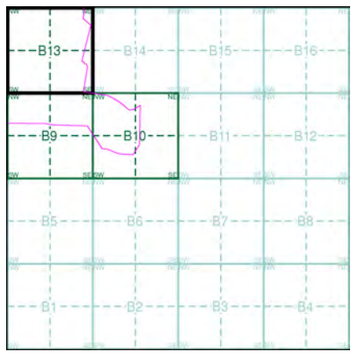

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Search Buffer (m):	0

Site Details

Site at 286370, 667860

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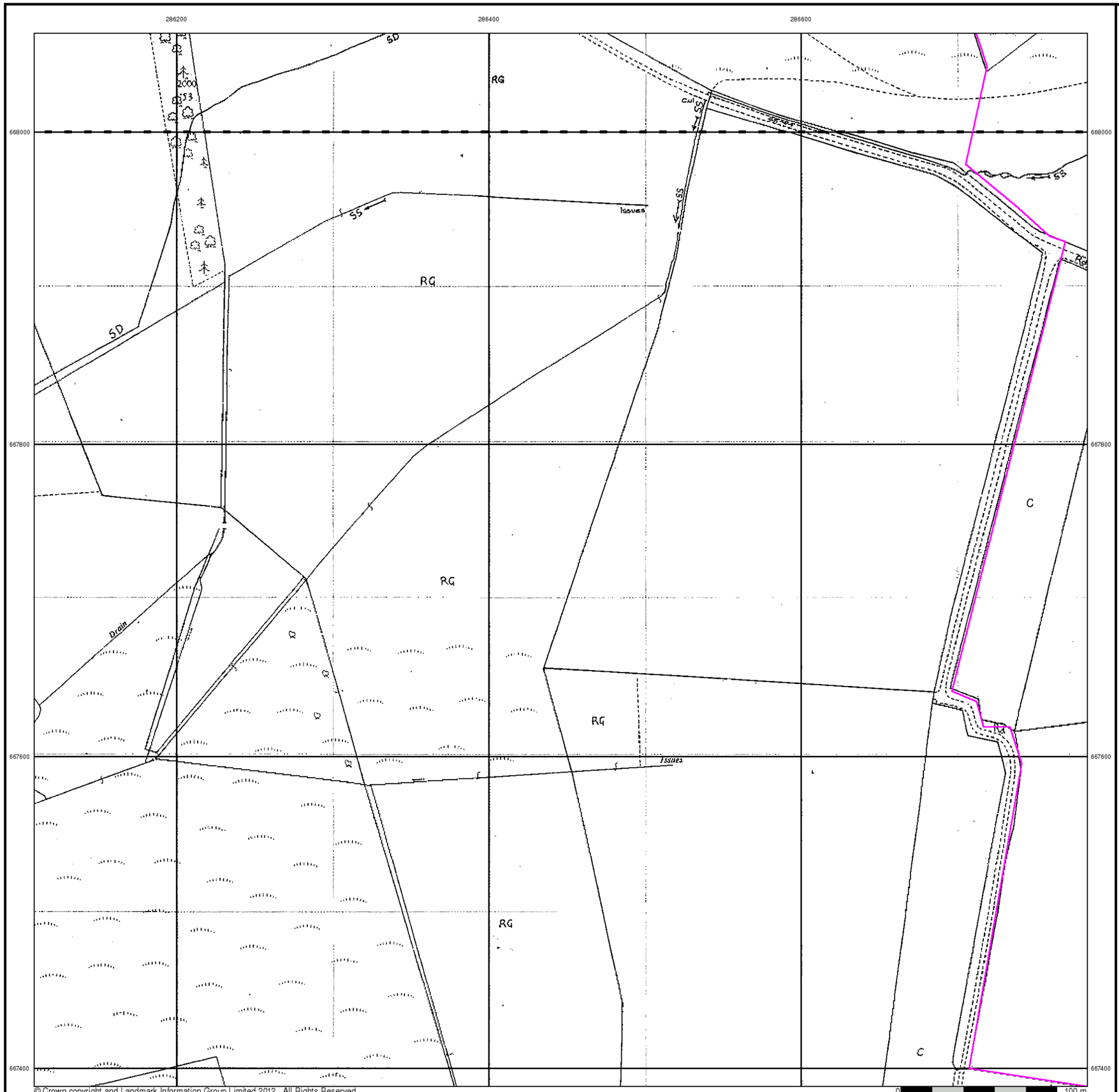
Web: www.envirocheck.co.uk



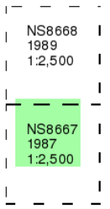
Additional SIMs

Published 1987 - 1989

Source map scale - 1:2,500

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



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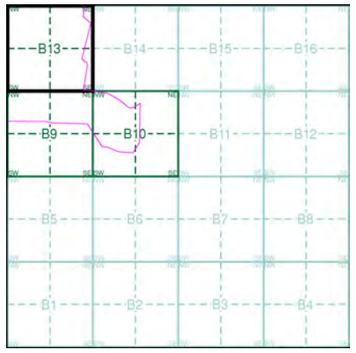

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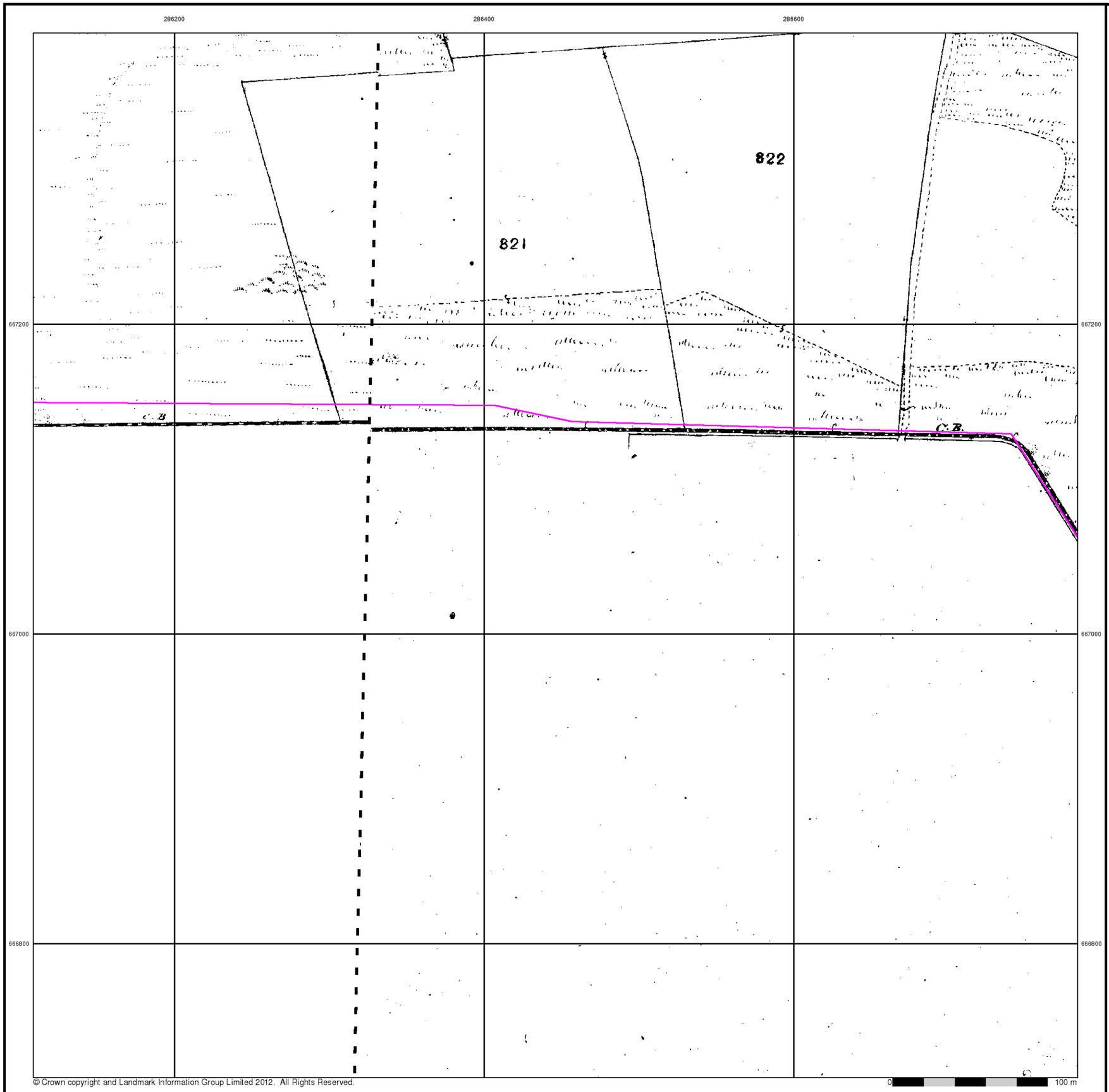

Linlithgowshire

Published 1856

Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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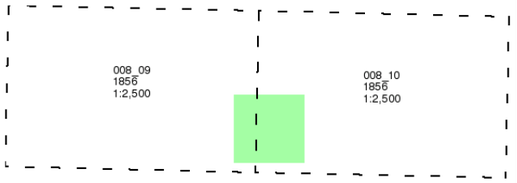
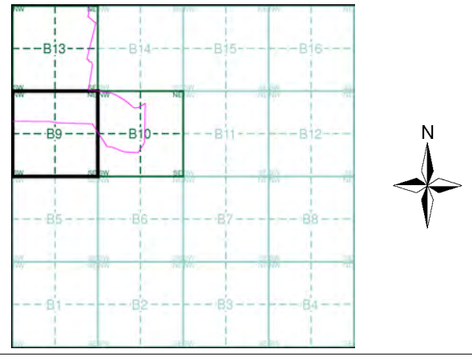


Historical Map - Segment B9



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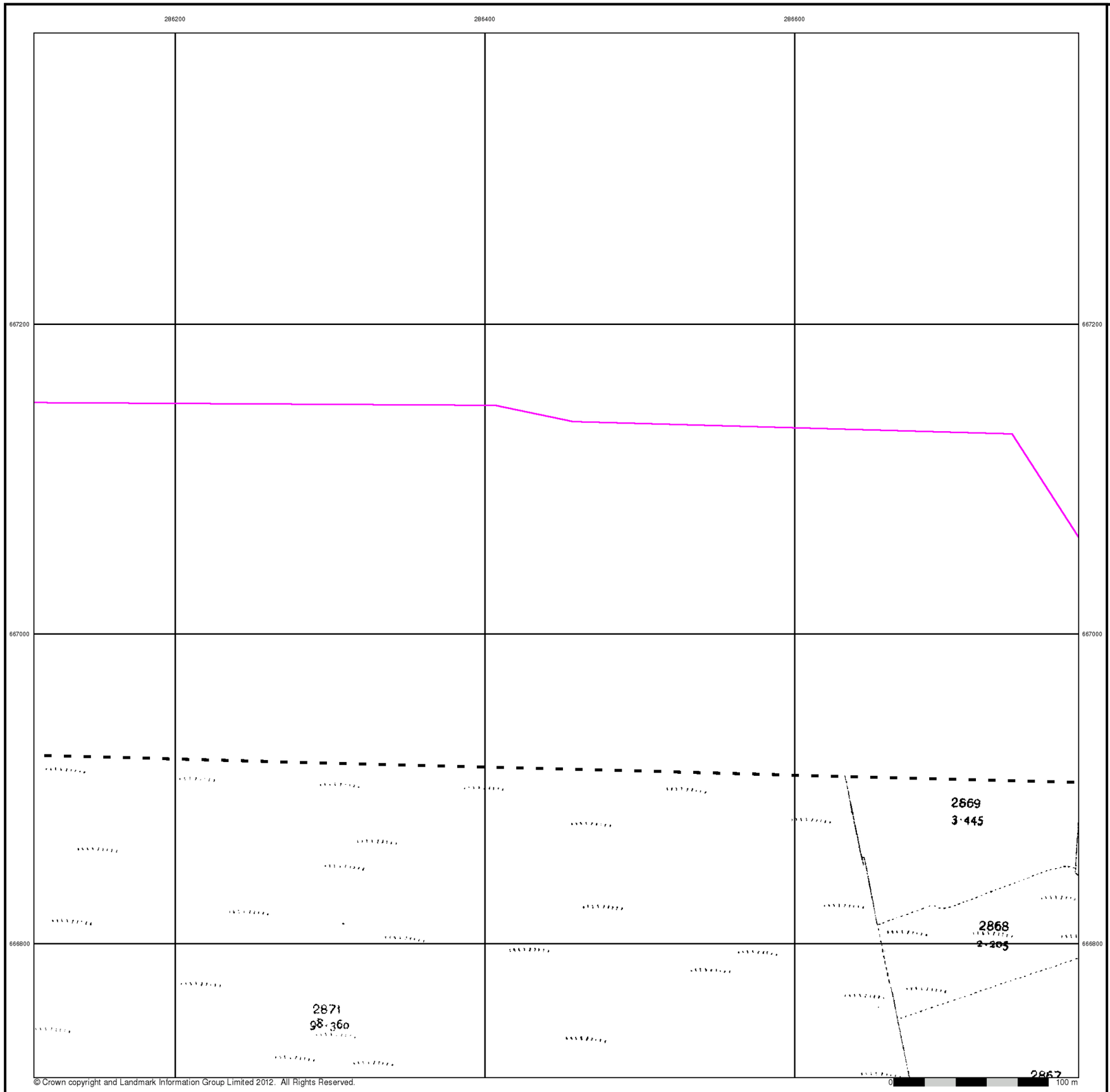

Linlithgowshire

Published 1915

Source map scale - 1:2,500

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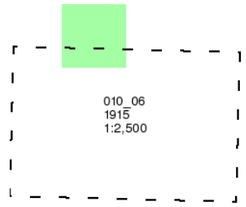

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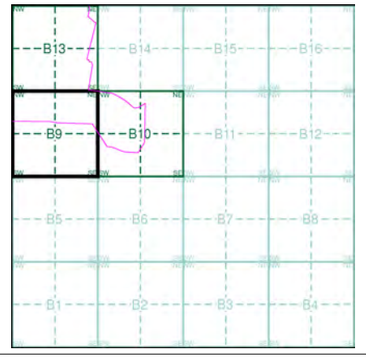

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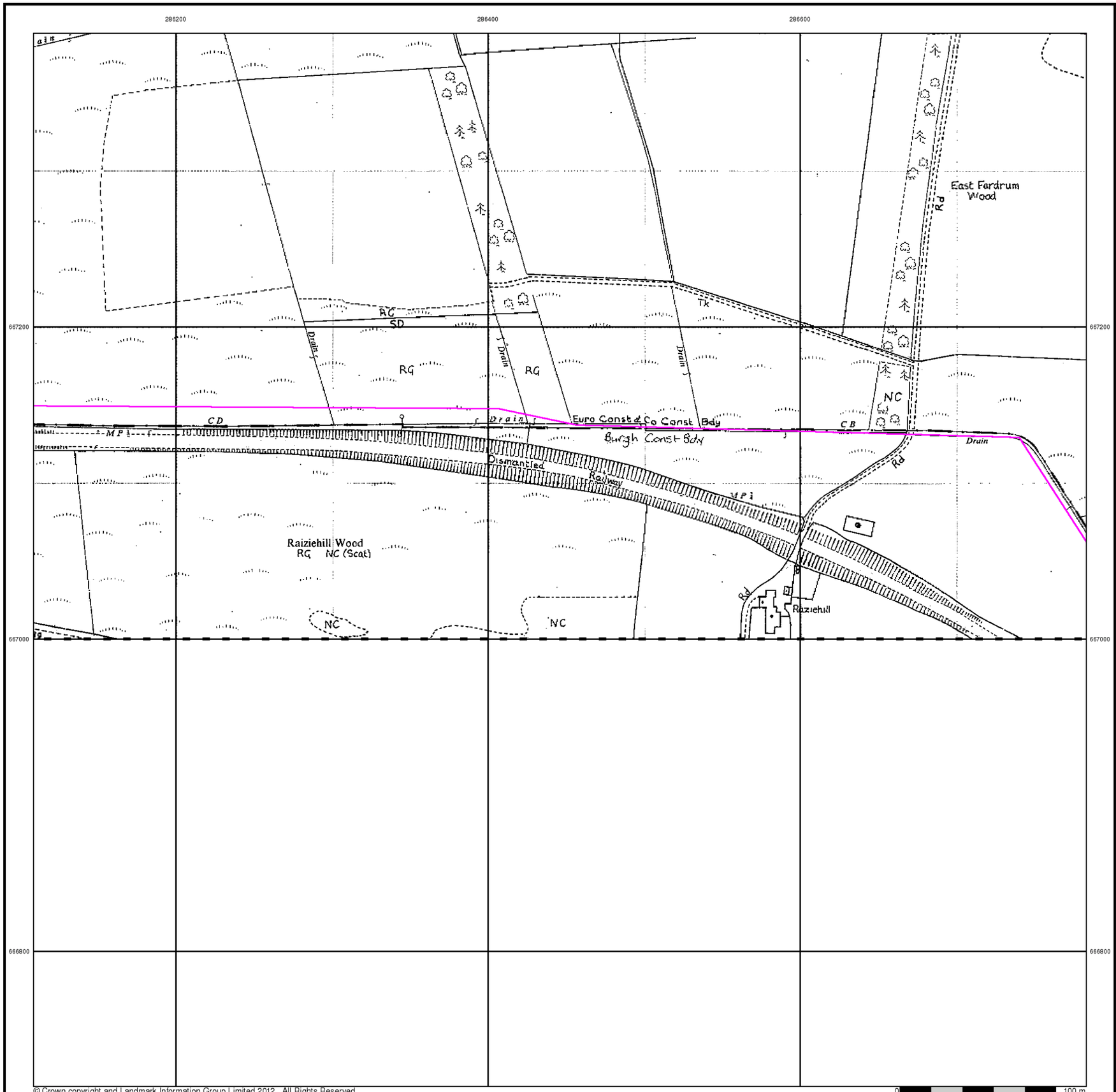

WSP

Additional SIMs

Published 1987

Source map scale - 1:2,500

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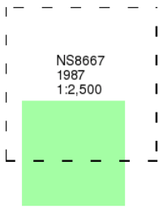

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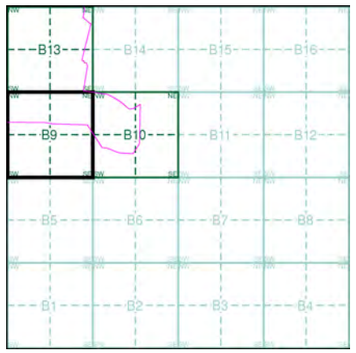

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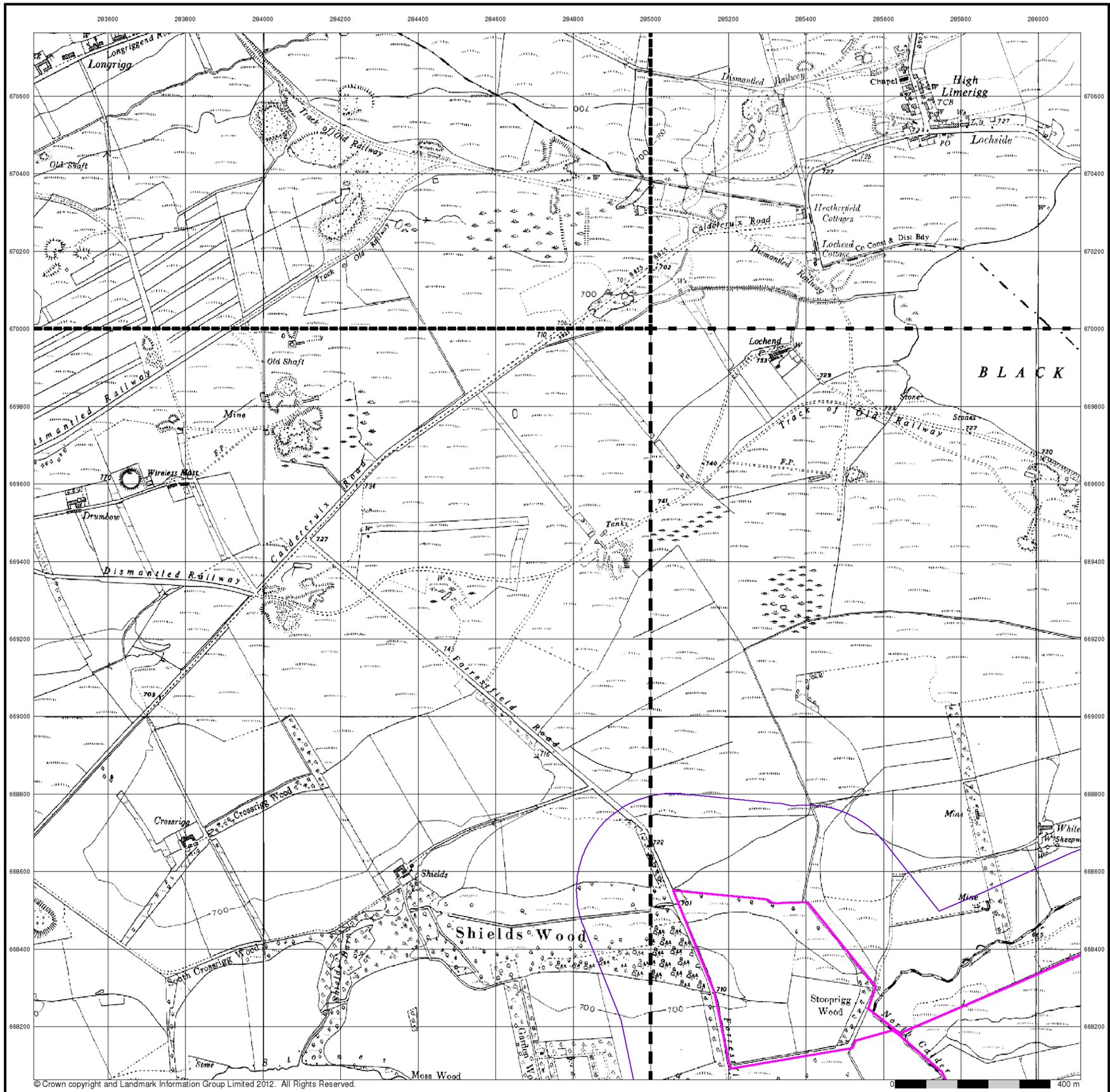

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Ordnance Survey Plan

Published 1957

Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

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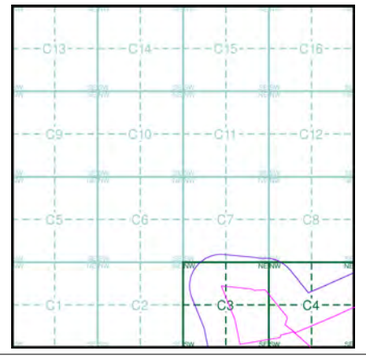
NS86NW 1957 1:10,560	NS86NE 1957 1:10,560

Historical Map - Slice C



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Site Details

Site at 286370, 667860

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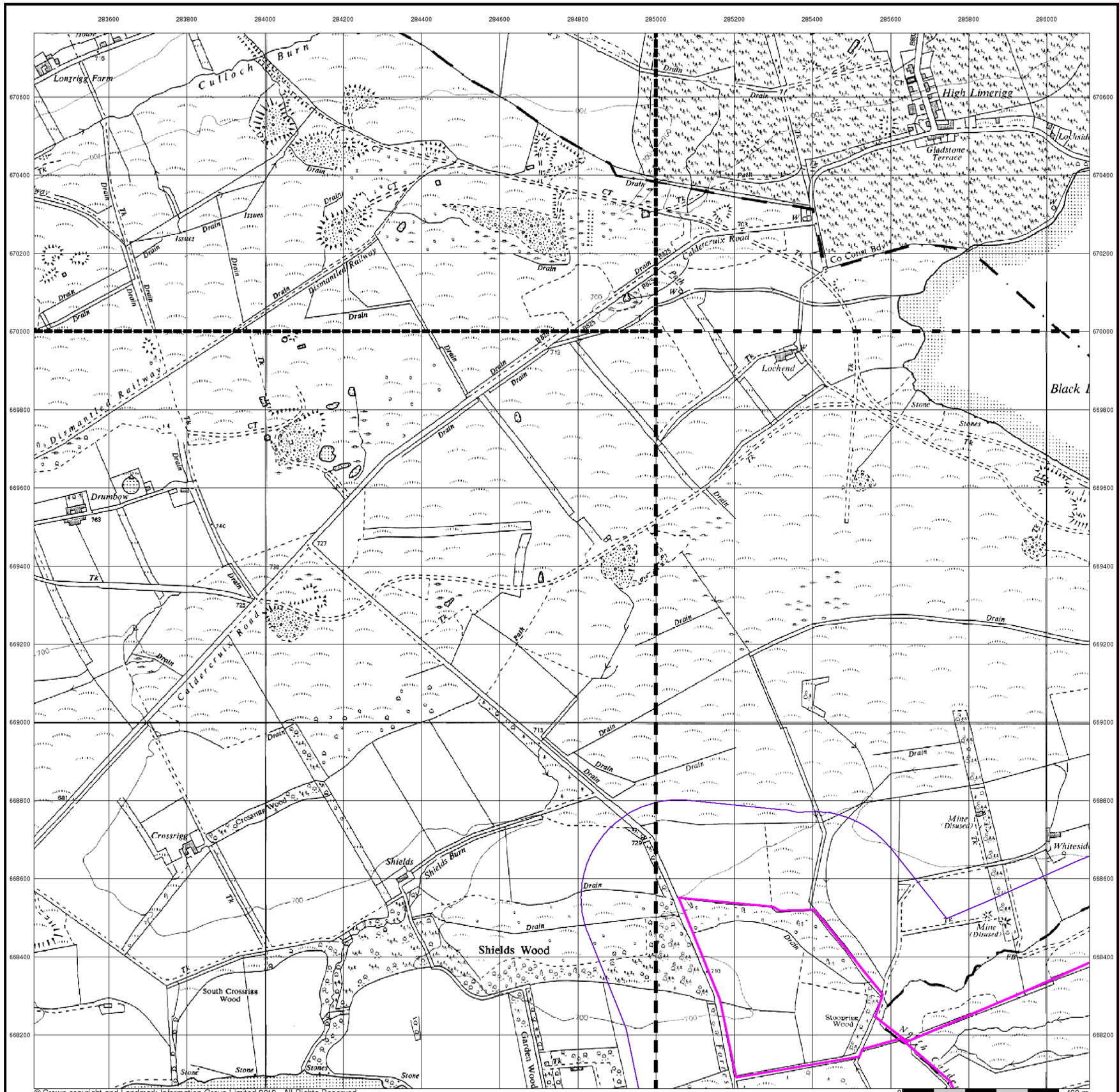

WSP

Ordnance Survey Plan

Published 1966 - 1967

Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

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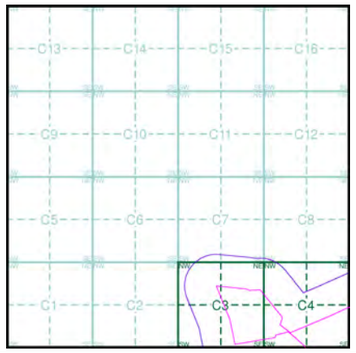
NS86NW 1966 1:10,560	NS86NE 1967 1:10,560

Historical Map - Slice C



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Site Area (Ha):	133.81
Search Buffer (m):	250

Site Details

Site at 286370, 667860

Landmark Information Group
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Appendix D Coal Authority/Additional Relevant Information

COAL AUTHORITY REPORT ENCLOSED

ADDITIONAL RELEVANT INFORMATION ENCLOSED

- BGS Borehole Log
- GIS database designated sites plan
- SEPA Flood Map
- SEPA RBMP North Calder Water
- SEPA RBMP Groundwater Body

(68/5505) Wt 73541/95 3000 1/54 M. & St., Ltd. G 68

SECTION OF Journal of No. 271 Bore Shotts 7

Otherwise No. 9 Bore on the Lands of Bedlormie

NS 86NE/83

NS 8586 6799 Surface Level O.D.

Communicated by 80'08 220 yD

Date of boring or sinking Borer John Smith

One-inch Map Six-inch Map (County and Half-Quarter Sheet) Dalkeith 8 Sw.

	Thickness.			Depth from Surface.		
	Fathoms.	feet.	ins.	Fathoms.	feet.	ins.
Surface of soil		2	-	-	2	-
Loose gravel		30	-	5	2	-
Running sand		4	-	6	-	-
Light fakes		4	2	6	4	2
White sandstone		1	1	6	5	3
Extra hard sandstone		1	-	7	-	3
Hard sandstone		3	-	7	3	3
Kingle sandstone		1	-	7	4	3
Coarse calmstone		11	2	9	3	5
Dark blaes and coal		-	6	9	3	11
Light fakes		1	-	9	4	11
Grey fakes		1	1	10	-	-
White calmstone		2	6	10	2	6
Grey fakes		3	8	11	-	2
White calmy whinstone		7	6	12	1	8
Calmy whinstone		14	6	14	4	2
Hard whinstone		223	10	52	-	-
Calm white ribs		6	-	53	-	-
Blaes		5	-	53	5	-
Faky blaes		7	6	55	-	6
Dark blaes		2	-	55	2	6
Grey sandstone		1	10	55	4	4
Dark fakes		1	-	55	5	4
Grey sandstone		23	10	59	5	2
Grey fakes		1	9	60	-	11
White sandstone		3	6	60	4	5
Grey fakes		1	-	60	5	5
White sandstone		8	4	62	1	9
Grey fakes		1	-	62	2	9
White sandstone		14	4	64	5	1
Dark fakes			5	64	5	6
Coal (Blind)		1	4	65	0	10
Faky fireclay		1	-	65	1	10
White sandstone		6	-	66	1	10
Extra hard sandstone		4	5	67	-	3
Faky blaes		1	-	67	1	3
Blaes		3	7	67	4	10
Ironstone			2	67	5	-
Black blaes		1	8	68	-	8
Hard sandstone		11	-	69	5	8
Blaes		1	6	70	1	2
Blaes and fireclay		5	9	71	-	11
Fakes and blaes		4	7	71	5	6
Grey faky		6	-	72	5	6
Sandstone		1	9	73	1	3
Blaes		1	3	73	2	6
Grey fakes		3	-	73	5	6
Hard sandstone		1	-	74	-	6
Dark blaes		2	5	74	2	11
Faky sandstone		2	-	74	4	11
Hard sandstone		1	5	75	-	4
Dark blaes		2	11	75	3	3
Carry forward	75	3	3			

	Thickness.			Depth from Surface.		
	Fathoms.	feet.	ins.	Fathoms.	feet.	ins.
Brought forward	75	3	3	75	3	3
Ironstone (Clayband)			2	75	3	5
Dark blaes		3	-	76	-	5
Dark blaes and fireclay		2	6	76	2	11
Coal (free)		1	-	76	3	11
Brown fireclay		3	-	77	-	11
White sandstone		21	4	80	4	3
Coal (foul)			4	80	4	7
Brown fireclay		1	5	81	-	-
Dark blaes		1	7	81	1	7
Ironstone (clayband)			5	81	2	-
Dark blaes ?		3	-	81	4	-
Soft blaes		2	2	82	-	2
Hard sandstone		16	8	84	4	10
Coal (foul)			6	84	5	4
Fireclay		1	10	85	1	2
Faky fireclay		6	9	86	1	11
Faky sandstone		1	-	86	2	11
Extra Hard Sandstone		42	5	93	3	4
Coal (foul) ?			3	93	4	7
Dark blaes		1	3	93	5	10
Fireclay		2	2	94	2	-
Grey fakes		1	8	94	3	8
Coal			2	94	3	10
Fireclay		1	-	94	4	10
Grey fakes			7	94	5	5
Hard sandstone		2	10	95	2	3
Dark blaes			4	95	2	7
Dark blaes and coal		2	9	95	5	4
Grey fakes		1	3	96	-	7
Black blaes		1	-	96	1	7
Faky blaes		2	-	96	3	7
Grey fakes		3	2	97	-	9
Faky fireclay		2	2	97	2	11
Ironstone			5½	97	3	4½
Dark fireclay			5	97	3	9½
Grey fakes		1	4	97	5	1½
Hard sandstone		21	6	101	2	7½
Black blaes		1	-	101	3	7½
Grey fakes			8	101	4	3½
Hard sandstone		31	1	106	5	4½
Faky fireclay			6	106	5	10½
Hard white sandstone		2	9	107	2	7½
Coal (foul)			9	107	3	4½
Dark blaes			10	107	4	2½
Faky fireclay		1	2	107	5	4½
Light fakes		2	4	108	1	8½
Brown sandstone		4	2	108	5	10½
Hard sandstone		1	-	109	-	10½
Very hard sandstone		4	-	109	4	10½
Faky fireclay		1	-	109	5	10½
Grey fakes			10	110	-	8½
Hard sandstone		1	3	110	1	11½
Fireclay and coal		-	10	110	2	9½
Grey fakes		1	-	110	3	9½
Hard sandstone		2	-	110	5	9½
Fireclay and coal		1	9	111	1	6½
Dark blaes			7	111	2	1½
Ironstone (ball)			3½	111	2	5
Dark blaes			9	111	3	2
Ironstone (clay band)			4	111	3	6
Dark blaes			6	111	4	-
Ironstone (ball)			2	111	4	2
Dark blaes		1	6	111	5	8
Faky fireclay		1	-	112	-	8
Carry forward	112	-	8			

(57/849) Wt 74436/125 3000 4/57 M. & St., Ltd. G 57

SECTION OF No. 271 Shotts: No. 9 Lands of Bedlormie

Six-inch Map (County and Quarter Sheet) Linlithgow 8 SW

NS 86NE/83

	Thickness.			Depth from Surface.		
	Fathoms.	feet.	ins.	Fathoms.	feet.	ins.
Brought forward	112	-	8	112	-	8
Grey fakes		2	2	112	2	10
Hard white sandstone		24	6	116	3	4
Coal (free)		-	4	116	3	8
Hard sandstone		18	6	119	4	2
Faky fireclay		4	6	120	2	8
Faky blaes		1	2	120	3	10
Fireclay		2	10	121	-	8
Fireclay and light fakes		2	-	121	2	8
Faky blaes		1	6	121	4	2
Dark blaes		2	-	122	-	2
Light fakes		1	10	122	2	-
White sandstone		9	-	123	5	-
Total depth	123	5	-			

SECTION OF Whiteside (Westertown) Open cast site

(falls within square NS 86.67) approximately

NS 865 675

118

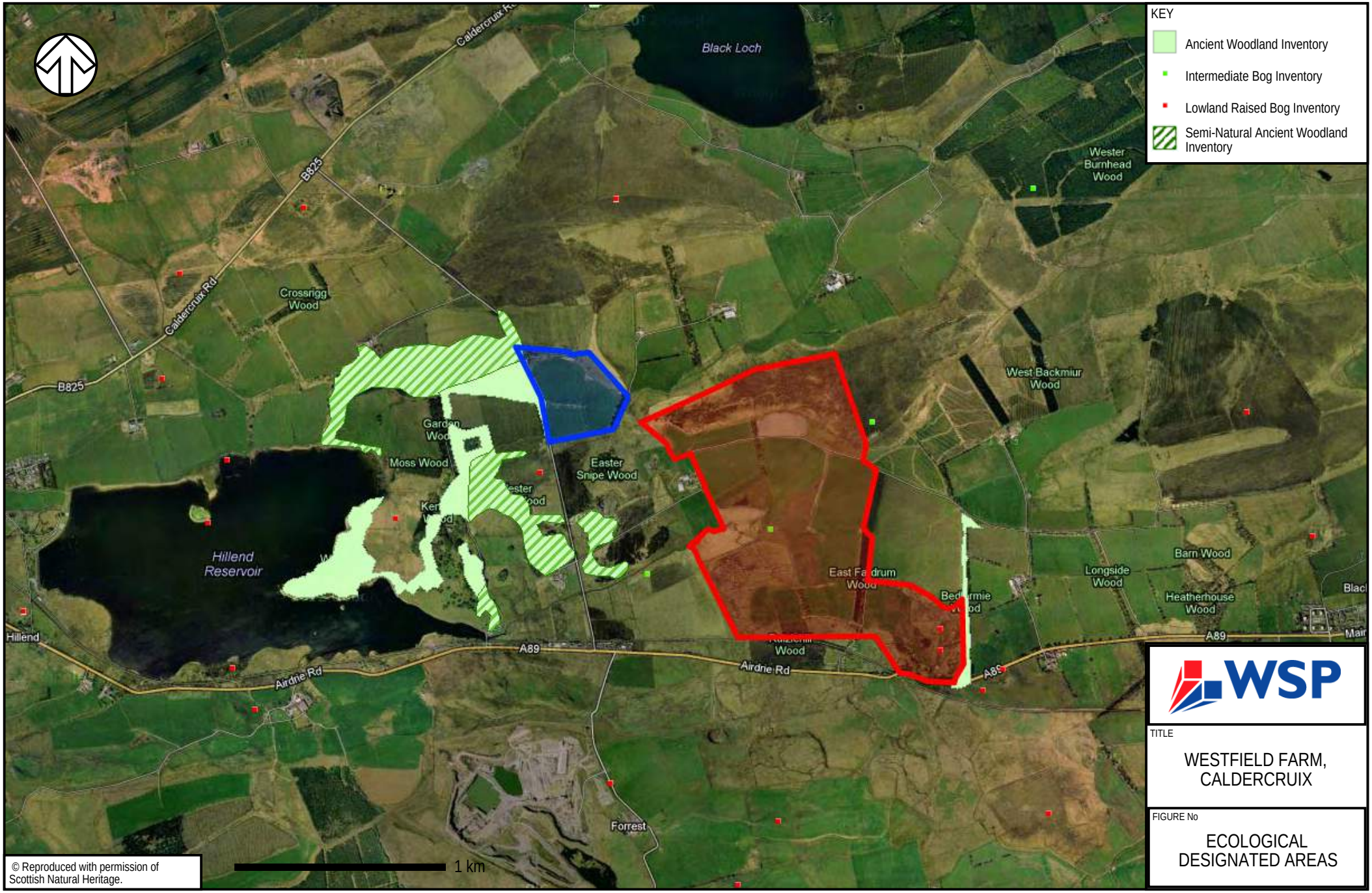
Feasts: EU 2937-2992 Surface Level O.D.

Communicated by Measured P J Brand November 1971

Date of boring or sinking Borer

One-inch Map 31 Six-inch Map NS 86 NE

	Thickness Metres		Depth from Surface Metres	
Seen in Eastern cut, from Eastern boundary of site c 100yd westwards.				
Largely inaccessible — Sandstone, yellowish, current bedded. Silty mudstone, sandy ribs	4	500		
Mudstone, grey, ironstone ribs with very rare *Cweirimula* near base		600	5	10
Coal, bright, with 'eenie structure'		380	5	48
Seen. Seatclay		200	5	68
In the Western Cut the strata overlying the coal are progressively replaced from base up by a white massive sandstone.				
Section in Western cut:-				
Sandstone, white, massive, Erosive Base seen c.	6	100	6	10
Coal, bright between	300 and 250mm		6	40
Sandstone white, rooty top	1	250	7	65
Dark grey siltstone, sandstone ribs		960	8	61
Sandstone, whitish		340	8	95
Mudstone, dark grey, Ironstone nodules, *Carbonicolas*, *Naiadites*, *Cweirimula* and Plants		740	9	69
Coaly parting		10	9	79
Dirty grey rooty sandstone, some irony nodules		270	10	6
Coaly Seatclay, dark grey		150	10	21
Grey Sandstone, siltstone ribs, rooty near top	1	550	11	76
Silty mudstone, becoming sandier towards top	1	050	12	81
Black Mudstone with irony ribs with *Carbonicolas* and *Cweirimula* 520mm in West, 580 in East of cut			13	33
Ironstone rib variable thickness 200mm in West, 40 mm in East, usually only 120 mm			13	45
Coal bright variable thickness 180 mm in West 260 mm in East			13	63
Seatclay.				


KEY
Ancient Woodland Inventory
Intermediate Bog Inventory
Lowland Raised Bog Inventory
Semi-Natural Ancient Woodland Inventory
Black Loch
Wester Burnhead Wood
Caldercruix Rd
B825
Crossrigg Wood
West Backmiur Wood
Garden Wood
Moss Wood
Easter Snipe Wood
Hillend Reservoir
East Fa drum Wood
Barn Wood
Longside Wood
Heatherhouse Wood
Hillend
A89
Airdrie Rd
Forrest
1 km
© Reproduced with permission of Scottish Natural Heritage.
WSP
TITLE
WESTFIELD FARM, CALDERCRUIX
FIGURE No
ECOLOGICAL DESIGNATED AREAS

Indicative River & Coastal Flood Map

Please note: the flood map does not take into account all flood defences which may be in place now or in the future.

Some features of the flooding map are based on digital spatial data licences from the Centre for Ecology and Hydrology ©CEH, ©MO, ©NSRI, ©MLURI, ©OSNI, ©DARD(NI), ©Defra and includes material based on Ordnance Survey 1:50,000 maps with permission of the controller of Her Majesty's Stationery Office ©Crown Copyright.

Important Information
By viewing this page you are deemed to have read and understood the important information summarised below.
The Indicative River & Coastal Flood Map (Scotland) has primarily been developed to provide a strategic national overview of flood risk in Scotland and does not provide enough detail to show the flood risk to individual properties. Whilst all reasonable effort has been made to ensure that the flood map is accurate for its intended purpose, no warranty is given by SEPA in this regard. SEPA reserves the right to change the information contained in the flood map without notice. Users are required to validate any information provided independently - any reliance upon the flood map is at the user's own risk. The criteria, assumptions and intended purpose of the flood map can be found in the full text of this notice, along with the terms and conditions associated with its use.

LEGEND

INDICATIVE FLOOD MAP

- Areas at risk of flooding from rivers
- Areas at risk of flooding from the sea

FLOOD DEFENCES

- 44 Defence scheme ref no. and location
- Embankment
- Wall

- Area benefiting from flood defence relative to t scheme's standard of protection
- Storage area
- Pump


Areas at risk of flooding from both rivers and the sea
Channel Improvement
Culvert
Floodgate

RBMP Water body information sheet for water body 10063 in Clyde

General details

Water body name:	North Calder Water (u/s Hillend Reservoir)
Water body Identifier code:	10063
Length:	6.51 km
Water body category:	River
Baseline:	Y
River basin district:	Scotland
Area advisory group:	Clyde
Catchment:	River Clyde
Associated protected areas:	River Clyde - FRESHWATER FISH (EXISTING)
Associated groundwater:	Clydesdale bedrock and localised sand and gravel aquifers
Responsible body:	SEPA North Lanarkshire
Heavily modified:	No
Artificial:	No
Typology:	Mid-altitude Small Calcareous
National Grid Reference:	NS 86576 68897
Latitude:	55.89978
Longitude:	-3.81556

Current status of this water body

We have classified this water body as having an overall status of Poor with Low confidence in 2008 with overall ecological status of Poor and overall chemical status of Pass.

This overall classification of status is made up of many different tiers of classification data. A complete set of classification data for 2008 is shown at the end of this document.

Targets for the future status of this water body

We have set environmental objectives for this water body over future river basin planning cycles in order that sustainable improvements to its status can be made over time, or alternatively that no deterioration in status occurs, unless caused by a new activity providing significant specified benefits to society or the wider environment.

For this water body we have set the overall environmental objectives for the first, second and third River Basin Management Planning (RBMP) cycles as:

Year	2008	2015	2021	2027
Status	Poor	Poor	Poor	Good

We have established an ongoing programme of monitoring in order to identify pressures on our water bodies. The pressures listed below contribute to this water body's failure to meet good ecological status. River basin planning allows us to plan improvements for particular parameters over time. We have collaborated with others to identify measures which will act to protect or improve our water environment in order that all water bodies reach good status over successive RBMP cycles.

Pressures and measures on this water body

The pressures listed below contribute to this water body's failure to meet good ecological status or potential. River basin planning allows us to plan improvements for particular parameters over time. We have collaborated with others to identify measures which will act to protect or improve our water environment in order that all water bodies reach good status over successive RBMP cycles.

The following table shows our collated information on the pressures on this water body, their causes and the measures which could be introduced to mitigate their effects. We have also indicated the current funding status of the measure; with projected measures being potentially funded and agreed measures having funding in place. Finally, we have included information on the potential or actual owner of the measure, the date it will be effective and information on the justification for extending the deadlines or for setting an alternative objective, where appropriate.

Pressure	**As a Result of**	**Assessment Parameter**	**Objective**	**Reasons for Failure**
	Measure	**Funding**	**Owner**	**Effective date**
Morphological Alterations	Impounding - weir / dam	Fish passage	Poor by 2015	Implementation of the measure by an earlier deadline would impose disproportionate burdens
	Removal of barriers or provision of mechanisms to enable fish migration	Neither Agreed nor Projected	British Waterways	31/12/2026
Morphological Alterations		Multiple Pressure	Good by 2015	
	Improvement to condition of channel/ bed and/or banks/ shoreline	Neither Agreed nor Projected	Landowner(s)	31/12/2014

Future work

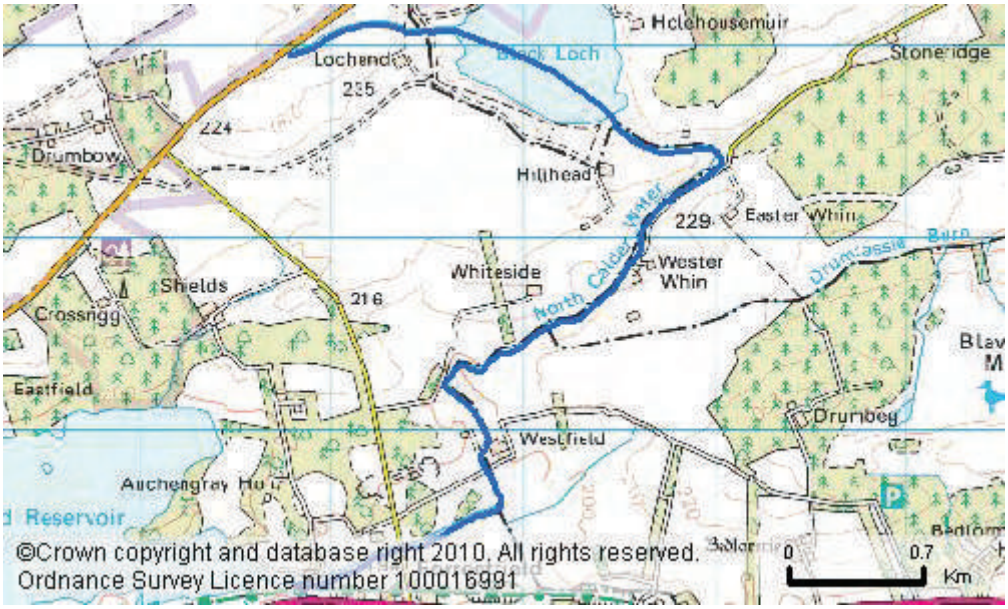
Additional work to identify pressures and to develop and implement measures to mitigate their impacts will continue over subsequent river basin cycles.

Complete classification for this water body in 2008

Parameter	Status	Confidence of Class
OVERALL STATUS	POOR	LOW
Pre-HMWB status	Poor	Low
Overall chemistry	Pass	Low
Priority substances	Pass	Low
Overall ecology	Poor	Low
Physico-Chem	High	Low
Biological elements	Poor	Low
Phytobenthos	High	Low
Macrophytes	High	Low
Benthic invertebrates	High	Low
Macro-invertebrates (acid)	High	Low
Macro-invertebrates (RiCT)	High	Low
Macro-invertebrates (ASPT)	High	Low
Macro-invertebrates (NTAXA)	High	Low
Alien species	High	Low
Fish	Poor	Low
Fish ecology	High	Low
Fish barrier	Poor	Low
Specific pollutants	Pass	Low
Hydromorphology	Moderate	Medium
Morphology	Moderate	Medium
Hydrology	High	Medium
Hydrology (impoundment)	High	Medium
Hydrology (abstraction)	High	Medium
Water quality	High	
Morphological pressures	Poor	

Location of this water body

You can find the geographical location of this water body by searching on water body ID in the interactive maps at www.sepa.org.uk/water/river_basin_planning.aspx



SEPA Contact Details: rbmp@sepa.org.uk

RBMP Water body information sheet for water body 150218 in Clyde

General details

Water body name:	Clydesdale bedrock and localised sand and gravel aquifers
Water body identifier code:	150218
Area km^2:	498.82
Water body category:	Groundwater
Baseline:	Y
River basin district:	Scotland
Area advisory group:	Clyde
Associated protected areas:	Clydesdale bedrock and localised sand and gravel aquifers
Associated surface waters:	Auchter Water Avon Water (Powmillon Burn to River Clyde) Backrow Burn Birninehill Burn Browns Burn Cander Water/White Corse Burn Darngaber Burn Garrion Burn Hillend Reservoir Jock s Burn Kittoch Water Luggie Burn Markethill Burn North Burn/Gartsherrie Burn North Calder Water (Luggie Burn to Clyde) North Calder Water (Shotts Burn to Luggie Burn) North Calder Water (d/s Hillend Reservoir to Shotts Burn) North Calder Water (u/s Hillend Reservoir) River Clyde (Mouse Water to Strathclyde Loch outflow) River Clyde (Strathclyde Loch outflow to North Calder) Rotten Calder Water Roughrigg Reservoir Shirrel Burn/Thankerton Burn/Legbranock Burn Shotts Burn South Burn South Calder Water (Auchter Water to Tillan Burn) South Calder Water (Tillan Burn to Strathclyde Park) South Calder Water (u/s Auchter Water) Strathclyde Loch Tassie Burn Tillan Burn Wellshaw/Earnock Burn
Responsible body:	SEPA

RBMP Water body information sheet for water body 150218 in Clyde

	Falkirk & W Lothian, South Lanarkshire, Renfrew & Inverclyde, Glasgow, North Lanarkshire
National Grid Reference	NS 76839 56278
Latitude:	55.78408
Longitude:	-3.96545

Current status of this water body

We have classified this water body as having an overall status of Poor with High confidence in 2008.

The quality of the groundwater has been classified as Poor with High confidence and the quantity of groundwater has been classified as Poor with Medium confidence in 2008

There is no trend for pollutants for this water body.

This overall classification of status is made up of many different tiers of classification data. A complete set of classification data for 2008 is shown at the end of this document.

Targets for the future status of this water body

We have set environmental objectives for this water body over future river basin planning cycles in order that sustainable improvements to its status can be made over time, or alternatively that no deterioration in status occurs, unless caused by a new activity providing significant specified benefits to society or the wider environment.

For this water body we have set the overall environmental objectives for the first, second and third River Basin Management Planning (RBMP) cycles as:

Year	2008	2015	2021	2027
Overall Status	Poor			
Chemistry Status	Poor	Poor	Poor	Poor
Quantitative Status	Poor	Poor	Poor	Good

We have established an ongoing programme of monitoring in order to identify pressures on our water bodies. The pressures listed below contribute to this water body's failure to meet good ecological status. River basin planning allows us to plan improvements for particular parameters over time. We have collaborated with others to identify measures which will act to protect or improve our water environment in order that all water bodies reach good status over successive RBMP cycles.

Pressures and measures on this water body

We have established an ongoing programme of monitoring in order to identify pressures on our water bodies.

The pressures listed below contribute to this water body's failure to meet good ecological status or potential. River basin planning allows us to plan improvements for particular parameters over time. We have collaborated with others to identify measures which will act to protect or improve our water environment in order that all water bodies reach good status over successive RBMP cycles.

The following table shows our collated information on the pressures on this water body, their causes and the measures which could be introduced to mitigate their effects. We have also indicated the current funding status of the measure; with projected measures being potentially funded and agreed measures having funding in place. Finally, we have included information on the potential or actual owner of the measure, the date it will be effective and information on the justification for extending the deadlines or for setting an alternative objective, where appropriate.

Pressure Type	**As a Result of**	**Assessment Parameter**	**Objective**	**Reasons for Failure**
	Measure	***Funding***	***Owner***	***Effective date***
Diffuse Source Pollution	Mining and quarrying of coal	Conductivity	Poor by 2015	Groundwater status recovery time
	Reduce Diffuse Source Inputs	*Neither Agreed nor Projected*	*Coal Authority*	*31/12/2025*
Diffuse Source Pollution	Mining and quarrying of coal	Assessment Parameter associated with Surface Water Body	Poor by 2015	Implementation of the measure by an earlier deadline would impose disproportionate burdens
Abstraction	Whisky production	Assessment Parameter associated with Surface Water Body	Poor by 2015	Implementation of the measure by an earlier deadline would impose disproportionate burdens
	Control Abstraction	*Projected*	*Operator*	*31/12/2026*

Pressure Type	As a Result of	Assessment Parameter	Objective	Reasons for Failure
	Measure	*Funding*	*Owner*	*Effective date*
Abstraction	Whisky production	Assessment Parameter associated with Surface Water Body	Poor by 2015	Implementation of the measure by an earlier deadline would impose disproportionate burdens
	Control Abstraction	*Projected*	*Operator*	*31/12/2026*

Future work

Additional work to identify pressures and to develop and implement measures to mitigate their impacts will continue over subsequent river basin cycles.

Complete Classification for this water body in 2008

Parameter	Status	Confidence of Class
OVERALL STATUS	POOR	HIGH
Quantitative	Poor	Medium
Saline intrusion	Good	High
River impacts	Poor	Medium
Wetland interactions	Good	High
Water balance	Good	Medium
Groundwater chemistry	Poor	High
Saline intrusion	Good	Low
River interactions	Poor	High
Diffuse impacts	Good	High
Point source impacts	Poor	High
DWPA test	Good	Low
General chemical test	Poor	High
General chemical test (other)	Good	Low
General chemical test (mining)	Poor	High
Trends in groundwater	None	Medium

You can find out more information on trends in groundwater pollutants at
http://www.wfduk.org/tag_guidance/Article_05/Folder.2004-02-16.5332/gw_trend

Location of this water body

You can find the geographical location of this water body by searching on water body ID in the interactive maps at www.sepa.org.uk/water/river_basin_planning.aspx

Waterbody Not Found

SEPA Contact Details: rbmp@sepa.org.uk

Appendix E Methodology & Report Limitations

Table 1.0 – Potential Pollutant linkages (PPL)

PPL	Source	Pathway	Receptor[15]	Comments
Human Health (on-site)				
H1	Contaminants in near surface materials	Dermal contact, ingestion, inhalation of dust	Current and future site users; construction personnel	None
H2	Contaminants in deeper materials	Dermal contact, ingestion, inhalation of dust during groundwork's	Construction personnel	Usually managed by use of personal protective equipment (PPE) except in incidents of extreme contamination where further measures are needed
H3	Contaminants in near surface materials	Root uptake in site-grown produce followed by ingestion	Consumers of produce	Requires residential, allotment or agricultural use
H4	Volatile contaminants in ground or groundwater	Migration to indoor air	Current and future site users	Requires occupied, enclosed structures
H5	Ground Gas generation from made ground, organic material degradation, or coal measures	Migration to indoor air	Current and future site users	Requires occupied, enclosed structures
H6	Contaminants in groundwater	Abstraction and ingestion	Current and future site users	Not a viable linkage in the absence of groundwater abstractions
H7	Contaminants in surface water	Dermal contact, ingestion, or abstraction and ingestion	Current and future site users, construction personnel	Usually not a viable linkage in the absence of surface water abstractions, however contact with surface waters may occur
H8	Radon Gas	Migration of radon gas from bedrock to indoor air and inhalation	Current and future site users	None
H9	Radioactive materials in ground	Exposure through radiation	Current and future site users; construction personnel	None
H10	Radon, Ground gas, and volatile materials	Outdoor air inhalation	Current and future site users; construction	Generally not a viable risk due to dilution with outdoor air, unless

[15] 'Receptors' are defined in BS10175 as "persons, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by the contaminant(s)".

			personnel	significant contamination / source is present. May need consideration for trenching works or confined space entry.
Water Environment (on site and surrounding)				
W1	Contaminants in ground	Leaching to groundwater	Groundwater	None
W2	Near-surface contaminants	Surface run-off	Surface Water	Viability of linkage is dependent on the distance to surface water receptors
W3	Contaminants in groundwater	Lateral migration	Surface Water	Viability of linkage is dependent on the distance to surface water receptors
W4	Contaminants in groundwater	Lateral and downward migration	Drift aquifer with Future Resource Potential	Following SEPA guidance, if drift material includes greater than 1-2m of non-cohesive materials
W5	Contaminants in groundwater	Downward migration	Bedrock aquifer with Future Resource Potential	Following SEPA guidance, most bedrock aquifers in Scotland have future resource potential.
Built Environment (on-site)				
B1	Phytotoxic contaminants in shallow ground	Root update	Plant life	None
B2	pH and sulphate in shallow ground and/or groundwater in contact with concrete structures	Attack on concrete by direct contact	Buried concrete	None
B3	Contaminants in shallow ground	Permeation of water pipes	Pipe material and water ingestion	None
Off-Site Human Health / Built Environment Receptors				
O1	Ground Gas / volatile contaminants vapour generation on-site	Migration to indoor air on off-site properties	Adjacent site users	Requires occupied, enclosed structures within influencing distance of site
O2	Groundwater with volatile contamination	Migration off site and subsequent	Adjacent site users	Requires occupied, enclosed structures within

		volatilisation to indoor air		influencing distance of site
O3	Contaminated groundwater	Migration off site and contact with services	Services and structures in adjacent site	Requires built environment structures within influencing distance of site

BEST PRACTICE GUIDANCE

WSPE's adopted approach has sought to ensure that a systematic, comprehensive appraisal has been made of all relevant uncertainties and sources of risk. In completing this Land Quality Assessment WSPE has sought be consistent with UK regulatory best practice including but not restricted to the following:

- Scottish Executive Circular 1/2000;
- Contaminated Land (Scotland) Regulations 2000 SSI 178;
- Contaminated Land (Scotland) Regulations 2005 SSI 658;
- Investigation of Potentially Contaminated Sites – Code of practice BS10175;
- British Standards (2001). Investigation of Potentially Contaminated Sites;
- Environment Agency (2004). Model Procedures for the Management of Land Contamination CLR 11;
- Department of the Environment, Transport and the Regions (2000). Environmental Protection Act 1990: Part IIA. Contaminated Land. DETR Circular 02/2000;
- Environment Agency (2001), Guide to good practice for the development of conceptual models and the selection and application of mathematical models of contaminant transport processes in the subsurface. NC/99/38/2;
- SEPA (2010). Assigning Groundwater Assessment Criteria for Pollutant Inputs;
- CIRIA (2006). Assessing Risks Posed by Hazardous Gases to Buildings, Report C665; and
- DoE (1994). Guidance on preliminary site inspection of contaminated land.

This Environmental Assessment has been designed to provide information relating to:

- the current and former land uses on and surrounding the site;
- the environmental sensitivity of the site location as determined by factors including geology, hydrogeology, surface watercourses and neighbouring land uses; and,
- relevant records held by the environmental regulators.

Any relevant information provided by the Client has been reviewed, with action taken to ensure this information is taken into account and/or verified where necessary. All information has then been assessed to define the potential for the site to give rise to environmental liabilities for the freehold/leasehold owner (as appropriate). Recommendations have been made for additional work where this is necessary to fully define the site's environmental liabilities, and cost estimates of the financial implications of the findings can be provided under separate cover, where appropriate.

RISK CLASSIFICATION

For the purposes of Part IIA of the Environmental Protection Act 1990, contaminated land is identified as "any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that:

- significant harm is being caused or there is a significant possibility of such harm being caused; or
- significant pollution of the water environment is being caused or there is a significant possibility of such pollution being caused."

Harm is defined as "harm to the health of living organisms or other interference with the ecological systems of which they form a part, and in the case of man includes harm to his property". Substance is defined as "any natural or artificial substance whether in solid or liquid form or in the form of gas or vapour".

The standard definition of land applies, which includes land under water. The term pollution of the water environment is as defined in section 78A (9) of the Act in terms of direct or indirect introduction into the water environment of substances which may give rise to harm to human health or the quality of ecosystems, result in damage to material property or impair or interfere with amenities and other legitimate uses of the water environment. Local authorities are required to

have regard to section A46 of the statutory guidance “Measures of significant pollution” in deciding whether pollution is significant.

The Contaminated Land (Scotland) Regulations 2005 which extend to Scotland only, amend Part IIA of the Environmental Protection Act 1990 (c.43) ("the 1990 Act") and the Contaminated Land (Scotland) Regulations 2000 (S.S.I. 2000/178) ("the 2000 Regulations") in light of the Water Environment and Water Services (Scotland) Act 2003 (asp 3) ("the 2003 Act").

Both Part IIA to the 1990 Act, and the 2000 Regulations, make provision in relation to the pollution of "controlled waters". In so far as contaminated land is a source of pollution of controlled waters, it has been necessary to amend the relevant provisions of Part IIA of the 1990 Act and the 2000 Regulations to align the contaminated land regime with the requirements of the 2003 Act. The amendments have also accommodated a change in terminology from "controlled waters" to "the water environment" to ensure consistency of approach in the operation of the pollution control regime as provided for under the 2003 Act, with the provisions of Part IIA of the 1990 Act which concern contaminated land as a source of pollution of the water environment. Similar amendments have been made to the 2000 Regulations to ensure consistency of approach in the designation of special sites under those Regulations with the pollution control regime provided for under the 2003 Act.

This assessment has been undertaken with due regard to Contaminated Land Guidance documents issued by the Department for Environment, Food and Rural Affairs (and its Predecessors), the British Standards Institute (the BSi), the Royal Institution of Chartered Surveyors (RICS) and the American Society for Testing and Materials (ASTM) Standard E 1527-05. The methods used follow a risk-based approach, with the potential environmental risk assessed qualitatively using the ‘source-pathway-target pollutant linkage’ concept introduced in the Environmental Protection Act 1990.

Specific comment is made regarding the site’s status under the Contaminated Land Regime implemented on the 1st April 2000 as Part IIA of the Environmental Protection Act 1990, and the actual or potential designation of the site as ‘Contaminated Land’ as defined in Section 78A(2). Unless specifically stated as relating to this definition, references to ‘contamination’ and ‘contaminants’ relate in general terms to the presence of potentially hazardous substances in, on or under the site.

In addition, consideration has been given to a wide range of related topics including (where appropriate): environmental processes; current and foreseeable environmental legislation; the practices and duties of environmental regulators; the health and safety of occupiers and neighbours as affected by contamination; effects on the structure of buildings; and financial implications.

ENVIRONMENTAL RISK ASSESSMENT

The presence of contaminated materials on a site is generally only of concern if an actual or potentially unacceptable risk exists. Within the context of current UK Legislation, the interpretation of a "significant risk" is termed to be one where:

Significant harm is being caused or there is a significant possibility of such harm being caused, (where harm is defined as harm to health of living organisms or other interference with the ecological systems of which they form a part and, in the case of man, includes harm to his property); and / or, pollution of Controlled Waters is being caused.

- The potential for harm to occur requires three conditions to be satisfied:
- Presence of substances (potential contaminants/pollutants) that may cause harm (Source of Pollution).
- The presence of a receptor which may be harmed, e.g. the water environment or humans, buildings, fauna and flora (The Receptor).
- The existence of a linkage between the source and the receptor (The Migration Pathway).

Therefore, the presence of measurable concentrations of contaminants within the ground and subsurface environment does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm.

The nature and importance of both pathways and receptors, which are relevant to a particular site, will vary according to the intended use of the site, its characteristics and its surroundings.

In order to assess the contamination risk at the subject site the above rational has been applied and is discussed within Section 6 in the context of Contamination Sources and Potential Pollutant Linkages.

LIMITATIONS

WSP Environmental Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from WSP Environmental Limited; a charge may be levied against such approval.

WSP Environmental Limited accepts no responsibility or liability for:

a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and

b) this document to any third party with whom an agreement has not been executed.

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client) and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP Environmental Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

Where no site inspection is undertaken (for example a Desk Study Assessment or due to restricted site access), WSPE cannot comment on the potential for environmental concerns associated with the current use or structure including the presence of asbestos.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

WSPE are unaware of any proposed redevelopment plans and any reference made to actions that might be required in the event of redevelopment are made for information only.

Environment Agency Aquifer Classifications

The Environment Agency (EA) divide the underlying strata in England and Wales into Principal Aquifer, Secondary Aquifer and Unproductive Strata in line with the updated Groundwater Protection Policy (GP3) and the Water Framework Directive (WFD). This replaces the former designation of Major, Minor and Non Aquifers. The following is derived from the main policy document.

Principal Aquifers

These are geological strata that exhibit high intergranular and/or fracture permeability. They usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. Principal Aquifers equate in most cases to aquifers previously designated as Major Aquifer.

Secondary Aquifers

These include a wide range of geological strata with a correspondingly wide range of permeability and storage. Secondary aquifers are subdivided into two types:

Secondary A - permeable strata capable of supporting water supplies at a local rather than strategic scale and in some cases forming an important source of base flow to rivers. These generally equate to aquifers formerly classified as 'Minor Aquifers'

Secondary B - predominantly lower permeability strata which may in part have the ability to store and yield limited amounts of groundwater by virtue of localised features such as fissures, thin permeable horizons and weathering. These are generally the water bearing parts of the former 'Non-Aquifers'

In cases where it has not been possible to attribute either category A or B to a rock type, a designation of Secondary Undifferentiated has been assigned. In most cases, this means that the stratum in question has previously been designated as both Minor and Non-Aquifer in different locations due to the variable characteristics of the rock type.

Unproductive Strata

These are geological strata with low permeability that have negligible significance for water supply or river base flow

Regulatory Information Sources

Reference has been made to the Landmark Information Group data provision service. This includes information and data collated from several organisations, including the Environment Agency (EA), Department for Environment, Food & Rural Affairs (DEFRA), Health & Safety Executive (HSE), the Health Protection Agency (HPA), and the Coal Authority

Rebecca Shaw Archaeological Services

Westfield Farm, Caldercruix, West Lothian
Archaeological Survey

by Rebecca Shaw
5th June 2014

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Contents

Figures

1 Introduction

This report presents findings of a desk based assessment and archaeological walkover survey undertaken on an area of ground located at Westfield Farm, near Caldercruix in West Lothian (centred on NGR NS 862 678) (Figure 1).

The ground, which extends to 135.5 hectares approx, mainly comprises a mix of open rough grazing (marshy with rushes or heather) and improved grazing – there is also a small area of former opencast (Figure 2) which has been replanted (grass). The archaeological works were required to provide information during the public consultation process for a proposed planting scheme and help with the production of a Forest Design Plan. The report also includes an assessment of the value of any features that were located.

Rebecca Shaw Archaeological Services was appointed to carry out the works by Emma Stewart from Forestry Commission Scotland (Scottish Lowlands Forest District).

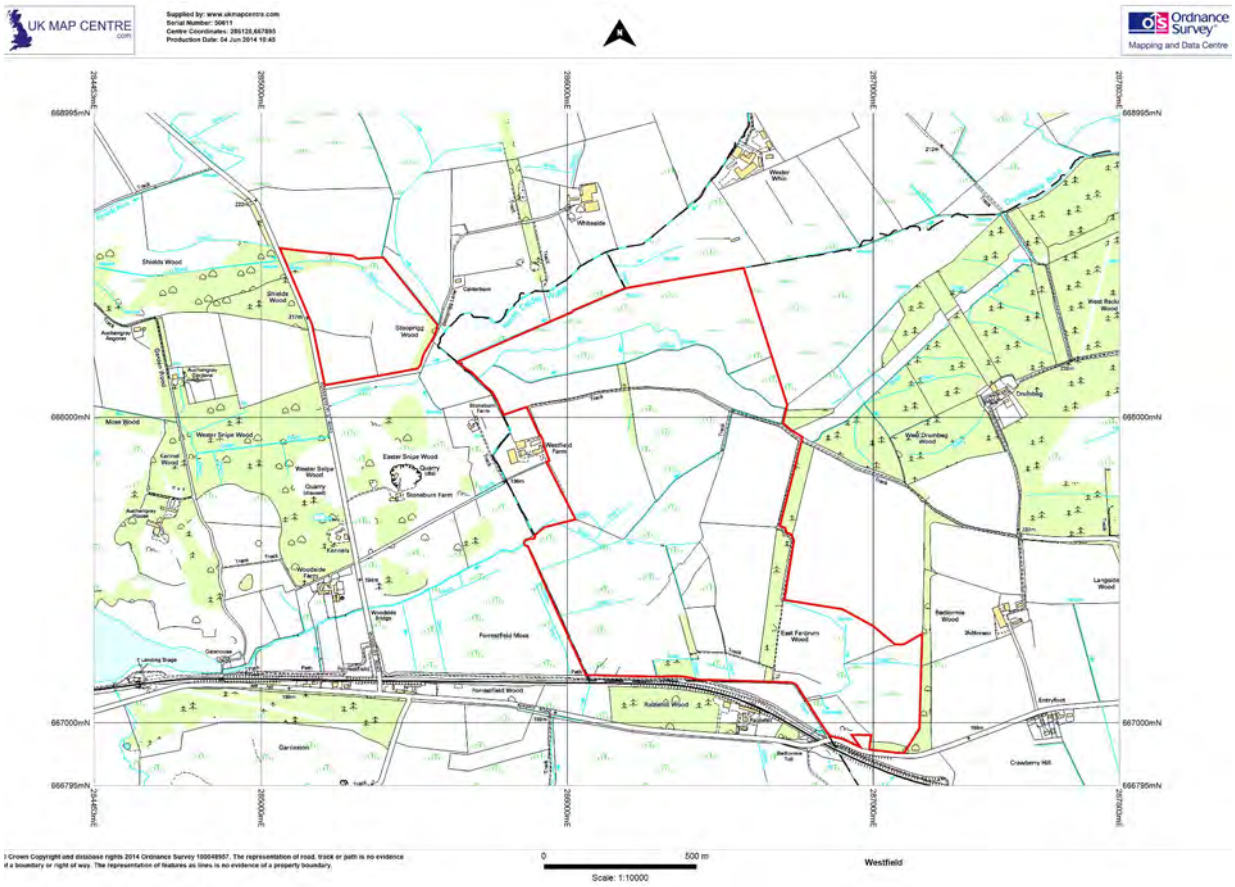

Figure 1 – map showing survey area (depicted in red)

2 Desk Based Assessment

The earliest sound mapping for the study area dates to the mid eighteenth century (Roy, 1747-55) and depicts a fairly high concentration of cultivation (rig & furrow) (Figure 3a).as well as a cluster of buildings (*possibly* named Green of Pond Lonney).

The first detailed mapping for the area, the 1st edition ordnance survey map (1856) (1:10,560) mainly depicts a mix of rough pasture and improved land. One site of possible archaeological interest was noted within the survey area: a farmstead called Westertoun comprising at least five roofed structures (one of which has a horse engine attached) as well as associated fields and a well to the south (**Site 1**). There is a strip of woodland depicted along the eastern edge of the site. On the 2nd edition ordnance survey map (1900) (1:10,560)

(Figure 3b) **Site 1** is now depicted as a two structures one of which is U-shaped and one L-shaped. The strip of woodland is named as Bedlormie Wood and two new woodland strips are shown, one of which is unnamed and one named as East Fardrum Wood. The subsequent map (1914-22) shows little or no change to the previous edition. By 1940 **Site 1** is depicted as two separate farmsteads, both comprising a number of buildings named as and named as East Westertoun and West Westertoun. East Westertoun is U-shaped and has the word *pump houses* associated and West Westertoun is L-shaped and has a *sheepwash* to the north. The farmsteads both alter over the following decades with buildings being added and removed. The farmsteads are still depicted in 1967 but no longer mapped in 1979.

Assessment of documentary sources indicated one archaeological site within the study area: Westertoun / Westertoun of Bedlormie – buildings NS 8677 6761. Sources also note that an archaeological watching brief that was undertaken during the earthworks for the (Bathgate to Newarthill Pipeline), which recorded: "topsoil finds may be attributed to the prehistoric period but no dateable features or finds. Some features from the medieval and later periods such as rig and furrow and ceramic drains. No further work recommended due to the general lack of finds" (GUARD 2005) (WoSAS ID 3380). The Edinburgh Gazette records in 1970 that the National Coal Board have submitted an application 'to work coal or cause or permit coal to be worked by opencast operations' (dated 27th March 1970).

A roughly 100m buffer zone outside the study area was also examined as part of the desk based assessment, which revealed one site of archaeological interest: St Johns Well (NS 8720 6739; NS86NE 4).

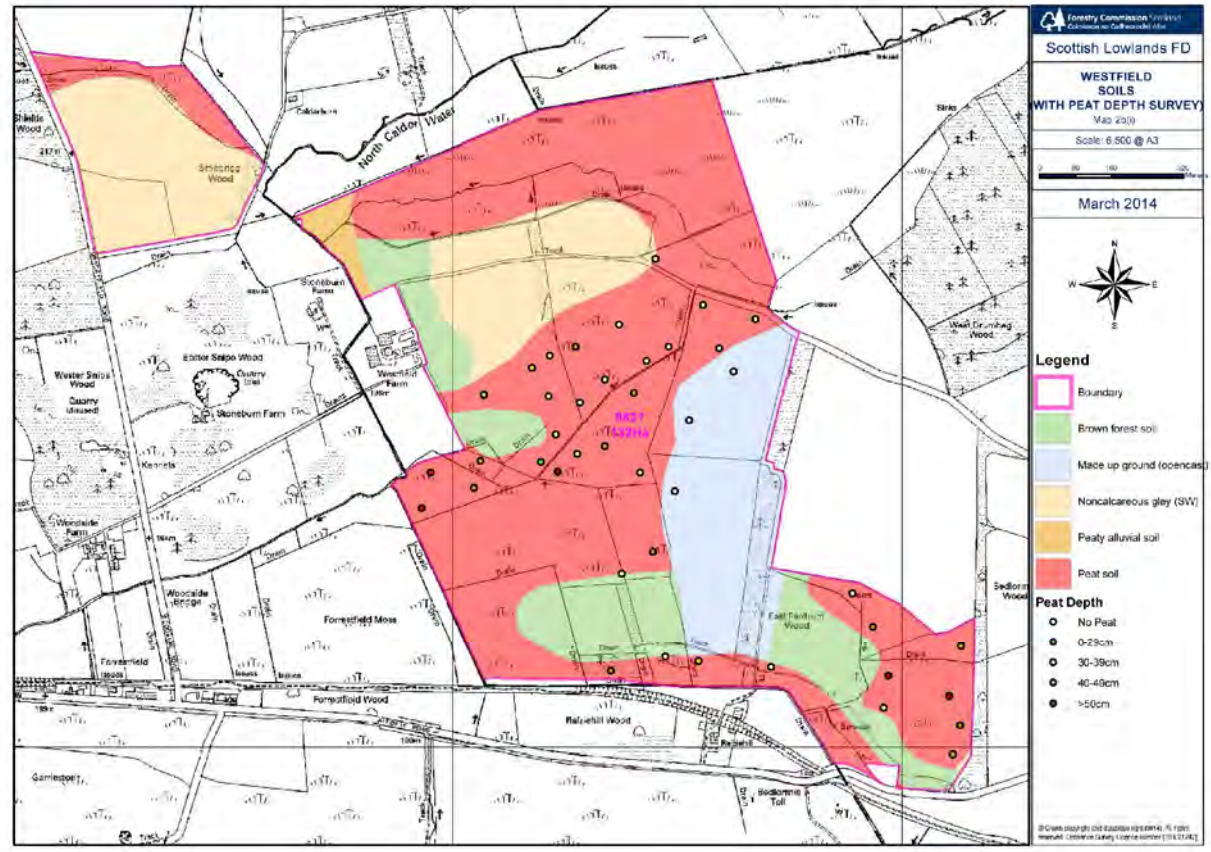

Figure 2 – soil map, showing location of previous opencast (kindly provided by Scottish Lowlands Forest District).

3 Walkover Survey – Findings

The comprehensive prospective walkover of the study area was undertaken in June 2014. Brief details of each of the sites are noted below with specifics documented in the gazetteer (page 11).

Site 2 demolition debris (centred on NS 86488 67844)

Site 3 clearance cairn (NS 86885 67218)

Site 4 rig & furrow (centred on NS 86865 67146)

Site 5 demolition debris (NS 86557 67295)

Site 6 small brick structure (NS 86067 67963)

There is a track which goes along the bottom (western) edge of the area of former opencast which comprises discreet areas of demolition debris (flattened) similar to **Site 2**).

4 Conclusions

An archaeological desk based assessment and comprehensive perspective walkover survey was undertaken in June 2014 on an area of ground located at Westfield Farm, near Caldercruix in North Lanarkshire (centred on NGR NS 862 678).

The archaeological works were required to provide information during the public consultation process for a proposed planting scheme and help with the production of a Forest Design Plan. The ground, which extends to roughly 135.5hectares, mainly comprises open improved ground. The objective of the study was to identify any archaeological sites within the proposed development area and where appropriate suggest measures to avoid any direct adverse impact on the archaeology.

The archaeological survey depicted the remains of seven sites of possible interest within the survey area. **Site 1** was the site of two farmsteads which historical mapping indicated dated to late 18th / early 19th century – opencast works circa 1970 have removed all remains of these sites. **Site 2** comprised a spread of demolition debris containing large section of broken concrete; concrete slabs and tarmac which are indicative of a floor surface or area of hard standing. **Site 3** comprised a stone clearance cairn, where stones were cleared off the land to allow an area to be cultivated, these sites can date from prehistoric to post medieval. **Site 4** comprised an area of rig & furrow – it is located fairly close to Site 3 and it probable that the two are contemporary. The style of rig & furrow is indicates 18th century and therefore is could be one of the areas on Roys map (Figure 3a) and could also be associated with the cluster of structures (*possibly* named Green of Pond Lonney). **Site 5** comprised a number of heaps of demolition debris (at least 7) with red bricks with the brickmark CAMPS – these are more than likely from a demolished structure(s) (there is a reference to 'Camps Lime and Brick Works, Wilkieston, West Lothian' in the Edinburgh Gazette, 1898). **Site 6** comprised a very small red brick structure, with a disused switch inside and a low opening in one of the side walls. This structure appears to be a watershed – these structures used to contain a pump which would need to be manually started to pump water to the farm (normally).

In conjunction with the map in Figure 7, the table below gives the significance of each site.

Site No	Site Type	Site Name	Importance	Significance
1	Farmstead	Westertoun	Local	-
2	Spoil heap (demolition debris)	-	Local	Low
3	Clearance cairn	-	Local	Moderate
4	Cultivation remains (rig & furrow)	-	Local	Moderate
5	Spoil heap (demolition debris)	-	Local	Low
6	Structure	-	Local	Low

Figure 3a – Roy (1747-55)

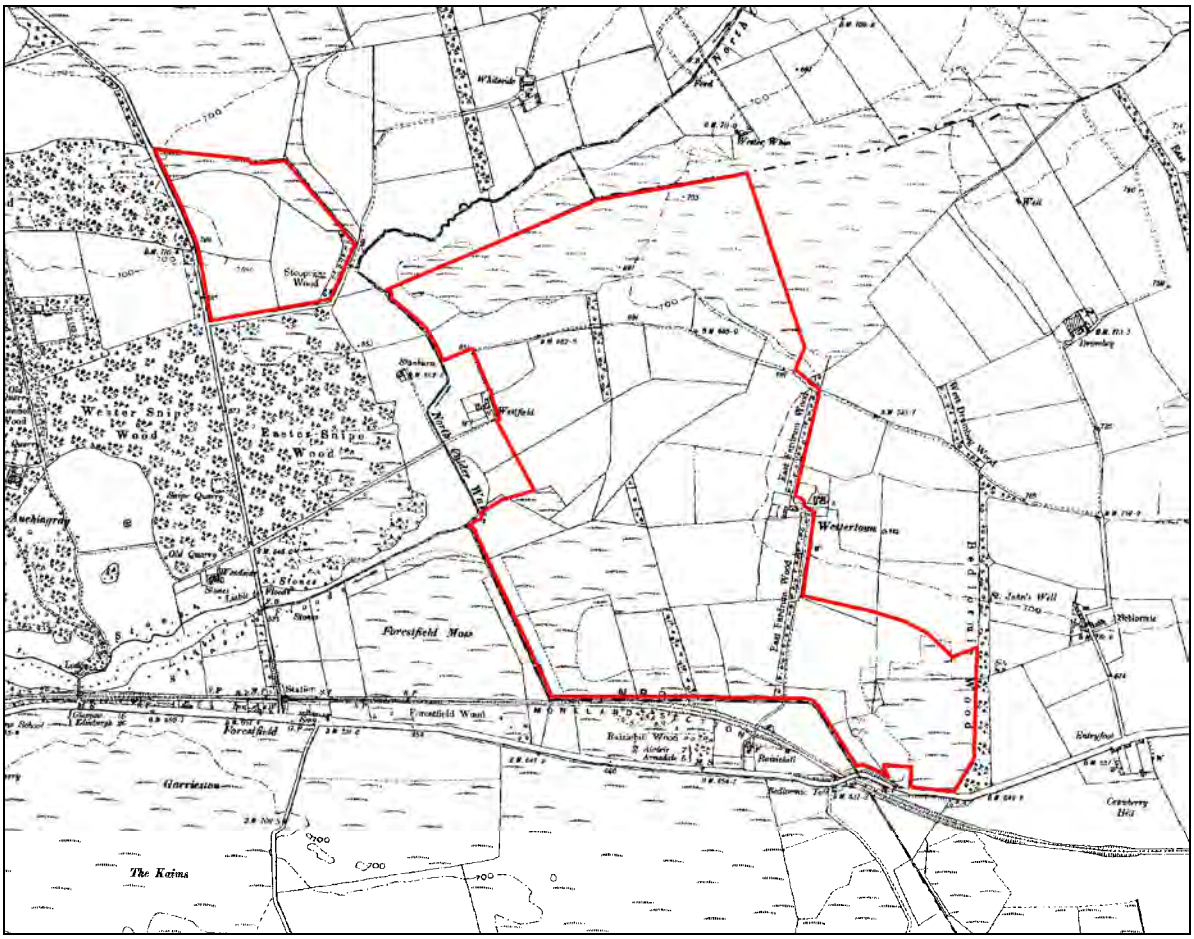

Figure 3b – Ordnance Survey (1899) (1:10, 560) © Crown Copyright and Landmark Information Group – not to be reproduced without permission - 2583125)

Figure 4a – clearance cairn (**Site 3**)

Figure 4b – area of rig & furrow (**Site 4**)

Figure 5a – showing rough (heather) ground along northern edge of site

Figure 5b – looking down through of one of the former field boundaries

Figure 5c – demolition debris at edge of former opencast area (**Site 2**)

Figure 6a – area of rig & furrow (**Site 4**)

Figure 6b – demolition debris (mostly bricks) (**Site 5**)

Figure 6c – small brick structure (watershed) (**Site 6**)

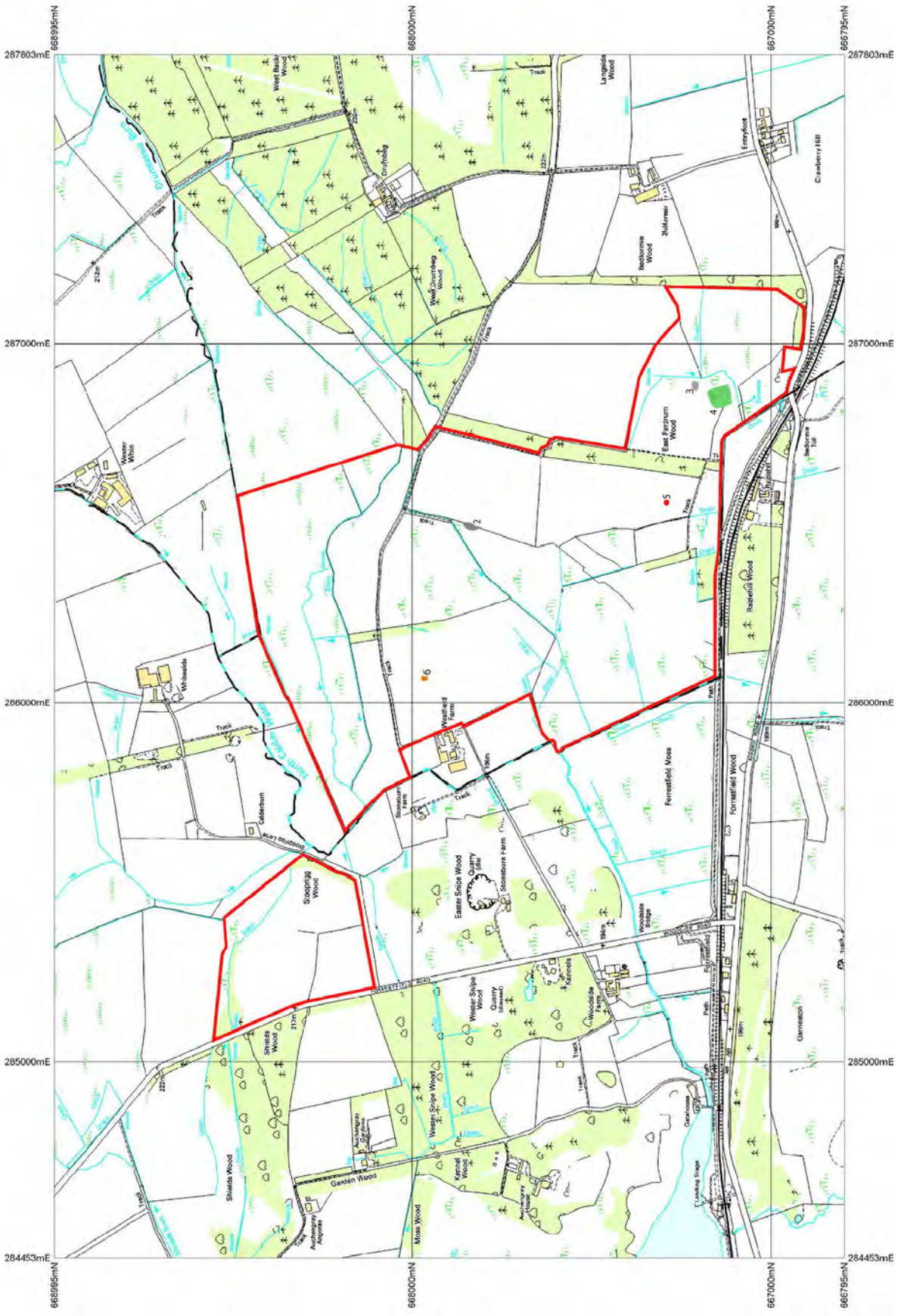

Figure 7 – site map indicating sites / areas of archaeological interest

References

Documentary

Forestry Commission	1995	Forestry and Archaeology Guidelines.

Cartographic

Ordnance Survey	1856	1st Edition Ordnance Survey, Linlithgowshire (1:10 560)
Ordnance Survey	1899	2nd Edition Ordnance Survey, Lanarkshire (1:10 560)
Roy	1747-55	Military Survey of Scotland

Appendix 1 – Gazetteer

NO.	NGR / NMRS No. HER No.	Name	Class	Description
1	NS 8677 6761 NS86NE 29 Canmore ID 82840 WoSAS ID18405	Westertoun / Westertoun of Bedlormie	Building(s)	A group of buildings depicted on the 1st edition of the 6-inch OS map, about 800m WNW of Bedlormie (Linlithgowshire 1865, sheet viii), have been destroyed by opencast mining. (CSW 4376). Visited by RCAHMS (PJD) 9 September 1992. Westerton of Bedlormie Information from West Lothian Archaeology Group Entered WoSAS (MO'H) 31/03/2011.
2	Centred on NS 86488 67844	-	Demolition Debris (concrete/ tarmac)	Large area of (modern) demolition debris mainly comprising: concrete; concrete slabs and tarmac (Figure 5c) – possibly from a floor or area of hard-standing.
3	NS 86885 67218	-	Clearance Cairn	Oval cairn of various sized stones (some very large rocks) (Figure 4a), aligned E / W and measuring 7.5m by 4.5m (at most).
4	Centred on NS 86865 67146	-	Area of Rig & Furrow	Area of rig & furrow (Figures 4b & 6a). Rigs aligned NE / SW and measuring up to 3m in width (at most)
5	Centred on NS 86557 67295	-	Demolition Debris (bricks)	Area comprising a number of heaps of demolition debris – bricks visible in at least two heaps (Figure 6b). Brick mark – CAMPS.
6	NS 86067 67963	-	Very small red brick structure	Very small red brick structure with an entrance in the W wall (Figure 6c) and a small opening at the base of the N wall. Structure appears to be no longer in use. Water pump house.
7	NS 8720 6739 NS86NE 4 Canmore ID 46717 WoSAS ID 17762	Bedlormie Wood / St Johns Well	Well	St John's Well is a very fine spring of pure cold water. It is enclosed with rough stone work and is never dry. It is not known how it obtained its name, nor is there any tradition in the neighbourhood regarding it. Name Book 1856. A stone-lined well with no

				appearance of great antiquity. No further information. Visited by OS (JFC) 8 March 1955.

Photographic Record

No.	Disc No.	B&W Digital No.	Disc No.	Colour Digital No.	Description	From	Date
1	-	-	1	1	General of heather area along N edge of site	E	3/05/2014
2	-	-	1	2	Looking down through one of the tree boundays	N	3/05/2014
3	-	-	1	3	Demolition debris (concrete; concrete slabs & tarmac) (**Site 2**)	NW	3/05/2014
4	-	-	1	4	Clearance cairn (**Site 3**)	N	3/05/2014
5	-	-	1	5	Area of Rig & Furrow (**Site 4**)	NE	3/05/2014
6	-	-	1	6	Area of Rig & Furrow (**Site 4**)	SSE	3/05/2014
7	-	-	1	7	Heaps of demolition debris (brick) (**Site 5**)	WNW	3/05/2014
8	-	-	1	8	Small brick structure (**Site 6**)	W	3/05/2014

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RBMP Water body information sheet for water body 10063 in Clyde

General details

Water body name:	North Calder Water (u/s Hillend Reservoir)
Water body Identifier code:	10063
Length:	6.51 km
Water body category:	River
Baseline:	Y
River basin district:	Scotland
Area advisory group:	Clyde
Catchment:	River Clyde
Associated protected areas:	River Clyde - FRESHWATER FISH (EXISTING)
Associated groundwater:	Clydesdale bedrock and localised sand and gravel aquifers
Responsible body:	SEPA North Lanarkshire
Heavily modified:	No
Artificial:	No
Typology:	Mid-altitude Small Calcareous
National Grid Reference:	NS 86576 68897
Latitude:	55.89978
Longitude:	-3.81556

Current status of this water body

We have classified this water body as having an overall status of Poor with Low confidence in 2008 with overall ecological status of Poor and overall chemical status of Pass.

This overall classification of status is made up of many different tiers of classification data. A complete set of classification data for 2008 is shown at the end of this document.

Targets for the future status of this water body

We have set environmental objectives for this water body over future river basin planning cycles in order that sustainable improvements to its status can be made over time, or alternatively that no deterioration in status occurs, unless caused by a new activity providing significant specified benefits to society or the wider environment.

For this water body we have set the overall environmental objectives for the first, second and third River Basin Management Planning (RBMP) cycles as:

Year	2008	2015	2021	2027
Status	Poor	Poor	Poor	Good

We have established an ongoing programme of monitoring in order to identify pressures on our water bodies. The pressures listed below contribute to this water body's failure to meet good ecological status. River basin planning allows us to plan improvements for particular parameters over time. We have collaborated with others to identify measures which will act to protect or improve our water environment in order that all water bodies reach good status over successive RBMP cycles.

Pressures and measures on this water body

The pressures listed below contribute to this water body's failure to meet good ecological status or potential. River basin planning allows us to plan improvements for particular parameters over time. We have collaborated with others to identify measures which will act to protect or improve our water environment in order that all water bodies reach good status over successive RBMP cycles.

The following table shows our collated information on the pressures on this water body, their causes and the measures which could be introduced to mitigate their effects. We have also indicated the current funding status of the measure; with projected measures being potentially funded and agreed measures having funding in place. Finally, we have included information on the potential or actual owner of the measure, the date it will be effective and information on the justification for extending the deadlines or for setting an alternative objective, where appropriate.

Pressure	**As a Result of**	**Assessment Parameter**	**Objective**	**Reasons for Failure**
	Measure	**Funding**	**Owner**	**Effective date**
Morphological Alterations	Impounding - weir / dam	Fish passage	Poor by 2015	Implementation of the measure by an earlier deadline would impose disproportionate burdens
	Removal of barriers or provision of mechanisms to enable fish migration	Neither Agreed nor Projected	British Waterways	31/12/2026
Morphological Alterations		Multiple Pressure	Good by 2015	
	Improvement to condition of channel/ bed and/or banks/ shoreline	Neither Agreed nor Projected	Landowner(s)	31/12/2014

Future work

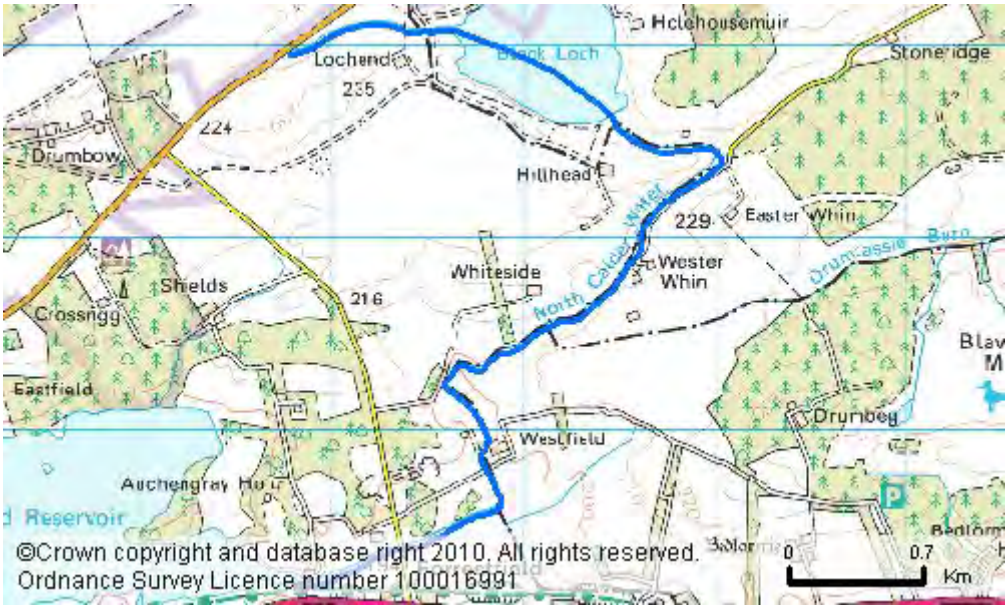
Additional work to identify pressures and to develop and implement measures to mitigate their impacts will continue over subsequent river basin cycles.

Complete classification for this water body in 2008

Parameter	Status	Confidence of Class
OVERALL STATUS	POOR	LOW
Pre-HMWB status	Poor	Low
Overall chemistry	Pass	Low
Priority substances	Pass	Low
Overall ecology	Poor	Low
Physico-Chem	High	Low
Biological elements	Poor	Low
Phytobenthos	High	Low
Macrophytes	High	Low
Benthic invertebrates	High	Low
Macro-invertebrates (acid)	High	Low
Macro-invertebrates (RiCT)	High	Low
Macro-invertebrates (ASPT)	High	Low
Macro-invertebrates (NTAXA)	High	Low
Alien species	High	Low
Fish	Poor	Low
Fish ecology	High	Low
Fish barrier	Poor	Low
Specific pollutants	Pass	Low
Hydromorphology	Moderate	Medium
Morphology	Moderate	Medium
Hydrology	High	Medium
Hydrology (impoundment)	High	Medium
Hydrology (abstraction)	High	Medium
Water quality	High	
Morphological pressures	Poor	

Location of this water body

You can find the geographical location of this water body by searching on water body ID in the interactive maps at www.sepa.org.uk/water/river_basin_planning.aspx



SEPA Contact Details: rbmp@sepa.org.uk

Westfield Farm, near Hillend Reservoir, Caldercruix

Report on site visit 14.12.11 to assess habitats

E Stewart, 16.12.11

I have mapped the general habitats as above to show the peatland areas in brown, grassland pastures in pale green and existing tree cover in dark green. Peatland areas correspond on the ground very well with GIS layers for peatland from BGS and James Hutton data.

The farm has been managed by agricultural contractors for many years. It is a dairy farm and they have focussed on installing good drainage (at 10yards rather than 20yards) and applying lots of manure to the fields. There has been a small opencast in the middle of the farm now restored, there are a few shelterbelts present that date from the 1800s through to the 1980s. The improved fields were very wet and poached but the farmer put this down to heavy rain recently.

Some peatland areas were not visited due to time restrictions. Blanket bog 1 was not visited but was seen from across the field and appears to be in good condition with a good depth of peat visible as an edge to the moss. The farmer reports seeing a good amount of wildlife on this moss including grouse. This section of bog is a Local Wildlife Site called Wester Whin, the FD does not have the accompanying data for this LWS yet.

Blanket bog 2 is a flat expanse of heavily grazed bog that appears to link across the western fence to Forrestfield Moss. It has an area of lagg habitat to the south and west and has a network of water-filled channels across it. Some drainage channels appear man-made but they are all full of water and the landscape is flat so the water has nowhere to go. Although this habitat is overgrazed it appears to have a good selection of active peat forming species present and would be likely to recover once grazing pressure

is removed. 2 brown hare were flushed from this section of ground. A small section of this bog has been isolated by drainage channels at location 'A'. It is too small, isolated and damaged to be able to restore to a useful bog habitat and so could be planted. There is a shelterbelt to the east that is also on the bog but the trees (SS, SP and Bi) have established well and sit on another isolated section of the bog.

Blanket bog 3 was not walked across but looked at over the fence. It appears to be an isolated section of peat covered by thick purple moor grass with occasional heather and some willow scrub along the western edge. This area may well be suitable for broadleaf planting as appears to currently be of poor value as a bog habitat. There was also a section of peat that can be seen extending into the middle of the farm from the NE of this section. It was not all walked across due to time restrictions but it appeared that some of this peat has been opencasted away and some has been improved to pasture. This section would therefore also probably be suitable for planting.

Blanket bog 4 was not visited but can be clearly seen on aerial photography as blanket bog with scattered broadleaves to the west. Although a peatland deposit that appears to have blanket bog vegetation, it may be that due to its size and location at the west of the site it could be acceptable to establish native broadleaves here and extend the birch woodland habitat present to the west.

Blanket bog 5 is a good section of blanket bog at the bottom of the sloping ground to the north. It has some lagg habitats and a good selection of active peat forming species present.

Blanket bog 6 is overgrazed but has a very good selection of active peat forming species including a very good covering of bog asphodel. There is lagg habitat present to the edges.

In summary, I would suggest the following evaluation:

Blanket bog 1	Not suitable for planting
Blanket bog 2	Not suitable for planting apart for section A
Blanket bog 3	Probably suitable for planting
Blanket bog 4	Probably suitable for planting
Blanket bog 5	Not suitable for planting
Blanket bog 6	Not suitable for planting

Other information:
The farmer explained that there is an issue outstanding about the land down by the railway line. Network Rail is still to pay some money to the farmer as compensation relating to changes now the railway line has been reopened. There would be another small bit of land to come to the new owner that is not shown on the sales particulars once this deal has been concluded. He said that the march fence is along the railway line and not as shown on the sales plan. I think the land in question is a small hillock of mineral soil with some lagg wetland to the east. Network Rail have told the farmer they have no money to pay him just now but the issue is with his lawyers.

FES Open Habitats Ecologist Habitat Survey Report

Westfield Forest, NS863678

7th of August 2013

Present

Jeff Waddell	FES Open habitats Ecologist	FES Head Office.
Colin Barr	Voluntary Job Experience	Scottish Lowlands Forest District.

Site Map

Refer to files "Westfield Habitat Map 7th August 2013" for the habitat maps and "Westfield Habitat Data Table 7th August 2013" for the survey data.
An advisory report has also been produced, see the file "Westfield Forest Open Habitats Advisory Report 7th August 2013", this should be referred to in conjunction with this survey report and data.

Bogs

The most significant habitats on the site by both conservation significance and area were bogs. Four separate Lowland Raised Bogs and a single Intermediate Bog are present.

The bog vegetation was quite varied and depended largely on the recent management history of the individual peatlands. The large, un-named Intermediate Bog in the north of the site had the least modified vegetation with some Mire 18 *Erica tetralix-Sphagnum papillosum* Cross-leaved Heath-Papillose Bog-moss mire present in the flat centre of the bog. This was the rarest and most natural vegetation encountered on the survey and included occasional frequency Austin's Bog-moss *Sphagnum austinii*, a rare species associated with the least modified bogs in the UK. Mire 19 *Calluna vulgaris-Eriophorum vaginatum* Heather-Hare's-tail Cotton grass mire was common in the flat centre of the intermediate bog and extended onto the rand slopes, with Mire 15 *Trichophorum cespitosum-Erica tetralix* Deer-grass-Cross-leaved Heath wet heath and Mire 25 *Molinia caerulea-Potentilla erecta* Purple-moor Grass-Tormentil mire in the western most, steepest part of the rand.

The three Lowland Raised Bogs were dominated by vegetation indicating much more intensive management, such as burning, drainage, peat cutting and heavy grazing. I.e. Mire 15 and Mire 25. But in the wetter areas of Forestfield Moss there was some Mire 17 *Trichophorum cespitosum-Eriophorum vaginatum* Deer-grass-Hare's-tail Cottongrass blanket mire indicating better condition vegetation and hosting Papillose Bog-moss. The highly modified lowland raised bogs in the far north-west of the site had developed quite a high cover of W4 *Betula pubescens-Molinia caerulea* Downy Birch-Purple-Moor Grass woodland.

Lowland Fens and Purple-moor Grass & Rush Pastures

The second most significant habitat encountered in conservation terms were the lowland fens, although these did not occupy more than a few hectares of the site. All of the fens were associated with bogs, being part of the same peatland macrotope and most of the fens were on deep (>50cm) fen peat.

The largest fen was the Lagg Fen in Forestfield Moss which straddles the boundary of the FES estate and private land to the west. This was on deep wet fen peat and was largely dominated by Sharp-flowered Rush *Juncus acutiflorus* with M6d *Carex echinata-Sphagnum*

recurvum/auriculatum mire, Sharp-flowered Rush sub community mire in the more acid areas and M23b Soft-rush-Common Marsh Bedstraw *Juncus effusus-Galium palustre* mire in the more neutral groundwater areas. There was also some M4 Bottle-sedge-Bog-moss *Carex rostrata-Sphagnum recurvum* mire in the wettest parts.

There was also some fen vegetation just north of Raziehill in the south of the site. In this peatland it occurred in two situations, around the north of the lowland raised bog, were bog peat had been cut down to the lower zone of fen peat, allowing the fen vegetation to colonise the cuttings and in a valley mire fen to the east of this, which appeared not to be a cut over bog. The main vegetation here was Mire 23b with Mire 23a Sharp-flowered Rush-Common Marsh Bedstraw mire and Mire 6c also present. The vegetation was species rich with for example Marsh Cinquifoil *Comarum palustre*; Devil's-bit Scabious *Succisa pratensis* and Greater Bird's-foot Trefoil *Lotus pedunculatus*. The wettest parts of the valley mire fen had S10 Water Horsetail *Equisetum fluviatile* swamp.

Neutral Grasslands

Damp neutral grasslands occupied the moderately agriculturally improved parts of the site with Mire 10 Yorkshire-fog-Soft-rush *Holcus lanatus-Juncus effusus* rush pasture and to a lesser extent Mire 9 Tussock Grass-Yorkshire-fog *Deschampsia cespitosa-Holcus lanatus* grassland present.

Improved Grasslands

Improved grasslands occupied the most agriculturally improved parts of the site with MG7 *Lolium perenne-Trifolium repens* Rye-grass-White Clover leys present.

Polygon 2: Degraded remnant of lowland raised bog at foot of slope with W4 woodland.

Polygon 29: Forestfield Moss viewed from east side, degraded lowland raised bog with M25 vegetation.

Polygon 28: Forestfield Moss, viewed from western side of FES estate, looking north east. This bog has been burnt in recent years as indicated by the abundance of Mire 15 and Mire 25 vegetation. Better condition Mire 17 is present as well however.

Polygon 9: Rather undisturbed Mire 19 and Mire 18 showing lack of recent fire in centre of intermediate bog in north of site.

Polygon 9: The rare Austin's Bog-Moss is present in Mire 18 vegetation here indicating little or no recent burning.

Polygon 8: The bog axiophyte (indicator plant) Cranberry *Vaccinium oxycoccus* was present in small amounts.

Polygon 19: Valley mire fen with M23b vegetation containing frequent Angelica.

Polygon 26: Forestfield Moss, lowland fen on western FES boundary, Sharp-flowered Rush dominated M6d.

Polygon 26: Forestfield Moss, lowland fen on western FES boundary, Bottle Sedge dominated M4.

Polygon 27: Viewed from eastern edge, looking south-west. Small transitional band of M25c on edge of bog M25 and fen M23a, gives way to more extensive M23a.

Polygon 17: Species rich fen in re-vegetated peat cutting with abundant Marsh Cinquefoil *Comarum palustre*.

Species poor MG10 dominated by Soft-rush, most of the neutral grassland present on site looks like this.

Circulation

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Species

Blackridge, West Lothain

Issue record

Issue	Date	Prepared by	Checked by	Approved by
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Comment from SLFD E&H team: the phase 1 report contradicts a previous report and may not be accurate

INTRODUCTION

This report has been prepared by Peak Ecology Ltd on behalf of Forestry Commission Scotland. It provides details of a protected species assessment of an area of farmland known as Westfield Farm. This relates to the proposed changes in land use. It is understood that some areas are to be planted for forestry purposes.

An Extended Phase 1 habitat survey(i.e. including protected species) was carried out on 3rd October2012. The primary focus of the survey was to assess the use and value of the site by protected and priority species and the potential for the site to host breeding birds.

METHODOLOGY

Field Survey

The site was surveyed using standard Phase 1 Habitat assessment methodology (Joint Nature Conservation Council, 2010) with a primary focus on assessing the presence, or potential for, species that are either protected by law or of a priority conservation status. This involved a walkover of the survey area to classify and map the habitats present within the survey boundary, marking all such features on a base map. In addition detailed target notes were used to record the nature of the habitats present and any protected species features of interest. The extended Phase 1 Habitat map is shown in **Figure 1**. Target notes are provided in **Appendix A**.

Survey Constraints

It should be noted that the absence of certain protected or rare species does not preclude their presence on a site. There is always a risk of a protected or are rare species being over-looked, either owing to the timing of the survey or the scarcity of the species at the site.

The survey that was undertaken was an Extended Phase 1 Habitat Survey; therefore plant species lists are not extensive. It should also be noted that the primary objective of this survey was to access the presence of, or habitat potential for, protected or priority species (i.e. zoological interest) and not botanical interest.

RESULTS

Overview ofHabitats

The dominant habitats at the site consist of raised bog and grassland habitats. The majority of the grassland habitat at the site is marshy grassland with a small area of semi-improved grassland (of acid nature) in the northern part of the site. On the northern boundary of the site is a small area of wet flush habitat. There are three small areas of mixed plantations and a small conifer plantation within the site.

Conifer Plantation

Conifer plantation at the site consists of two narrow strips along the farm tracks. One of these consists of mature plantation with a lot of windblow (running north-south along the track) whilst the other (running west-east) consists of young plantation. These provide nesting habitat for woodland and woodland-edge bird species.

Mixed Plantation

Mixed plantation consists of a small area in the southeast corner of the site (NS868 670) and a second area located to the east of Westfield Farmhouse (NS854 684). These consist of pine*Pinus sp.*, beech *Fagus sylvatica*and sycamore *Acer pseudoplatanus*and provide suitable nesting habitat for birds, but are unsuitable for roosting bats.

Acid Grassland

Acid grassland at the site consists of a narrow strip separating the southern boundary of the northern blanket bog from the farm track (NS861 681). This area is semi-improved in nature and grazed by sheep.

Improved Pasture

There is one large improved pasture field covering the north-eastern block at the site (NS854 682). This has a very short sward and is unlikely to host protected or priority species.

Marshy Grassland and Raised Bog

Marshy grassland and raised bog are the dominant habitats at the site. These habitats cover the vast majority of the site and it is likely that the marshy grassland areas were originally bog habitat that has been drained over several decades. The remaining areas of bog show signs of modification (drainage ditches). These habitats have potential to be of interest for breeding birds, particularly waders.

Wet Flush

There is a small area of wet flush on the northern edge if the site (NS857 682). This area is just outside the site boundary but provides suitable nesting habitat for snipe *Gallinago gallinago*as well as suitable habitat for dragonflies.

Overview of Protected and Priority Species

Badger

No signs of badger*Meles meles* were recorded during the survey. The majority of the open areas are too wet for badger setts.

Bats

No evidence of bats was recorded during the survey and habitats were unsuitable for roosting bats, but potential foraging habitat along plantation and wooded edges was present.

Red Squirrel

No evidence of red squirrels *Sciurus vulgaris*was found during the survey. The woodland areas are small and isolated leading to them being unlikely to host red squirrels.

Breeding Birds

All native bird species are afforded general protection under the Wildlife and Countryside Act 1981 (as amended). In addition some species are afforded extra protection via Schedule 1 of the Act or via the EC Birds Directive, referred to here as species with 'enhanced protection'. The site is likely to host a number of breeding bird species associated with upland farmland and moorland including snipe, curlew *Numenius arquata*and lapwing*Vanellus vanellus*. It would be advisable that a breeding bird survey is carried out to access the sites interest for these species.

Other Species of Note

Other species of note recorded during the walkover survey consisted of brown hare*Lepus europaeus*.

ASSESSMENT OF IMPACTS OF LAND USE ON PROTECTED & PRIORITY SPECIES

This section assesses the potential impact of the changes in land use on the species present at the site. For quick reference purposes each species/species group is considered individually.

Mammals

There is some (limited) potential for red squirrels in the conifer and mixed plantations, but this is reduced by the isolated nature of these areas. The only other mammal species of note recorded during the survey was brown hare. The site is largely unsuitable for badger. Planting areas within the site for forestry purposes, or any other changes in land use are unlikely to have negative impacts on protected or priority mammal species.

Woodland Birds

Woodland birds consisted of common species such as woodpigeon*Columba palumbus* and carrion crow*Corvus corone*. The conifer plantations are narrow and exposed which limits their interest for small woodland bird species. Changes in land use (other than felling the conifer plantations) are unlikely to impact on woodland bird species at the site.

Farmland and Upland Birds

Upland and farmland birds are likely to be the most noticeable species at the site. The site is dominated by areas of bog and marshy habitat that provides suitable nesting habitat for waders and other upland nesting bird species. Changes in land use (particularly forestry planting) are likely to have a significant impact on these species (if present) and it is therefore advised that a breeding bird survey is carried out to access the presence of these species on the site.

Figure 1:Extended Phase 1 Habitat Map

CONCLUSIONS

The primary purpose of this survey was identify the presence of protected or priority species at the site. The secondary purpose was to assess the sites potential to host such species, and the sites potential for breeding birds.

Mammals

The only mammal species recorded during the survey was brown hare and the habitats at the site are highly suitable for this species. The site is also suitable for roe deer*Capreolus capreolus*, but the potential for other species such as badger or red squirrel is limited. There are no watercourses on site to host otter or water vole. Habitat was unsuitable for roosting bats but foraging habitat along plantation and wooded edges was present.

Woodland Birds

The plantations at the site are likely to host a range of woodland, scrub and woodland edge species such as blackbird*Turdus merula*, chaffinchFringilla coelebs and siskin*Carduelis spinus*.

Farmland and Upland Birds

The site is likely to be of interest to upland and farmland breeding bird species skylark and breeding waders. It would be advisable that a breeding bird survey is carried out at the appropriate time of year.

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APPENDICES

Appendix A – Features and Photographs

Target note numbers refer to locations in Figure 1.

Feature	Target Notes	Description	Photograph
Habitats			
Conifer Plantation (A1.2.2)	13	Conifer plantation consisted of a narrow strip of conifers along the eastern boundary of the site. This was fairly open in nature with the entire middle section consisting of windblow. Provides suitable habitat for common species such as siskin and woodpigeon. A second area of young conifers was located to the north of the farm track at NS867 679. This are provides suitable nesting habitat for small songbirds such as mistle thrush *Turdus viscivorus*and willow warbler*Phylloscopus trochilus*.	
Mixed Plantation (A1.3.2)	15	There is an area of mixed plantation located on raised bog at NS868 670. This provides suitable nesting habitat for a wide range of bird species. A second area of mixed plantation is located in the north-eastern corner of the site at NS869 669. A third area of mixed plantation consisting of pine, beech ad sycamore *Acer pseudoplatanus*is located on the eastern edge of the improved pasture at NS854 684.	
Lone Trees (A3.1)	4	There are a number of trees scattered around the site, mainly beech and oak*Quercus sp*.	-

Feature	Target Notes	Description	Photograph
Acid Grassland (B1.2)	7	This consists of semi-improved pasture to the north of the farm track that crosses the site at NS861 681. The grassland is on the southern edge of the raised bog to the north of the farm track.	
Improved Pasture (B4)	17	Improved pasture at the site consists of a large field (with a defunct hawthorn*Crataegus monogyna* hedge running up the centre). This is located at the north-western part of the site (NS854 682).	
Marshy Grassland (B5)	3, 12, 14	NS859 680. Along with raised bog, marshy grassland is the dominant habitat at the site. This habitat is suitable for upland nesting birds, particularly snipe and meadow pipit.	
Raised Bog (E1.2)	7, 8, 15	NS859 682. On the northern side of the farm track leading east from Stoneburn Farm the habitat is dominated by raised bog. This bog shows signs of modification illustrated by drainage ditches around the outside of the bog. The bog provides good nesting habitat for upland bird species.	
Wet Flush (E2)	9	NS857 682. On the north edge of the bog in the northern part o dreg site is a small area of wet flush separating the bog from the southern bank of the North Calder Water. This provides good nesting habitat for snipe and reed bunting*Emberiza schoeniclus*, however it is just outside the site boundary.	
Zoological Interest			

Feature	Target Notes	Description	Photograph
Breeding Birds	3, 4, 5, 6, 7, 9, 11, 12, 13, 15, 18	The site is likely to be of interest for upland breeding birds. Species likely to use the site include moorland/farmland species such as snipe, curlew, lapwing, meadow pipit and skylark as well as woodland and moorland fringe species such as woodpigeon, warblers and pied flycatcher*Ficedula hypoleuca*.	   
Brown Hare	8	During the survey a brown hare was seen on the raised bog at NS86538 68144.	

Appendix B – Species Lists (lists non exhaustive)

Flora

Common name	Scientific name
Beech	*Fagus sylvatica*
Pine	*Pinus* sp.
Silver birch	*Betula pendula*
Hawthorn	*Crataegus monogyna*
Ling	*Calluna vulgaris*
Purple Moor Grass	*Molinia caerulea*
Broadleaved Dock	*Rumex obtusifolius*
Rosebay Willowherb	*Chamerion angustifolium*
Rowan	*Sorbus aucuparia*
Dog Rose	*Rosa canina*
Hazel	*Corylus avellana*
Sycamore	*Acer pseudoplantanus*

Fauna

Common name	Scientific name
Brown hare	*Lepus europaeus*
Carrion crow	*Corvus corone*
House Martin	*Delichon urbicum*
Meadow pipit	*Anthus pratensis*
Mistle Thrush	*Turdus viscivorus*
Pied wagtail	*Motacilla alba*
Siskin	*Carduelis spinus*
Snipe	*Gallinago gallinago*

Common name	Scientific name
Swallow	*Hirundo rustica*
Woodpigeon	*Columba palumbus*

Westfield walkover

Date : 04.06.2013 & 10.06.13

Weather : warm and sunny.

Timing : 012.00 till 17:30 & 0230 till 07.30
Surveyor : Kelvin Wilson

Survey Results

Stooprigg Wood

During the walkover a buzzard was seen flying over this general area, but was not obviously hunting to feed chicks.
The main features are the existing hedgerows, of which the best example is the roadside one with a mix of species and not over managed, possibly due to the overhead power lines. This hedge if fenced on both sides. The other 2 hedges running east-west and north-south are sporadic hawthorn, but could be developed to create a linear connection between the old mixed wood to the east and the private woodland to the west, which would be good for birds and bats, as well as mammals.
The mature mixed woodland to the east has high potential for bat roosts, and is not too far from the private woodland to the south. There are old nests in this wood, probably used by crows this year given their presence during the survey (NS 85561 68297 & NS 85361 68276).

The watercourse running east west to the north of this area is heavily grazed by sheep (present during survey) and also takes the run off from the public road. There were no signs of water vole observed along this stream.
The pocket of open birch wood has an embankment within it where a number of holes are located. Given the presence of high numbers of rabbit dropping and limited soil excavation o would suggest this is currently a rabbit warren. One hole had been recently excavated, possibly by a fox seeking food. The level of excavation, lack of bedding and latrines would suggest this is not a badger sett. This embankment runs almost to the road and here there is a crossing place under the boundary fence leading to the private woodland. (NS 85080 68504)

East Fardrum Wood

A numbers of meadow pipits and skylarks are using the area of wet pasture to the east of the shelterbelts.
2 nests were seen in the shelterbelts (NS 86696 67557 & NS 86667 67279). These are most likely used by the crows and pigeons that were present on site, though the southerly nest is much larger and may have been a buzzard nest in the past.

Approx 50% of this shelter belt is blown giving potential for further nesting, though it is advisable that they belts are felled before blowing completely. This will leave a small belt of oak/beech and some birch to the south.
Given the level of blow and disturbance from sheep it is difficult to assess whether there is any mammal activity within these belts at present.

Raiziehill wood to Westfield farm

Again a number of meadow pipits and skylark were observed in this area gathering food for young, as was a fox, roe buck and 2 brown hare. The water courses here are again heavily grazed by sheep and no signs of water vole were seen.

Raizielhill wood contains some good broadleaf deadwood (active crow nest NS 86386 67294) both standing and fallen hardwood.

Walking north a single small hole was observed at NS 86507 68188, though it did not look to have been occupied.

The shelterbelts to the easy of Westfield farm also have some good standing and fallen deadwood within them.

A fox and curlew were observed on the moss to the north.

Note

There were a large number of sheep grazing the property during both visits.

Objective	Concept Zone Applicable	Woodland Applicable	Methodology	Monitoring Method	Monitor Where	Monitor When	Monitor Who	Record Monitoring Where	Evaluation. *How does the Appraisal and Monitoring method inform current & future proposals? If you cannot answer this question then the methods may not be appropriate.*
Plant site suited species for timber production where site conditions allow									
Include productive conifers where appropriate in the landscape									
Suitable pest management to ensure success of planting and regeneration					Onsite				
Preserve the most important views within the site and enhance where possible					On site				
Protect known historic features					On site				
Develop options for expansion of native woodland Improve quality of bog, and minimise impact of planting					Onsite Forester GIS Onsite Forester GIS				