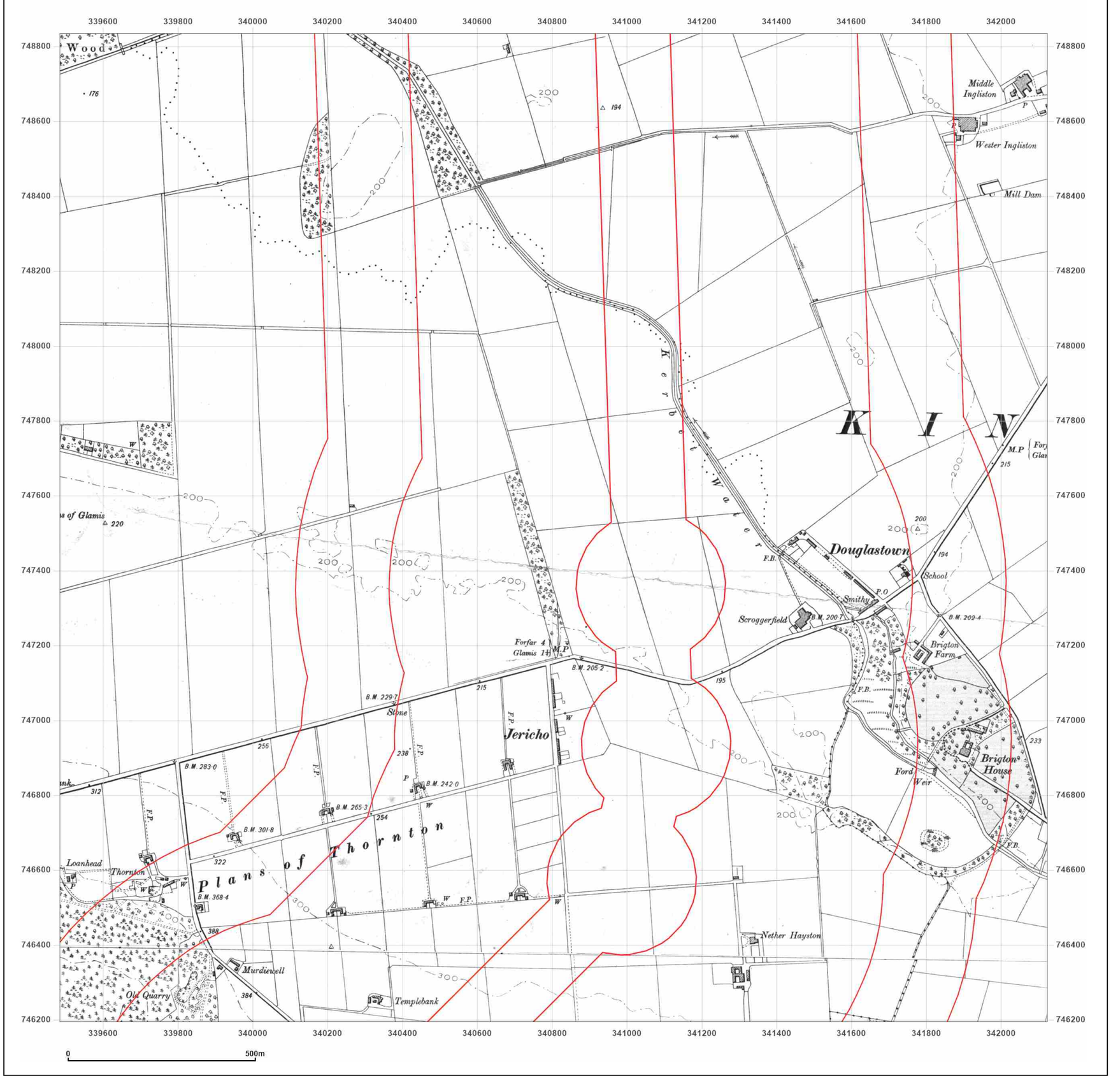

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_5
Grid Ref: 340803, 747514

Map Name: County Series

Map date: **1901**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1861
Revised 1901
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1861
Revised 1901
Edition N/A
Copyright N/A
Levelled N/A

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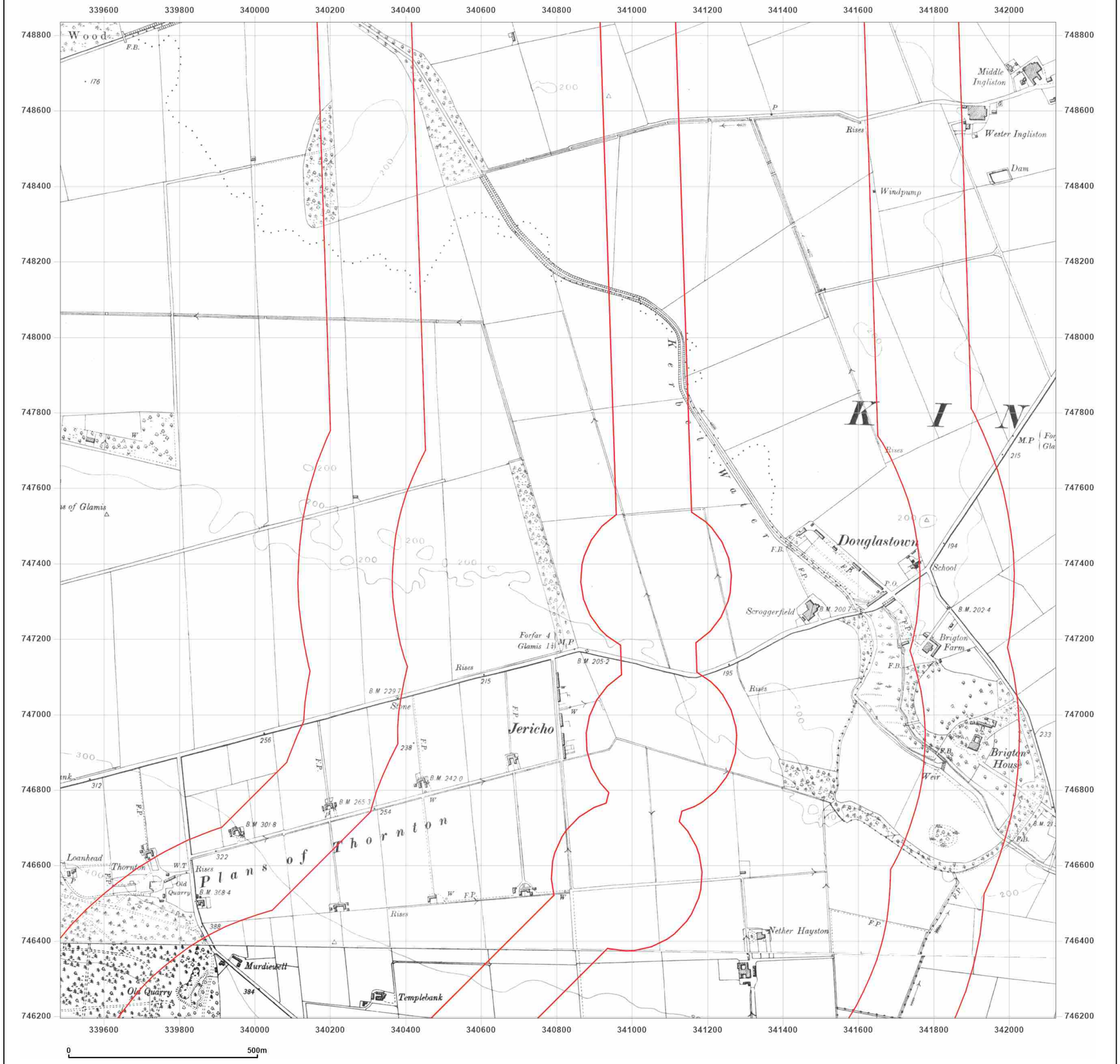

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_5
Grid Ref: 340803, 747514

Map Name: County Series

Map date: **1926-1927**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1861
Revised 1927
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1861
Revised 1926
Edition N/A
Copyright N/A
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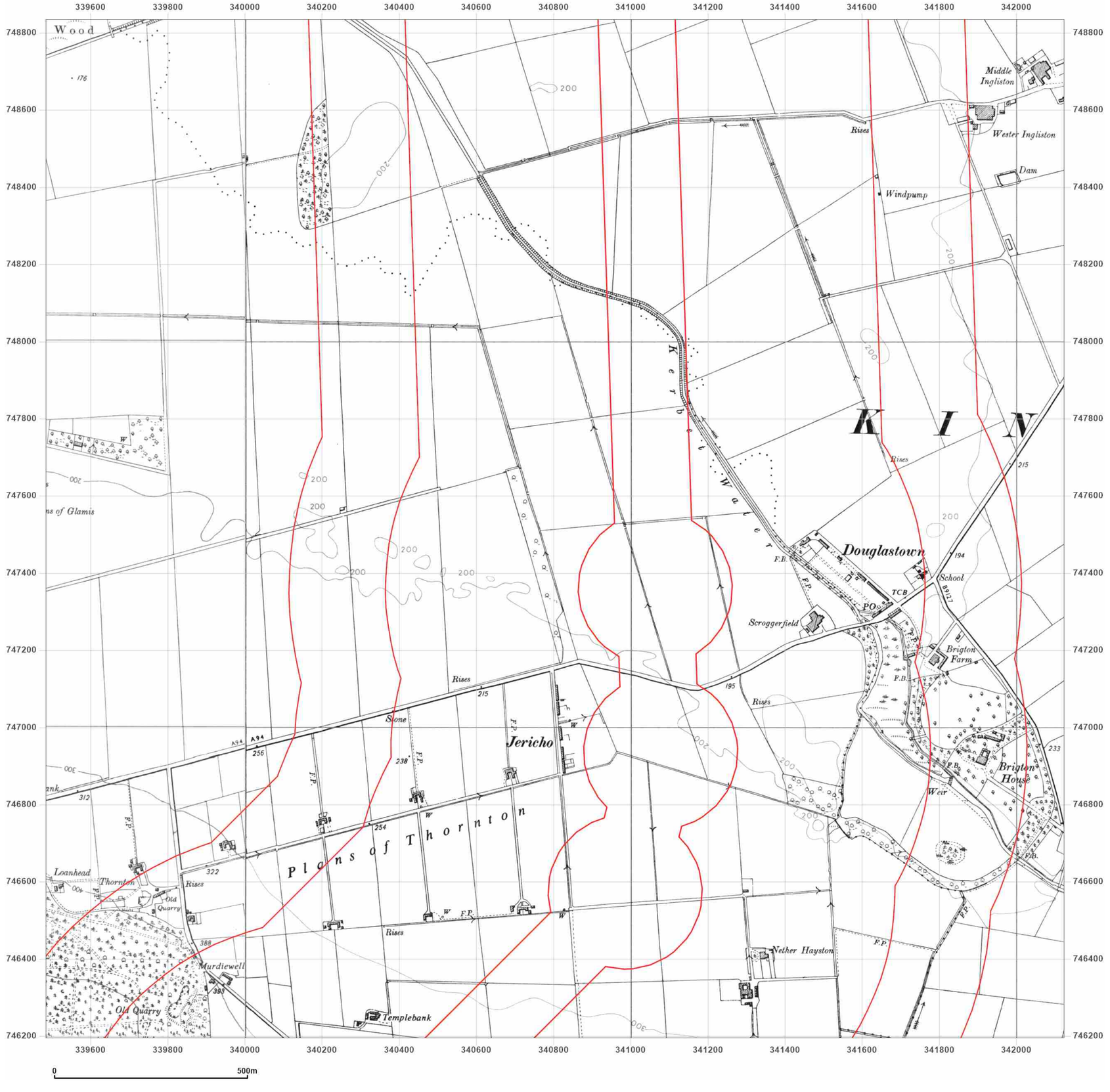

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_5
Grid Ref: 340803, 747514

Map Name: Provisional

Map date: **1955**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
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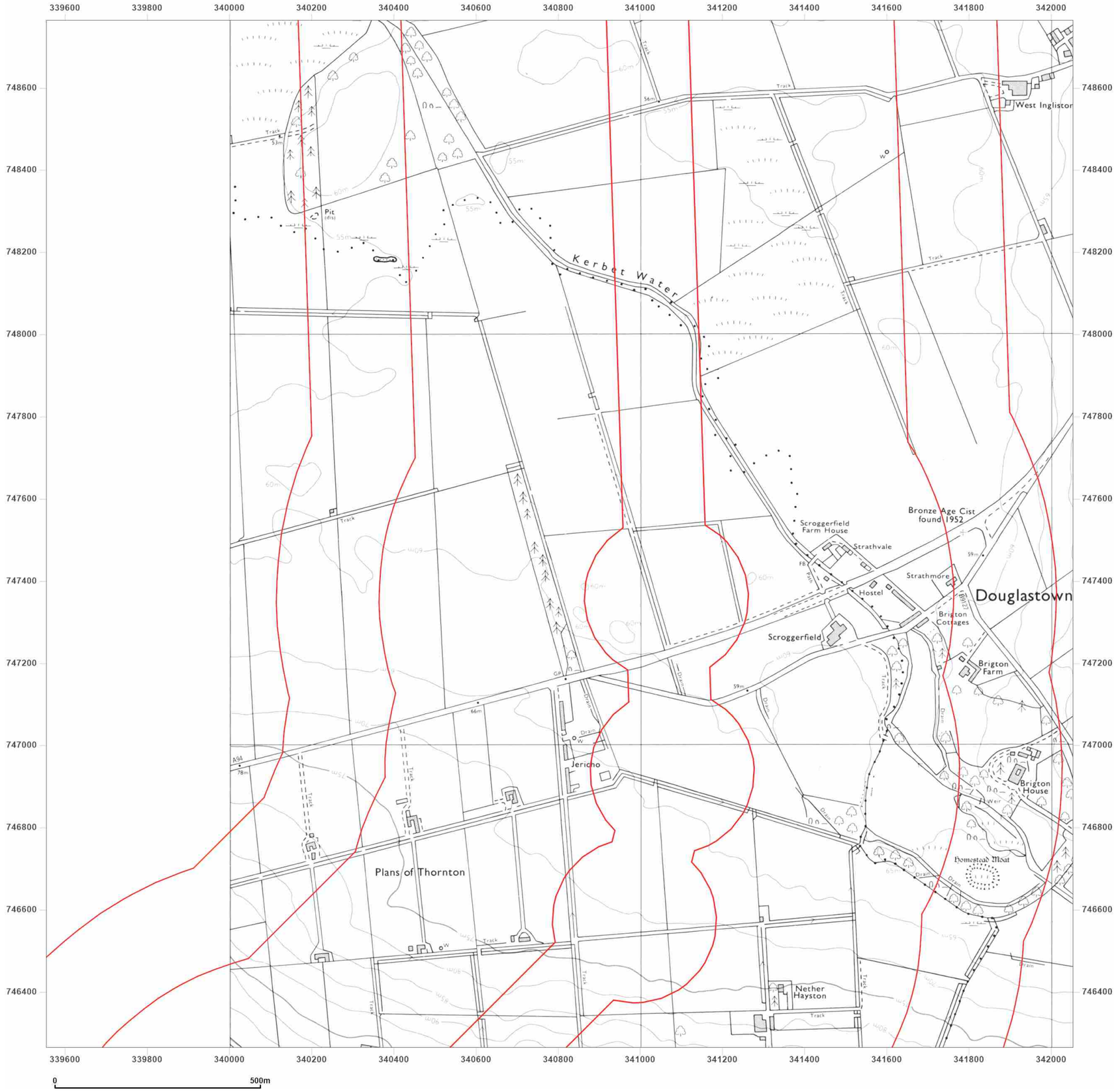

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_5
Grid Ref: 340803, 747514

Map Name: National Grid

Map date: **1974**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1972
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

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Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_5
Grid Ref: 340803, 747514

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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www.groundsure.com/sites/default/files/groundsure_legend.pdf

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_5
Grid Ref: 340803, 747514

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

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Production date: 08 September 2025

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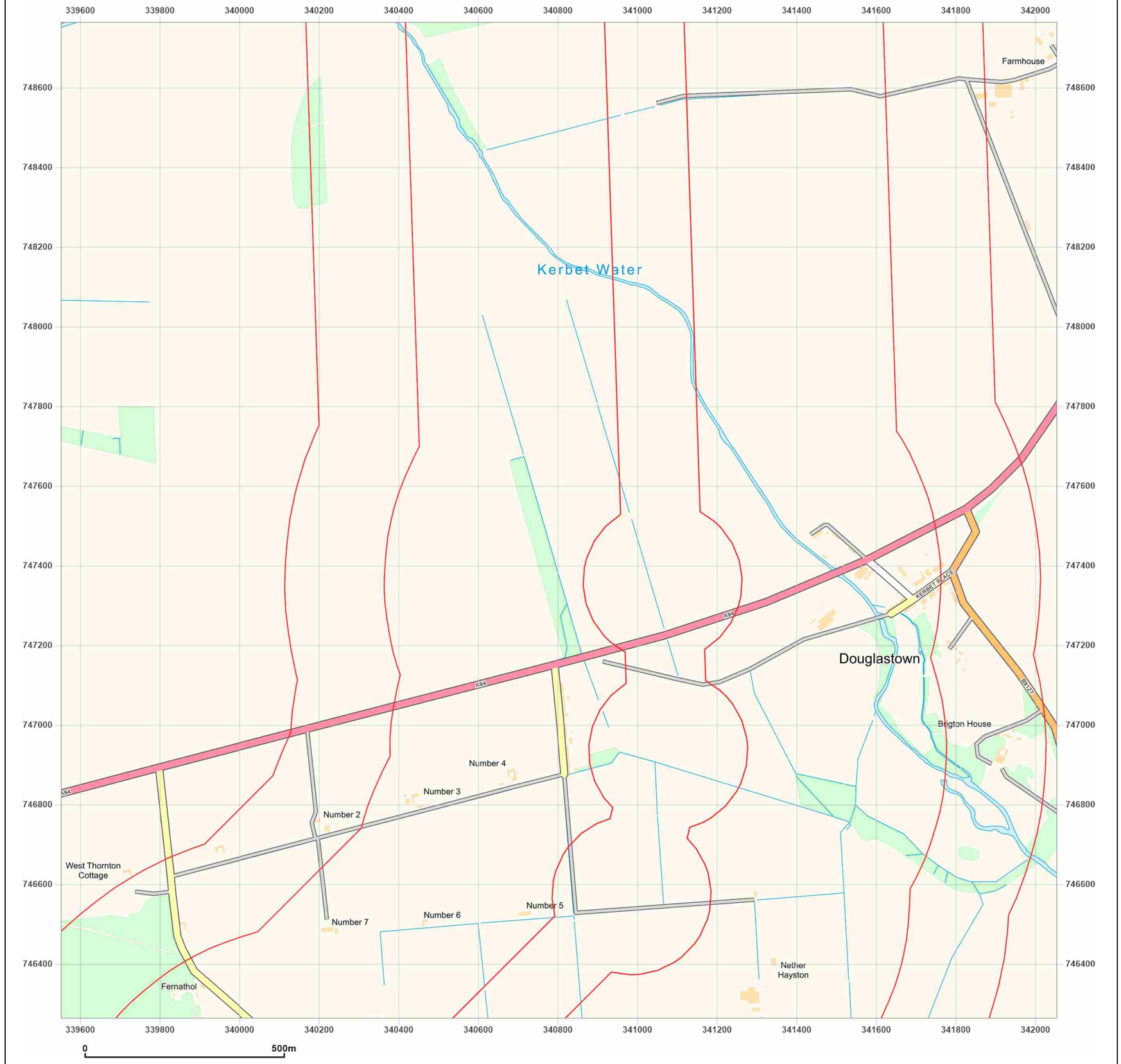
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_5
Grid Ref: 340803, 747514

Map Name: National Grid

Map date: **2025**

Scale: 1:10,000

Printed at: 1:10,000

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Production date: 08 September 2025

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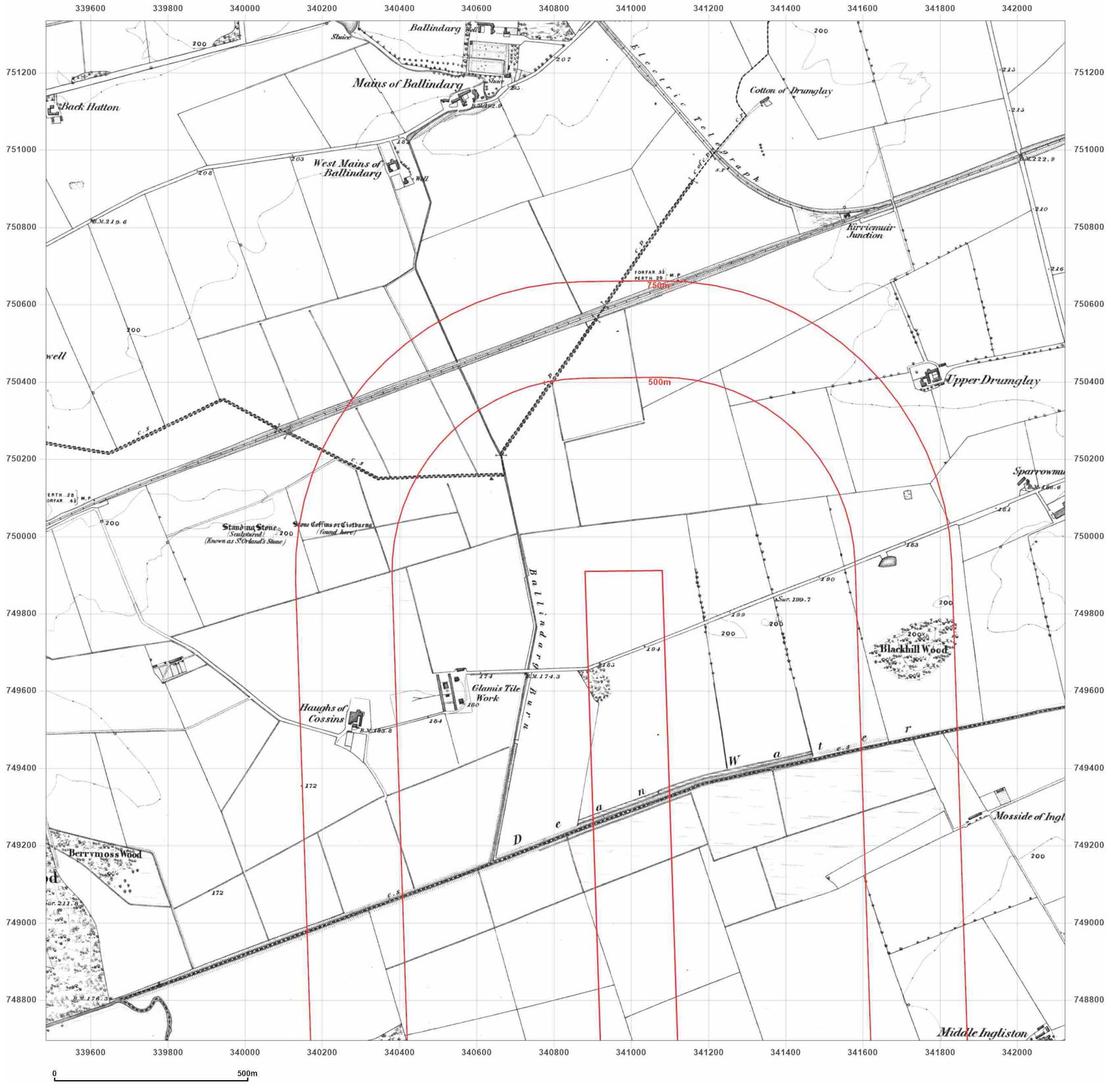

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_6
Grid Ref: 340803, 750014

Map Name: County Series

Map date: **1861**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1861
Revised 1861
Edition N/A
Copyright N/A
Levelled N/A

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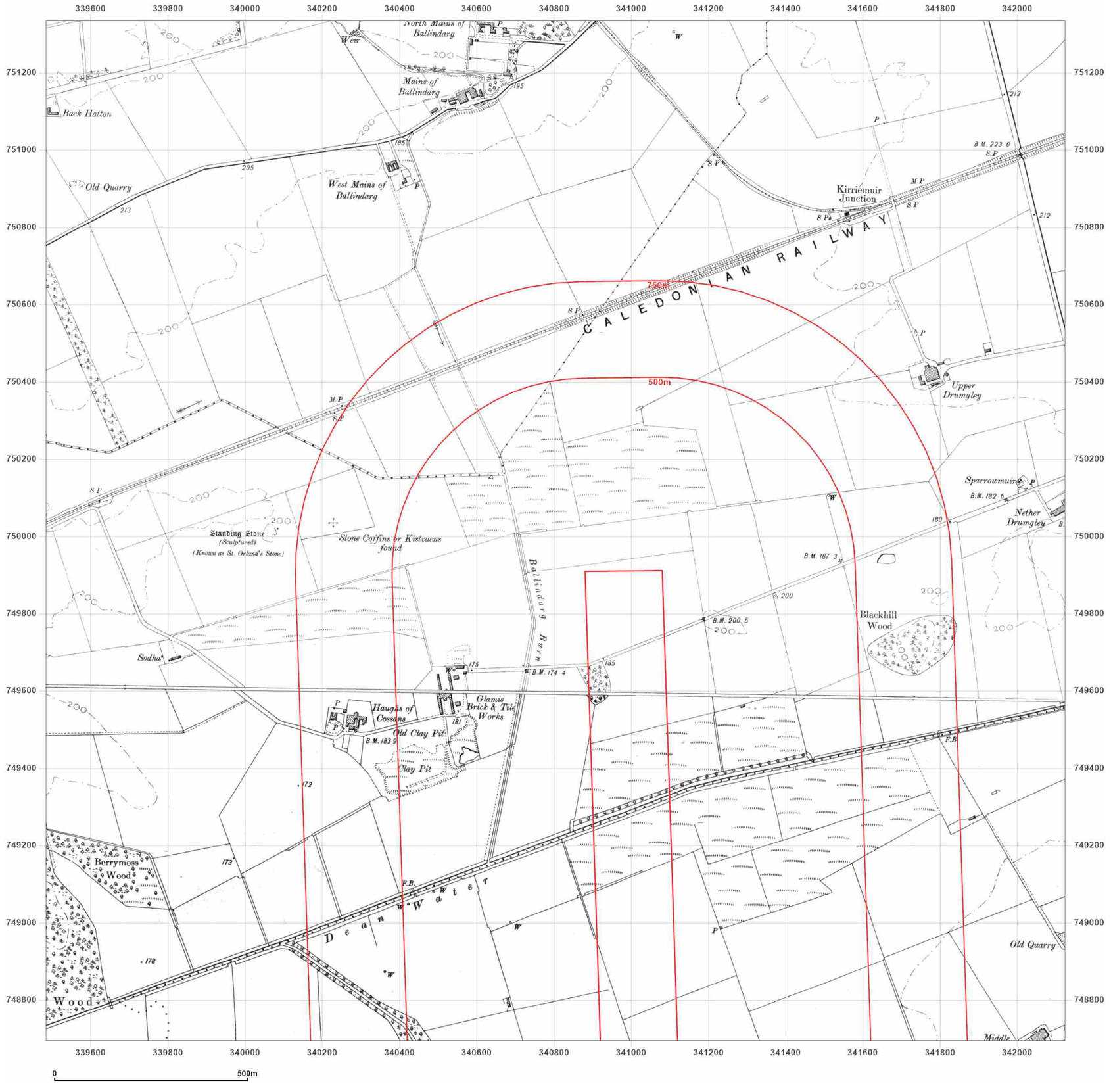

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_6
Grid Ref: 340803, 750014

Map Name: County Series

Map date: **1900-1901**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1861
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1861
Revised 1901
Edition N/A
Copyright N/A
Levelled N/A

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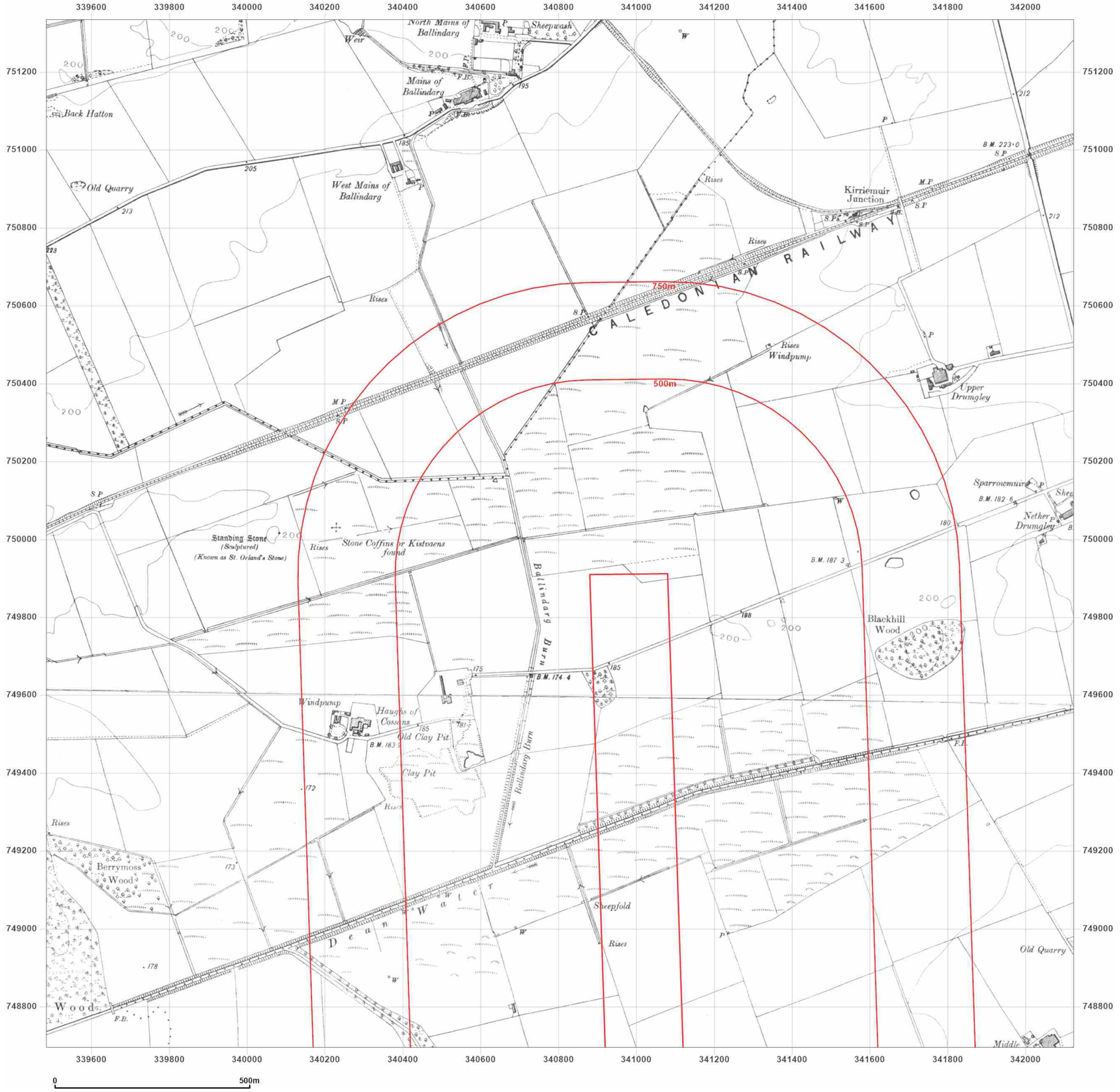

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_6
Grid Ref: 340803, 750014

Map Name: County Series

Map date: **1927**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1861
Revised 1927
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1861
Revised 1927
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 08 September 2025

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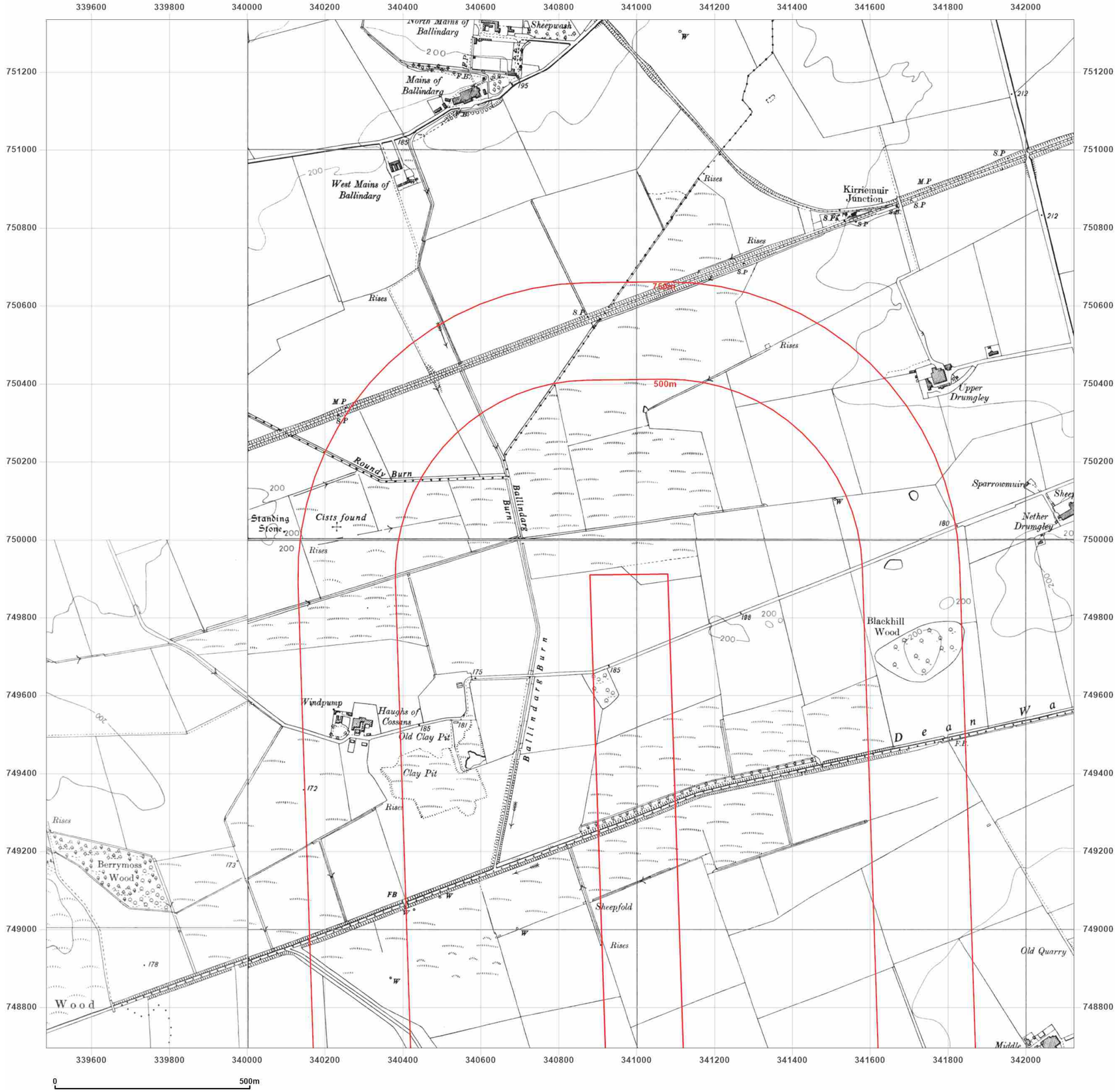

WSP

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_6
Grid Ref: 340803, 750014

Map Name: Provisional

Map date: **1955**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1955
Revised 1955
Edition N/A
Copyright N/A
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Surveyed 1955
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Revised 1955
Edition N/A
Copyright N/A
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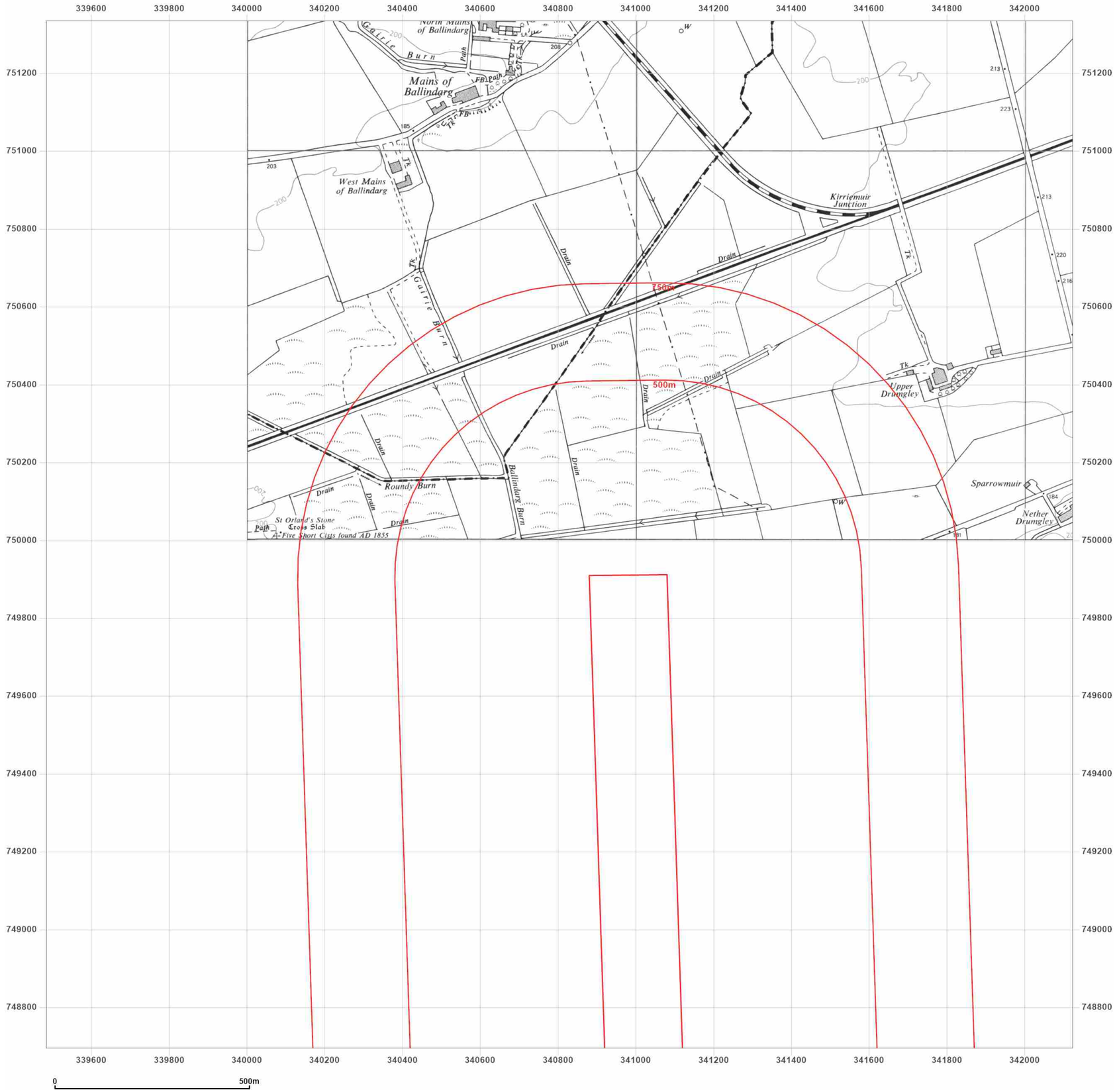

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_6
Grid Ref: 340803, 750014

Map Name: Provisional

Map date: **1969**

Scale: 1:10,560

Printed at: 1:10,560

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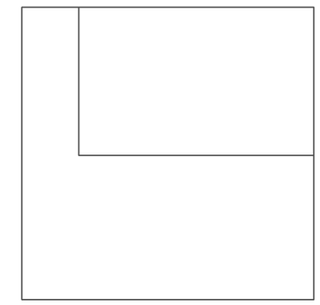
Surveyed 1969
Revised 1969
Edition N/A
Copyright N/A
Levelled N/A



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Production date: 08 September 2025

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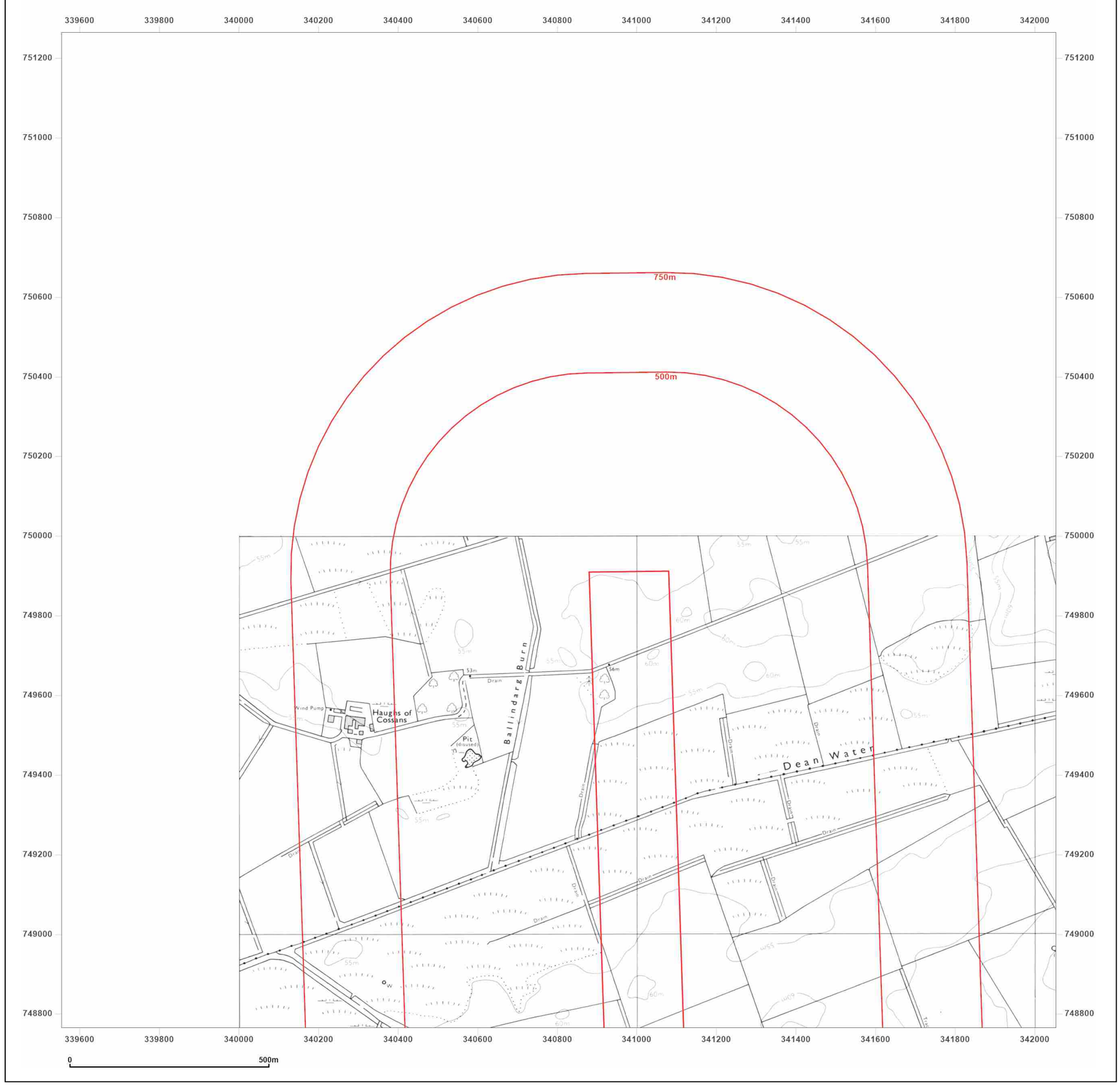

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_6
Grid Ref: 340803, 750014

Map Name: National Grid

Map date: **1974**

Scale: 1:10,000

Printed at: 1:10,000

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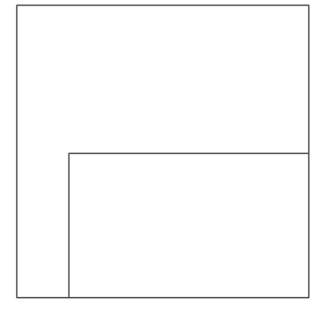

Surveyed 1972
Revised 1974
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 08 September 2025

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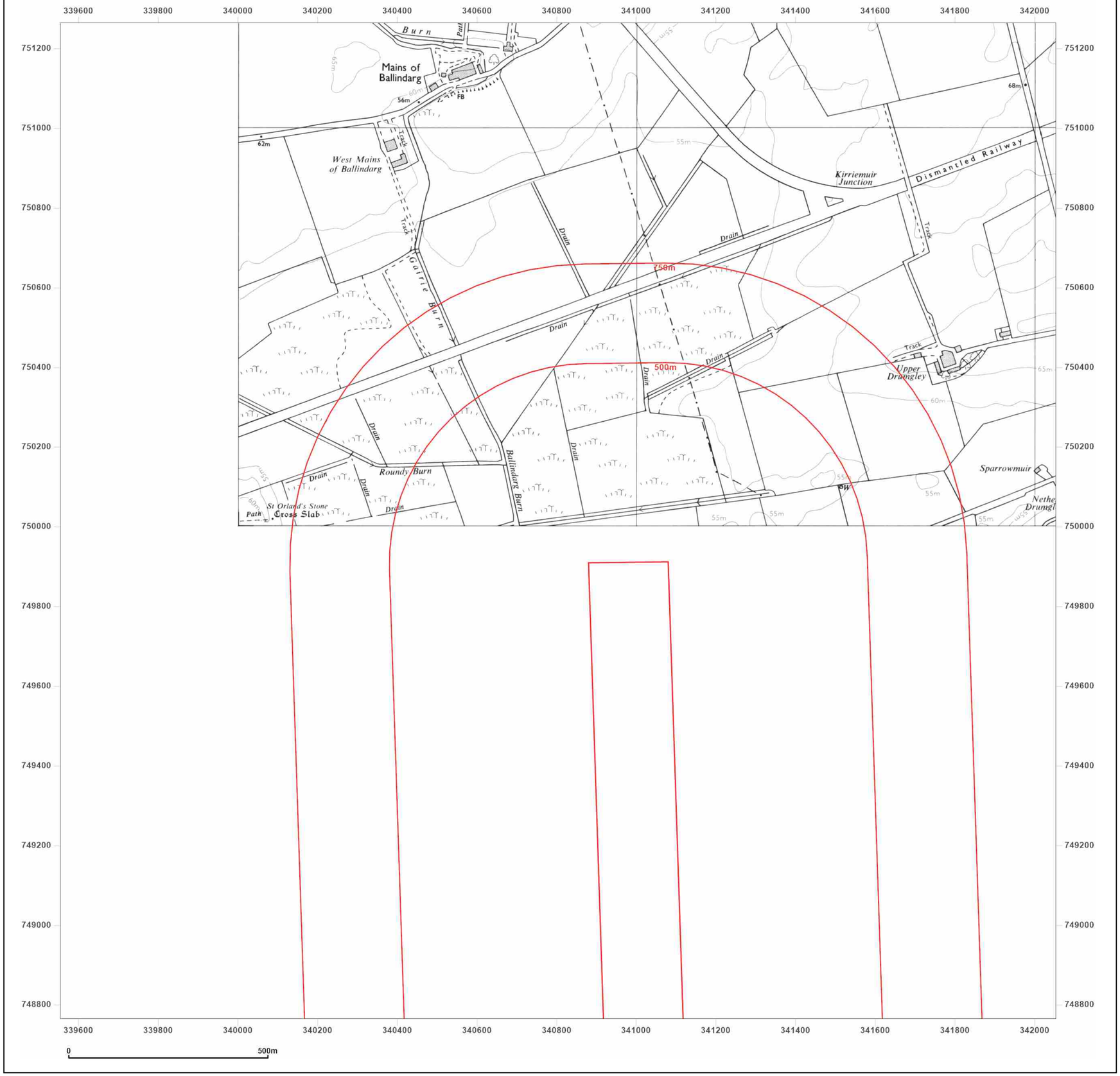

Site Details:

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Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_6
Grid Ref: 340803, 750014

Map Name: National Grid

Map date: **1990**

Scale: 1:10,000

Printed at: 1:10,000

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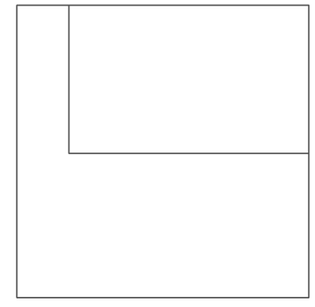
Surveyed 1983
Revised 1990
Edition N/A
Copyright N/A
Levelled N/A



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Production date: 08 September 2025

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Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_6
Grid Ref: 340803, 750014

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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2001

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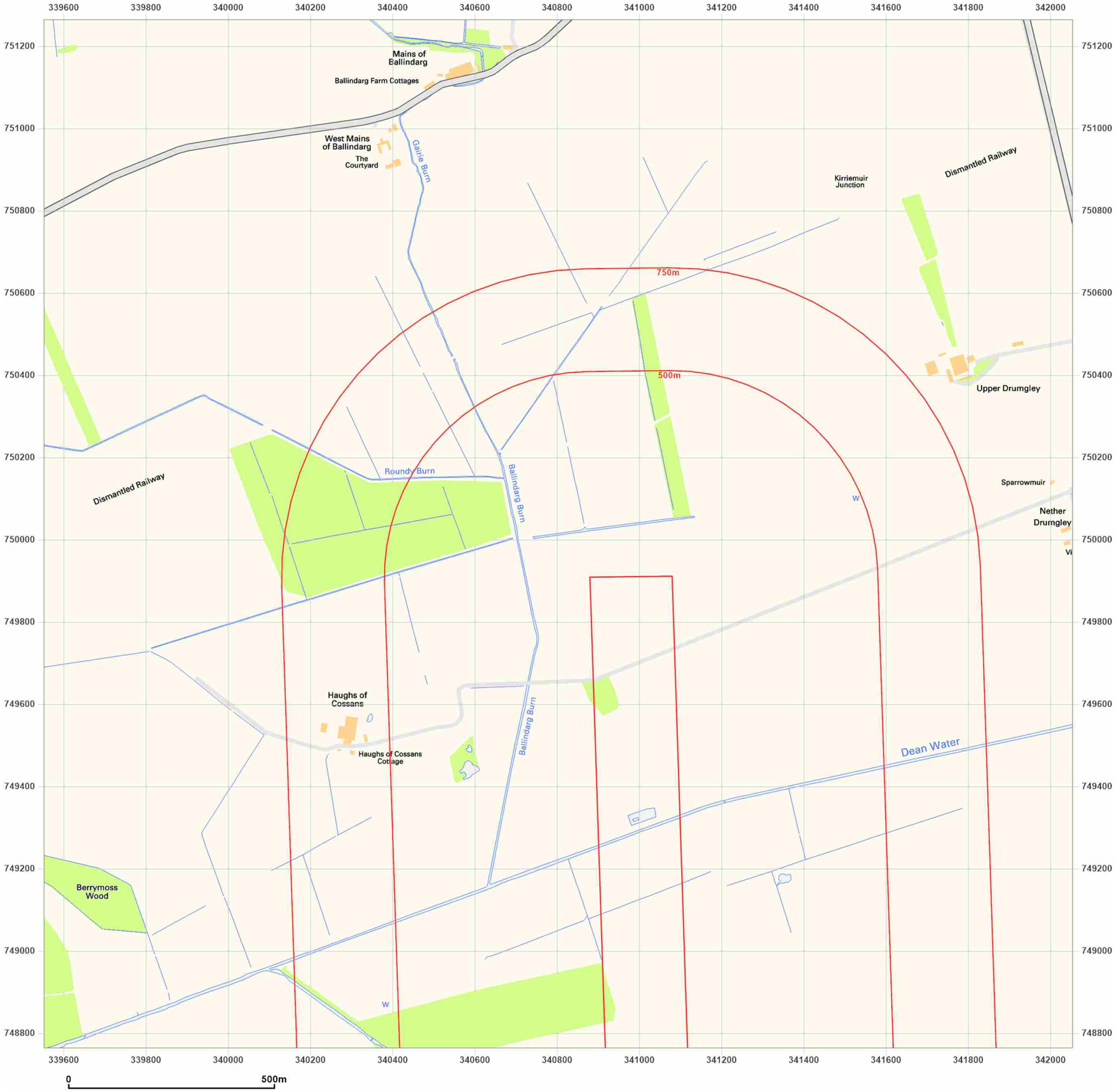

Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_6
Grid Ref: 340803, 750014

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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W E
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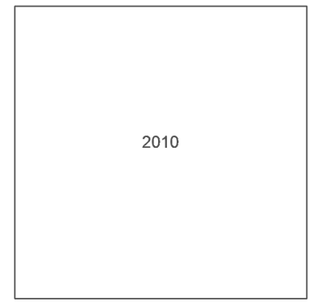

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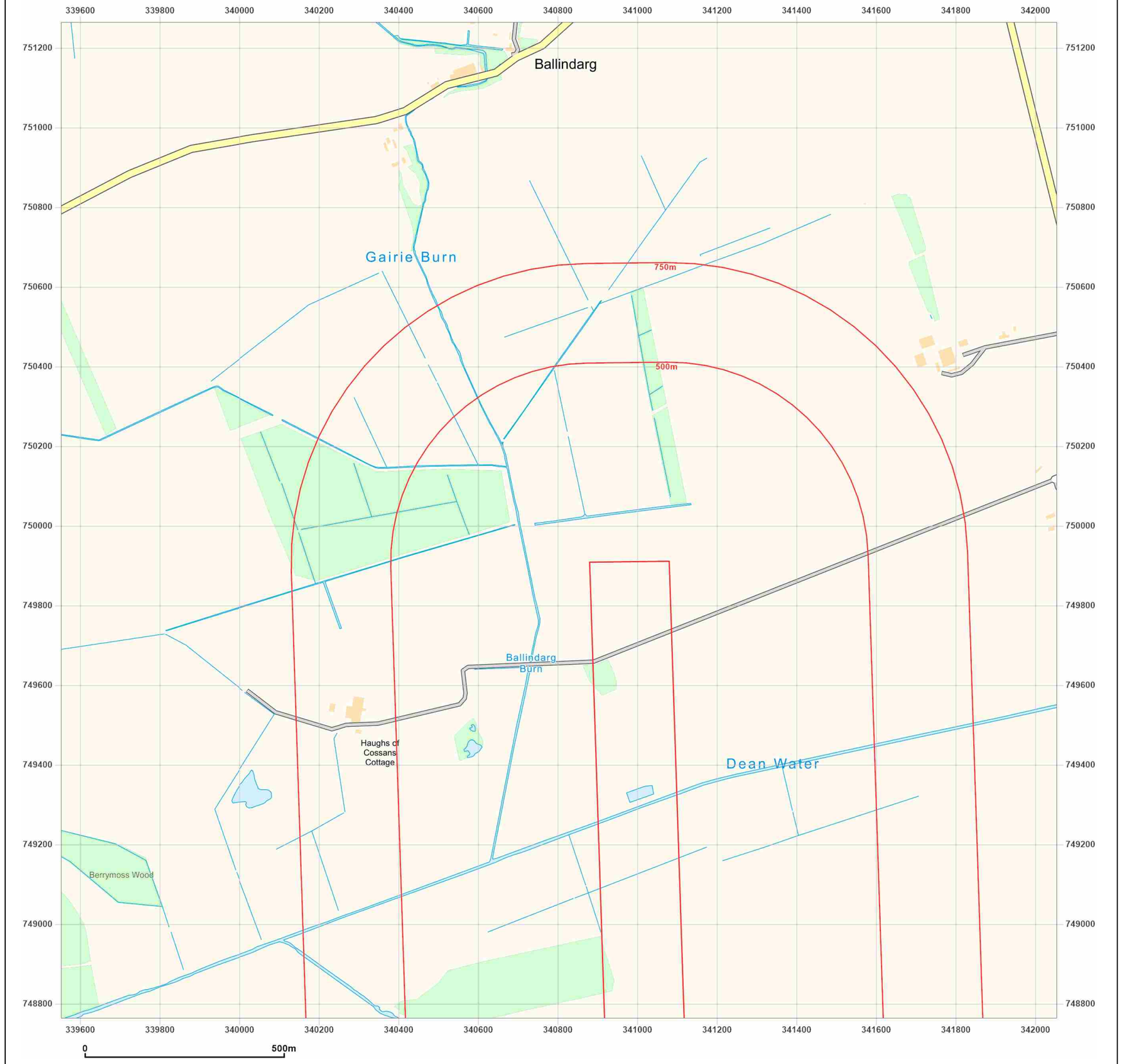
Production date: 08 September 2025

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Section A

Client Ref: P110439UK001
Report Ref: WSP-IM7-R4A-JTN-7QP_SS_2_6
Grid Ref: 340803, 750014

Map Name: National Grid

Map date: **2025**

Scale: 1:10,000

Printed at: 1:10,000

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Appendix B.2

ZETICA UXO MAPS

UNEXPLODED BOMB RISK MAP

SITE LOCATION

Location: DD8 1UL,
Map Centre: 339310,743383

This map principally indicates a hazard from Unexploded Bombs (UXB) due to WWII bombardment. Other sources of Unexploded Ordnance (UXO) may be present. It should be noted that this map does not represent UXO risk and should not be reported as such when reproduced.

LEGEND

- **High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- **Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- **Low:** Areas indicated as having 15 bombs per 1000acre or less.

Miltary | **Industry** | **UXO find** | **Other**
Transport | **Docks** | **Luftwaffe targets**
Utilities | **Bombing decoy** | **Airfields**

How to use your Unexploded Bomb (UXB) risk map?

This map indicates the potential for UXBs to be present because of World War Two (WWII) bombing. It can be incorporated into a technical report, such as a Phase 1 Desk Study, or similar document as an indication of the potential for UXO encounter on a Site. Other sources of UXO may also be indicated, although note that these are not comprehensive and more detailed research is required to confirm their presence.

What if my Site is in a moderate or high density area?

We typically recommend that a detailed UXO desk study and risk assessment is undertaken for sites in an area with a moderate or high bombing density.
Additionally, if your site is in close proximity to a strategic target, military establishment, airfield or bombing decoy, then additional detailed research is recommended.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirm that there is a low potential for UXO to be present on your site, then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

If you are unsure whether other sources of UXO may be present, you can request one of our pre-desk study assessments (PDSA) by emailing a site boundary and location to pdsa@zetica.com.

You should never plan site work or undertake a risk assessment using these maps alone. More detail is required, to include an assessment of the likelihood of a source of UXO hazard from other military activity not reflected on these maps.

If I have any questions, who do I contact?

tel: +44 (0) 1993 886682 **email:** uxo@zetica.com **web:** www.zeticauxo.com

The information in this UXB risk map is derived from a range of sources and should be used with the accompanying notes on our website.

Appendix C

LEGISLATIVE BACKGROUND

THE REGULATORY FRAMEWORK FOR OUR ASSESSMENT

Our assessment is made within the framework of the Contaminated Land Regime defined by Part 2A of the Environmental Protection Act and the Contaminated Land Statutory Guidance 2012. We have considered the contaminated land guidance documents issued by the Department for Environment, Food and Rural Affairs (DEFRA) including the 'Land Contamination Risk Management (LCRM) (Environment Agency, 2020).

Our method is to create a clear conceptual model of the potential Pollutant Linkages present on site, consider the Sources (potential contaminants on site) which may cause harm, via Pathways, to Receptors such as human health (e.g., that of site users), the water environment (groundwater, surface water) and the built environment (buildings, services). Contaminated Land has a precise definition, and does not include all land which contains contaminants, but only land where there is a Pollutant Linkage causing (or giving rise to a significant risk of) a degree of harm.

Our approach to the assessment of risks to Human Health is consistent with that established in LCRM. This establishes a tiered approach including:

- Preliminary Risk Assessment (e.g., the establishment of potential pollutant linkages) – normally through desk based work;
- Generic Quantitative Risk Assessment (GQRA) (e.g., the comparison of contaminant concentrations against Soil Guideline Values (SGV) or other Generic Assessment Criteria (GAC)); and,
- Detailed Quantitative Risk Assessment (DQRA) (e.g., the comparison of contaminant concentrations against site specific assessment criteria).

Our approach to Generic Quantitative Risk Assessment (GQRA) is described in outline in the Section A.

In addition to the Contaminated Land Regime, where appropriate, we have considered :

- The Environmental Damage Regulations (2009). These implement the European Environmental Liability Directive and provide that; for certain activities, where there is an imminent risk of environmental damage, steps must be taken to prevent such damage, and if environmental damage has already occurred, the operator of the activity must prevent further damage.
- Common Law Liability. This remains an important aspect of contaminated land law, particularly for third parties harmed by, or suffering loss as a result of, contaminated land. Through Nuisance a person may be liable if he owns or occupies land and behaves in a way so as to cause foreseeable injury, loss or damage by creating a nuisance, for example by allowing contamination to migrate off-site either over a period of time or as a one-off event. By Negligence, where the owner of contaminated land owes a duty of care (to a claimant) which was breached. In Trespass where the contamination on a defendant's land has directly interfered with the property of a claimant.

OUR APPROACH TO GQRA

Once we have an initial understanding of the site and the potential pollutant linkages in place we plan our investigation, soil sampling regime and analytical suites. Our plan is informed by documentation such as:

- The available desk study/preliminary risk assessment reports available for the site;
- CLR 8 'Priority Contaminants for the Assessment of Land' (Environment Agency 2002a); and,
- The Department of the Environment's Industry Profiles (DoE 1995-95).

In order to undertake a GQRA, contaminant concentrations need to be compared to appropriate generic assessment criteria. Current UK industry practice is to use, as first preference, UK Soil Guideline Values (SGV)s which are generic assessment criteria published by the Environment Agency and derived using the Contaminated Land Exposure Assessment model (CLEA).

The CLEA model provides an approach for the assessment of chronic risks to human health from concentrations of a substance within soil; where appropriate. However, the SGVs published to date are limited to only a small number of contaminants. Consequently, where published SGV do not exist, other GAC can be used including:

- GAC prepared in accordance with the CLEA V1.071 model by authoritative bodies (e.g. Chartered Institute of Environmental Health (CIEH), Environment Industries Commission (EIC)); or in their absence,
- WSP in-house GAC prepared in accordance with the CLEA V1.071 model and associated documents.

The approach adopted by WSP has been to generate GAC for chronic risks to human health using CLEA V1.071. In generating GAC, input parameters consistent with Environment Agency publications have been adopted by WSP. In generating GAC, the default CLEA assumptions have been applied to a range of likely human health exposure models and associated critical age receptor groups including:

- Residential with Plant Uptake;
- Residential without Plant Uptake;
- Allotments;
- Parks;
- Open Spaces; and,
- Commercial/Industrial.

CYANIDES

The primary risk to human receptors from free cyanide in soils is an acute risk (i.e. a single dose could have a lethal affect as opposed to adverse effects from cumulative intake (chronic affect)). There is no current UK guidance available for calculating acute risks from free cyanide; therefore, an in-house methodology has been used to derive an acute GAC of 60 mg/kg for all exposure scenarios.

Volatile Hydrocarbons from Groundwater and Impacts to Human Health.

The CLEA model does not explicitly consider the potential for chronic impact to Human Health from indoor inhalation of concentrations of volatile vapours from dissolved phase contamination. The potential exists for this to be an important exposure route for a limited number of highly volatile contaminants. GAC have been calculated for volatile contaminants for volatilisation from groundwater using an in-house implementation of the Johnson and Ettinger model (WSP In-house Groundwater Model V1.1) which has been adapted to account for a dissolved phase source through

consideration of (a) partitioning from groundwater to soil vapour, and, (b) transport through the capillary zone.

GENERIC QUANTITATIVE RISK ASSESSMENT - CONTROLLED WATERS / WATER ENVIRONMENT

Our approach to the assessment of plausible pollutant linkages with respect to the pollution of Controlled Waters / Water Environment is consistent with UK guidance. The guidance identifies that for the pollution of the water environment to occur; poisonous, noxious, polluting or solid waste matter must be entering such waters or must be considered more likely than not to enter the water environment in the future. The assessment of whether the pollution of the water environment is likely to occur in the future requires consideration of those contaminants at source, which are present in a mobile form, at such a concentration that they will reach a receptor at concentrations considered to be poisonous, noxious, polluting or solid waste matter.

Our adopted approach for GQRA assessment therefore typically comprises the following:

- Consideration of soil concentrations of organic substances in the context of soil saturation to assess the potential for migration under gravity;
- Comparison of soil leachate/pore water concentrations against appropriate GAC; and
- Comparison of groundwater concentrations against appropriate GAC.

This approach is equivalent to Tier 1 / Level 1 Assessment as undertaken using ConSim (2009) / Environment Agency Remedial Targets Methodology V3.1 (2006).

Effectively, for the majority of sites, contaminant concentrations are compared to both drinking water standards and environmental quality standards to identify the need for further consideration/DQRA.

FURTHER WORK

Where a GAC is exceeded further work and/or remediation is normally required. For moderate exceedances further work may include progression to a Detailed Quantitative Risk Assessment (DQRA) which is likely to require further data collection. The outcome of the DQRA may be that the risk is not significant or, if the risk is identified as being significant, the generation of site-specific remedial targets.

Where significant exceedances of GAC are identified or there is evidence of potential acute risks remedial measures may be immediately required.

GROUND GAS

Gas results are assessed with regard to Assessing Risks Posed by Hazardous Gases to Buildings, CIRIA Report C665, 2007 (CIRIA C665).

The method in CIRIA C665 uses both gas concentrations and borehole flow rates to define a characteristic situation for a site based on the gas screening value for methane and carbon dioxide. Gas screening value = borehole flow rate (litres of gas per hour) x gas concentration (%). The calculation is carried out for both methane and carbon dioxide and the worse-case value adopted.

If necessary, more detailed information on our approach to risk assessment can be provided if required

THE REGULATORY FRAMEWORK FOR OUR ASSESSMENT

Our assessment is made within the framework of the Contaminated Land Regime defined by Part 2A of the Environmental Protection Act and the Contaminated Land Statutory Guidance 2012. We have considered the contaminated land guidance documents issued by the Department for Environment, Food and Rural Affairs (DEFRA) including Model Procedures for the Management of Land Contamination (CLR11) (Environment Agency 2004a).

Our method is to create a clear conceptual model of the potential Pollutant Linkages present on site, consider the Sources (potential contaminants on site) which may cause harm, via Pathways, to Receptors such as human health (e.g. that of site users), the water environment (groundwater, surface water) and the built environment (buildings, services). Contaminated Land has a precise definition, and does not include all land which contains contaminants, but only land where there is a Pollutant Linkage causing (or giving rise to a significant risk of) a degree of harm.

Our approach to the assessment of risks to Human Health is consistent with that established in CLR11. This establishes a tiered approach including:

Preliminary Risk Assessment (e.g. the establishment of potential pollutant linkages) – normally through desk based work;

Generic Quantitative Risk Assessment (GQRA) (e.g. the comparison of contaminant concentrations against Soil Guideline Values (SGV) or other Generic Assessment Criteria (GAC)); and,

Detailed Quantitative Risk Assessment (DQRA) (e.g. the comparison of contaminant concentrations against site specific assessment criteria).

Our approach to Generic Quantitative Risk Assessment (GQRA) is described in outline in the Section A.

In addition to the Contaminated Land Regime, where appropriate, we have considered

The Environmental Damage Regulations (2009). These implement the European Environmental Liability Directive and provide that; for certain activities, where there is an imminent risk of environmental damage, steps must be taken to prevent such damage, and if environmental damage has already occurred, the operator of the activity must prevent further damage.

Common Law Liability. This remains an important aspect of contaminated land law, particularly for third parties harmed by, or suffering loss as a result of, contaminated land. Through Nuisance a person may be liable if he owns or occupies land and behaves in a way so as to cause foreseeable injury, loss or damage by creating a nuisance, for example by allowing contamination to migrate off-site either over a period of time or as a one-off event. By Negligence, where the owner of contaminated land owes a duty of care (to a claimant) which was breached. In Trespass where the contamination on a defendant's land has directly interfered with the property of a claimant.

OUR APPROACH TO GQRA

Once we have an initial understanding of the site and the potential pollutant linkages in place we plan our investigation, soil sampling regime and analytical suites. Our plan is informed by documentation such as:

- The available desk study/preliminary risk assessment reports available for the site;
- CLR 8 'Priority Contaminants for the Assessment of Land' (Environment Agency 2002a); and,
- The Department of the Environment's Industry Profiles (DoE 1995-95).

In order to undertake a GQRA, contaminant concentrations need to be compared to appropriate generic assessment criteria. Current UK industry practice is to use, as first preference, UK Soil Guideline Values (SGV)s which are generic assessment criteria published by the Environment Agency and derived using the Contaminated Land Exposure Assessment model (CLEA).

The CLEA model provides an approach for the assessment of chronic risks to human health from concentrations of a substance within soil; where appropriate. However, the SGVs published to date are limited to only a small number of contaminants. Consequently, where published SGV do not exist, other GAC can be used including:

- GAC prepared in accordance with the CLEA V1.06 model by authoritative bodies (e.g. Chartered Institute of Environmental Health (CIEH), Environment Industries Commission (EIC)); or in their absence,
- WSP in-house GAC prepared in accordance with the CLEA V1.06 model and associated documents.

The approach adopted by WSP has been to generate GAC for chronic risks to human health using CLEA V1.06. In generating GAC, input parameters consistent with Environment Agency publications have been adopted by WSP. In generating GAC, the default CLEA assumptions have been applied to a range of likely human health exposure models and associated critical age receptor groups including:

- Residential with Plant Uptake;
- Residential without Plant Uptake;
- Allotments;
- Parks;
- Open Spaces; and,
- Commercial/Industrial.

CYANIDES

The primary risk to human receptors from free cyanide in soils is an acute risk (i.e. a single dose could have a lethal affect as opposed to adverse effects from cumulative intake (chronic affect)). There is no current UK guidance available for calculating acute risks from free cyanide; therefore, an in-house methodology has been used to derive an acute GAC of 60 mg/kg for all exposure scenarios.

Volatile Hydrocarbons from Groundwater and Impacts to Human Health.

The CLEA model does not explicitly consider the potential for chronic impact to Human Health from indoor inhalation of concentrations of volatile vapours from dissolved phase contamination. The potential exists for this to be an important exposure route for a limited number of highly volatile contaminants. GAC have been calculated for volatile contaminants for volatilisation from groundwater using an in-house implementation of the Johnson and Ettinger model (WSP In-house Groundwater Model V1.1) which has been adapted to account for a dissolved phase source through consideration of (a) partitioning from groundwater to soil vapour, and, (b) transport through the capillary zone.

GENERIC QUANTITATIVE RISK ASSESSMENT - CONTROLLED WATERS / WATER ENVIRONMENT

Our approach to the assessment of plausible pollutant linkages with respect to the pollution of Controlled Waters / Water Environment is consistent with UK guidance. The guidance identifies that for the pollution of the water environment to occur; poisonous, noxious, polluting or solid waste matter must be entering such waters or must be considered more likely than not to enter the water environment in the future. The assessment of whether the pollution of the water environment is likely to occur in the future requires consideration of those contaminants at source, which are present in a mobile form, at such a concentration that they will reach a receptor at concentrations considered to be poisonous, noxious, polluting or solid waste matter.

Our adopted approach for GQRA assessment therefore typically comprises the following:

- Consideration of soil concentrations of organic substances in the context of soil saturation to assess the potential for migration under gravity;
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- Comparison of groundwater concentrations against appropriate GAC.

This approach is equivalent to Tier 1 / Level 1 Assessment as undertaken using ConSim (2009) / Environment Agency Remedial Targets Methodology V3.1 (2006).

Effectively, for the majority of sites, contaminant concentrations are compared to both drinking water standards and environmental quality standards to identify the need for further consideration/DQRA.

FURTHER WORK

Where a GAC is exceeded further work and/or remediation is normally required. For moderate exceedances further work may include progression to a Detailed Quantitative Risk Assessment (DQRA) which is likely to require further data collection. The outcome of the DQRA may be that the risk is not significant or, if the risk is identified as being significant, the generation of site-specific remedial targets.

Where significant exceedances of GAC are identified or there is evidence of potential acute risks remedial measures may be immediately required.

GROUND GAS

Gas results have been assessed with regard to Assessing Risks Posed by Hazardous Gases to Buildings, CIRIA Report C665, 2007 (CIRIA C665) and, where a residential end use is being considered, Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present, Edition 4, NHBC, 2007 (NHBC 2007).

The method in CIRIA C665 uses both gas concentrations and borehole flow rates to define a characteristic situation for a site based on the gas screening value for methane and carbon dioxide. Gas screening value = borehole flow rate (litres of gas per hour) x gas concentration (%). The calculation is carried out for both methane and carbon dioxide and the worse-case value adopted.

If necessary, more detailed information on our approach to risk assessment can be provided if required.

Appendix D

CIRIA RISK DEFINITIONS

CIRIA RISK DEFINITIONS

Table A1– Classifications of Probability

Classification	Definition
High likelihood	There is a pollution linkage / identified geotechnical hazard and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term

Table A2 – Classifications of Consequence

Classification	Definition
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem.
Medium	Chronic damage to Human Health ("significant harm" as defined in DETR, 2000). Pollution of sensitive water resources. A significant change in a particular ecosystem, or organism forming part of such ecosystem.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services (significant harm as defined in the Draft Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve, Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc.). Easily repairable effects of damage to buildings, structures and services.

The risk categories presented in this reporting, taking into account both probability and severity, are based on the matrix presented in Table A3 below, following CIRIA C552.

Table A3- Adopted Risk Categories / Comparison of Consequence against Probability

Probability	Consequence			
	Severe	Medium	Mild	Minor
High Likelihood	Very High Risk	High Risk	Moderate Risk	Low to Moderate Risk
Likely	High Risk	Moderate Risk	Low to Moderate Risk	Low Risk
Low Likelihood	Moderate Risk	Low to Moderate Risk	Low Risk	Very Low Risk
Unlikely	Low to Moderate Risk	Low Risk	Very Low Risk	Very Low Risk

CONTAMINANT LINKAGES UNDER CONSIDERATION

CPL	Source	Pathway	Receptor1	Comments
Human Health (on-site)				
H1	Contaminants in near surface materials	Dermal contact, ingestion, inhalation of dust	Current and future site users; construction personnel	
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

[1] '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)". Controlled waters equate to water environment receptors in Scotland. The Contaminated Land (Scotland) Regulations 2005 which extend to Scotland only, amends 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").

CPL	Source	Pathway	Receptor1	Comments
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	The implementation of radon protection measures may be required for new structures on the site or where existing structures are significantly modified.
H9	Radon, Ground gas, and volatile materials	Outdoor air inhalation	Current and future site users; construction personnel	Generally, not a viable risk due to dilution with outdoor air, unless 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	
W2	Near-surface contaminants	Surface run-off	Surface Water	Viability of linkage is dependent on the distance to surface water receptors

CPL	Source	Pathway	Receptor1	Comments
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 uptake	Plant life	
B2	pH and sulphate in shallow ground and/or groundwater in contact with concrete structures	Attack on concrete by direct contact	Buried concrete	
B3	Contaminants in shallow ground	Permeation of water pipes	Pipe material and water ingestion	
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 volatilisation to indoor air	Adjacent site users	Requires occupied, enclosed structures within 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

CIRIA 552 RISK DEFINITIONS

The risk categories presented in this reporting, taking into account both probability and severity, are based on the matrix presented in Table A3 below, following CIRIA C552.

Table A1– Classifications of Probability

Classification	Definition
High likelihood	There is a pollution linkage / identified geotechnical hazard and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution
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Table A3- Adopted Risk Categories / Comparison of Consequence against Probability

Probability	Consequence			
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High Likelihood	Very High Risk	High Risk	Moderate Risk	Low to Moderate Risk

Likely	High Risk	Moderate Risk	Low to Moderate Risk	Low Risk
Low Likelihood	Moderate Risk	Low to Moderate Risk	Low Risk	Very Low Risk
Unlikely	Low to Moderate Risk	Low Risk	Very Low Risk	Very Low Risk

Appendix E

GENERAL LIMITATIONS

REPORT LIMITATIONS - GROUND AND WATER

GENERAL

1. WSP UK 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 and outlined in the body of the report.

2. Unless explicitly agreed otherwise, in writing, this report has been prepared under WSP UK Limited standard Terms and Conditions as included within our proposal to the Client.

3. Project specific appointment documents may be agreed at our discretion and a charge may be levied for both the time to review and finalise appointments documents and also for associated changes to the appointment terms. WSP UK Limited reserves the right to amend the fee should any changes to the appointment terms create an increase risk to WSP UK Limited.

4. The report needs to be considered in the light of the WSP UK Limited proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

PHASE 1 GEO ENVIRONMENTAL AND PRELIMINARY RISK ASSESSMENTS

Coverage: *This section covers reports with the following titles or combination of titles: phase 1; desk top study; geo environmental assessment; development appraisal; preliminary environmental risk assessment; constraints report; due diligence report; geotechnical development review; environmental statement; environmental chapter; project scope summary report (PSSR), program environmental impact report (PEIR), geotechnical development risk register; and, baseline environmental assessment.*

5. The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects responses may not have been received from all parties. WSP UK Limited cannot be held responsible for any disclosures that are provided post production of our report and will not automatically update our report.

6. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for 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 UK Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

7. 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 intrusive investigations of the site.

8. WSP UK Limited does not warrant work / data undertaken / provided by others.

REPORT LIMITATIONS - GROUND RISK AND REMEDIATION

INTRUSIVE INVESTIGATION REPORTS

Coverage: *The following report titles (or combination) may cover this category of work: geo environmental site investigation; geotechnical assessment; GIR (Ground Investigation reports); preliminary environmental and geotechnical risk assessment; and, geotechnical risk register.*

9. The investigation has been undertaken to provide information concerning either:

- **i.** The type and degree of contamination present at the site in order to allow a generic quantitative risk assessment to be undertaken; or
- **ii.** Information on the soil properties present at the site to allow for geotechnical development constraints to be considered.

10. The scope of the investigation was selected on the basis of the specific development and land use scenario proposed by the Client and may be inappropriate to another form of development or scheme. If the development layout was not known at the time of the investigation the report findings may need revisiting once the development layout is confirmed.

11. For contamination purposes, the objectives of the investigation are limited to establishing the risks associated with potential contamination sources with the potential to cause harm to human health, building materials, the environment (including adjacent land), or controlled waters.

12. For geotechnical investigations the purpose is to broadly consider potential development constraints associated with the physical property of the soils underlying the site within the context of the proposed future or continued use of the site, as stated within the report.

13. The amount of exploratory work, soil property testing and chemical testing undertaken has necessarily been restricted by various factors which may include accessibility, the presence of services; existing buildings; current site usage or short timescales. The exploratory holes completed assess only a small percentage of the area in relation to the overall size of the Site, and as such can only provide a general indication of conditions.

14. The number of sampling points and the methods of sampling and testing do not preclude the possible existence of contamination where concentrations may be significantly higher than those actually encountered or ground conditions that vary from those identified. In addition, there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

15. The inspection, testing and monitoring records relate specifically to the investigation points and the timeframe that the works were undertaken. They will also be limited by the techniques employed. As part of this assessment, WSP UK Limited has used reasonable skill and care to extrapolate conditions between these points based upon assumptions to develop our interpretation and conclusions. The assumption made in forming our conclusions is that the ground and groundwater conditions (both chemically and physically) are the same as have been encountered during the works undertaken at the specific points of investigation. Conditions can change between investigation points and these interpretations should be considered indicative.

16. The risk assessment and opinions provided are based on currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values. Specific assumptions associated

with the WSP UK Limited risk assessment process have been outlined within the body or associated appendix of the report.

17. Additional investigations may be required in order to satisfy relevant planning conditions or to resolve any engineering and environmental issues.

18. Where soil contamination concentrations recorded as part of this investigation are used for commentary on potential waste classification of soils for disposal purposes, these should be classed as indicative only. Due consideration should be given to the variability of contaminant concentrations taken from targeted samples versus bulk excavated soils and the potential variability of contaminant concentrations between sampling locations. Where major waste disposal operations are considered, targeted waste classification investigations should be designed.

19. The results of the asbestos testing are factually reported and interpretation given as to how this relates to the previous use of the site, the types of ground encountered and site conceptualisation. This does not however constitute a formal asbestos assessment. These results should be treated cautiously and should not be relied upon to provide detailed and representative information on the delineation, type and extent of bulk ACMs and / or trace loose asbestos fibres within the soil matrix at the site.

20. If costs have been included in relation to additional site works, and / or site remediation works these must be considered as indicative only and must be confirmed by a qualified quantity surveyor.

EUROCODE 7: GEOTECHNICAL DESIGN

21. On 1st April 2010, BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design – Part 1) became the mandatory baseline standard for geotechnical ground investigations.

22. In terms of geotechnical design for foundations, slopes, retaining walls and earthworks, EC7 sets guidance on design procedures including specific guidance on the numbers and spacings of boreholes for geotechnical design, there are limits to methods of ground investigation and the quality of data obtained and there are also prescriptive methods of assessing soil strengths and methods of design. Unless otherwise explicitly stated, the work has not been undertaken in accordance with EC7. A standard geotechnical interpretative report will not meet the requirements of the Geotechnical Design Report (GDR) under Eurocode 7. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. The report is likely to represent a Ground Investigation Report (GIR) under the Eurocode 7 guidance.

DETAILED QUANTITATIVE RISK ASSESSMENTS AND REMEDIAL STRATEGY REPORTS

23. These reports build upon previous report versions and associated notes. The scope of the investigation, further testing and monitoring and associated risk assessments were selected on the basis of the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.

24. The outputs of the Detailed Quantitative Risk Assessments are based upon WSP UK Limited manipulation of standard risk assessment models. These are our interpretation of the risk assessment criteria.

25. Prior to adoption on site they will need discussing and agreeing with the Regulatory Authorities prior to adoption on site. The regulatory discussion and engagement process may result in an alternative interpretation being determined and agreed. The process and timescales associated with the Regulatory Authority engagement are not within the control of WSP UK Limited. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

GEOTECHNICAL DESIGN REPORT (GDR)

26. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. All the relevant information needs to be provided to allow for a GDR to be produced.

MONITORING (INCLUDING REMEDIATION MONITORING REPORTS)

27. These reports are factual in nature and comprise monitoring, normally groundwater and ground gas and data provided by contractors as part of an earthworks or remedial works.

28. The data is presented and will be compared with assessment criteria.

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