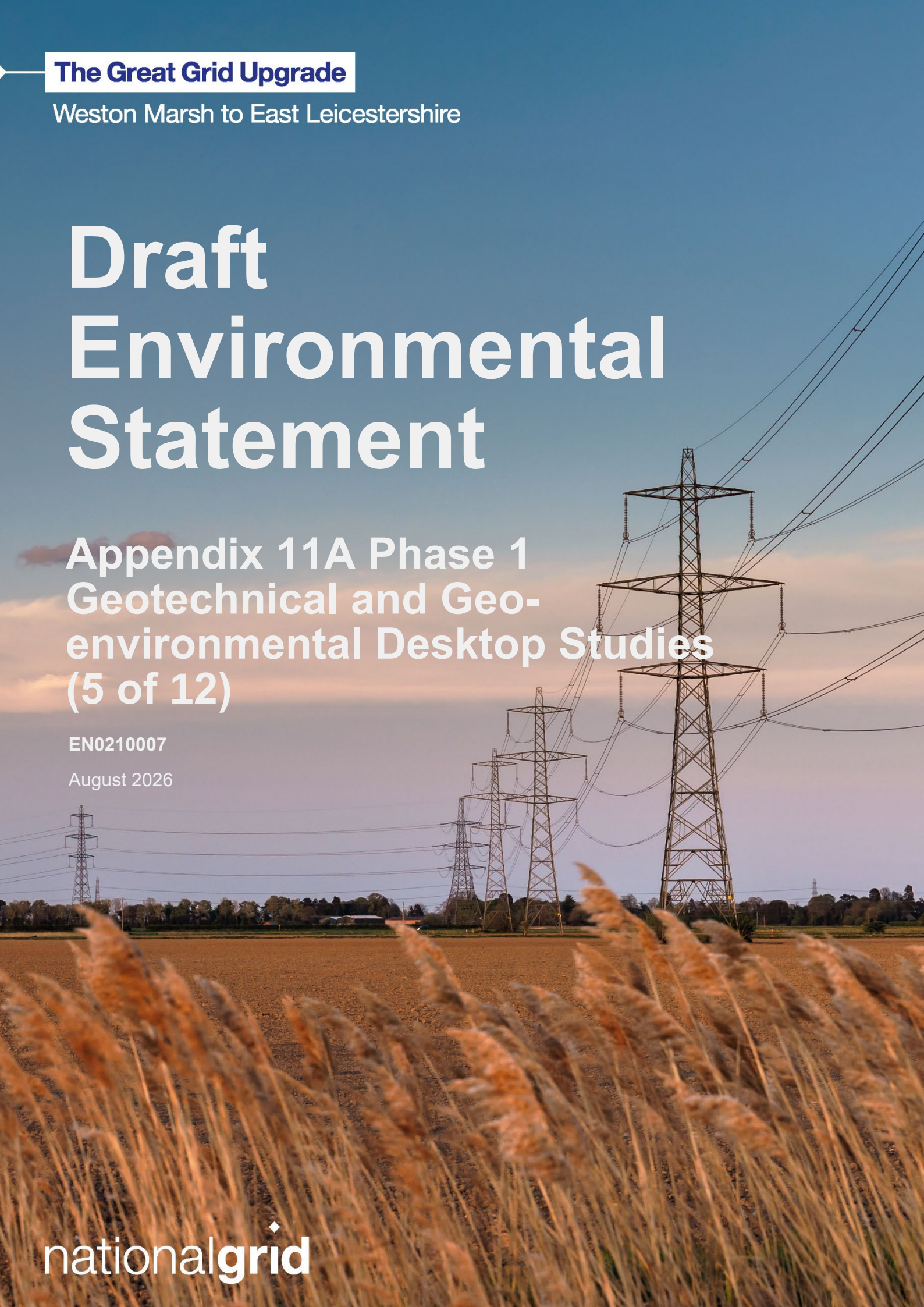




The Great Grid Upgrade

Weston Marsh to East Leicestershire

Draft Environmental Statement

Appendix 11A Phase 1 Geotechnical and Geo- environmental Desktop Studies (5 of 12)

EN0210007

August 2026

nationalgrid

11A. Phase 1 Geotechnical and Geo- environmental Desktop Studies

The Great Grid Upgrade

Weston Marsh to East Leicestershire

Phase 1 Geotechnical and Geo- Environmental Desktop Study Report

WMEL A Substation

June 2026

nationalgrid

GGP-GI-Pt-24	Structure / Potential Contamination Source	Evidence of bricks and concrete boulders. Appears to be part of a path running adjacent to the west of the field boundary. Potential evidence of made ground or remanence of a structure	24b
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GGP-GI-Pt-24	Structure / Potential Contamination Source	Evidence of bricks and concrete boulders. Appears to be part of a path running adjacent to the west of the field boundary. Potential evidence of made ground or remanence of a structure	24c
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GGP-GI-Pt-25	Potential Contamination Source	Several IBC tanks and barrels observed behind barn. IBC appears empty but previous contents and contents of barrels unknown. Photograph taken facing north east from walkover route.	25a
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GGP-GI-Pt-26	Relict Structure/obstruction	No evidence of an historical structure identified in the DTS as being located in the south west corner of the field. Image taken facing south from walkover route. View and observation limited due to distance.	26a
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GGP-GI-Pt-
27

Other

Bridge ID (ECM1/235)
and contact information.

27a



GGP-GI-Pt-
28

Access

Field access, gap in hedge row approx 3m wide. Proposed parking area not suitable as would block access and either side is vegetated and sloped. Access located directly off of a 60mph road. Accessed by walking from suitable parking area located near the saw mill.

28a



GGP-GI-Pt-
28

Access

Field access, gap in
hedge row approx 3m
wide. Proposed parking
area not suitable as
would block access and
either side is vegetated
and sloped. Access
located directly off of a
60mph road. Accessed
by walking from suitable
parking area located near
the saw mill.

28b



GGP-GI-Pt-
28

Access

Field access, gap in
hedge row approx 3m
wide. Proposed parking
area not suitable as
would block access and
either side is vegetated
and sloped. Access
located directly off of a
60mph road. Accessed
by walking from suitable
parking area located near
the sawmill.

28c



GGP-GI-Pt-
29

Other

Public access into
development area.

29a



GGP-GI-Pt-30	Depression / Potential Contamination Source	Depressions (approx 3m depth max) located in area of identified historical pit in DTS, otherwise no other evidence.	30a
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GGP-GI-Pt-30	Depression / Potential Contamination Source	Depressions (approx 3m depth max) located in area of identified historical pit in DTS, otherwise no other evidence.	30b
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GGP-GI-Pt-31	Access	Limited height and width access point under railway bridge c.8m height 6m width	31a
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GGP-GI-Pt-32	Viewpoint	General view of agricultural land looking south slightly sloping south	32a
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GGP-GI-Pt-33	Viewpoint/ Karst	General view of agricultural land looking west sloping towards central potential karstic valley feature	33a
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GGP-GI-Pt-34	Viewpoint	Parking location	34a
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GGP-GI-Pt-34	Viewpoint	Parking location	34b
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GGP-GI-Pt-35	Viewpoint	General view of agricultural land looking southwest along field boundary	35a
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GGP-GI-Pt-36	Infrastructure	General view of overhead line infrastructure bisecting fields	36a
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GGP-GI-Pt-
36

General view of overhead
line infrastructure
bisecting fields 36b



GGP-GI-Pt- 37	Viewpoint/ Karst	General view of agricultural land looking east sloping towards valley features	37a
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GGP-GI-Pt-
38

Access

Access point into field
boundary, clearing c.3m
in width looking southeast

38a



GGP-GI-Pt-39 Viewpoint View of agricultural land looking southwest 39a



GGP-GI-Pt-40	Viewpoint	Genres view of agricultural land sloping towards central depression looking south	40a
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GGP-GI-Pt-41	Viewpoint	General view of agricultural land sloping towards central depression looking south	41a
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GGP-GI-Pt-
42

Viewpoint

General view of
agricultural land looking
south very slightly sloping
to the south

42a



GGP-GI-Pt-42	Viewpoint	General view of agricultural land looking south very slightly sloping to the south	42b
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GGP-GI-Pt-
43

Viewpoint/
Karst

General view of
agricultural land and
potentially karstic valley
feature looking north

43a



GGP-GI-Pt-
44

Viewpoint

General view of
agricultural land slightly
looking northwest slightly
sloping to the south

44a



GGP-GI-Pt-
45

Viewpoint

General view of
agricultural land looking
south slightly sloping to
central depression

45a



GGP-GI-Pt-46	Viewpoint	General view of agricultural land looking north sloping south with overhead line infrastructure	46a
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GGP-GI-Pt-47	Viewpoint	General view of agricultural land looking south towards barn slightly sloping south	47a
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GGP-GI-Pt-
48

Viewpoint

General view of
agricultural land looking
west sloping south

48a



GGP-GI-Pt-49	Viewpoint	General view of agricultural land looking south sloping towards valley feature	49a
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GGP-GI-Pt-50	Infrastructure	General view of overhead line and railway infrastructure adjacent to field boundary looking north	50a
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GGP-GI-Pt-51	Viewpoint	View looking southwest of agricultural land slopping into potential central karstic feature	51a
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GGP-GI-Pt-52	Viewpoint	General view of agricultural land looking north slightly sloping to the north	52a
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GGP-GI-Pt-
53

Access

General view of dirt track
access road c. 3m width
and adjacent mostly dry
drainage ditch looking
southwest

53a



GGP-GI-Pt- 54	Viewpoint/ Karst	Potential stream sink karst feature	54a
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GGP-GI-Pt-55	Infrastructure / Slope	General view of railway embankment	55a
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GGP-GI-Pt-56	Utility	General view of existing overhead infrastructure	56a
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GGP-GI-Pt-56	Utility	General view of existing overhead infrastructure	56b
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GGP-GI-Pt-
57

Viewpoint

General view of
agricultural land looking
north slightly sloping
towards central
depression

57a



GGP-GI-Pt-
58

Access

View of northwestern
access point c. 5m wide
with no gate and view of
railway bridge with
clearance of c. 14m
height and 8m wide.
Looking northeast

58a



GGP-GI-Pt-59 Access Bridge height restriction and Id 59a



GGP-GI-Pt-60	Viewpoint/ Karst	General view of agricultural land looking southeast sloping towards valley feature with overhead line infrastructure	60a
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GGP-GI-Pt-
61

Viewpoint

General view of
agricultural land slightly
increasing in level to the
northeast

61a



GGP-GI-Pt-62	Infrastructure	Views of overhead line infrastructure bisecting site	62a
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GGP-GI-Pt-62	Infrastructure	Views of overhead line infrastructure bisecting site	62b
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GGP-GI-Pt-62	Infrastructure	Views of overhead line infrastructure bisecting site	62c
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GGP-GI-Pt-63	Access	3m wide gravel track access road to the south of the site with no gate	63a
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GGP-GI-Pt-63	Access	3m wide gravel track access road to the south of the site with no gate	63b
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GGP-GI-Pt-
63

Access

3m wide gravel track
access road to the south
of the site with no gate

63c



GGP-GI-Pt-64	Viewpoint/ Karst	View of valley feature looking northeast	64a
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GGP-GI-Pt-
65

Viewpoint/
Karst

General view of
agricultural land looking
northeast sloping towards
central potential karstic
valley feature

65a



GGP-GI-Pt- 66	Viewpoint/ Karst	Photographs of the potentially karstic valley feature from within it looking west	66a
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GGP-GI-Pt-66	Viewpoint/ Karst	Photographs of the potentially karstic valley feature from within it looking west	66b
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GGP-GI-Pt-66	Viewpoint/ Karst	Photographs of the potentially karstic valley feature from within it looking west	66c
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GGP-GI-Pt-67	Viewpoint/ Karst	General view of agricultural land looking north slightly sloping towards central potential karstic	67
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GGP-GI-Pt-68 Viewpoint View of slight ditch along field boundary looking west 68a



GGP-GI-Pt-69	Potential Contamination Source	Saw mill confirmed at location on aerial imagery. There is a suitable lay-by for parking for site access at this location.	69a
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GGP-GI-Pt-69	Potential Contamination Source	Saw mill confirmed at location on aerial imagery. There is a suitable lay-by for parking for site access at this location.	69b
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GGP-GI-Pt-
70

Access

Suitable lay-by for
parking. Located on Back
Lane, to the right of
restricted by way
entrance.

70a



GGP-GI-Pt-
70

Access

Suitable lay-by for
parking. Located on Back
Lane, to the right of
restricted by way
entrance.

70b



GGP-GI-Pt-71	Access	Restricted byway entrance.	71a
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GGP-GI-Pt-71	Access	Restricted byway entrance.	71b
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GGP-GI-Pt-72	Access/Other	Views of restricted byway and adjacent vegetated drainage ditches.	72a
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GGP-GI-Pt-72	Access/Other	Views of restricted byway and adjacent vegetated drainage ditches.	72b
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GGP-GI-Pt-73	Potential Contamination Source	Large patch of disturbed land approx. 20m*10m located on the south of the by-way.	73a
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GGP-GI-Pt-74	Surface Water Feature/Contamination Source	Approximately 200m runoff from large manure pile located on the offsite (northern) side of restricted by way. Flowing into drainage ditch adjacent to the road.	74a
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GGP-GI-Pt-74	Surface Water Feature/Contamination Source	Approximately 200m runoff from large manure pile located on the offsite (northern) side of restricted by way. Flowing into drainage ditch adjacent to the road.	74b
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GGP-GI-Pt-74	Surface Water Feature/Contamination Source	Approximately 200m runoff from large manure pile located on the offsite (northern) side of restricted by way. Flowing into drainage ditch adjacent to the road.	74c
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GGP-GI-Pt-74	Surface Water Feature/Contamination Source	Approximately 200m runoff from large manure pile located on the offsite (northern) side of restricted by way. Flowing into drainage ditch adjacent to the road.	74d
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GGP-GI-Pt-75	Potential Contamination Source	Large manure stockpile located to the north of the by-way. Evidence of run-off into drainage ditches.	75a
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GGP-GI-Pt-75	Potential Contamination Source	Large manure stockpile located to the north of the by-way. Evidence of runoff into drainage ditches.	75b
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GGP-GI-Pt-
76

Access

Approximately 3/4m wide
ungated access at extent
of the byway. Cattle grid
present.

76a



GGP-GI-Pt-
77

Viewpoint

General view of
agricultural land looking
south sloping north with
drainage ditch adjacent to
field boundary

77a



GGP-GI-Pt-78	Access	View of access point c.2.5m with no gate looking south	78a
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GGP-GI-Pt-
79

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General view of
agricultural land looking
northwest

79a



GGP-GI-Pt-
80

Wildlife/Ve
getation

View of bull signage
looking west towards
agricultural field

80a



GGP-GI-Pt-81 Viewpoint General view of agricultural land looking southeast slightly sloping south 81a



GGP-GI-Pt-82 Viewpoint General view of agricultural land looking north with overhead line infrastructure 82a



GGP-GI-Pt-83 Utility Buried services indication 83a



GGP-GI-Pt-84	Access	View of access c.4m wide with no gate and proposed parking location, restricted byway	84a
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GGP-GI-Pt-84	Access	View of access c.4m wide with no gate and proposed parking location, restricted byway	84b
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GGP-GI-Pt-84	Access	View of access c.4m wide with no gate and proposed parking location, restricted byway	84c
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GGP-GI-Pt-
85

Viewpoint

General view of
agricultural land looking
south slightly sloping
south with adjacent
drainage ditch

85a



GGP-GI-Pt-86	Utility	Confirmation of buried services	86a
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GGP-GI-Pt-
86

Utility

Confirmation of buried
services

86b



GGP-GI-Pt-
87

Utility

Confirmed buried pipeline at this location.

87a



GGP-GI-Pt-
88

Dry depressions (max 1.5 m deep and 3 m diameter) at the location of a “pond” identified in the DTS. No evidence of Iron resource area/mining (also identified in DTS).

88a



GGP-GI-Pt-88	Surface Water Feature/Potential Contamination Receptor	Dry depressions (max 1.5 m deep and 3 m diameter) at the location of a “pond” identified in the DTS. No evidence of Iron resource area/mining (also identified in DTS).	88b
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GGP-GI-Pt-89	Other	Shooting platform.	89a
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E. Approach to Geo- environmental Reporting

Appendix E Approach to Geo-environmental Reporting

Legislative Context and Guidance

Where this report relates to existing or proposed planning application, it considers the contents of the Town and Country Planning Act 1990 (as amended), the National Planning Policy Framework (2012, updated in December 2024) and considers the potential implications of Part 2A of the Environmental Protection Act 1990 (Part 2A) and the associated Contaminated Land (England) Regulations 2006 and Contaminated Land Statutory Guidance (2012).

This report has been prepared in general accordance with the technical guidance and procedures described in the UK Government guidance Land Contamination: Risk Management (2019) and its predecessor, Model Procedures for the Management of Land Contamination, Contaminated Land Report (CLR) 11 (Defra/Environment Agency, 2004), British Standard (BS) 5930:2015 (as amended) Code of Practice for Site Investigations (BSI), BS:EN 1997 Eurocode 7 – Geotechnical Design (BSI) and BS 10175:2026 Investigation of Potentially Contaminated Sites – Code of Practice (BSI).

Historical Map Review

AAJV notes that only indicative map scales are provided. Where dates are stated, these refer to the dates of maps on which the features are present, have changed use or are no longer annotated, and do not necessarily refer to the exact dates of existence of a particular feature. Development that may have occurred between map editions is recorded as occurring on the latter published map, hence there are some limitations to the accuracy to the date of development unless supplementary evidence is available.

Conceptual Site Model Derivation

The CSM is aimed at identifying possible risks, if any, arising from substances used or deposited on-site, or from other sources of land contamination. Both past and current potentially contaminative land uses have been considered. It is based on the proposed site redevelopment described in **Section 1** of this report.

Assessment Framework

The Site, in terms of potential land contamination, will be regulated by the Local Authority under the Town and Country Planning Act 1990 (as amended), taking account of the National Planning Policy Framework (2012, updated in December 2024), with the Environment Agency, Natural England and English Heritage acting as potential statutory consultees.

Environmental liabilities can arise through provisions contained within statutory legislation including Part 2A of the EPA 1990, the Environmental Damage (Prevention and Remediation) Regulations 2009, the Water Resources Act 1991, the Groundwater Regulations 2009 and the Water Act 2003.

Current best practice recommends that the determination of health hazards due to contaminated land is based on the principle of risk assessment, as outlined in the Statutory Guidance to Part 2A (2012) and Land Contamination: Risk Management (LCRM).

The “suitable for use” approach is adopted (as outlined in the Contaminated Land Statutory Guidance) for the assessment of contaminated land where remedial measures are undertaken

where unacceptable risks to human health or the environment are realised taking into account the use (or proposed use) of the land in question and the environmental setting.

The risk assessment process for environmental contaminants is based on a source-pathway-receptor analysis. These terms can be defined as follows:

- **Source:** hazardous substance that has the potential to cause adverse impacts.
- **Pathway:** route whereby a hazardous substance may come into contact with the receptor: examples include ingestion of contaminated soil and leaching of contaminants from soil into watercourses.
- **Receptor:** target that may be affected by contamination: examples include human occupants/ users of site, water resources (surface waters or groundwater), or structures.

For a risk to be present, there must be a relevant / viable contaminant linkage; i.e. a mechanism whereby a source impacts on a sensitive receptor via a pathway.

AAJV have determined the potential sources, pathways and receptors to assess potential risks/liabilities and constraints associated with the Site in its current condition prior to any proposed redevelopment. Risks associated with the proposed redevelopment have also been assessed based on the future land use scenario specified, including any potential sources of contamination, potential receptors and potential contaminant pathways identified during this desk based assessment.

Approach to Risk Assessment

Current best practice recommends that the determination of hazards due to contaminated land is based on the principle of risk assessment, as outlined in the Environment Agency guidance on LCRM.

For a risk to be present, there must be a viable contaminant linkage; i.e. a mechanism whereby a source impacts on a sensitive receptor via a pathway.

Assessments of risks associated with each of these contaminant linkages are discussed in the following sections.

Using criteria broadly based on those presented in the CIRIA C552, the magnitude of the risk associated with potential contamination at the Site has been assessed. To do this an estimate is made of:

The magnitude of the potential consequence (i.e. severity).

The magnitude of probability (i.e. likelihood).

The severity of the risk is classified according to the criteria in Table E-1.

Table E.1 Description of Severity of Risk

Severity Definition		Examples (as defined by C552)
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by Environmental Protection Act	High concentrations of cyanide on the surface of an informal recreation area.

	1990, Part IIA. Short-term risk of pollution (note: Water Resources Act contains no scope for considering significance 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 (note: the definitions of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health ("significant harm" as defined in DETR 2000). Pollution of sensitive water resources (note: Water Resources Act contains no for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem. (note: the definitions of ecological systems within Draft Circular on Contaminated Land, DETR, 2000).	Concentrations of a contaminant from site exceed the generic, or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve.
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.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
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 presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

The probability of the risk occurring is classified according to the criteria in Table E-2.

Table E.2 Likelihood of Risk Occurrence

Likelihood Definition		Example
High	There is a pollutant linkage and an event that either appears very likely in the short-term and almost	The contaminant linkage exists or is very likely to exist in the short term, and / or may also be linked to visual / olfactory evidence of that

	inevitable over the long-term, or there is evidence at the receptor of harm or pollution.	linkage being present and active in some cases. The conditions are such that there is no foreseeable reason to suggest that a source-pathway-receptor linkage is not occurring and required mediums for a contamination source to pass through / within to reach a receptor are all present.
Likely	There is pollutant 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.	The conditions are such that there are very few foreseeable reasons to suggest that a source-pathway-receptor linkage is not occurring, and that all or most of the required mediums for a contamination source to pass through / within to each a receptor are present.
Low	There is pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term.	The source, pathway and receptor linkage may exist and it is possible that contamination could reach a receptor in certain circumstances. The Site conditions indicate that there are limiting factors in the pathway mediums / generation potential of the source / or presence of the receptor.
Unlikely	There is pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.	The source, pathway and receptor may exist in certain circumstances, but the contaminant linkage is improbable in the short term and in the long term.

An overall evaluation of the level of risk is gained from a comparison of the severity and probability, as shown in Table E-3.

Table E.3 Risk based on Comparison of Likelihood and Severity

		Severity			
		SEVERE	MEDIUM	MILD	MINOR
Likelihood	HIGH	Very High	High	Moderate	Moderate/Low
	LIKELY	High	Moderate	Moderate/Low	Low
	LOW	Moderate	Moderate/Low	Low	Very Low
	UNLIKELY	Moderate/Low	Low	Very Low	Very Low

Further description of the classified risks as defined by CIRIA C552 is provided below.

Very high risk

There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the Site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.

High risk

Harm is likely to arise to a designated receptor from an identified hazard at the Site without remediation action. Realisation of the risk is likely to present a substantial liability to the Site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.

Moderate risk

It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

Low risk

It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the Site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.

Very low risk

It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

Discussion of Acute Risk to Construction Workers

AAJV understands that the proposed development works will be undertaken in compliance with Construction Design and Management (CDM) 2015 regulations.

Prior to work commencing, a health and safety risk assessment should be carried out by the appointed Principal Contractor / developed in accordance with current health and safety regulations. This assessment should cover potential risks to construction staff, permanent site staff and the local population. Based on the findings of this risk assessment, appropriate mitigation measures should be implemented during the construction period.

The greatest potential for generation of dust will be during the Site works and therefore dust generation should be kept to a minimum in accordance with general best practice, as outlined in, for example, 'Environmental Good Practice on Site', CIRIA Publication C692 to reduce this risk.

The risk to construction workers during the excavation and construction phases in terms of potential exposure to high concentrations of contaminants is considered to be low given the historic and current land uses identified at the Site. Should gross contamination be identified

during the construction phase, then this may pose a potential acute risk to construction works. It is likely to be able to be effectively managed through good health and safety practices and protocols. Adoption of appropriate dust suppression techniques would also mitigate the degree of potential particulate migration off-site.

F. Geotechnical Risk Register

Appendix F Geotechnical Risk Register

A Geotechnical Risk Register has been compiled to show the degree of risk attached to various ground related aspects of the proposed scheme. The purpose of the register is to produce an assessment of the risk to the project posed by site specific ground related problems and identify suitable mitigation measures to control the risk to an acceptable level. The risk register should be developed and refined as the geotechnical design and assessment progresses such that the register will allow management of the geotechnical risks.

The degree of risk (R) is determined by combining an assessment of the likelihood (L) of the hazard with an assessment of the severity (S) of the hazard. The scale against which the likelihood and severity are measured, and the resulting degree of risk determined is presented below. Table F.4 presents the risk register for the proposed scheme.

Table F.1 Classification of Probability and Impact

Likelihood (L)		Severity (S)	
Very Likely	5	Very High	5
Likely	4	High	4
Probable	3	Medium	3
Unlikely	2	Low	2
Negligible	1	Very Low	1

Table F.2 Risk Matrix

Likelihood	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
		Severity				

Table F.3 Classification of Risk Rating

Risk rating	Response
Intolerable	Unacceptable
Substantial	Early Attention
Tolerable	Regular Attention
Trivial	Monitor

Table F.4 Geotechnical Risk Register

Identified Geotechnical Hazard	Location	Cause	Risk before Control			Consequence	Mitigation Measures	Risk after Control		
			L	S	R (LxS)			L	S	R(LxS)
Aggressive Ground Chemistry	North of Site where Till is mapped and South of site where Rutland Formation is mapped	Till , Rutland Formation, Grantham Formation and Whitby Mudstone are potentially sulphide/sulphate bearing stratum;	4	3	12	Deleterious effects on buried concrete/piles; Pavement Heave.	Analyse BRE test results and design concrete mix and the additional protective measures during detailed design in accordance with BRE guidance.	1	3	3
Existing Underground and Overhead Services at proposed site of works	Scheme Wide	Overhead lines visible crossing from the west of the Site. Fuel Pipeline Onsite Ground Investigation Works; Site construction works, site clearance and site set-up (compound, haul roads etc.)	4	4	16	Increased cost and delay to divert or lower services; H&S impact during any excavations during Ground Investigation or construction; Relocation of ground investigation or site area to avoid overhead services; Scheme design alterations to avoid overhead/underground services.	Obtain up to date service plans and records current records include Partial PAS 128 Type D survey included within Figure 6; Liaise with asset owners of overhead lines to confirm stand-off requirements for construction/GI Avoid positioning investigation locations within the	2	4	8

Identified Geotechnical Hazard	Location	Cause	Risk before Control			Consequence	Mitigation Measures	Risk after Control		
			L	S	R (LxS)			L	S	R(LxS)
							standoff distance of the overhead lines Undertake safe digging procedures in accordance with HSG47 and PAS128; Undertake GPR surveys and mark out services prior to any investigations; Contact asset owners to agree standoff requirements; Plan Ground Investigation to avoid buried services; Design proposed scheme to minimise impact on existing services.			
Groundwater/ Watercourses	Central site area	Evidence of recent stream/unnamed watercourse flowing across the north of the	4	3	12	Flooding of excavations.	Aquifer protection measures to be adopted during	2	3	6

Identified Geotechnical Hazard	Location	Cause	Risk before Control			Consequence	Mitigation Measures	Risk after Control		
			L	S	R (LxS)			L	S	R(LxS)
		Site and a small branching stream confluences south of the Site along field boundaries. Perched groundwater may be present in clayey superficial soils where Till is present in north and central site area. Site contains underlying bedrock with Principal Aquifer status.				Inadequate design (incorrect groundwater level assumptions). Perched groundwater may give local artesian conditions causing delays to the ground investigation and issues with construction. Risk of contamination from construction to aquifer.	Ground Investigation. Provision of groundwater control in temporary works design. Conservative approach to be taken at design stage in selecting groundwater level. Review ground investigation data and if required carry out additional ground investigation to install further monitoring instrumentation and continue to monitor groundwater levels. Groundwater monitoring to be continued into construction.			
Collapsible and Ground	Central Site area within Upper	There is potential for the limestone bedrock	4	3	12	Karst features may result in abnormal ground conditions	Ground investigations to	2	3	6

Identified Geotechnical Hazard	Location	Cause	Risk before Control			Consequence	Mitigation Measures	Risk after Control		
			L	S	R			L	S	R(LxS)
Dissolution Feature Ground Stability	Lincolnshire Limestone, elevated band associated with margin of Till in the north of the site.	at the Site to contain karst features.				and voids, posing a risk of subsidence / ground collapse.	identify underlying ground conditions and assess risk. Piling method to consider potential for Karst features for design.			
Compressible, Shrinking or Swelling Clay Ground Stability	Scheme Wide	Medium (isolated within Till) risk from WebGIS data set but may be present depending on local site conditions.	3	2	6	Unacceptable degrees of settlement, including differential settlement resulting in damage to infrastructure. Including potential for issues with excavation	Ground investigations to identify underlying ground conditions and assess risk. Designs to account for settlement Appropriate design parameters to be incorporated into designs.	3	1	3
Landslide Risk	Northwest	Elevated risk of landsliding on southeastern facing slopes, where superficial deposits are present.	3	4	12	Slope instability including failure of earthworks and cuttings.	Ground investigation to identify underlying ground conditions. Appropriate design of excavations and support to prevent failure and slope stability analysis where required.	1	4	4

Identified Geotechnical Hazard	Location	Cause	Risk before Control			Consequence	Mitigation Measures	Risk after Control		
			L	S	R (LxS)			L	S	R(LxS)
Unknown / unexpected ground conditions	Scheme Wide	Absence of ground investigation information across site. Site is situated between mapped boundaries of multiple bedrocks which may not be a true reflection of the ground conditions. Impact of faulting and mineral extraction on site.	4	4	16	Damage to and possible failure of proposed development due to incorrect ground model, design parameters etc. Increased cost and delay to account for unexpected ground conditions.	Ground investigations and associated in-situ and laboratory testing to identify underlying ground conditions and assess risk, targeted across Site depending on nature of proposed development. Appropriate design ground model and parameters to be incorporated, considering changes in ground conditions. Consideration of inspection by a suitably qualified geotechnical engineer and inclusions of validation testing during construction to confirm design assumptions.	2	2	4

Identified Geotechnical Hazard	Location	Cause	Risk before Control			Consequence	Mitigation Measures	Risk after Control		
			L	S	R (LxS)			L	S	R(LxS)
Lateral and vertical variabilities in ground conditions	Scheme wide	Site is situated within sequence comprising relatively thin bedrock strata and therefore variation and pinching out in addition to faulting shown present may have significant changes to the ground profile in a lateral space.	4	2	8	Differential settlement due to variable ground conditions are similar depths, resulting in damage to proposed development, including infrastructure.	Ground investigations to identify underlying ground conditions and assess risk. Designs to account for variations e.g. through increasing construction depths to account for variations in ground condition.	2	2	4
Unexploded ordnance (UXO)	Scheme Wide	Preliminary UXO Risk Assessment with identification of potential for encountering UXO on site. Subsequent Detailed UXO Risk Assessment Awaited.	3	4	12	Potential for loss of life if struck. Delays / increased costs if encountered.	Obtaining UXO desk detailed assessment to further inform risk and mitigation measures. Mitigation measures implemented based on UXO assessments prior to any breaking ground works. If further assessment not undertaken prior to ground investigation works,	2	4	8

Identified Geotechnical Hazard	Location	Cause	Risk before Control			Consequence	Mitigation Measures	Risk after Control		
			L	S	R			L	S	R(LxS)
							full UXO supervision / mitigation measures to be incorporated throughout works.			
Excavation instability, including potential for saturated granular deposits	Potential for granular weathered limestone, faulted bedrock and loose unconsolidated sediments within Till	The published geology indicates the presence Limestone within bedrock lithologies and structural features showing faults crossing the Site may have brecciated zones.	3	4	12	Unstable excavations, prone to collapse, posing risk to life and difficulties / delays during construction, with potential for increasing construction costs and causing delays.	Ground investigations to be undertaken to identify underlying ground and groundwater conditions and assess risk. Instabilities to be considered during investigations, design and constructions e.g. through: - Battering back excavation faces to suitable safe angles. - Excavation support.	2	3	6

Identified Geotechnical Hazard	Location	Cause	Risk before Control	Consequence	Mitigation Measures	Risk after Control
			L S R (LxS)			L S R(LxS)
					- Selecting suitable excavation methodologies / equipment / plant. - For any permanent cuttings, engineering solution to mitigate instabilities e.g. retaining wall, soil nails, rock bolts, netting / mesh systems etc. Consideration of limiting any cut works, especially any permanent cuttings, in areas likely prone to excavation instabilities. Appropriate design parameter to be incorporated into designs. Consider ongoing monitoring post construction and	

Identified Geotechnical Hazard	Location	Cause	Risk before Control			Consequence	Mitigation Measures	Risk after Control		
			L	S	R (LxS)			L	S	R(LxS)
							maintenance plan, as appropriate, for any permanent cuttings.			
Recorded and unrecorded mining	Site wide	BritPit present on site, strata known to be mined for ironstone present beneath the Site. A ceased mine is located 4km from the Site has mineral permissions encroaching the northern site boundary present, therefore there may be workings associated with it present. LiDAR survey identifying depressions in topography potentially related to quarrying.	3	4	12	Presence of potentially mining related made ground within historical BritPit , LiDAR survey and potential for void potential for unrecorded / voids to exist at or close to the Site, leading to rapid surface collapse and / or settlement in the surrounding area.	Area was targeted during walkover, No evidence was observed from the walkover of surface expression to indicate mining occurred in this area. Obtain mining plans of nearby Easton Mine to confirm extent of workings. Geophysics survey ahead of intrusive works to survey voids associated with mining activity to target ground investigation.	1	4	4

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