

Contaminated Land Inspection Report

Former Oil Field Lynn Road Setchey King's Lynn

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Contents

Executive Summary	1
1 Introduction	2
2 Desk Study Information	2
Location	2
Previous investigation	2
Previous Site Usage	2
Present Site Usage	3
Ownership	3
Environmental Setting	4
Geology	4
Hydrogeology	4
Hydrology	4
Local Authority Pollution Prevention and Control Regulations	5
Department for Environment, Food and Rural Affairs, Historic England,	
Natural England, Environment Agency Web site records	5
Setch Oil fields	5
Setch Tip	5
Norfolk E-map Explorer	6
Historic Maps on file at the Borough Council of King's Lynn and West	•
Norfolk	6
Aerial Photographs	6
Planning History	/
	8
	8
Humans	ð
Property	8
Environment	8
Controlled Water - Groundwater & Surface water	8
4 Contaminated Land Risk Assessment	9
Assessment of probability of a contamination event	9
Human health, property environment	9
Controlled water - Groundwater	9
Controlled water - Surface water	9
Assessment of Hazard	a
Human Health	10
Droporty	10
	10
	10
Controlled Water - Groundwater	10
Controlled Water - Surface waters	10
Conceptual site model	11
5 Outcome of Preliminary Risk Assessment	12
Conclusion	12
Part 2A status	12
Further Action	12
Appendices	13
Appendix A: Site Photographs	14
Appendix B: Drawings	23

Appendix C. Risk Assessment Methodology	.32
Appendix D. Determination of contaminated land – Contaminated Land	
Statutory Guidance, April 2012	.34

Executive Summary

The Borough Council of King's Lynn and West Norfolk (BCKLWN) has a statutory duty to inspect its district for potentially contaminated land under Part 2A of the Environmental Protection Act 1990. The Borough Council's Part 2A inspection strategy has identified the Former Oil Fields, Lynn Road Setchey (the site) as being of high priority due to the presence of a former oil shale extraction site & landfill and potentially sensitive receptors. Given the former site usage, an assessment of the site has been undertaken to assess the potential for harm to human health, property, ground/surface water and designated environmental receptors.

The site is situated to the west of the A10, Lynn Road and north of Willow Drive in Setchey, within the West Norfolk borough.

To gather information of the site's history a desk study and preliminary risk assessment were carried out by the Environmental Quality Team. From the evidence gathered during the desk study of the site history and a site walkover, the following can be stated: The site was historically agricultural land before being developed as part of the Setch Oil Fields, following which the area appears to have been filled and returned to open grassland. The site's present use is as a Church Meeting Hall. The site is in a semi-rural area surrounded by houses, agriculture, open land and commercial units. The site and meeting hall are managed by the Church Trustees.

The site has been subject to previous investigations as part of the planning process for redevelopment. No significant risks were identified but the development took place with measures to protect the building and end-users as an additional safeguard.

From the contaminated land risk assessment plausible source pathway receptor linkages were identified. The hazard was generally judged as low and the probability of a contamination event was low or unlikely. A LOW risk was assessed from contamination to human health, LOW risk to property, VERY LOW risk to the wider environment and LOW risk was identified to surface water and groundwater.

There was no evidence of harm or of a significant possibility of significant harm to the receptors identified in the conceptual site model. As the risk posed is low, the site would be classified as Category 4 as set out in the Statutory Guidance. Therefore the site is not considered to be contaminated land under Part 2A of the Environmental Protection Act 1990.

1 Introduction

This report details a review of information and risk summary about land on Lynn Road and to the North of Willow Drive, Setchey and provides a conclusion on the risk to human health, property, groundwater and the wider environment.

The Contaminated Land Statutory Guidance (DEFRA, 2012) suggests that where the authority has ceased its inspection and assessment of land as there is little or no evidence to suggest that it is contaminated land the authority should issue a written statement to that effect.

2 Desk Study Information

Location

The site is located to the West of the A10 Lynn Road and North of Willow Drive, Setchey. The location is shown in Figure 1. The grid reference for the centre of the site is NGR 563417 314315. The nearest postcode is PE33 0BG.

Previous investigation

The site has been subject to a number of investigations. Table 1 below lists the reports used in compiling this written statement. The reports on the public record and can be accessed via our <u>planning webpage</u> via the planning reference 06/01244/FM.

Table 1 Docum	ents used in this	report
Date	Author	Title
6th June 2006	MM Enviro Ltd	Letter Report on ground gas tests
21st August	Kingham	Investigation of Soil and Ground Gas,
2006	Construction/	further report
	MM Enviro	
March 2009	Kingham	Drainage and Environmental report
	Construction	
25 th March	Kingham	Letter report
2009	Construction	
September	EPS	Environmental Desk Study, Land south
2010		of 8 Willow Drive Setchey
November	EPS	Addendum to desk study
2010		

The June 2006 and 2009 letter reports set an investigation which took place as a result of concerns over the site having been a landfill in the past.

The 2010 EPS reports were in connection with land south of 8 Willow Drive which is adjacent to the site. However, this application (09/01415/F) was withdrawn and the report is not on the public record.

Previous Site Usage

The site was historically agricultural land before being developed as part of the Setch Oil Fields, following which the area appears to have been filled and returned to open grassland.

Present Site Usage

The site's present use is as a Church Meeting Hall. The aerial photograph below (figure 1) shows that the site is in a semi-rural area surrounded by houses, agriculture, open land and commercial units. Photographs of the site are in appendix A.



Figure 1: Site location and aerial photograph

Ownership

Enquiries have been made to establish land ownership. This report will be made available to the site owners. The site is managed by the Church Trustees.

Environmental Setting Geology

Local soils are described as freely draining slightly acid sandy soils with mainly arable land cover¹.

The BGS 1:50 000 scale² mapping describes Superficial geology as Tottenhill Gravel Member - Gravel. These sedimentary deposits are glaciogenic in origin. They are created by the action of ice and meltwater, and can form a wide range of deposits and geomorphologies associated with glacial and inter-glacial periods.

Bedrock geology is described as Kimmeridge Clay Formation - Mudstone. These sedimentary rocks are shallow-marine in origin and range from coarseto fine-grained (locally with some carbonate content) forming interbedded sequences.

The site is at 7-9 metres above ordnance datum (m AOD). Previous investigations have shown the geological strata encountered to be as set out in table 2.

Table 2: Geological strata (from MM Enviro, EPS re	a encountered l ports & BGS bo	locally prehole record)	1
Strata	Thickness	Average	Range of depth
	range (m)	thickness (m)	to top of stratum
			(m below
			ground level)
Topsoil	0.4 – 0.6	0.4	0
Made ground	0 - 3.0	1.5	0 - 0.4
Tottenhill gravel	1.2 – 1.4	1.3	0.4 - 3m
Kimmeridge Clay	Base not	-	16 – 17.0
	encountered		

Hydrogeology

The Tottenhill gravel is a secondary aquifer. The Kimmeridge Clay deposits are designated by the Environment Agency as an unproductive aquifer of medium-low vulnerability. There are no known licensed water abstractions within 1km of the site and no known private water abstractions. The site is within a nitrate vulnerable zone. Groundwater has been reported within the secondary aquifer at 2.5 - 3.0m below ground level.

Hydrology

The nearest water features are unnamed drains. There is a pond 274m Northwest associated with Fen End Farm. Water courses are assumed to flow towards the Puny drain, which is over 500m west of the site.

¹ MAGIC website, DEFRA/Natural England <u>https://magic.defra.gov.uk/MagicMap.aspx</u>

² Geology of Britain, British Geological Society <u>https://mapapps.bgs.ac.uk/geologyofbritain</u>

Local Authority Pollution Prevention and Control Regulations

Two processes exist within 500m of the site which are subject to local authority pollution control: GM concrete (concrete batching), T-Spray (vehicle refinishing).

Department for Environment, Food and Rural Affairs, Historic England, Natural England, Environment Agency Web site records³

West Winch Common is approximately 100m to the west of the site. No designated sites or ecological systems as set out in Table 1 of the contaminated land statutory guidance are situated on the site or within 1km.

Setch Oil fields

The site formed part of Setch Oil Fields where exploration took place and significant infrastructure was built by the privately-funded English Oilfields Ltd in 1916-1921⁴. The site was intended to exploit the potential oil reserves contained in the more organic-rich parts of the Kimmeridge Clay Formation. The early drilling programme claimed to have proved sulphur-free oil shales, together with many tons of free oil, a thick seam of natural paraffin wax (ozokerite), and an abundance of metalliferous minerals.

Extensive works are reported to have been carried out at the Setchey site between 1919 and 1920. Two opencast pits were opened, one on the east side of the site to work Pleistocene gravels for aggregate, and one in the north west to work oil shales. Four retorts were constructed to process 1000 tons of oil shale per day, a network of standard-gauge and 2 ft-gauge railway tracks was laid to connect the mine and oilshale opencast pit to the retorts, and a spur line (Clarke's Drove Siding) was constructed to link the site to the main London to King's Lynn railway line. Some of this development can be seen on the historical mapping described below.

However, in 1921, samples of shale oil from Setchey and the products derived from them were shown to have no commercial value because of their high sulphur content. The large deposits of free oil, ozokerite and metalliferous minerals were not proven. The full-scale retorts were never completed, the mine and opencast pit were abandoned, and there was little activity after about 1922.

Setch Tip

Setch tip is an area of land to the east and south east of the site which was historically used for sand and gravel extraction. Information from Norfolk County Council suggests that the site operated as a tip from 1959-1972. The site owner was reported to have been Sommerfield and Thomas. The site is thought to have been operated by Freebridge Lynn Rural District Council and then the borough council. There is little documentary record of the fill materials. There is no evidence that the site was capped and it is assumed that any hazardous ground gas can vent vertically upwards. Norfolk County Council have categorised the tip as 'NCC involvement unclear'. The site is reported to have

³ MAGIC website, DEFRA/Natural England <u>https://magic.defra.gov.uk/MagicMap.aspx</u>

⁴ Gallois, R. W. 2012. The Norfolk Oil-Shale Rush, 1916-1921. *Proc. Geol. Assoc.*, Vol. 123,

⁶⁴⁻⁷³

received category 2b waste, including decomposable waste. Due to the age of the tip it is not a priority for further risk assessment by Norfolk County Council.⁵

Historic Maps

Norfolk E-map Explorer

Tithe map circa 1840 – The site is shown to west of a road running north south (now the route of the A10). The site consists of numbered fields including one narrow strip. Common land is shown to the west.

Historic Maps on file at the Borough Council of King's Lynn and West Norfolk

Historic maps are presented in Appendix B and summarised below.

1843 – 1893: The site is depicted as one rectangular field to the west of an unnamed road (now the route of the A10). A number of trees are shown on the eastern border of the site. Fen End Farm is shown approximately 200m to the north west. Land to the south west is depicted as furze (gorse) and brushwood.

1891 – 1912: The map shows the site much the same as previously. A building and land (presumed house) are shown approximately 150m to the south to the west of the main road.

1904 – 1939: Much of the infrastructure associated with the Setch Oil Fields is shown. On the site several buildings are depicted in the centre and east of the site and an engine house in the north. Two railway sidings run north south in the east of the site and gravel and clay pits are shown to the west. Land to the south contains further sidings, tanks and other minor excavations, a chimney, filter bed and structures thought to represent the oil field retorts. The railway and oil field buildings are shown extending to over 500m to the south west of the site. An additional building (assumed to be associated with Fen End Farm) is shown approximately 160m the north north-west of the site.

1919 – 1943: Not available.

1945 – 1970: The Setch Oil Fields infrastructure is no longer shown. The site is bordered on the western side by a number of buildings which appear to be houses with gardens. A large warehouse with a tank is shown approximately 130m to the south of the site. 1:10000 scale mapping shows the land to the southeast of the site and east of the main road to be old sand and gravel pits.

1970 – 1996: not available

Aerial Photographs

Aerial photographs are presented in Appendix B and summarised below.

⁵ Email correspondance with Charles Wright, NCC Closed Landfills team 13/03/2020

1945 - 1946 MOD Aerial Photograph – A number of excavations and buildings can be seen on the site and surrounding area, corresponding to the oil fields infrastructure shown on the early 1900's mapping. There appears to be some limited excavation of the field to the south east of the site corresponding with the setch tip area.

1999 – The site appears as a grassed area within a larger field. The field to the north appears as bare soil. Several houses with gardens border the site to the west and a row of houses can be seen to the south. The warehouse and tank observed on the 1945-1970 map can be seen. The surrounding area appears to be agricultural fields or open land.

2006-2009 – The site is undergoing building works related to the construction of the Brethren church that still stands on the site. The same properties border the site, some have been redeveloped. The surrounding area is largely open land.

Latest – The Brethren Christian Church is shown post development with the property covering the majority of the effected area. There is a small pit on the field north of the site and a new warehouse has been built on land 140m north of site. The majority surrounding area continues to be open land.

Planning History

There are 2 relevant applications for redevelopment of the site which were permitted:

Year	Reference	Descriptio	on					
2005	05/00637/FM	Erection	of	brethren	church	with	associated	car
		parking						
2006	06/01244/FM	Erection	of	brethren	church	with	associated	car
		parking						

Planning consent 06/01244/FM included conditions 6, 7 and 8 which required investigation and remediation of ground contamination and protection against hazardous ground gas.

Reports submitted to discharge the conditions set out an investigation which took place as a result of concerns over the site having been a landfill in the past. Analysis of selected soil samples is reported to show no significant contamination which could affect the permitted use. It is reported that gas monitoring did not detect methane but indicated some carbon dioxide to be present together with depleted oxygen.

Additional (2009) information includes:

- an explanation of how the investigation related to the site's previous use
- photographs showing ground conditions in trial pits and excavations
- location of trial pits and a description of soil types

The information submitted in support of the planning consent provides details of soft landscaping including the use of site-won soils and incorporation of a terram membrane under the surface. As the site is predominantly hard-surfaced or turfed following the development of the meeting hall and a gas impermeable membrane has been installed beneath the building floor slab, there is now little potential for contact with residual contamination or the ingress of vapours. Conditions 6 & 7 of the planning consent were recommended for discharge April 2009. No new pathways were introduced for exposure to contaminants as a result of the development.

3 Site Walkover

A site walkover was carried out in February 2022. Photographs are presented in Appendix A.

The site was seen in good condition with no evidence of subsidence and well maintained. The plants on site appeared healthy with no evidence of vegetation stress due to contamination. There was evidence of rabbit and moles on site, particularly on the raised banks on the northwest and northeast of the plot which provide a screen to the site (photos 2 & 7). There was no evidence of waste materials or contamination in the mole hills or burrows.

There have been no problems reported from the site during its current occupancy and no visible or olfactory evidence of contamination or ground gas was noted during the walkover.

Location of Receptors

Humans

Houses are present adjacent to the site to the south and west and within 150m to the north. The site is securely fenced and it is assumed that the site is only accessed by those attending the meeting hall or maintaining the building and grounds.

Property

There are houses adjacent to the site and commercial property 140m to the north and 100m to the south.

Environment

There are no relevant types of receptor as set out in Table 1 of the statutory guidance within 1km of the site.

Controlled Water - Groundwater & Surface water

The Tottenhill gravel is a secondary aquifer. The geology at depth is designated as an unproductive aquifer. No evidence of water abstractions was noted. The nearest water features are unnamed drains and a pond 274m Northwest associated with Fen End Farm, The river Nar is over 800m South, Puny drain is around 500m west where the surrounding drains are assumed to lead into.

4 Contaminated Land Risk Assessment

The borough council has used a process adapted from CIRIA C552 (Contaminated Land Risk Assessment, a guide to good practice) to produce the conceptual site model and estimate the risks to defined receptors. Information gathered from documentary sources has been assessed together with evidence from the walkover survey to consider the probability, nature and extent of exposure and the severity and extent of the effects of the contamination hazard should exposure occur. Further explanation is provided in Appendix C.

Assessment of probability of a contamination event

Potential sources of contamination to be present on the site and also within Setch tip (12m to the East).

Human health, property environment

There are people and buildings present both on-site and off-site. No environmental receptors as defined in the statutory guidance have been identified on site or adjacent. No pollution incidents have been reported and it is not likely that human health or buildings are being harmed by the on-site or off-site sources or are likely to be harmed in the long-term. The probability of a contamination event affecting human health, property, or designated environmental receptors is LOW

Controlled water - Groundwater

There is a secondary aquifer beneath the site within the Tottenhill gravel. Some of this formation has been removed in the different phases of development of the site and the most recent phase of development took account of surface water drainage though the site. Although a pollutant linkage could exist the likelihood of a pollution event is considered to be LOW.

Controlled water - Surface water

Site drainage does not provide a preferential pathway for run-off to surface water and an exposure pathway was not found from the documentary and visual information gathered. The probability of a pollution event to surface water is therefore assessed as LOW.

Assessment of Hazard

From the information gathered it is considered that there is the potential for a source of contamination to be present on the site and also within Setch tip (12m to the East). The potential source is waste material within the on-site fill (rubble, soil, glass, wood) and waste in Setch tip (inert and decomposable waste). Due to the type and age of the fill material and landfill material, much of the decomposition will have taken place and therefore the infilled and landfilled land is not considered to form highly significant sources of mobile contaminants or hazardous ground gas. Site investigation information suggests that methane was not present. Some carbon dioxide was detected together with depleted oxygen.

Human Health

No visible waste materials were observed on any visits to the site. The site itself has been developed to take account of fill materials and the presence of hazardous ground gas. Health effects to human health can be easily prevented by means such as normal hygiene during grounds maintenance or gardening on the site or in adjacent gardens and washing of home grown produce. The hazard is assessed as LOW

Property

Harm, should it occur to crops, produce, livestock, owned or domesticated animals and buildings is not expected to be significant as defined in the statutory guidance. The hazard is assessed as LOW.

Environment

In considering environmental receptors, the statutory guidance states that the authority should only regard certain receptors (described in Table 1 of the Statutory Guidance) as being relevant for the purposes of Part 2A. Harm to an ecological system outside that description should not be considered to be significant harm. The site and surrounding area do not contain any of the receptors stipulated in Table 1 of the Statutory Guidance.

Controlled Water -Groundwater

There are no reports of significant concentrations of pollutants locally in the secondary aquifer. Therefore the hazard is assessed as LOW.

Controlled Water - Surface waters

There are no reports of significant levels of pollution in nearby watercourses The hazard is assessed as LOW.

Conceptual site model

The conceptual site model (Table 3) shows the sources, pathways and receptors identified and the subsequent risk classification.

Source	Pathway	Receptor	Probability	Hazard	Risk
Heavy metals,	Direct contact, ingestion, dust	Humans (adults and	Low	Low	Low risk
polyaromatic	inhalation, plant uptake	children)			
hydrocarbons	Direct contact	Property (buildings,	Low	Low	Low risk
petroleum	Gas migration into buildings	crops, owned or			
hydrocarbons		domesticated animals)			
asbestos	Direct contact	Environment*	Unlikely	Low	Very low risk
containing	Direct contact	Controlled water (surface	Low	Low	Low risk
materials		and groundwater)			
within fill					
materials					
Hazardous					
ground gas					

Table 3: Conceptual site model EXAMPLE

Low risk - It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.

Very low risk - There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is unlikely to be severe.

*Ecological systems as set out in Table 1 of the contaminated land statutory guidance

5 Outcome of Preliminary Risk Assessment

Conclusion

Plausible source pathway receptor linkages were identified and a LOW risk from contamination to human health, LOW risk to property, VERY LOW risk to the wider environment and LOW risk was identified to surface water and groundwater.

There was no evidence of harm or of a significant possibility of significant harm to the receptors identified in the conceptual site model. As the risk posed is low, the site would be classified as Category 4 as set out in the Statutory Guidance (Appendix D contains the categorisations from the Statutory Guidance).

No evidence was noted of significant pollution of controlled waters or of the significant possibility of such pollution.

Part 2A status

Statutory Guidance states that 'If the authority considers there is little reason to consider that the land might pose an unacceptable risk, inspection activities should stop at that point.' In such cases the authority should issue a written statement to that effect. This report forms that written statement.

On the basis of its assessment, the authority has concluded that the land does not meet the definition of contaminated land under Part 2A and is not considered contaminated land.

Further Action

This assessment is based on the site's current use and is valid providing no changes are made to the soil or vegetation cover material, to surface water conditions or to the site's use.

No further assessment of the site is considered necessary under Part 2A unless additional information is discovered or if changes are made to the site. Any applications for development adjacent to the site should take this report into account.

Appendices

Appendix A: Site Photographs



Photograph 2: Western boundary verge and lagoon. Mole hills and rabbit burrows evident on site.

















Appendix B: Drawings

















Appendix C. Risk Assessment Methodology

Land contamination: risk management guidance from the Environment Agency⁶ provides the technical framework for applying a risk management process when dealing with contaminated land.

The Borough Council's Contaminated Land Strategy has identified priority sites based on mapping and documentary information. The Contaminated Land Inspection Report collates all the existing information on the site and develops a conceptual site model to identify and assess potential pollutant linkages and to estimate risk.

The risk assessment process focuses on whether there is an unacceptable risk, which will depend on the circumstances of the site and the context of the decision. The Council has used a process adapted from CIRIA C552, Contaminated Land Risk Assessment, a guide to good practice⁷ to produce the conceptual site model and estimate the risk of harm to defined receptors. This involves the consideration of the probability, nature and extent of exposure and the severity and extent of the effects of the contamination hazard should exposure occur.

The probability of an event can be classified as follows:

- Highly likely: The event 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: It is probable that an event will occur, or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term;
- Low likelihood: Circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term;
- Unlikely: Circumstances are such that it is improbable the event would occur even in the long term.

The severity of the hazard can be classified as follows:

- High: 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 resources. Catastrophic damage to buildings or property. Short term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Contaminated Land Statutory Guidance, April 2012');
- Medium: Chronic damage to human health ('significant harm' as defined in 'Contaminated Land Statutory Guidance, April 2012'), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Contaminated Land Statutory Guidance, April 2012');

⁶ gov.uk/guidance/land-contamination-how-to-manage-the-risks

⁷ www.brebookshop.com/samples/142102.pdf

- Low: Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Contaminated Land Statutory Guidance, April 2012'). Damage to sensitive buildings, structures or the environment.
- Minor: Harm, though not necessarily significant harm, which may result in financial loss, to expenditure to resolve. Non-permanent human health effects (easily prevented by use of PPE). Easily repairable effects of damage to buildings, structure and services.

Once the probability of an event occurring and hazard severity has been classified, a risk category can be assigned from the table below:

	Hazard					
		High		Medium	Low	Minor
	High Very Hi Probability Risk		y High ‹	High Risk	Moderate Risk	Moderate/Low Risk
>	Likely	High Risk		Moderate Risk	Moderate/Low Risk	Low Risk
abilit	Low Probability	Moderate risk		Moderate/Low Risk	Low Risk	Very Low Risk
Prob	Unlikely	Moc Risk	derate/Low	Low Risk	Very Low Risk	Very Low Risk
Very High RiskThere is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is current happeningThis risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediat			uld arise to a OR, there is eptor is currently antial liability. and remediation			
Hig	h Risk		Harm is like	be required. ely to arise to a de	signated receptor	from an identified
Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) if required to clarify the risk and to determine the potential liability. Some remedial work may be required in the longer term.				stantial liability. if required to ability. Some rm.		
Mo	derate risk	e risk It's possible that harm could arise to a designated receptor from an identified hazard. However, it is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that harm would be relatively mild.			ted receptor from nlikely that any re to occur it is	
Moderate/Low risk It is possible that harm could arise to a designated receptor an identified hazard. However, if any harm were to occur it is more likely that harm would be relatively mild.			ted receptor from e to occur it is			
Lov	v Risk		It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.			ated receptor from m, if realised,
Ver	y Low Risk	Low Risk There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is unlikely to be severe				

Appendix D. Determination of contaminated land – Contaminated Land Statutory Guidance, April 2012

Human Health

Cotogony	
1	 The local authority should assume that a significant possibility of significant harm exists in any case where it considers there is an unacceptably high probability, supported by robust science-based evidence that significant harm would occur if no action is taken to stop it. For the purposes of this Guidance, these are referred to as "Category 1: Human Health" cases. Land should be deemed to be a Category 1: Human Health case where: (a) The authority is aware that similar land or situations are known, or are strongly suspected on the basis of robust evidence, to have caused such harm before in the United Kingdom or elsewhere; or (b) The authority is aware that similar degrees of exposure (via any medium) to the contaminant(s) in question are known, or strongly suspected on the basis of robust evidence, to have caused such harm before in the United Kingdom or elsewhere; (c) The authority considers that significant harm may already have been caused by contaminants in, on or under the land, and that there is an unacceptable risk that it might continue or accure
	there is an unacceptable risk that it might continue or occur again if no action is taken. Among other things, the authority may decide to determine the land on these grounds if it considers that it is likely that significant harm is being caused, but it considers either: (i) that there is insufficient evidence to be sure of meeting the "balance of probability" test for demonstrating that significant harm is being caused; or (ii) that the time needed to demonstrate such a level of probability would cause unreasonable delay, cost, or disruption and stress to affected people particularly in cases involving residential properties.
2	Land should be placed into Category 2 if the authority concludes, on the basis that there is a strong case for considering that the risks from the land are of sufficient concern, that the land poses a significant possibility of significant harm, with all that this might involve and having regard to Section 1. Category 2 may include land where there is little or no direct evidence that similar land, situations or levels of exposure have caused harm before, but nonetheless the authority considers on the basis of the available evidence, including expert opinion, that there is a strong case for taking action under Part 2A on a precautionary basis.
3	Land should be placed into Category 3 if the authority concludes that the strong case described in 4.25(a) does not exist, and therefore the legal test for significant possibility of significant harm is not met. Category 3 may include land where the risks are not low, but nonetheless the authority considers that regulatory intervention under Part 2A is not warranted. This recognises that placing land in Category 3 would not stop others, such as the owner or occupier of the land, from taking action to reduce risks outside of the Part 2A regime if they choose. The authority should consider making available the results of its inspection and risk assessment to the owners/occupiers of Category 3 land.

	Human Health
Category	
4	The local authority should consider that the following types of land should be placed into Category 4: Human Health:
	 (a) Land where no relevant contaminant linkage has been established.
	(b) Land where there are only normal levels of contaminants in soil, as explained in Section 3 of this Guidance.
	(c) Land that has been excluded from the need for further inspection and assessment because contaminant levels do not exceed relevant generic assessment criteria in accordance with Section 3 of this Guidance, or relevant technical tools or advice that may be developed in accordance with paragraph 3.30 of this Guidance.
	(d) Land where estimated levels of exposure to contaminants in soil are likely to form only a small proportion of what a receptor might be exposed to anyway through other sources of environmental exposure (e.g. in relation to average estimated national levels of exposure to substances commonly found in the environment, to which receptors are likely to be exposed in the normal course of their lives).

Ecological system effects

Relevant types of	Significant harm	Significant possibility
receptor		of
		significant narm
Any ecological system, or living organism forming part of such a system, within a location which is: • A site of special scientific interest (under section 28 of the Wildlife and	The following types of harm should be considered to be significant harm: • Harm which results in an irreversible adverse change, or in some other substantial adverse	Conditions would exist for considering that a significant possibility of significant harm exists to a relevant ecological receptor where the local authority considers that:
• A national nature reserve (under s.35 of the 1981)	change, in the functioning of the ecological system within any substantial part of that location; or	• Significant harm of that description is more likely than not to result from the contaminant linkage in
Act)		question; or
• A marine nature reserve (under s.36 of the 1981 Act)	Harm which significantly affects any species of special interest within that location and which endangers the long-term	• There is a reasonable possibility of significant harm of that description being caused and if that harm
• An area of special protection for birds (under s.3 of the 1981 Act)	maintenance of the population of that species at that location.	were to occur, it would result in such a degree of damage to features of special interest at the location in
 A "European site" within the meaning of regulation 8 of the Conservation of Habitats and Species 	In the case of European sites, harm should also be considered to be significant harm if it endangers the	question that they would be beyond any practicable possibility of restoration.
Regulations 2010	favourable conservation status of natural habitats at	Any assessment made for these purposes should take
 Any habitat or site afforded policy protection under paragraph 6 of Planning Policy Statement (PPS 9) on nature conservation (i.e. candidate Special Areas of Conservation, potential Special Protection Areas and listed Ramsar sites); or 	such locations or species typically found there. In deciding what constitutes such harm, the local authority should have regard to the advice of Natural England and to the requirements of the Conservation of Habitats and Species Regulations 2010.	into account relevant information for that type of contaminant linkage, particularly in relation to the ecotoxicological effects of the contaminant.
 Any nature reserve established under section 21 of the National Parks and Access to the Countryside Act 1949. 		

Property effects

Relevant types of	Significant harm	Significant
receptor		possibility of
Property in the form of:	For crops, a substantial diminution	Conditions would exist
Crops, including timber;	in yield or other substantial loss in their value resulting from death, disease or other physical damage.	for considering that a significant possibility of significant harm exists to
Produce grown domestically, or on allotments, for consumption;	disease or serious physical damage. For other property in this category, a substantial loss in its value resulting from death, disease or other serious physical damage.	receptor where the local authority considers that significant harm is more likely than not to result from the contaminant
 LIVESTOCK; Other owned or domesticated animals; 	The local authority should regard a substantial loss in value as occurring only when a substantial proportion of the animals or crops	Inkage in question, taking into account relevant information for that type of contaminant linkage, particularly in
• Wild animals which are the subject of shooting or fishing rights.	are dead or otherwise no longer fit for their intended purpose. Food should be regarded as being no longer fit for purpose when it fails to comply with the provisions of the Food Safety Act 1990. Where a diminution in yield or loss in value is caused by a contaminant linkage, a 20% diminution or loss should be regarded as a benchmark for what constitutes a substantial diminution or loss.	relation to the ecotoxicological effects of the contaminant.
	In this section, this description of significant harm is referred to as an "animal or crop effect".	
Property in the form of buildings. For this purpose, "building" means any structure or erection, and any part of a building including any part below ground level, but does not include plant or machinery comprised in a building, or buried services such as sewers, water pipes or electricity cables.	Structural failure, substantial damage or substantial interference with any right of occupation. The local authority should regard substantial damage or substantial interference as occurring when any part of the building ceases to be capable of being used for the purpose for which it is or was intended. In the case of a scheduled Ancient Monument, substantial damage should also be regarded as occurring when the damage significantly impairs the historic, architectural, traditional, artistic or archaeological interest by reason of which the monument was scheduled.	Conditions would exist for considering that a significant possibility of significant harm exists to the relevant types of receptor where the local authority considers that significant harm is more likely than not to result from the contaminant linkage in question during the expected economic life of the building (or in the case of a scheduled Ancient Monument the foreseeable future), taking into account relevant information for that type of contaminant
	In this Section, this description of significant harm is referred to as a "building effect".	linkage.

Controlled waters

Significant pollution of controlled waters

The following types of pollution should be considered to constitute significant pollution of controlled waters:

(a) Pollution equivalent to "environmental damage" to surface water or groundwater as defined by The Environmental Damage (Prevention and Remediation) Regulations 2009, but which cannot be dealt with under those Regulations.

(b) Inputs resulting in deterioration of the quality of water abstracted, or intended to be used in the future, for human consumption such that additional treatment would be required to enable that use.

(c) A breach of a statutory surface water Environment Quality Standard, either directly or via a groundwater pathway.

(d) Input of a substance into groundwater resulting in a significant and sustained upward trend in concentration of contaminants (as defined in Article 2(3) of the Groundwater Daughter Directive (2006/118/EC)5).

Significant	possibility of significant pollution of controlled waters
Catagory	
1	This covers land where the authority considers that there is a strong and
	compelling case for considering that a significant possibility of significant pollution of controlled waters exists. In particular this would include cases
	where there is robust science-based evidence for considering that it is
	paragraph 4.38) would occur if nothing were done to stop it.
2	This covers land where: (i) the authority considers that the strength of evidence to put the land into Category 1 does not exist; but (ii)
	nonetheless, on the basis of the available scientific evidence and expert
	opinion, the authority considers that the risks posed by the land are of sufficient concern that the land should be considered to pose a significant
	possibility of significant pollution of controlled waters on a precautionary
	and the benefits, costs and other impacts of regulatory intervention).
	Among other things, this category might include land where there is a
	might occur
3	This covers land where the authority concludes that the risks are such that (whilst the authority and others might prefer they did not exist) the tests set
	out in Categories 1 and 2 above are not met, and therefore regulatory
	land where the authority considers that it is very unlikely that serious
	pollution would occur; or where there is a low likelihood that less serious
4	This covers land where the authority concludes that there is no risk, or that
	the level of risk posed is low. In particular, the authority should consider
	(a) No contaminant linkage has been established in which controlled
	waters are the receptor in the linkage; or
	4.40 above (i.e. types of pollution that should not be considered to be
	significant pollution); or (c) The possibility of water pollution similar to that which might be accurated
	by "background" contamination as explained in Section 3.