



South East Strategic Reservoir Option
Preliminary Environmental Information Report

Appendix 10.1 - Desk study and preliminary contamination assessment

Date: October 2025

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Executive summary

The South East Strategic Reservoir Option (SESRO) (the 'Project') is proposed to comprise a new fully bunded 150 million cubic metre raw water storage reservoir located in Oxfordshire, approximately 5km south-west of Abingdon. The proposed works include habitat creation, a corridor for future Wilts and Berks canal, road and watercourse diversions, various recreational and education facilities and water treatment works.

This geoenvironmental desk study and preliminary contamination assessment provides accompanying information to the PEI Report Chapter 10: Geology and Soils for the Environmental Impact Assessment (EIA) in general accordance with Land Contamination Risk Assessment guidance (LCRM).

The proposed reservoir and its infrastructure would mainly be located within an area bordered by the A415 (north), A34 (east), Great Western Main Line railway (south), and A338 (west), near the villages of Marcham, Steventon, and East Hanney. The draft Order limits also extend beyond the A34 for a River Thames intake/outfall structure and further south and west for habitat creation. The study area is predominantly agricultural land with isolated houses and farmsteads, other current land uses include three existing solar farms, sewage treatment works and depots. To identify potential land contamination risks to the Project, a desk-based assessment of the environmental setting, site history, previous ground investigation, screening and detailed assessment has been undertaken.

The superficial deposits present across most of the study area are River Terrace Deposits (RTD) consisting of sand and gravel members with areas of Head Deposits and Alluvium. The RTD and Alluvium are secondary A superficial aquifers and the Head Deposits are secondary undifferentiated aquifers. The bedrock consists of Ampthill and Kimmeridge Clay Formations and the Gault Formation underlain by the Corallian Group which is a secondary A aquifer. The Upper Greensand and West Melbury Marly Chalk Formation are classified as principal bedrock aquifers in the south of the study area.

Multiple potential contaminative sites were identified during the desk-based assessment. An initial assessment based on location and potential for contamination is presented in the report. Further assessment was undertaken for more significant sites including an initial conceptual site model (CSM). The following sites within the study area were subjected to detailed consideration:

- Steventon Depot
- Five historic landfills and one authorised landfill
- Five petrol filling stations
- Military sources including RAF Grove, anti-tank ditches and a gun emplacement
- Current and historic sewage treatment works
- Mineral extraction at Oday Hill Quarry
- Three infilled pits, quarries and claypits;
- Disused Wilts and Berks canal
- Numerous unspecified tanks across the study area
- Drayton substation
- A historic barn fire in the west
- Railways and railway stations including the Great Western Railway and two historic stations.

Further assessment is recommended to better understand the risks associated with potentially contaminative sources listed above. This will include targeted walkover and ground investigation

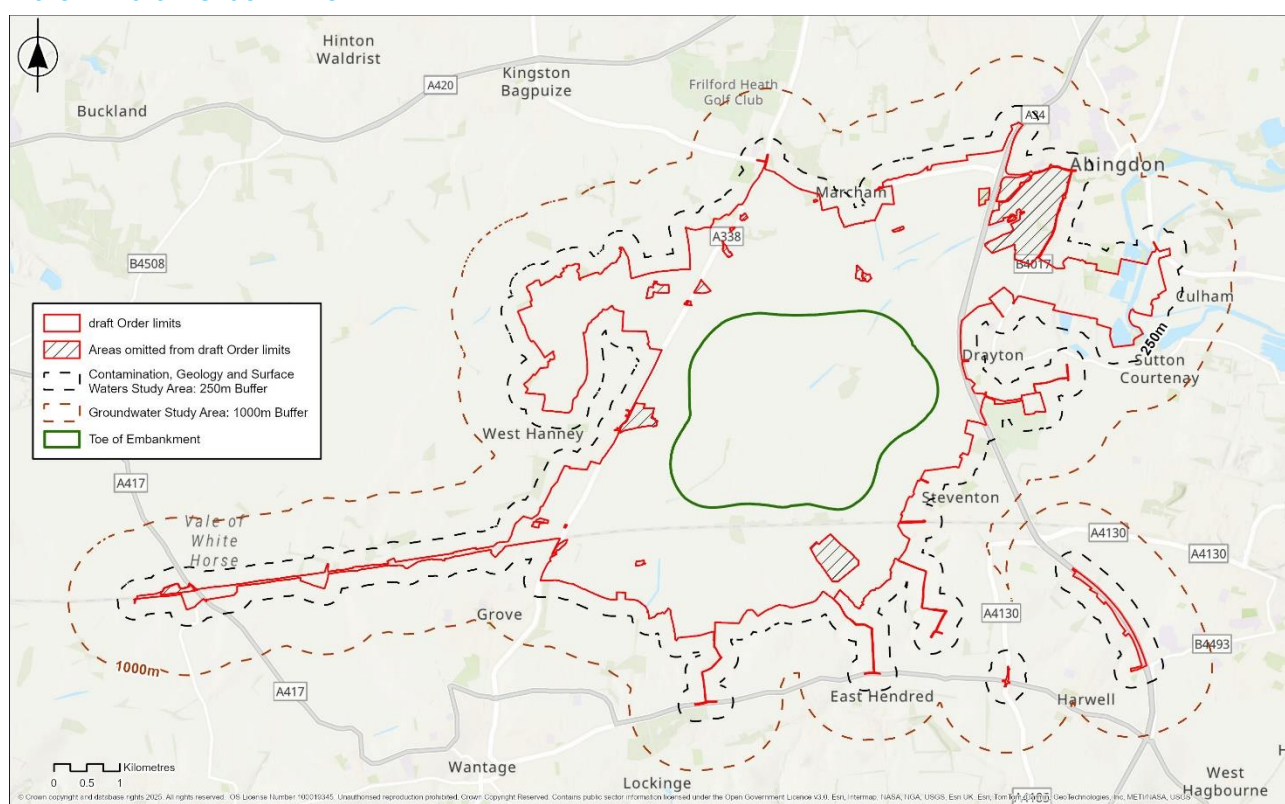
surveys, and an assessment of the bituminous content of the Kimmeridge Clay onsite. This will also include further engagement with Natural England, Environment Agency, Vale of White Horse District Council and South Oxfordshire District Council, farmers, petroleum officers and the fire brigade, and the Ministry of Defence (MOD).

1 Introduction

1.1 Background

- 1.1.1 Thames Water is developing the South East Strategic Reservoir Option (SESRO) (hereafter referred to as the 'Project'), a new reservoir near Abingdon, Oxfordshire. The draft Order limits cover approximately 37km² and would comprise a new reservoir with a potential storage capacity of 150 million m³ and circumference of 10km. Several watercourses currently crossing the draft Order limits would be diverted, and other infrastructure including recreational lakes, water treatment works, and tunnels connecting the reservoir and River Thames would be required.
- 1.1.2 Details of the Project are set out in Chapter 2: Project description of the Preliminary Environmental Information (PEI) Report.
- 1.1.3 The draft Order limits and contamination, soils and groundwater study areas are shown in Plate 1.1.

Plate 1.1 draft Order limits



1.2 Scope

- 1.2.1 This report summarises desk-based information and presents an outline preliminary contamination assessment based on the draft Order limits.
- 1.2.2 The draft Order limits (dated April 2025) are shown by the red line in Plate 1.1. A 250m buffer was used to identify off site potential geoenvironmental constraints that might impact or be impacted by the Project.

1.2.3 The report comprises:

- A review of desk-based information collated for the study area concerning historical and current uses to provide an assessment of the potential for ground contamination and the nature of potential contamination sources.
- A summary of the local geology, hydrogeology and hydrology, and an appraisal of the environmental setting and sensitivity.
- A review of previous ground investigation data.
- Consultation with regulators including local authorities and the Environment Agency in respect to the landfills, other potential contaminative land uses, previous investigation in the study area and records of private water abstractions.
- Consultation with the Animal Plant and Health Agency (APHA) with respect to animal burials in the study area.
- Consideration of relevant information and details of the Project to inform an initial conceptual site model and preliminary assessment of the potential implications for the development related to ground contamination.
- Provide recommendations for the development within the draft Order limits and identify the requirements for an intrusive ground investigation and further assessment.

1.3 Sources of information

1.3.1 The following sources of information have been used to produce this report:

- British Geological Survey (BGS, 2025), Geoindex: Online Geology Viewer.
- UK Health Security Agency (UKHSA, 2022), UKradon - UK maps of radon.
- Groundsure (2025a; 2025b; 2025c; 2025d) including historical maps and Enviro and Geo Insight included in Annex 1.
- Zetica (2025) UXO Desk Study for UXO and Military Uses included in Annex 2.
- Previous ground investigation reports (Exploration Associates Limited, 1990, 1992; Norwest Holst Engineering Ltd, 2006a; 2006b).
- Thames Water (2024b) South East Strategic Reservoir Option EIA Scoping Report.

1.4 Limitations

1.4.1 This report has been prepared for the use of Thames Water. It should not be relied upon by any third party except as provided for in ArB's appointment with Thames Water.

1.4.2 ArB has based this report on the sources detailed within it and believes them to be reliable but cannot and does not guarantee the authenticity or reliability of third-party information. Reasonable skill and care have been exercised in preparation of this report in accordance with the technical requirements of the brief. Notwithstanding the efforts made by the professional team in undertaking this contamination assessment, it is possible that ground conditions and contamination other than that potentially indicated by this report may exist in the draft Order limits .

1.4.3 This report has been prepared based on current legislation, statutory requirements, planning policy and industry good practice at the time of writing. Any subsequent changes or new guidance may require the findings, conclusions and recommendations made in this

report to be reassessed in light of the circumstances. Should the proposed layout or use change, the assessments and conclusions presented in this report may need to be revised.

- 1.4.4 This report does not present a survey or assessment of the location, condition or liabilities associated with hazardous materials in the building fabric such as (but not limited to) asbestos containing materials or lead.

1.5 Study area

- 1.5.1 A 250m buffer has been used to identify off site potential contamination sources, geology and surface waters. This is referred to throughout this report as the study area for contamination and is shown on Plate 1.1.
- 1.5.2 A 1km buffer from the draft Order limits has been applied for considering sensitive groundwater receptors as shown on Plate 1.1 and Plate 4.3.
- 1.5.3 The draft Order limits are mainly within the Vale of White Horse District, except for the far eastern extent on the eastern bank of the River Thames, which falls within the South Oxfordshire District. The Project is situated within the county of Oxfordshire and centred around grid reference X444595:Y193617.
- 1.5.4 The reservoir and associated infrastructure would mostly be situated within an area bounded by the River Ock to the north, the A34 and the village of Steventon to the east, the Great Western Main Line railway to the south and, the A338 and village of East Hanney to the west (hereafter referred to as the 'reservoir infrastructure area'). The draft Order limits extends east of the A34 for the intake / outfall structure on the River Thames and to the south and west for habitat provision. Further information on the location and context is provided in PEI Report Chapter 2: Project description. There are several isolated locations included within the draft Order limits where minor works are proposed to support the Project, these are on the A34 to the east of Harwell at Rowstock and extending approximately 5.5km west from the southern part of the draft Order limits along a corridor following the Great Western Main Line railway.
- 1.5.5 The area within the draft Order Limits currently comprises predominantly agricultural land and the topography slopes gently from approximately 65m AOD along the Great Western Main Line railway in the south, down to 54m AOD along the River Ock in the north, and back up to 57m AOD north of the A415 Marcham Road. Isolated houses and farmsteads are present in the agricultural areas, bisected by hedgerows and ditches.
- 1.5.6 There is a small industrial area in the south associated with Steventon Depot, and three existing operational solar farms, two located to the north of Hanney Road in the centre of the draft Order limits and one to the east of the A338 in the west of the draft Order limits.
- 1.5.7 Current land uses also include depots, sewage treatment works, landfills and quarries.
- 1.5.8 The current and historical land uses have been identified from the Groundsure report (Groundsure, 2025a,b,c,d) and are presented on Figure 1: Potentially contaminated sites.
- 1.5.9 The nearest centres of population are Marcham to the north, Drayton to the east, Steventon to the south-east, and East Hanney to the south-west. Residential communities present within the study area include Abingdon, Drayton, Steventon, East Hendred, West Hendred, Wantage, Grove, East Hanney, West Hanney, Frilford and Marcham.

2 Engagement

2.1.1 Stakeholders consulted with regards to land contamination within the study area for contamination and their responses are summarised in Table 2.1.

Table 2.1 Summary of stakeholder engagement and outcomes

Stakeholder	Consultation	Outcome
Natural England	Provided details of the ALC survey methodology and referring to the ALC assessment methodology in the scoping report.	Natural England confirmed the survey methodology and information the survey would provide would be suitable for assessing impacts on BMV land. No major comments were shared. Links to surveys in the local area were shared for reference. This meeting was held before the draft Order limits were updated and Natural England will be consulted prior to submission of the DCO.
Environment Agency	Recurring technical liaison group (TLG) meetings with the Environment Agency to discuss potential contaminated land sites and permitting.	Provided an overview of groundwater and contaminated land was presented. The EA later commented that they were supportive of the approach outlined but could not agree the scope, methodology or assumptions associated with impacts on groundwater without further information on the rationale for the ground investigation. Further details are provided below this table.
Environment Agency	Requested information on landfills within the previous draft Order limits and surrounding 250m.	Requested information was provided. This has been incorporated in Section 4.5 and Annex 4. Additional information relating to gas monitoring will be included in an updated issue of this report.
Environment Agency	Requested information on previous ground investigation and risk assessment data, FMD and anthrax burial sites, landfill records and shallow or deep opencast mining.	The Environment Agency referred to previous data provided to Thames Water in previous iterations of the Project. Further engagement will be undertaken to request data acquired since then. It was confirmed that no Part 2A sites exist within the contamination study area. No records are held relating to animal burial sites. Links were provided to groundwater quality monitoring data available online and data related to four nearby monitoring sites. This will be reviewed and commented in future assessments
Vale of White Horse Council	Requested information on previous ground	The Environmental Protection department is joint between Vale of White Horse Council and

Stakeholder	Consultation	Outcome
and South Oxfordshire District Council	investigations, risk assessment data, foot and mouth disease (FMD) and anthrax burial sites, landfill records and shallow or deep opencast mining.	South Oxfordshire District Council. They confirmed they do not hold records relating to land contamination in the draft Order limits other than historical mapping. Vale of White Horse District Council confirmed they have not classified land within draft Order limits or adjacent sites as contaminated under Part 2A of the Environmental Protection Act 1990. Records relating to landfills were provided and incorporated in Section 4.5 and Annex 4. The department that responded does not hold records relating to animal burial sites, agriculture, or mining. Further engagement is to be undertaken to find out if other departments with the Vale of White Horse District Council hold this data.
Animal and Plant Health Agency (APHA)	Requested information on FMD and anthrax burial sites within 500m of the draft Order limits and any relevant associated data.	The APHA confirmed it does not hold a register of burial sites. It was noted that works should cease should animal remains be discovered and this should be reported to APHA. A licence would then be required to excavate and dispose of the remains in line with the Animal By-Products Regulations (Enforcement) (England) 2013. A copy of the Guidelines for Exhumation and Disposal of Animal Carcasses (AB142) was also shared by APHA for information.
Canal and River Trust	Requested records related to the partially infilled Wilts and Berks Canal and the backfilled material.	The Canal and River Trust do not hold records relating to the Wilts and Berks Canal and advice should instead be sought from the Wilts and Berks Canal Trust.
Wilts and Berks Canal Trust	Requested records related to the partially infilled Wilts and Berks Canal and the backfilled material.	The Wilts and Berks Canal Trust do not have any relevant information they can share and backfill would have been down to individual farmers.
Petroleum Officers / Fire Brigade	Requested information relating to fires and fuel storage including the use of per- and polyfluoroalkyl substances (PFAS) containing firefighting foams.	Response not yet received from the relevant department.
Ministry of Defence (MOD)	Requested information relating to former military uses.	Response not yet received.

Stakeholder	Consultation	Outcome
Landmead air strip	The Project will be requesting information related to fire training and fuel storage.	-

2.1.2 Further details from the Environment Agency's response following the TLG meeting in May 2025 are provided below. The response is included in Annex 3. The Environment Agency noted that:

- The distribution of groundwater monitoring boreholes across the draft Order limits appeared reasonable.
- A technical note setting out the rationale behind the investigation, exploratory locations, sampling strategy and sample locations was requested, with submission preferably prior to ground investigation starting.
- A copy of ground investigation and groundwater monitoring reports (once complete) was requested.
- They were happy that links between surface water, groundwater and sensitive ecological receptors e.g. the groundwater fed SSSI within 250m of the north of the draft Order limits , are being considered.
- Concerns around potential impacts on South Oxfordshire Cemetery in the north of the draft Order limits were raised, relating to how changes in groundwater level would impact existing (source) and proposed (receptor) burials. To be considered as both a source and receptor.

3 Site history

3.1 On site history

- 3.1.1 Historic land uses within the draft Order limits were reviewed to determine potential contaminative activities.
- 3.1.2 The area within draft Order limits has been primarily agricultural since before the earliest map editions. Several farms are present throughout the draft Order limits . Many of these farms have associated wells, pumps, tanks, wind pumps, and/or ponds.
- 3.1.3 A summary of the on site land uses identified in the draft Order limits is presented below:
- Steventon Depot, recorded as a Store and Transport Depot with a sewage works on site. Steventon Depot is reported to have been a Ministry of Defence (MOD) site. This site was in military use from 1943 until after World War Two (WW2). It has since been used as an industrial depot.
 - Landmead airstrip (also known as Garford airstrip) is a private airstrip and model flying site in the north-west of the study area. Aerial imagery from the early 2000s show three runways surrounding Landmead Farm, with a field for aircraft storage.
 - The Wilts and Berks Canal was first recorded on mapping in 1875. The canal was recorded as disused in 1910.
 - Military uses include a volunteer rifle range at Abingdon Common from 1875, the rifle range was labelled as disused in 1932. Other military uses include an anti-tank ditch shown on imagery in the north of the draft Order limits in 1943 and infilled in 1946.
 - The Great Western Railway is present in the south of the draft Order limits on all map editions, since the 1880s. The railway crosses the draft Order limits in an east-west alignment. Signal posts and embankments to support this are also present.
 - Several rail stations are present on site (Challow historic station, Wantage Road Station) with associated goods sheds, coal yards, weighbridges, turntable, cranes, timber yard, and/or tanks.
 - Numerous electrical substations exist in the villages on site, the largest of which is Drayton electricity substation noted in the draft Order limits in 1973 to present day, to the east of Steventon Depot.
 - Tanks are shown at numerous locations including Drayton (from 1870s until 1970s), at Common barn (from 2001 until present), and Steventon Depot (from 1956 until 1990s).
 - Hutchins's Copse with associated ponds shown on all map editions.
 - In 2015, there was a fire outside of East Hanney where a barn burnt down which is considered likely to have had an asbestos roof.

Various commercial and industrial sites:

- Garages noted in the draft Order limits at East Hanney (from 1975).
- A storage depot noted at East Hanney (from 1975 until the 1990s).
- Builders yards noted at East Hanney (from 1975 until the 1990s).
- Venn Corn Mill shown from 1870s; this was labelled as "disused" in 1956.
- Marcham Mill from 1899 until present.
- Horticultural nurseries noted in East Hanney (from 1990s until 2025).

Sewage works and pumping stations:

- Drayton sewage treatment works including filter beds shown from 1974 to present day
- Abingdon Sewage Treatment Works in Drayton shown from 1970 to present day
- Sewage treatment works on site at Steventon Depot (1940-1991)
- Sewage treatment works east of Garford in the north of the draft Order limits (from 2001 until present), south of Frilford (from 1970s to present) and at Milton (from 1975 to present)

Landfills:

- Southern Town Park landfill noted in the draft Order limits in 1990 to 1994, north of Abingdon Sewage Treatment Works in the east of the draft Order limits
- South of A34 and Drayton Golf Course landfills, shown as a sandpit in 1974 and a refuse tip in 1978. This area was developed in 1994 and labelled a golf driving range, with a waste reception centre to the west of the draft Order limits

Mineral extraction:

- Gravel pits in the location of Sutton Wick historical landfill between 1979 and 1980.
- An “old clay pit” was shown at Kiln Copse in the north-east of the draft Order limits from the 1898 map edition; it was labelled as disused from the 1970s.
- Gravel pits shown in the north-eastern corner of the draft Order limits (from 1930s until 1960s). Gravel pits are also recorded in 2001 to the west of Sutton Wick landfill associated with Oday Hill quarry.
- An unspecified quarry was shown in the north-centre of the draft Order limits (near Frilford) from 1899 until the 1970s, when it was no longer labelled.

3.2 Off site history

- 3.2.1 The surrounding 250m of the draft Order limits has been primarily agricultural since before the earliest map editions. Several farms are present, many having associated wells, tanks, pumps, wind pumps, and/or ponds.
- 3.2.2 Several villages with more industrialised areas exist within the study area for contamination, these include Frilford, Marcham, Abingdon-on-Thames, Drayton, Steventon, East Hendred, Grove, East Hanney, Garford, Frilford, and Marcham. Most of these villages have a church with associated burial ground.
- 3.2.3 Summarised below are historical land uses within the wider study area for contamination (within 250m of the draft Order limits).
- Garages and filling stations at Abingdon, Frilford, Grove Park, and Rowstock.
 - Several depots, including a police depot and a transport depot in Rowstock, a coach depot and a council depot in Marcham, and a vehicle maintenance and a car depot in Abingdon.
 - Metalwork related industries include blacksmiths in Marcham, Drayton, and East Hanney and a scrapyard near Sutton Wick.
 - Mills primarily of agricultural use e.g. corn and flour mills and a sawmill in Abingdon.
 - Horticultural nurseries in Abingdon and Marcham.

- Quarrying and mining of a variety of mineral resources. This includes clay pits associated with the Drayton Brick and Tile Works to the east of the draft Order limits , gravel and sand pits near Drayton and Abingdon Sewage Works, and quarrying of unspecified minerals in Sutton, Abingdon, south of Frilford, and near Garford.
- Sewage works and pumping stations were noted in Abingdon, near Milton interchange, north of Grove, to the north-east of the draft Order limits , at East Hanney, and at Bradfield Farm immediately to the west of the draft Order limits .
- Other industrial activities noted in the study area for contamination were primarily in Abingdon. This includes malthouses and brewery, a hospital, an abattoir, motor car works, printworks, chemical works, parchment works, and leather works. Also noted were Wantage tramway, a builder's yard east of the draft Order limits in Harwell and unspecified works north of Grove.
- A fire at the Prince of Wales pub near Challow Station was recorded in 1999. The pub has now been demolished and replaced with industrial units.

3.2.4 Figure 1 shows the potentially contaminated sites identified within the study area.

3.3 Unexploded ordnance and military use contamination

3.3.1 A desk study for unexploded ordnance (UXO) and military use contaminants was obtained from Zetica (2025) to establish the potential contamination risk resulting from former military activity within the draft Order limits and the UXO hazard level, summarised below:

- Most of the draft Order limits have a low UXO hazard level defined as there being no positive evidence that UXO is present, but its occurrence cannot be totally discounted.
- The centre of the draft Order limits has been assigned a high UXO hazard level due to the likely presence of practice bombs and potentially live unexploded bombs (UXB) at shallow depths.
- A 400-yard radius around the main high UXO area has been assigned a moderate UXO hazard level to account for potential overspill.

3.3.2 A summary of the potential contamination resulting from military use and the associated risk is shown in Table 3.1¹. Further information on each military use and a map of the UXO hazard zone plan is presented in Annex 2.

Table 3.1 Summary of military use, potential contamination and risk

Military use	Potential contamination	Risk
Abingdon Common rifle range	Metalloid and explosive	Low
Steventon bombing decoy	Hydrocarbon	Low
(No. 3 MU) Steventon Depot	Radiological and hydrocarbon	Low
United States Army Ordnance Depot	Localised disposal or spillage of munitions, metalloid and explosive	Low
Home Guard activity		Low

¹ Military uses with negligible risks, or those over 250m from the site, are not included in the table. They include aircraft crashes, Marcham Bombing Range and No. 3 MU Milton Depot. They are listed in Annex 2.

Military use	Potential contamination	Risk
Anti-invasion defences including anti-tank ditches and gun emplacement	Localised disposal or spillage of munitions, metalloid and explosive, and unknown backfill in ditches	Medium
RAF Grove	Potential contamination from engineering support buildings. Unknown engineering use, so a range of contaminants could be present	Medium

4 Environmental setting

4.1 Ground conditions

- 4.1.1 Superficial deposits, bedrock and artificial ground have been reviewed for the study area using online available geological mapping from the BGS (2025).

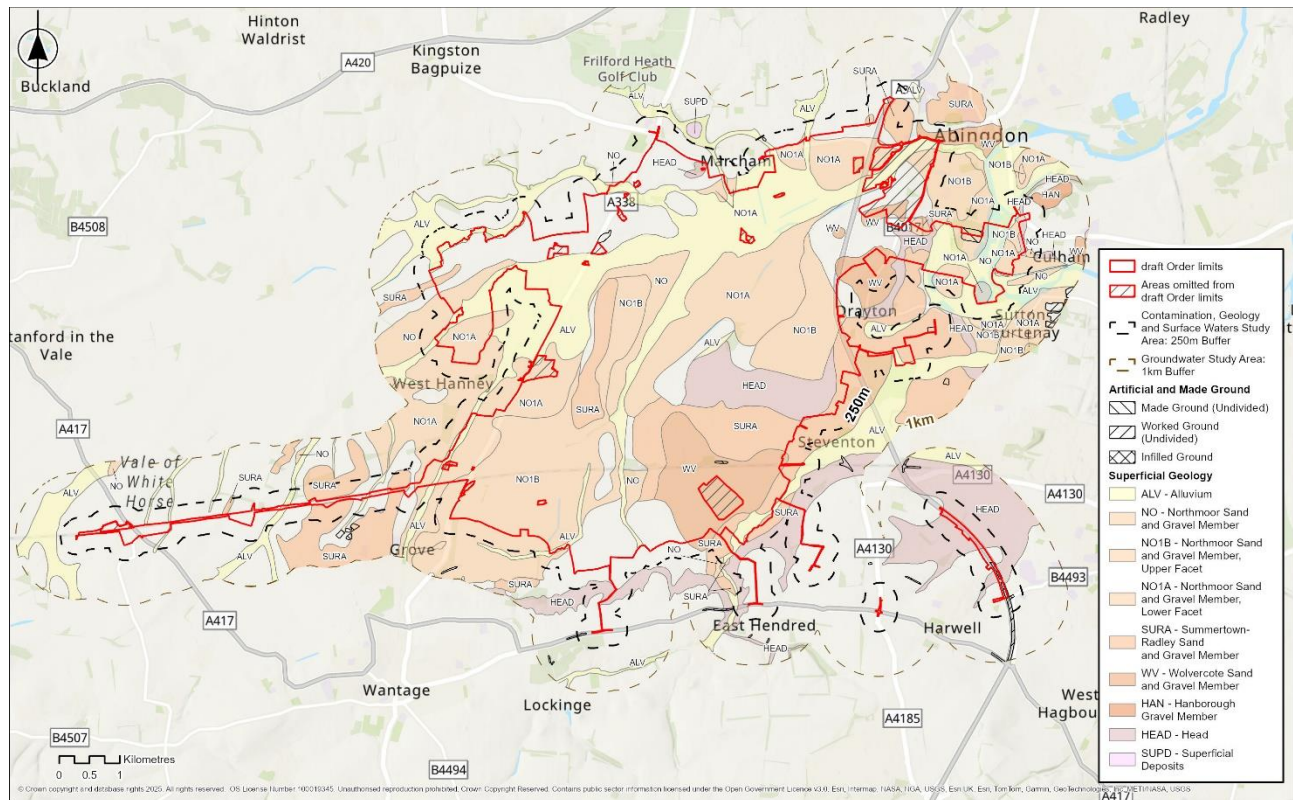
Made Ground

- 4.1.2 The study area for contamination consists primarily of agricultural land, where Made Ground is rarely encountered. Made Ground may be present in previously disturbed areas as well as locations not documented as having been disturbed.
- 4.1.3 BGS mapping and geological mapping within the Groundsure report indicates areas of artificial or Made Ground in the draft Order limits which are shown on Plate 4.1:
- In the south-east of Steventon Depot. It is likely that much of the draft Order limits will include some Made Ground
 - On site and off site to the south-west along the route of the A34m east of Harwell.
 - On site and off site at the current and former sewage works at Abingdon.
 - At a former mineral working to the north of the South Oxfordshire Cemetery.
 - Along a road to the north of Reading Road, in the south of the draft Order limits .
- 4.1.4 Mapped artificial or Made Ground within 250m of the draft Order limits is listed below:
- East of the A34 where it crosses the Great Western Railway line.
 - To the west of Drayton, associated with a former mineral extraction.
 - To the north-east of Marcham.
 - To the south of the Site, along Reading Road.

Superficial deposits

- 4.1.5 Alluvial deposits are found in the north and eastern area as well as a small area in the south of the draft Order limits. The alluvium comprises clay, silt, sand and gravel.
- 4.1.6 River Terrace Deposits (RTD) consisting of various sands and gravel members are mapped across the study area, as shown on Plate 4.1. These include the Northmoor Sand and Gravel Member Lower Facet, Northmoor Sand and Gravel Upper Facet, Summertown Radley Sand and Gravel Member and the Wolvercote Sand and Gravel Member.
- 4.1.7 Head Deposits consisting of clay, silt and gravel are mapped in the south and eastern part of the draft Order limits .
- 4.1.8 The ground investigations to date have found unmapped deposits of alluvium in the south of the draft Order limits and has confirmed the presence of alluvium in the east. The investigations have found that where RTD are present, thicknesses typically vary between 0.30m and 4.88m, however, the RTD are absent at some locations, particularly in the south.

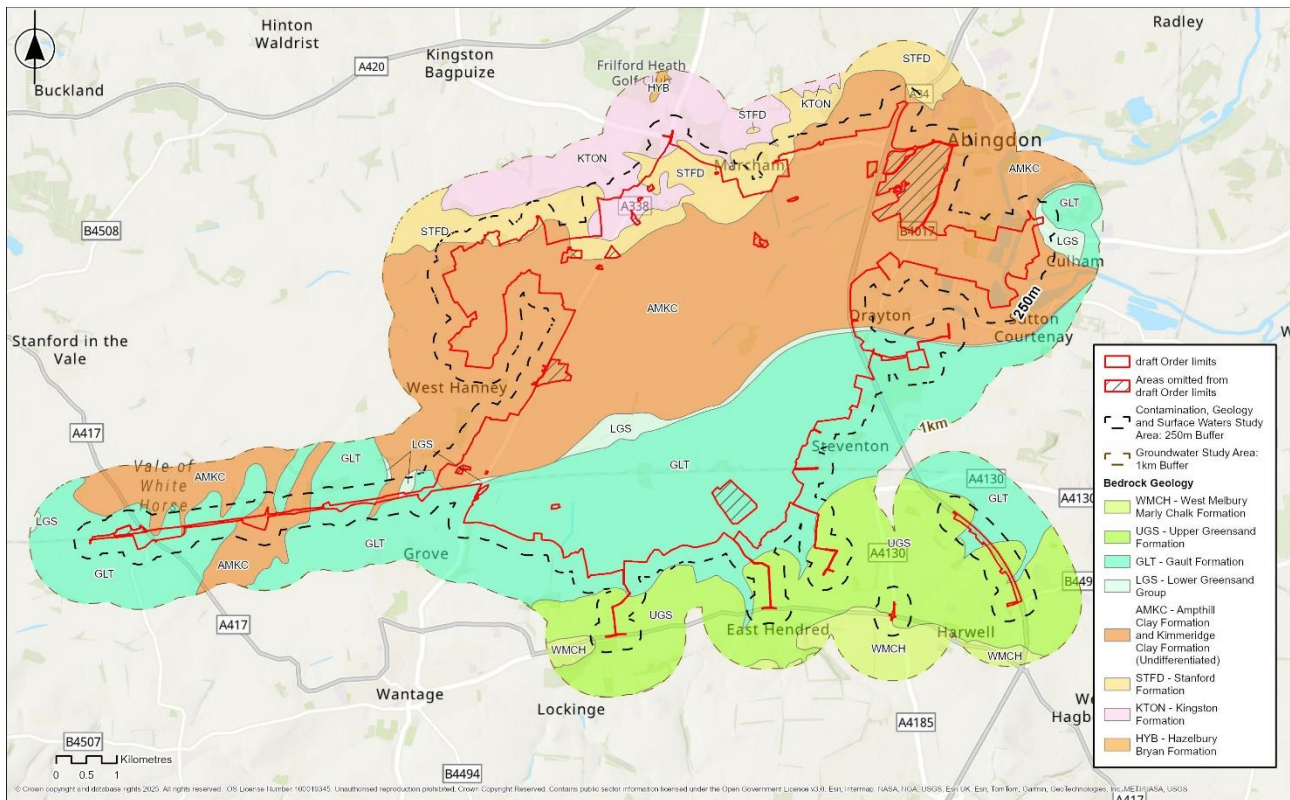
Plate 4.1 Superficial deposits



Bedrock geology

- 4.1.9 One area in the south of the draft Order limits is underlain by the West Melbury Marly Chalk Formation. This is underlain by the Upper Greensand Formation (Sandstone and Siltstone) which is the uppermost bedrock layer along the southern edge of the draft Order limits .
- 4.1.10 The Gault Mudstone Formation underlies the Upper Greensand Formation and is present across the south of the draft Order limits. The Gault Formation is underlain by the Lower Greensand Group sandstone which subcrops at the location of the proposed reservoir from south-west to east.
- 4.1.11 The Gault Formation and Lower Greensand Group is underlain by the Ampthill and Kimmeridge Clay Formations (mudstones) which are the uppermost bedrock layers in the centre of the draft Order limits.
- 4.1.12 The Kingston Formation and Stanford Formation (limestone and sandstone) underlie Ampthill and Kimmeridge Clay Formations and subcrop in the north and north-west of the draft Order limits. The bedrock geology is shown on Plate 4.2.

Plate 4.2 Bedrock geology



Geological designations

- 4.1.13 There are no sites of geological importance located within the draft Order limits.
- 4.1.14 The Kimmeridge Clay Formation is rich in fossils and may include Jurassic marine fossils, such as ichthyosaurs, and flying reptiles such as pterosaurs. A partial wing bone from a Jurassic pterosaur was exposed in the base of a quarry in the east, in the upper Kimmeridge Clay.

4.2 Hydrogeology

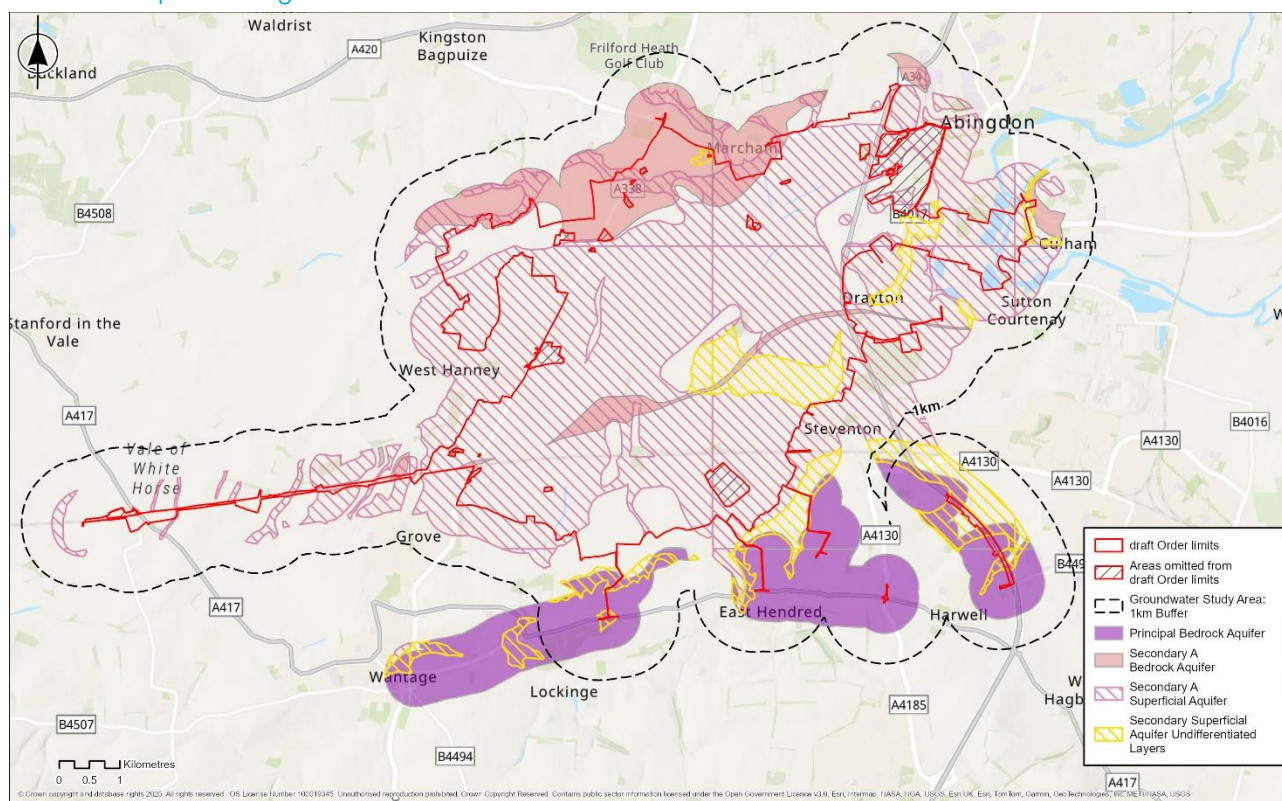
- 4.2.1 The study area for groundwater extends 1km from the draft Order limits, as shown on Plate 4.3. The Project is underlain by Secondary A, Secondary undifferentiated and Principal aquifers. The aquifer designations are shown on Plate 4.3 and summarised in Table 4.1.

Table 4.1 Summary of aquifer designations

Strata		Designation
Superficial	Alluvium	Secondary A
	River Terrace Deposits: Hanborough gravel member Northmoor sand and gravel member Sand and gravel deposits (undifferentiated) Summertown Radley sand and gravel member Wolvercote sand and gravel member	Secondary A

Strata		Designation
	Head Deposits	Secondary (undifferentiated)
Bedrock	Upper Greensand Formation (sandstone and siltstone) West Melbury Marly Chalk Formation	Principal
	Lower Greensand Group (sandstone) Stanford Formation (limestone) Kingston Formation (sandstone) Hazelbury Bryan Formation (sandstone, siltstone and mudstone)	Secondary A

Plate 4.3 Aquifer designations



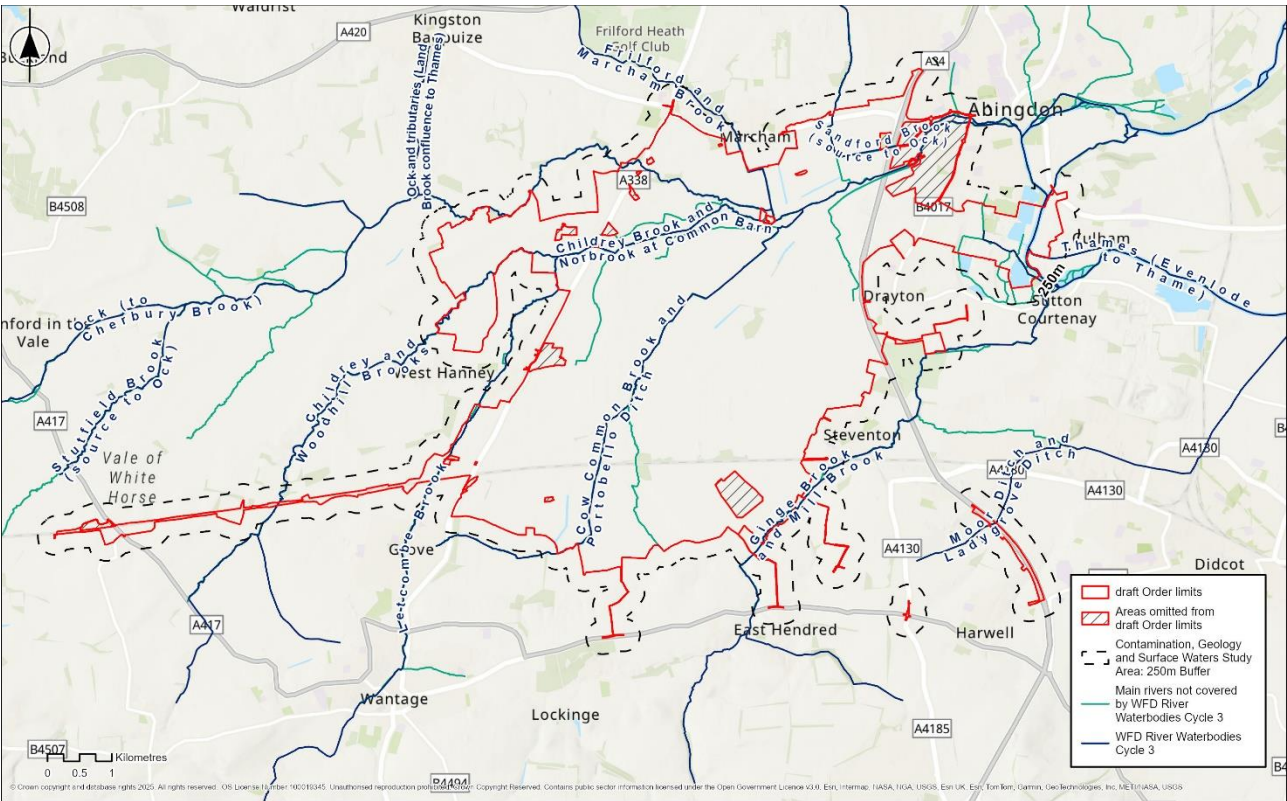
4.3 Hydrology

- 4.3.1 The draft Order limits are located within the Thames River Basin District and Ock Operational Catchment. Surface water bodies within the draft Order limits plus 250m study area are included in Table 4.2. In addition, there are numerous ponds along the Great Western Railway Line, as well as ponds within the east of the draft Order limits associated with former mineral excavation. Key surface water features are shown on Plate 4.4.

Table 4.2 Summary of watercourses

Watercourse	Tributary of
River Thames	-
River Ock	Thames
Childrey Brook	Ock
Cow Common Brook	Ock
Ginge Brook	Thames
Nor Brook	Ock
Stutfield Brook	Ock
Landmead Ditch	Ock
Portobello Ditch	Ock
Northbrook at Common Barn	Ock
Pill Ditch	Ock
Sandford Brook	Ock
Letcombe Brook	Ock
Marcham Brook	Ock
Mill Brook	Thames
Moor Ditch	Thames
Mere Dike	Ock
Orchard Farm Ditch	Ock
Steventon Ditch	Ock
Goose Willow Ditch	Ock
East Hanney Ditch	Ock
Oday Ditches	Thames
Land Brook	Ock
Wilts & Berks Canal	Ock
East Hendred Brook	Ock

Plate 4.4 Surface water receptors



4.4 Ecological designations

- 4.4.1 Environmentally sensitive sites have been recorded within the study area. Frilford Heath, Ponds and Fens is a site of special scientific interest (SSSI) and is located within 1km of the draft Order limits. This SSSI consists of an area of wet woodland and tall sedge fen over peat, approximately 110ha. The key aspect of importance is the hydrology of the area, so the maintenance of water supply and good water quality are critical. Plants and animals that occur in the areas of groundwater gentle seepages, flushes and/or springs are dependent on flow rate and chemistry (Natural England Designated Sites View, 2025).
- 4.4.2 Three local wildlife sites (LWS) are within 250m of the draft Order limits and are summarised in Table 4.3. Two areas of green belt are located on site along the north-eastern boundary, associated with the local authorities South Oxfordshire District and Vale of White Horse District.

Table 4.3 Local wildlifes sites within the draft Order limits

Local Wildlife Site and Name	Location
The Cuttings and Hutchins Copse	On site
Marcham Salt Spring	On site
Cowslip Meadow	On site

4.5 Landfills

- 4.5.1 Authorised and historic and landfills within the contamination study area are summarised in Table 4.4 and include one authorised landfill and five historic landfills.
- 4.5.2 Records have been obtained from the Environment Agency relating to the landfills within the draft Order limits. The Environment Agency information regarding these landfills is presented in Annex 4.
- 4.5.3 Records were sought from the relevant local authorities on former historic landfill sites not contained or regulated by the Environment Agency at the time of operation. The local authorities confirmed that no further information was held.
- 4.5.4 No further historic or authorised landfills have been identified within the draft Order limits.

Table 4.4 Authorised and historic landfills within the study area

EPR number	Site name	Location	Holder	Issue date	Status	Waste type
Authorised landfill						
EA/EPR/FB31 06HL/V002	Sutton Wick	180m east	Cemex UK Materials Ltd	09/11/2018	Expired/ Closure	Inert, industrial, commercial
Sutton Wick Leachate Treatment Plant (LTP)	R M C Materials	To the north-east	Cemex UK Materials Ltd	30/06/2005	Issued	Methane Stripping Plant (MSP)
Historic landfills						
EAHLD13488	South of A34 at Drayton	On site	ARC Limited	20/02/1979	Surrendered 31/12/1993	Inert
EAHLD13489	Drayton Golf Course	Nine metres east		22/07/1977	Surrendered 26/10/1984	Inert, industrial, commercial, household, liquid sludge
EAHLD13512	Sutton Wick No.1	On site	J Curtis and Sons	19/06/1981	N/A	Inert, industrial, household, special, liquid sludge
EAHLD13511	Southern Town Park	On site	Vale of White Horse District Council	31/12/1967	N/A	Inert, commercial, household, liquid sludge
Waste Management Licence (WML) 404967	CAMAS land	On site	H Tuckwell and Sons Limited	03/05/2019	Surrendered 31/12/2010	Deposit for recovery

4.6 Other permitted waste facilities

- 4.6.1 Permitted waste facilities within the contamination study area are listed in Table 4.5 and include a recycling and recovery centre to the south of Drayton, an asbestos waste transfer station and Oxfordshire County Council Drayton Highways Depot.

Table 4.5 Summary of Permitted waste facilities within the draft Order limits

Site name	Operator	Location	Issue date	Waste type	Status
Permitted waste sites					
Drayton Waste Recycling and Recovery Centre (W R R C)	G Thompson and J Rickett	23m SE	23/03/1993	75kte non-hazardous and hazardous HWA site	Modified
		51m SE	23/03/1993	Household waste amenity site	Modified
The Vale Housing Association Ltd		On site	13/01/2009	Asbestos waste transfer station	Surrendered
Drayton Highways Depot	Oxfordshire County Council	70m E	28/07/2017	Special waste transfer station	Issued

Historic waste facilities

- 4.6.2 The Groundsure report (Annex 1) identifies three historic waste facilities within the study area for contamination. They are all recorded as scrap yards, located between approximately 100m and 135m to the east / north-east of the draft Order Limits.

4.7 Pollution incidents

- 4.7.1 Multiple pollution incidents have been identified within the draft Order Limits. Fourteen pollution incidents have been recorded on site and twenty recorded within the wider 250m draft Order Limits/study area for contamination. Most of the pollution incidents recorded had a minor or no impact to land and water.
- 4.7.2 One pollution incident involving sewage materials was recorded as a significant impact to land and water (Category 2) in 2013. Further pollution incidents recorded a significant impact to water in 2004 and 2024 (Sewage materials).
- 4.7.3 The pollution incidents recorded on site are summarised in Table 4.6.

Table 4.6 Summary of pollution incidents recorded in the draft Order limits

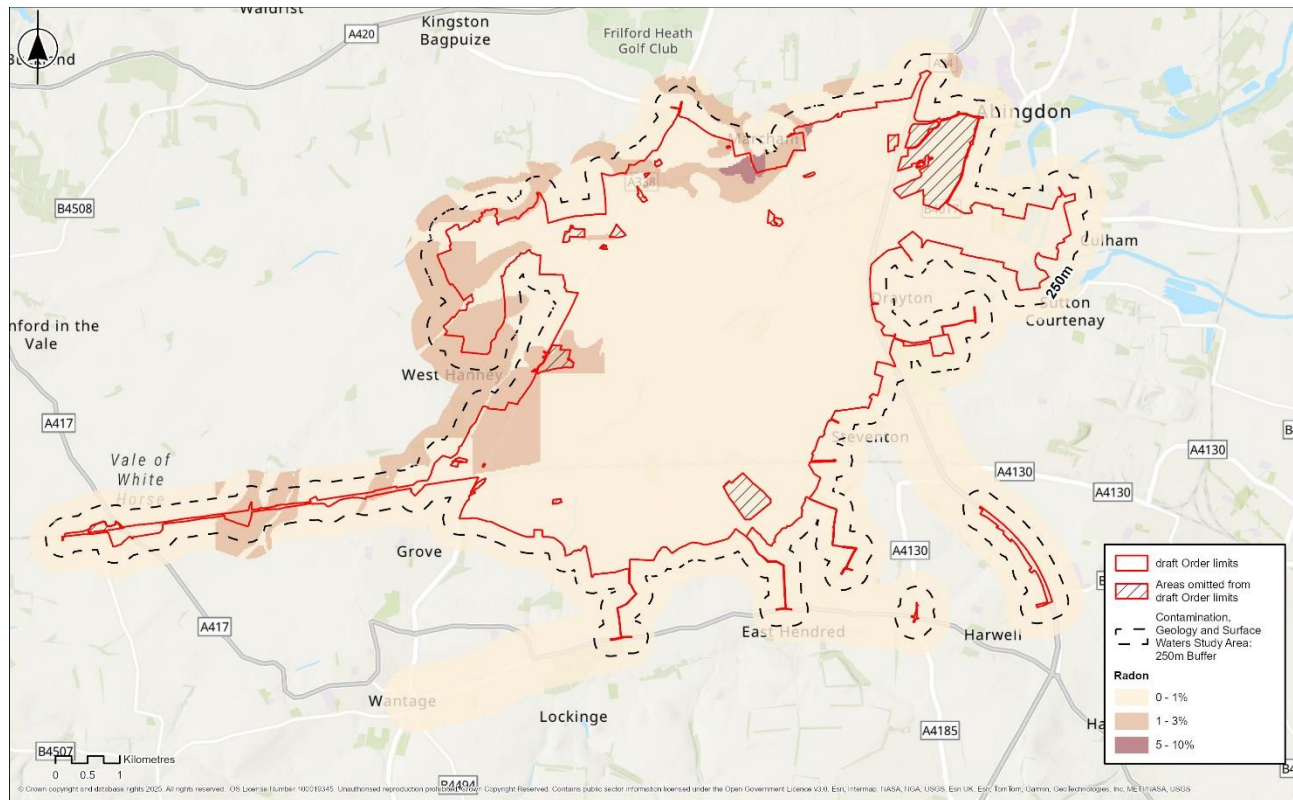
Pollutant	Date	Air Category	Land Category	Water Category
Not identified	13/03/2004	Category 4	Category 4	Category 2
Natural organic material	27/08/2002	Category 4	Category 3	Category 4
Inert materials and wastes (Construction and demolition)	08/10/2001	Category 4	Category 3	Category 4
	09/10/2001	Category 4	Category 3	Category 4
	27/09/2001	Category 4	Category 3	Category 4

Pollutant	Date	Air Category	Land Category	Water Category
Commercial waste	29/07/2002	Category 4	Category 3	Category 4
Kerosene and aviation fuel	16/01/2003	Category 4	Category 3	Category 3
Inert materials or waste	06/02/2002	Category 4	Category 3	Category 4
Other pollutant	14/02/2002	Category 4	Category 4	Category 3
	26/07/2001	Category 4	Category 4	Category 3
Sewage materials	04/03/2024	Category 4	Category 4	Category 2
	06/02/2013	Category 3	Category 2	Category 2
Specific waste materials	17/03/2003	Category 4	Category 4	Category 3
Notes Category 2 is significant. Category 3 is minor. Category 4 is no impact				

4.8 Radon

- 4.8.1 The UK Radon interactive map (UK Health Security Agency, 2022) provides a risk rating for radon potential. The radon action level is defined as 200 becquerels (Bq)/m³. East Hanney in the west, and areas in the north-west of the draft Order limits are in areas where 1 to 3% of homes are at or above the radon action level. A large area in the north (Marcham) is in an area where 5 to 10% of homes are at or above the action level. The remainder is in areas where less than 1% of homes are at or above the radon action level. The action levels are only relevant for residential properties. Currently, there are no residential properties proposed in the draft Order limits.

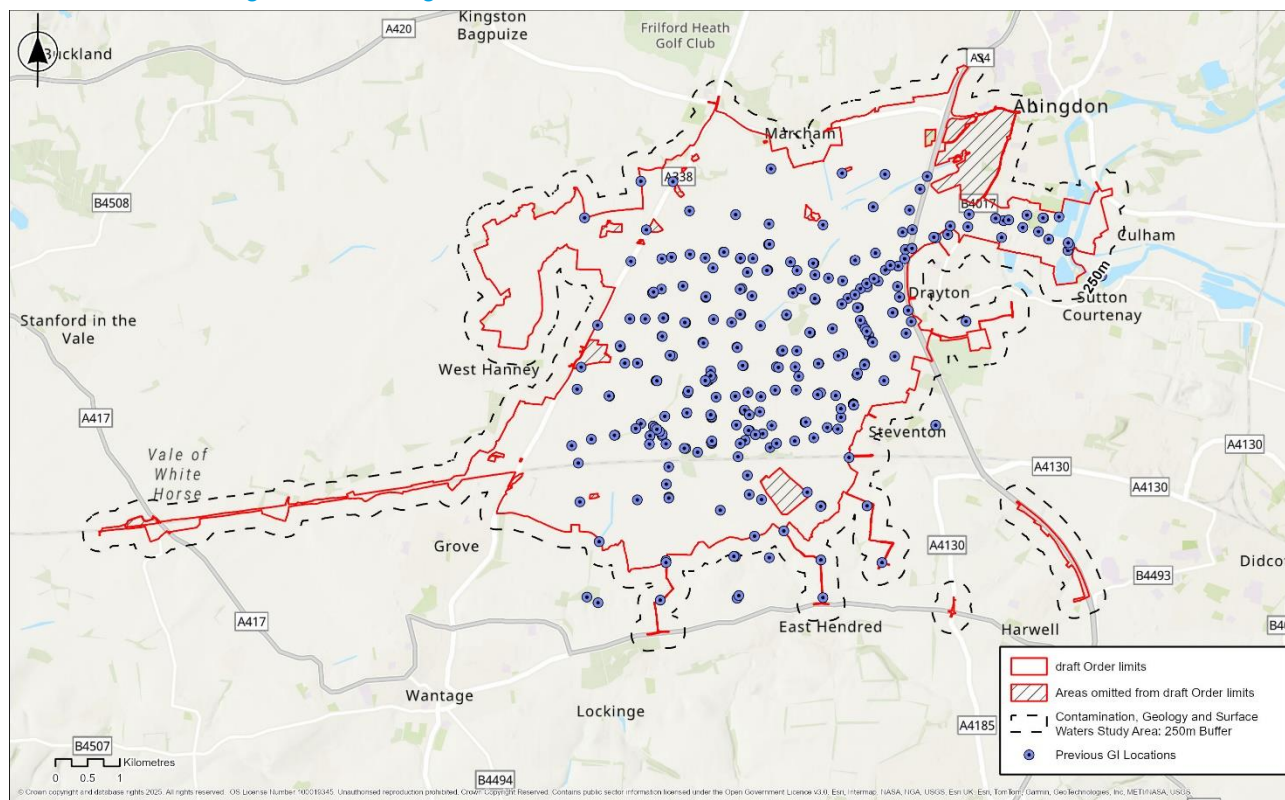
Plate 4.5 Radon potential



5 Previous ground investigations

- 5.1.1 Several ground investigations for geotechnical purposes have previously been conducted at the draft Order limits. These investigations are summarised below, and the locations are shown on Plate 5.1.

Plate 5.1 Previous ground investigation locations



5.2 Exploration Associates Ltd 1990

- 5.2.1 Exploration Associates Ltd (EAL) undertook five boreholes in the south of the draft Order limits near the Steventon Depot in 1990 (Exploration Associates Limited, 1990).

5.3 Exploration Associates Ltd 1991 to 1992

- 5.3.1 EAL (Exploration Associates Limited, 1992) undertook another investigation between July 15 to October 18, 1991. The investigation was carried out over a greater area than the current draft Order limits.
- 5.3.2 Ground conditions were determined by cable percussion, rotary cored boreholes in situ testing, trial pitting, geophysical techniques and geotechnical laboratory testing.
- 5.3.3 A total of 81 exploratory hole locations were completed in the ground investigation:
- Six cable percussive boreholes.
 - 35 cable percussive boreholes with a rotary follow on.
 - 20 rotary core boreholes (except for BH4 to BH43A which were rotary open holed).

- 20 trial pits.
- 5.3.4 Cable percussion boring was advanced to a maximum depth of 13.8m, rotary coring was generally advanced to 40m and in some locations 80m. Trial pitting extended down to depths of 5.3m.
- 5.3.5 In situ testing comprised of SPT, variable head penetration tests and packer permeability tests.
- 5.3.6 Bituminous materials are noted within the Kimmeridge Clay in the following EAL exploratory holes BH05, BH10 to BH18 described as bituminous clay and bituminous beds.

5.4 Norwest Holst Engineering Ltd 2005 Phase 1

- 5.4.1 The Norwest Holst Engineering Ltd (NHEL) ground investigation was completed across the draft Order limits between September 5 to December 21, 2005. The investigation included:
 - Six cable percussive boreholes to a maximum depth of 7m.
 - 58 rotary cored boreholes to a maximum depth of 84.8m.
 - Three observation shafts of diameter 2.7m to provide detailed geological descriptions to depths of 10m to 15m.
 - 44 trial pits to a maximum depth of 5m.
- 5.4.2 Permeability testing was undertaken via variable head, constant head testing, pressure meter and perimeter testing.
- 5.4.3 16 boreholes were installed with a 50mm pipe, and six boreholes were installed with Casagrande type piezometers for groundwater monitoring.
- 5.4.4 Combined geotechnical and geoenvironmental sampling and testing was conducted in this ground investigation. 59 soil samples were submitted for calorific value, carbonate content, polycyclic aromatic hydrocarbons (PAH), semi-volatile organic compounds (SVOC), total organic carbon (TOC), total petroleum hydrocarbons as speciated by the criteria working group (TPHCWG) and waste acceptance criteria (WAC) testing. Only one location encountered Made Ground and no samples were tested from this stratum.
- 5.4.5 The results for the PAH, SVOC and TPHCWG were generally below the limit of detection for each respective compound. This investigation did not test the source zones identified within this report.
- 5.4.6 14 water samples were submitted for metals and general water quality parameters.
- 5.4.7 Fragments of bituminous material were recovered during the investigation, but significantly less than that indicated by the earlier EAL investigations (1990 to 1992).

5.5 Norwest Holst Engineering Ltd 2006 Phase 2

- 5.5.1 The second phase of the Norwest Holst Engineering ground investigation was completed between August 12 and September 22, 2006. The investigation included:
 - Seven rotary cored boreholes to a maximum depth of 50m.
 - Eight trial pits to a maximum depth of 4.5m.
- 5.5.2 Permeability testing was undertaken via variable head and rising head tests.

- 5.5.3 One borehole was installed with 50mm pipe and a data logger for groundwater monitoring.
- 5.5.4 No chemical testing was carried out during this phase of investigation. No bituminous material was noted during this phase of the investigation.

5.6 SESRO GI Phases 1, 2A and 2B 2024 to 2025

- 5.6.1 This ground investigation is ongoing and the associated data will be updated.

Phase 1

- 5.6.2 The first round of ground investigation was completed between January 22 and March 22, 2024, primarily undertaken in southern and west areas of the draft Order limits.
- 13 dynamic sampling and rotary core follow on boreholes to a maximum depth of 25m.
 - Five cone penetration tests (CPT) to a maximum depth of 25m.
 - Three trial pits/trenches to a maximum depth of 6m.
- 5.6.3 Several boreholes were recommissioned from the NHEL ground investigations to continue groundwater monitoring and sampling into the future. Falling head permeability tests were conducted in selected boreholes.
- 5.6.4 Combined geotechnical and geoenvironmental sampling and testing was conducted in this ground investigation. 17 soil samples were sent for chemical analysis. These were tested for some inorganics which included fraction of carbon (FOC) and free cyanide, an asbestos screen and heavy metals. All levels were below the relevant generic assessment criteria (GAC).
- 5.6.5 No bituminous material was noted during this phase of the investigation.
- 5.6.6 Five water samples were submitted for inorganics and metals.

Phase 2A

- 5.6.7 The second round of ground investigation was completed between April 29 to August 16, 2024, primarily in southern and west areas. The investigation included:
- Five cable percussive boreholes to a maximum depth of 20m.
 - 15 dynamic sampling and rotary core follow on boreholes to a maximum depth of 45m.
 - Two cable percussive and rotary core follow on boreholes to a maximum depth of 45m.
 - Seven CPTs to a maximum depth of 25m.
- 5.6.8 Rising head and falling head permeability tests were conducted in selected boreholes.
- 5.6.9 Combined geotechnical and geoenvironmental sampling and testing was conducted in this ground investigation. Six soil samples were sent for chemical analysis. These were tested for some inorganics which included fraction of carbon (FOC) and free cyanide, an asbestos screen and metals. Two samples were submitted for speciated total petroleum hydrocarbons and benzene, toluene, ethylbenzene, and xylenes (BTEX). One of the samples was submitted for polyaromatic hydrocarbons and WAC testing. All levels were below the relevant GAC. Three samples were submitted for perfluoroalkyl and polyfluoroalkyl substances (PFAS) testing and were all below the method detection limit.
- 5.6.10 No bituminous material was noted during this phase of the investigation.

- 5.6.11 Four water samples were submitted for inorganics and dissolved metal analysis. All levels were low and below the relevant GAC.

Phase 2B

- 5.6.12 The third round of ground investigation began in August 2024 and has primarily been conducted in the eastern part of the draft Order limits as well as the south-east. This phase of the investigation has comprised:
- Four CPTs to a maximum depth of 35m
 - 26 dynamic samples with rotary follow on
 - One cable percussive with rotary follow on
 - Three cable percussion to a maximum depth of 15m
- 5.6.13 29 soil samples have been submitted for inorganics, metals, PAH and TPHCWG analysis. 14 samples have been submitted for WAC testing and two samples have been submitted for pesticides analysis.
- 5.6.14 All contaminants are below the relevant GAC. Asbestos has been detected in two locations to date. These locations are within the east of the draft Order limits, along the proposed tunnel alignment.
- 5.6.15 One water sample has been submitted for analysis. The sample was taken from the Corallian Group. The results indicate that most levels of contaminants were below the relevant water quality standards (WQS), however, there were levels of chlorides, ammoniacal nitrogen, boron and fluoride above both the drinking water standards (DWS) and the environmental quality standards (EQS) which is not unusual. The water sample was only tested for general water quality parameters and dissolved metals.
- 5.6.16 There has been limited targeting of source areas within the three phases of the SESRO ground investigations.

6 Initial assessment summary

- 6.1.1 Potential sources of contamination within the contamination study area, identified during initial assessment, are outlined in Plate 6.1 and Annex 7. Around 180 potential sources of contamination were identified. These are shown on Figure 1: Potentially contaminated sites.
- 6.1.2 The rating for each of the identified potential sources of contamination was determined based on location (Table 6.1
- 6.1.3 Table 6.1) and potential for contamination (Table 6.2). The impact rating matrix is presented in Table 6.3 and the full list of sources with rating is included in Annex 7.
- 6.1.4 Potential sources of contamination assigned an impact score of three or four are assessed in more detail. These are shown on Plate 6.1 and conceptual site models for each are provided in Section 7.

Plate 6.1 Contamination sources for detailed assessment

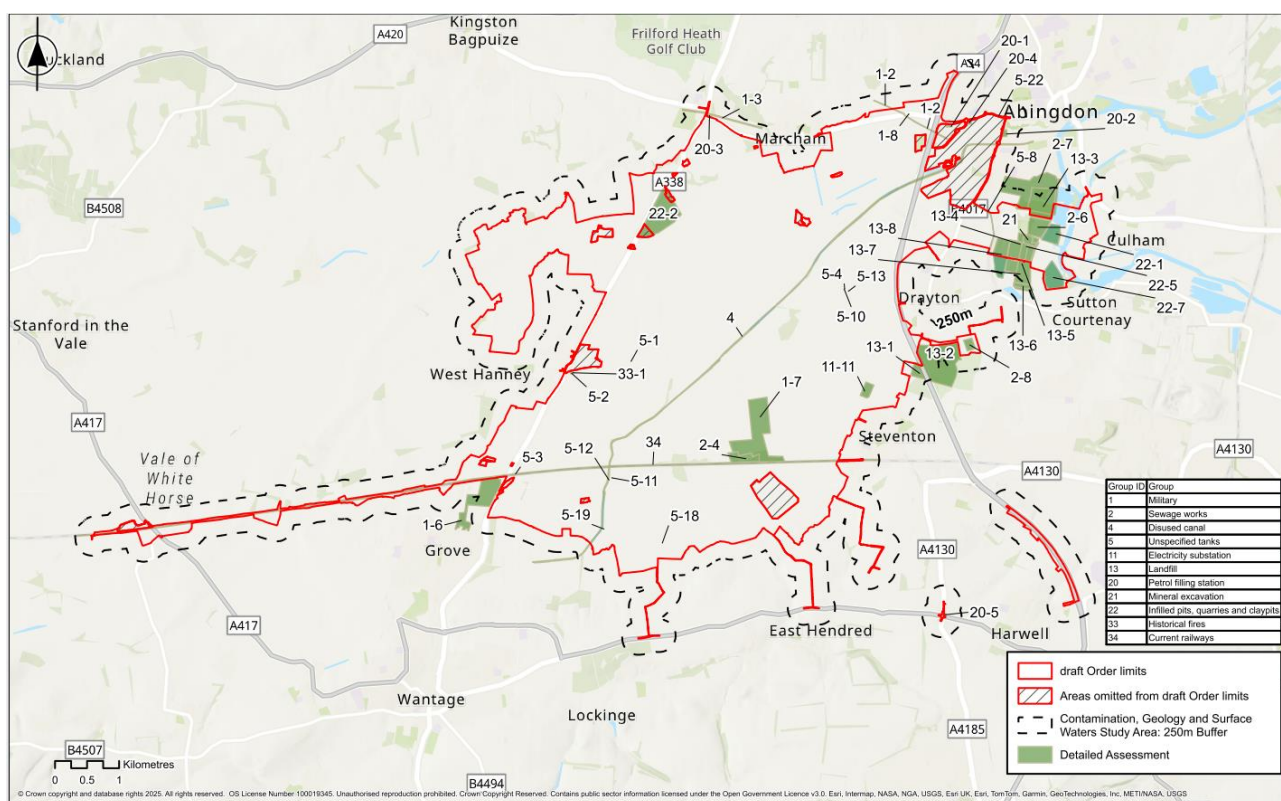


Table 6.1 Location definition

Zone	Definition
Zone 1	All land on or within the draft Order limits.
Zone 2	All land within 50m of the edge of Zone 1 land.
Zone 3	All land from between 50m and 250m from the edge of Zone 1 land

Table 6.2 Contamination rating

Potential	Land uses
Low	Farms, hospitals, retail and business parks, rifle ranges, electrical substations, warehouses, goods sheds, solar farms
Medium	Railways, disused rail lines, sewage works, brick works, breakers, workshops, depots, scrap yards, cemetery, waste transfer facilities, pumping station
High	Landfills, filling stations, chemical works, oil depots, gas and coke works, airfields, iron and steel works

Table 6.3 Impact rating matrix

	Zone 1	Zone 2	Zone 3
Low potential for contamination	2	1	1
Medium potential for contamination	3	2	1
High potential for contamination	4	3	2

7 Conceptual site models

Steventon Depot

7.1.1 Steventon Depot is in the south-east of the draft Order limits.

Table 7.1 Baseline CSM: Steventon Depot

Site / ID	Sensitive land use (human receptors)	Aquifer designation	Surface watercourse	Property e.g. buildings	Ecological
Steventon Depot (ID: 1-7)	Residential housing Commercial Railway workers	RTD (secondary A) Head Deposits (secondary undifferentiated) Lower Greensand (secondary A) Gault Formation and Ampthill Clay and Kimmeridge Clay (unproductive strata)	East Hendred Ditch Goose Willow Ditch Orchard Farm Ditch	Residential properties Railways	Adjacent agricultural land

Landfills

7.1.2 Landfills within 50m of the draft Order limits are assessed below:

Table 7.2 Baseline CSM: landfills located within/ 50m of the draft Order limits

Site / ID	Human receptors	Aquifer designation	Surface water	Property	Ecological
South of A34 Drayton historic landfill (ID: 13-1)	Residential housing	RTD (secondary A)	Mere Dike	Residential properties	Adjacent agricultural land Proposed woodland habitat
Drayton Golf Course historic landfill (ID: 13-2)	Golf course users	RTD (secondary A) Alluvium (secondary A)	On site ponds Ginge Brook	Golf club	Adjacent agricultural land
Southern Town Park historic landfill (ID: 13-3)	Residential housing Public open space users	RTD (secondary A)	Abingdon Marina	Residential properties	Adjacent agricultural land
Sutton Wick No.1 historic landfill (including leachate treatment plant) (ID: 13-4, 13-5)	Industrial workers (adjacent quarry)	RTD (secondary A) Alluvium (secondary A)	Abingdon Marina Ponds	-	Adjacent agricultural land
Sutton Wick active landfill / Cemex/Hales authorised landfill (ID: 13-7)	Industrial workers (adjacent quarry)	RTD (secondary A) Alluvium (secondary A)	Abingdon Marina Ponds	-	Adjacent agricultural land
Camas Land landfill (ID: 13-8)	Industrial workers	RTD (secondary A) Alluvium (secondary A)	Ponds	-	Adjacent agricultural land

Filling stations

7.1.3 Filling stations within 50m of the draft Order limits are assessed below:

Table 7.3 Baseline CSM: filling stations located within/ 50m of the draft Order limits

Site / ID	Human receptors	Aquifer designation	Surface water	Property	Ecological
Filling station near Ladygrove Court, Abingdon (ID: 20-2)	On site - residential, roads Offsite - residential, commercial, Public open Space (PoS) - Ock Valley Park	Corallian Group (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata) RTD (secondary A) Alluvium (secondary A)	River Ock Letcombe Brook	Commercial, residential and industrial properties Residential properties	PoS
Tesco filling station (ID: 20-1)	On site - commercial Off site - roads	Corallian Group (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata) RTD (secondary A) Alluvium (secondary A)	River Ock	Commercial/ industrial and residential properties	Landscaping
Shell filling station (ID: 20-3)	On site – commercial Off site - roads, agriculture, residential	Corallian Group (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata) RTD (secondary A) Alluvium (secondary A)	None with 250m.	Commercial/ industrial and residential properties	Agricultural land
Esso filling station (ID: 20-4)	On site – commercial Off site - roads	Corallian Group (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata) RTD (secondary A) Alluvium (secondary A)	River Ock	Commercial/industrial properties	Landscaping Trees around River Ock

Military sources

- 7.1.4 Military sources within 50m of the draft Order limits include an anti-tank ditches and gun emplacement; and RAF Grove. The latter will be assessed in an updated report in the ES.

Table 7.4 Baseline CSM: military sources located within/ 50m of the draft Order limits

Site / ID	Human receptors	Aquifer designation	Surface water	Property	Ecological
Anti-tank ditches and gun emplacement (ID: 1-2, 1-3, 1-8)	On site - commercial, roads Off site – Public open space, commercial, roads	RTD (secondary A) Alluvium (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata)	Marcham Brook Sandford Brook Unnamed ditches	Commercial and industrial properties	Crops on adjacent fields and allotments

Sewage works

7.1.5 Current and former sewage treatment works within 50m of the draft Order limits are assessed below:

Table 7.5 Baseline CSM: Sewage treatment works located within/ 50m of the draft Order limits

Site / ID	Human receptors	Aquifer designation	Surface water	Property	Ecological
Historic sewage works next to Steventon Depot (ID: 2-4)	On site - commercial Off site – railway, commercial,	RTD (secondary A) Lower Greensand Formation (secondary A) Gault Formation, Ampthill Clay and Kimmeridge Clay (unproductive strata)	East Hendred Ditch Goose Willow Ditch Orchard Farm Ditch	Commercial and industrial properties	Crops on adjacent fields
Abingdon Sewage Works (ID 2-6)	On site - commercial (sewage works) Off site - Public open space (allotments), road	RTD (secondary A) Ampthill Clay and Kimmeridge Clay (unproductive strata)	Oday Ditches River Thames	Commercial and industrial properties	Crops on adjacent fields and allotments
Historic Abingdon Corporation Sewage Works (ID: 2-7)	On site - commercial Off site - Public open space (marina), residential, road	RTD (secondary A) Ampthill Clay and Kimmeridge Clay (unproductive strata)	Oday Ditches River Thames	Commercial and industrial properties	- (surface water ecology only)
Drayton Sewage Works (ID: 2-8)	On site - Commercial Off site - Commercial, Drayton Golf Course	Summertown Radley sand and gravel member (Secondary A)	Ginge Brook	Commercial	Crops on adjacent fields

Mineral extraction

7.1.6 Mineral extraction sites within 50m of the draft Order limits are assessed below:

Table 7.6 Baseline CSM: mineral extraction sites located within/ 50m of the draft Order limits

Site / ID	Human receptors	Aquifer designation	Surface water	Property	Ecological
Former gravel pits in the east, including the current Oday Hill Quarry (ID: 21)	On site – commercial	RTD (secondary A) Alluvium (secondary A)	Oday Ditches Thames River	Commercial	Crops on adjacent fields

Infilled pits, quarries and claypits

7.1.7 Infilled pits, quarries and claypits within 50m of the draft Order limits are assessed below:

Table 7.7 Baseline CSM: infilled pits, quarries and claypits located within/ 50m of the draft Order limits

Site / ID	Human receptors	Aquifer designation	Surface water	Property	Ecological
Former infilled quarry in the north-west of the site near South Oxfordshire Crematorium (ID: 22-2)	On site - POS, roads Off site - commercial	Corallian Group (secondary A) RTD (secondary A) Alluvium (secondary A)	Nor Brook Unnamed ditches	Commercial and industrial properties	Crops on adjacent fields
Historic infilled gravel pit (ID: 22-5)	On site – commercial Off site – commercial	Corallian Group (secondary A) RTD (secondary A) Alluvium (secondary A)	River Thames Oday Ditches	Commercial and industrial properties	Crops on adjacent fields
Sutton Wick infilled pit (22-7)	On site – commercial Off site – commercial	Corallian Group (secondary A) RTD (secondary A) Alluvium (secondary A)	River Thames Oday Ditches	Commercial and industrial properties	Crops on adjacent fields

Disused canal

Table 7.8 Baseline CSM: Wilts & Berks Canal

Site / ID	Human receptors	Aquifer designation	Surface water	Property	Ecological
Disused Wilts & Berks Canal (infilled) (ID: 4)	On site - commercial, residential, roads Off site - commercial, residential	RTD (secondary A) Alluvium (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata)	Cow Common Brook, Mere Dike Orchard Farm Ditch Pill Ditch, Portobello Ditch, Unnamed ditches	Commercial, residential and industrial properties	Crops on adjacent fields

Unspecified tanks

7.1.8 Unspecified tanks within 50m of the draft Order limits are assessed below:

Table 7.9 Baseline CSM: tanks located within / 50m of the draft Order limits

Site / ID	Human receptors	Aquifer designation	Surface water	Property	Ecological
Tanks associated with farm on Kiln Lane, Drayton (ID: 5-4, 5-10 5-13)	On site - commercial, residential, roads Off site - commercial, roads	RTD (secondary A) Alluvium (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata)	Mere Dike	Commercial, residential and industrial properties	Crops on adjacent fields
Tanks near Steventon Road, East Hanney (ID: 5-1. 5-2)	On site - commercial, residential, roads Off site - commercial, residential, roads	RTD (secondary A) Alluvium (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata)	East Hanney Ditch Unnamed Ditch	Commercial, residential and industrial properties	Crops on adjacent fields
Tank near Railway Station Road, Grove (ID: 5-3)	On site - commercial, rail Off site- commercial, rail	RTD (secondary A) Alluvium (secondary A) Gault, Amphill Clay and Kimmeridge Clay (unproductive strata) Lower Greensand Group (secondary A)	East Hanney Ditch	Commercial and industrial properties	Crops on adjacent fields
Agricultural tanks adjacent to Goose Willow Solar Farm	On site - commercial Off site - commercial	RTD (secondary A) Alluvium (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata)	Orchard Farm Ditch Unnamed Ditch	Commercial and industrial properties	Crops on adjacent fields
Tank on Marcham road, Abingdon (ID: 5-22)	On site – roads Off site – commercial, residential and roads	RTD (secondary A) Alluvium (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata)	Larkhill Stream River Ock	Commercial, residential and industrial properties	Crops on adjacent fields

Site / ID	Human receptors	Aquifer designation	Surface water	Property	Ecological
Tank near Stonehill Lane north of Drayton (ID:5-8)	On site – POS Off site – Commercial, residential	RTD (secondary A) Alluvium (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata)	Oday Ditches	Commercial, residential and industrial properties	Crops on adjacent fields
Tanks on agricultural land south of railway (ID: 5-11, 5-12, 5-19)	On site - commercial Off site - commercial	RTD (secondary A) Alluvium (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata)	Wilts & Berks Canal (ditch) Unnamed ditch	Commercial and industrial properties	Crops on adjacent fields
Tank located east of Ardington Lane (ID: 5-18)	On site - commercial Off site - commercial	RTD (secondary A) Alluvium (secondary A) Amphill Clay and Kimmeridge Clay (unproductive strata)	Unnamed ditch Cow Common Brook	Commercial and industrial properties	Crops on adjacent fields

Railways and stations

- 7.1.9 Railways and railway stations within 50m of the draft Order limits include the current Great Western Railway. There has also been the previous Wantage Road Station and Challow Station. Both these older stations will be assessed in more detail in an updated assessment submitted with the ES.

Table 7.10 Baseline CSM: current railways located within / 50m of the draft Order limits

Site / ID	Sensitive land use (human receptors)	Aquifer designation	Surface watercourse	Property e.g. buildings	Ecological
Great Western Railway (ID: 34)	On site - commercial Off site - commercial, roads, residential, POS	Northmoor Sand and Gravel Member (Secondary A) Alluvium (Secondary A) Head deposits (Secondary undifferentiated)	Unnamed ditches, Portobello Ditch, Orchard Farm Ditch, Cow Common Brook, East Hendred Brook, Ginge Brook, Moor Ditch, Letcombe Brook, East Hanney Ditch, Childrey Brook	Commercial, industrial and residential properties	Crops on adjacent fields The Cuttings and Hutchins Copse (LWS)

8 Summary

- 8.1.1 This report presents a desk study and initial contamination assessment for the Project. The desk study has confirmed that there are several potential sources of contamination although the most of the land in the draft Order limits is agricultural.

8.2 Environmental setting

- 8.2.1 The study area is underlain by the Gault Formation, Lower Greensand Group, Upper Greensand Formation, West Melbury Marly Chalk Formation, Ampthill and Kimmeridge Clay Formations and the Corallian Group. Superficial deposits of RTD, Head Deposits and Alluvium are present across the draft Order limits. Several strata are locally important hydrogeological resources as secondary A aquifers and a principal aquifer. Several surface watercourses are present across the study area; some will be realigned as part of the proposed Project.

8.3 Conceptual site model and initial assessment

- 8.3.1 Following the development of an initial CSM, several potentially contaminative sites within 50m of the draft Order limits have been identified as requiring more detailed assessment. These sources had the highest contamination impact rating, with impact scores of three and four. These include:
- Steventon Depot
 - Landfills including historic landfills: Sutton Wick Landfill, Southern Town Park Landfill, Drayton Golf Course, and South of A34 Landfills and CEMEX/Hales authorised landfill and the CAMAS Land landfill
 - Petrol filling stations
 - Military sources including RAF Grove, anti-tank ditches and a gun emplacement
 - Sewage works including a historic sewage works within Steventon Depot, Drayton Sewage Works, Abingdon Sewage Treatment Works and Abingdon Corporation Historical Sewage Farm
 - Mineral extraction sites
 - Infilled pits, quarries and claypits
 - The Wilts & Berks Canal
 - Tanks
 - Railways and railway station
 - Drayton Substation
 - A historic barn fire

9 Recommendations

9.1 Further assessment

9.1.1 Based on the findings of this desk study, the following steps are recommended:

- A targeted walkover of the draft Order limits to assess current land use and potentially contaminative sources
- Records should be obtained from the Ministry of Defence (MOD) in respect to military activity in the study area
- Further engagement as described below in 9.2.
- Additional studies are ongoing, desk based research will continue and updated assessments will be informed by site-specific surveys including ground investigation.
- Further assessment of the presence of bituminous material in Kimmeridge Clay. This was reported in previous studies off site but has not been identified so far in ongoing site-specific investigation.

9.2 Further engagement

9.2.1 Additional engagement will be undertaken and included in an updated version of this report. Expected additional engagement is summarised in Table 9.1.

Table 9.1 Further engagement

Stakeholder	Issue
Natural England	Further engagement on soil surveys prior to DCO submission.
Environment Agency	Recurring technical liaison group (TLG) meetings with the Environment Agency to discuss potential contaminated land sites and permitting. Provision of scheme of investigation with rationale for ground investigation locations and sampling, prior to starting ground investigation.
Environment Agency	Further engagement to request information on previous ground investigation and risk assessment data, and shallow or deep opencast mining acquired since previous iterations of the SESRO Project as these were not provided in the EA's response to the initial data request.
Vale of White Horse District Council and South Oxfordshire District Council	The department that responded to the initial data request does not hold records relating to animal burial sites, agriculture, or mining. Further engagement is to be undertaken to request this data from other departments.
Farmers	Records to be requested related to the partially infilled Wilts and Berks Canal and the backfilled material.
Petroleum Officers / Fire Brigade	Records to be requested relating to fires and fuel storage within the contamination study area, including the use of PFAS containing firefighting foams from different department.
Ministry of Defence (MOD)	Information to be requested relating to former military uses within the contamination study area, as no response received in relation to the original request.

Stakeholder	Issue
Landmead air strip	Information to be requested related to fire training and fuel storage at the air strip.

9.3 Ground investigation

9.3.1 A geoenvironmental ground investigation is proposed. The objective of this ground investigation will be to gather baseline information which will enable a robust assessment for the DCO submission. The investigation will be designed to:

- Target locations at potential contamination source sites such as Steventon Depot, Landmead Airstrip, and the infilled West and Berks Canal, among others.
- Provide general coverage locations, particularly within the reservoir footprint to inform waste classification, material reuse and ground conditions.
- Allow some further topsoil analysis in agricultural areas
- Support the assessment of Kimmeridge Clay.

9.3.2 The proposed scope is in the design stage and has not yet been finalised but is likely to comprise the following:

- Window samples and boreholes between five metres below ground level (mbgl) and 50mbgl
- Trial pits to three mbgl
- Groundwater monitoring in both superficial and bedrock aquifers
- Geoenvironmental sampling and laboratory chemical testing.

10 References

- British Geological Survey (BGS), (2025). Geoindex Onshore. Accessed June 2025. <https://mapapps2.bgs.ac.uk/geoindex/home.html>
- Cemex UK Materials Limited, (2025). Annual environmental monitoring report for 2024.
- ChemSec, (2024). 'PFAS waste from solar panels: This is something that people in the sector don't like to talk about'. Accessed June 2025. <https://chemsec.org/pfas-waste-from-solar-panels-this-is-something-that-people-in-the-sector-dont-like-to-talk-about/>
- Exploration Associates Limited, (1990). Logs SU49SW12, SU49SW13, SU49SW14, SU49SW15, SU49SE187. Accessed June 2025. <https://mapapps2.bgs.ac.uk/geoindex/home.html>
- Exploration Associates Limited, (1992). Oxfordshire Reservoir Investigation, Ground Investigation Contract, Factual Report, Volume 1 to 4. Reference: H1252.
- Golder Associates, (2000). Sutton Wick Landfill Site Cell 2D Construction CQA Plan.
- Graham Sustainability Institute (2020) 'Facts about solar panels: PFAS contamination'. *Clean Energy in Michigan Series*, 12. Accessed June 2025. <https://graham.umich.edu/media/pubs/Facts-about-solar-panels--PFAS-contamination-47485.pdf>
- Groundsure, (2025a). Enviro+Geo Insight. Reference: GS-BNB-MTP-FY3-UC8_A.
- Groundsure, (2025b). Enviro+Geo Insight. Reference: GS-BNB-MTP-FY3-UC8_B.
- Groundsure, (2025c). Enviro+Geo Insight. Reference: GS-BNB-MTP-FY3-UC8_C.
- Groundsure, (2025d). Map Insight. Reference: GS-UUJ-CX3-LD90CCG.
- Iowa Solar, (2022). 'The Truth about Dangerous Chemicals in Solar Panels'. Accessed June 2025. <https://iowasolar.com/dangerous-chemicals-in-solar-panels/>
- Nain, P., Anctil, A. (2025). Per- and polyfluoroalkyl substances (PFAS) in solar photovoltaic modules. *Renewable and Sustainable Energy Reviews*. Accessed June 2025. <https://doi.org/10.1016/j.rser.2025.115562>.
- Natural England, (2025). Designated Sites View, Frilford Heath, Ponds and Fens SSSI. Accessed July 2025. <https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1001898&SiteName=Frilford%20Heath,%20Ponds%20and%20Fens&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=>
- Norwest Holst Engineering Ltd, (2006a). Report on a Ground Investigation at Upper Thames Reservoir, Volume One. Reference: F14059 (26/07/2006).
- Norwest Holst Engineering Ltd, (2006b). Report on a Ground Investigation at Upper Thames Reservoir, Volume One. Reference: F14539 (20/10/2006).

Popular Science, (2022). 'The hard truth of building clean solar farms'. Accessed June 2025.
<https://www.popsoci.com/environment/solar-farm-construction-epa-water-violations/>

SLR consulting, (2001). Sutton Wick Landfill Site, Cells 2A & 2B Works.

The Planning Inspectorate, (2024). Scoping Opinion: Proposed South East Strategic Reservoir Option (SESRO), Case reference: WA010005. Accessed July 025. <https://nsip-documents.planninginspectorate.gov.uk/published-documents/WA010005-000017-SESRO%20Scoping%20Opinion%202017%20EIA%20Regs%20FINAL.pdf>

Thames Water, (2025). SESRO PEI Report.

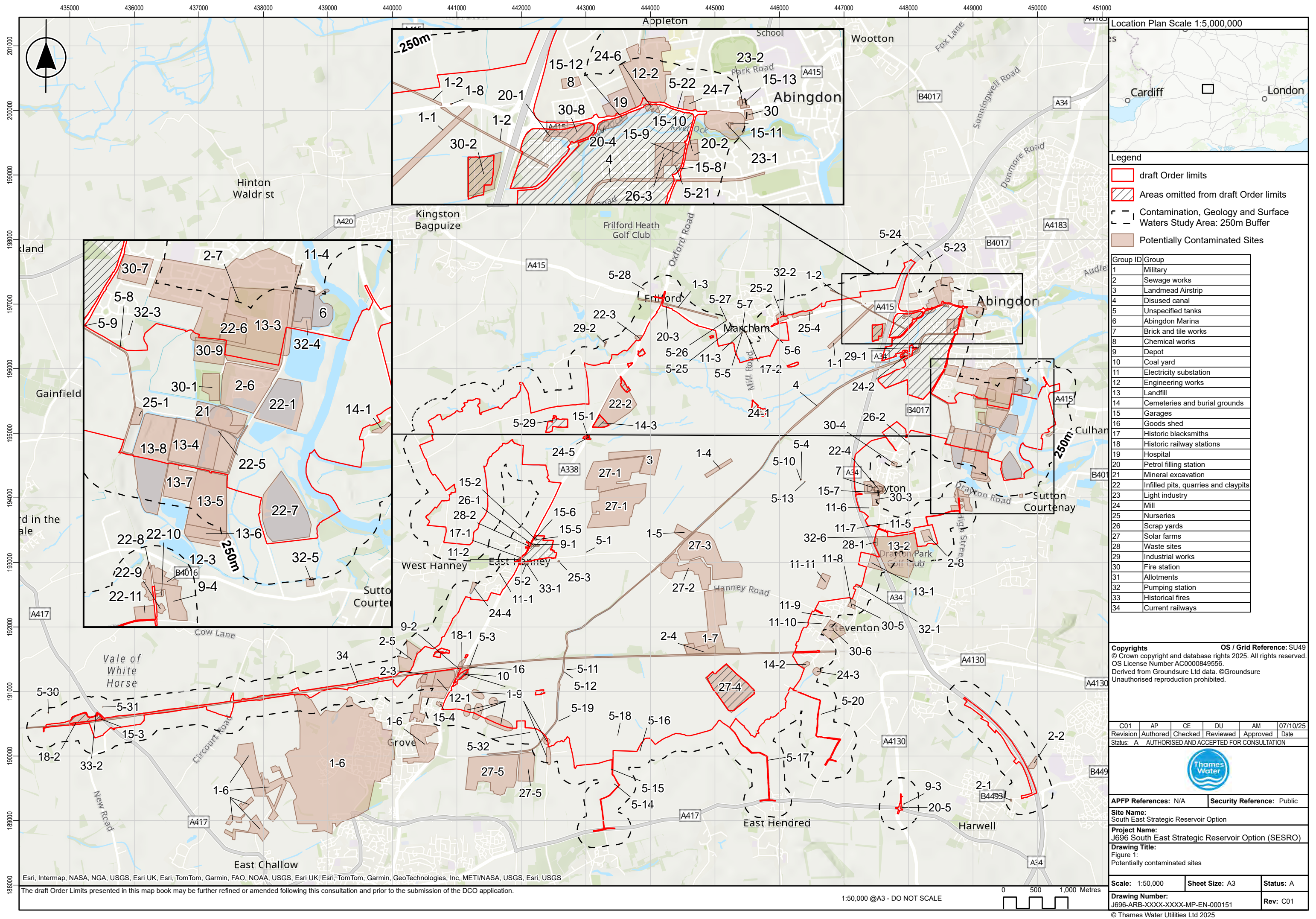
Thames Water, (2024b). South East Strategic Reservoir Option EIA Scoping Report, J696-AJ-A02X-ZZZZ-RP-EN-100100. Accessed July 2025. <https://nsip-documents.planninginspectorate.gov.uk/published-documents/WA010005-000010-SESRO%20EIA%20Scoping%20Report.pdf>.

UK Health Security Agency (UKHSA), (2022). UKradon - UK maps of radon. Accessed June 2025.
<https://www.ukradon.org/information/ukmaps>

The Wilts & Berks Canal Trust, (2004). Abingdon Feasibility Study, Final Report.

Zetica, (2025). UXO Desk Study for UXO and Military Uses. Reference: P15306-25-R1.

Figure 1: Potentially contaminated sites



Annex 2 Zetica UXO and military uses report and summary

A2.1. Zetica UXO and military uses report and summary

- A2.1.1. This annex provides a summary of the potential contamination risks associated with former military activities at SESRO.
- A2.1.2. The Zetica Desk Study for UXO and Military Uses report, dated 4th April 2025 (reference P15306-25-R1, rev D) has been reviewed and key information is summarised in this note. The Zetica report is included as PEI Report Appendix 10.3: Desk study for unexploded ordnance and military uses. The Zetica report draws on the following sources of information:
- Zetica's in-house records
 - Local records: West Berkshire Council, Oxfordshire County Council, Berkshire Records Office, Oxfordshire History Centre, local historical groups, and the Berkshire and Oxfordshire Historic Environment Record (HER) were consulted for records
 - Historical documents including historical maps, aerial photographs and drawings have been consulted from sources such as the National Archives, the US National Archives & Records Administration (NARA), the Imperial War Museum (IWM), Historic England, National Collection of Aerial Photography (NCAP), the Defence of Britain Project, the International Bomber Command Centre (IBCC) Archive, and relevant archaeological bodies
 - T REP EO Survey Rev 1 – BACTEC Explosive Ordnance Survey Report, Upper Thames Major Resource Development, 5th January 2006
 - South East Strategic Reservoir Option – Ground Investigation Factual Report Phase 1 (J696-ITA05C-ZZZZ-RP-CT-100001), July 2024
 - South East Strategic Reservoir Option – Ground Investigation Factual Report Phase 2a (J696-IT-A05C-ZZZZ-RP-CT-100002), November 2024
- A2.1.3. Other sources of information that ArB has used to find information on military uses include Ordnance Survey mapping, Historic England, and internet searches.
- A2.1.4. The following sections provide a summary of identified military features which may present sources of contamination. Military features with negligible military contamination risks have been excluded, such as, the recorded aircraft crashes and Marcham bombing range. No. 3 MU Milton Depot is not included as it is over 250m from the draft Order limits.

A2.2. Summary of potential contamination

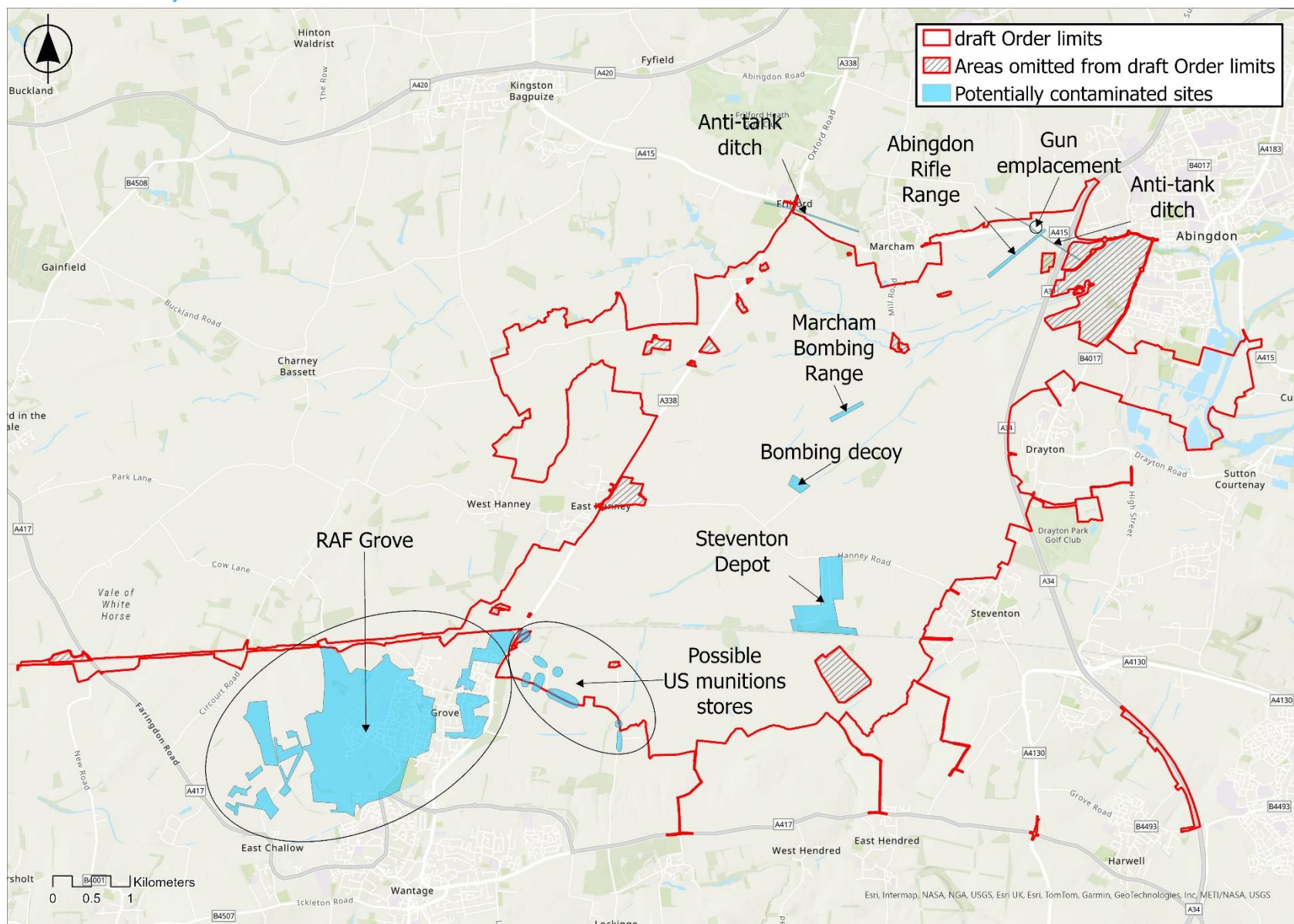
Table A2.1 Potential contamination from military sources

Source	Description	Potential contamination
Abingdon Common Rifle Range 1875 to 1934	The rifle range had a north-eastern to south-western firing direction, with target butts at SU 467963. The Zetica report states that these butts remain on site.	Metal contamination is associated with large numbers of cartridges, known as small arms ammunition (SAA), particularly lead, arsenic and antimony. The cartridge cases also pose a source of copper, nickel and zinc contamination. Explosive contamination from expended SAA (unburnt propellant) is also possible, but significant concentrations within topsoil were considered very unlikely by Zetica.
Steventon Bombing Decoy 1941 until after World War Two (WWII)	Controlled fires were used during air raids to simulate burning airfields.	The fires used a range of combustible materials and may pose a risk of localised hydrocarbon contamination.
(No. 3 MU) Steventon Depot 1943 to present	RAF depot used for staff accommodation and to store aircraft spares including aerofoils, propellers, tyres, engine components, and gun turrets until 1959. Since used as a commercial storage facility.	Potential hydrocarbon contamination associated with refuelling. Potential radiological contamination associated with the storage and disposal of aircraft parts containing radioactive materials, such as, luminescent paint and radium dials. No evidence of the disposal of aircraft parts has been identified, so this is considered unlikely.
United States Army Ordnance Depot G-0677 1943 to after WWII	The US ordnance depot, an ammunition sub-depot, was present from 1943 adjacent to RAF Grove, on site adjacent to the southern draft Order limits boundary. Ordnance was stored along roads and hedgerows. The depot closed after WW2 and ordnance was removed.	There is potential for localised disposal or spillage of munitions.
Home Guard activity 1940	During WW2, the Home Guard Battalion operated in the vicinity of the draft Order limits. In July 1940, several exercises took place near Steventon,	It is likely that blank SAA and pyrotechnics were used so there is a low potential for metal and explosive

Source	Description	Potential contamination
	including a mock battle within the southern part of the draft Order limits.	contamination associated with these in the south of the draft Order limits.
Anti-tank (AT) ditches 1943 to 1944/1946	There were AT ditches present in the north of the draft Order limits and associated gun emplacements. The ditches were filled between 1944 and 1946 and other defences were removed after WWII.	There is potential for localised spillage or disposal of ammunition around the gun emplacement and associated metal or explosive contamination. The ditches were infilled with unknown, potentially contaminated materials.
RAF Grove 1941 to 1969	Formerly an RAF training airfield with bomb stores ² , it was transferred to the US Army Air Forces in 1943 and expanded adjacent to the draft Order limits to the south-west of the draft Order limits. It was a major maintenance base for transport / cargo aircraft. It was returned to the RAF in 1946 and was used by the Atomic Energy Association as a support base for the Atomic Energy Research Establishment at Harwell. It has since been redeveloped into housing and an engineering works.	The Zetica Desk Study concludes that there is no potential for contamination from this site to the Site. However, the US expansion site of RAF Grove is adjacent to the draft Order limits. The area was used for engineering support and accommodation, but the exact uses are unknown. There is no further information on the activities carried out at the engineering support. Potentially contaminative works, storage or disposal may have occurred in this area.

² The original training airfield and bomb stores were over 400m and 1km south-west of the draft Order limits, respectively.

Plate A2.2 Military uses with the draft Order limits



Annex 3 Engagement

[REDACTED]
Thames Water Utilities Ltd
Clearwater Court
Vastern Road
READING
RG1 8DB

Our ref: XA/2025/100385/01-L01
Your ref: WA010005
Date: 16 June 2025

Dear [REDACTED]

GEOLOGY AND HYDROGEOLOGY TLG (MAY 2025)

SOUTH EAST STRATEGIC RESERVOIR OPTION (SESRO) ABINGDON, OXFORDSHIRE

I write in response to our initial meeting to discuss geology and groundwater issues on 06 May 2025. We welcome the submission of final slides and draft minutes of the discussion on 28 May 2025. We find the minutes to be an accurate representation of discussions.

We understand you have put in an information request into our local Customer Services team regarding groundwater and contaminated land records. It is understood this includes groundwater level and quality data requested, and that you have already obtained historic landfill data, therefore there is nothing additional we recommend.

A plan showing the distribution of groundwater monitoring boreholes across the site was presented which appeared to be broadly reasonable, however in order to fully comment on its suitability we request a technical note is provided which sets out the rationale behind the investigation/sampling strategy and choice of sampling locations. In terms of the outputs of this monitoring we

would welcome it if a report could be provided summarising and interpreting the data, with the raw data provided as an appendix.

We note that there is a groundwater fed SSSI outside the site boundary but within 250m, and that this will be considered. We are happy that it was acknowledged that contaminated land could have links to surface water and groundwater which may then have implications for sensitive ecological receptors.

We would like to flag concerns around potential impacts on South Oxfordshire Cemetery to the north of the site, and how a potential change in groundwater levels could impact both existing burials (source) and proposed burials (receptor) considerations. Enquiries from the cemetery operator indicate this risk may be picked up further so we recommend the location of this land use is considered as both a source of groundwater contamination, and receptor of groundwater flooding , and is fully addressed within the DCO documents to provide clarity on any impacts and proposed mitigation if applicable.

It is noted that the approach outlined for ground investigation is largely driven by geotechnical assessment drivers, however some areas are being targeted for contaminated land testing. In order to ensure the any scheme for ground investigation is robust and will satisfactorily manage risks to contaminated land, a detailed rationale for choosing locations should be submitted for comment and approval prior to the site investigation being initiated. If this is not possible it should be included in the reporting of the site investigation.

In light of the above, we are broadly supportive of the approach outlined to date, however are unable to agree to the scope, methodology or assumptions associated with the impact on groundwaters without further details being provided on the rationale behind the proposed investigation schedule.

If you have any queries please contact me on the details below.

Yours sincerely


Planning Specialist

Direct e-mail @environment-agency.gov.uk

Annex 4 Landfills

A4.1. Sutton Wick authorised landfill

- A4.1.1. On June 2017 two phases of waste management licences became environmental permits (Phase 1: EPR/FB3106GS, EPR/ FB3106FB and Phase 2: EPR/ FB3106HL). In November 2018, the permit was consolidated to be issued as a single EP (EPR/ FB3106HL/V002). In March 2017, a leachate treatment plant permit variation was issued to Cemex UK Materials Limited (EPR/ SP3395EM) regarding the methane stripping plant in operation at the draft Order limits (Cemex UK Materials Limited, 2025).

Capping and lining

- A4.1.2. The phase 1 area restoration occurred in 1997 and 1998, and the profile was raised through placement of inert soils. In December 2002, Phase 2 was closed to non-inert waste and capped through 2003 – 2007 with an engineered, low permeability cap beneath the restoration cover (Cemex UK Materials Limited, 2025).
- A4.1.3. A thick textured Linear low density polyethylene geomembrane overlies a lower protection geotextile 150mm layer. An upper protection geotextile overlies this layer, 700mm of restoration soils overlie the geosynthetic cap (SLR consulting, 2001).
- A4.1.4. Sutton Wick landfill is a contained site and consists of a clay lining system with 1m thick mineral barrier (Golder Associates, 2000).

Leachate

- A4.1.5. Following treatment at the methane stripping plant, leachate levels are controlled by pumping to sewer. Solar powered electric pumps were installed in 2014 to reduce leachate levels in Phase 2. The leachate extraction system was upgraded in 2021 however delay of the pumps caused leachate extraction to halt. Leachate abstraction recommenced in May 2022 (Cemex UK Materials Limited, 2025).

Annual monitoring

- A4.1.6. The annual environmental monitoring report for 2024 details the landfill gas, leachate and groundwater monitoring at the site (Cemex UK Materials Limited, 2025).
- A4.1.7. No methane concentration above the 1% v/v compliance limit were measured at perimeter gas monitoring wells, methane was detected twice in 2024 at 0.1% v/v and 0.2% v/v. Two exceedances were recorded for carbon dioxide at two locations above the 5% v/v compliance limit at 5.7% v/v in March and 5.4% v/v in July. Carbon dioxide concentrations for one location decreased to 0% v/v however, no further data is available for the other monitoring well which recorded 5.4%. The borehole monitoring locations did not exceed the 10% v/v compliance limit for carbon dioxide in 2024.
- A4.1.8. The monitoring frequency undertaken at Phase 1 and Phase 2 included fortnightly until July 2023, from this date monitoring returned to monthly in 2024. The Phase 1 area of the landfill reported higher leachate levels in 2024 than 2023 with little relation to seasonal variations. The Phase 2 area of the landfill had some evidence of a seasonal pattern, but

levels were higher in 2024 than the previous year. Trigger limits were exceeded at three monitoring locations for Phase 1 and at all locations for Phase 2 throughout 2024.

- A4.1.9. Groundwater quality monitoring was undertaken at the landfill site in 2024, manganese was reported above DWS in more than 50% of the samples, sulphate in 47.6% and ammoniacal nitrogen in 25.4%. Concentrations of ammoniacal nitrogen recorded were higher than in 2023 and 2022 with the peak concentration thought to be associated with the sewage treatment works. Ammoniacal nitrogen levels decreased throughout the year, and no trigger levels were exceeded during 2024.

A4.2. Drayton Golf Course Landfill

Gas

- A4.2.1. Gas monitoring records were provided by the Environment Agency and are detailed below. The monitoring plan and gas monitoring results are presented in Annex 4.
- A4.2.2. Gas monitoring was undertaken at Drayon Park Golf Course in 1997 and 1998; high concentrations of methane were recorded in multiple exploratory holes with highest concentration of methane recorded at the site was 75.6% in G23 south of the Waste Reception Centre (now Drayton Waste Recycling Centre). Elevated concentrations of methane were consistently recorded in the same exploratory holes across the monitoring period, largely near to the Waste Reception Centre. The same exploratory holes also recorded high concentrations of carbon dioxide across the monitoring period.

Table A4.1 Gas monitoring maximum concentrations at Drayton Park Golf Course

Exploratory hole	Maximum methane concentration (%)	Location
GBH13	62.2	East of the Refuse Tip
GBH17	70.0	South-western corner of Refuse Tip adjacent to A34
GBH21	71.9	Close to the Waste Reception Centre
G22	67.7	
G23	75.6	
G26	72.0	

A4.3. Sutton Wick No.1

- A4.3.1. Monitoring is still required for Phase 0 (Sutton Wick No.1) until a permit variation has been submitted as requested by the Environment Agency. One leachate level reading was taken in 2024 and was within historical ranges.
- A4.3.2. No capping or lining is known to have been used for Sutton Wick No.1.

Annex 5 Disused Wilts and Berks Canal

A5.1. Potential contamination in Wilts & Berks Canal

- A5.1.1. The Wilts & Berks Canal Trust Abingdon Feasibility Study (2004) indicates potential contamination of the disused canal. There is currently no data available regarding the composition of material used to infill sections of the canal in the draft Order limits. Available literature mentioned in the feasibility study suggests the old canal channel has been used to dump waste by adjoining land users. The Wilts & Berks canal passes through both urban and agricultural land.
- A5.1.2. The likely composition of the infill where present along the disused canal is unknown. Ground investigations will be undertaken in areas of the infilled canal to determine the composition and identify potential contamination of natural ground.

Annex 6 Additional research into solar farms and pesticides and herbicides

A6.1. Solar farms

- A6.1.1. Several solar farms are present within the draft Order limits, including: Landmead Solar Farm, Goose Willow Solar Farm and Steventon Solar Park. These solar farms are to be decommissioned and removed prior to excavation for the reservoir. Hill Farm Solar Park falls within 250m of the draft Order limits and is not expected to be disturbed during the Project. Reprovision of these solar farms is being considered.
- A6.1.2. Several contaminants might be associated with solar farms. Solar panels are made with photovoltaic (PV) cells of silicon semiconductors that absorb sunlight and create an electrical current. In addition to PV cells, PV thin films are also used which can comprise of:
- Copper indium gallium diselenide (CIS/CIGS)
 - Cadmium telluride (CdTe)
 - Amorphous silicon (a-Si)
 - Cadmium telluride (di)selenide
 - Hexafluoroethane
 - Lead
 - Polyvinyl fluoride
- A6.1.3. PFAS are sometimes used in panel coatings, adhesives, and substrates to enhance durability, and provide water resistance and self-cleaning properties. Published papers suggests that up to nearly 80% of the market share of solar panel outer layers in 2022 contained PFAS (ChemSec, 2024).
- A6.1.4. A scientific study on PFAS in solar photovoltaic modules concluded there is no evidence of presence and use of PFAS in commercially available solar modules however, available data on PFAS types and concentrations remain limited (Nain and Anctil, 2025).
- A6.1.5. The potential for contamination from solar panels is predominantly associated with production and end-of-life disposal, with most solar panels ending up in landfill. Damaged panels can also lead to leaching at the operational site. However, no studies have demonstrated that leaching from panels is occurring, either during active use or at end of life (Graham Sustainability Institute, 2020). New type 1 solar panels, introduced in 2012, are considered to have low potential for contamination (Iowa Solar, 2022).
- A6.1.6. Several maintenance chemicals are also associated with solar farms. These including de-icing and cleaning agents, lubricants and coolants. Herbicides and pesticides may be used to control flora and fauna around the solar farm.

A6.2. Pesticides and herbicides

- A6.2.1. There is predominantly agricultural use in the draft Order limits, including barley, wheat, rapeseeds and oats. In addition, there are areas of pasture.

A6.2.2. Pesticides are used to control pests and weeds. Common pesticides used in UK arable farming include herbicides, fungicides and insecticides.

A6.2.3. Some of the most common pesticides in the UK include:

- Glyphosate which is the most widely used of all herbicides. It is used on spring barley and potatoes but has recently been banned for use in the UK.
- Folpet is an organic fungicide used on winter wheat, winter barley and spring barley.
- 2,4-D is a widely used agricultural weedkiller.
- Acetamiprid is a type of neonicotinoids (insecticide), and the only one in the group not banned in the UK and EU due to the threat they pose to bee health.
- Chlorpyrifos is an insecticide that was banned in the EU. It is commonly used on winter barley.
- Imazalil is a post-harvest fungicide used on citrus fruits during storage and transportation.

Annex 7 Stage 1 Screening Results

A7.1. Stage 1 Screening

Table A7.1 Stage 1 Screening and detailed assessment sources

ID No.	Group	Source name	Zones	Risk	Impact	Further assessment
1-1	Military	Abingdon Rifle Range	1	Low	2	No
1-2	Military	Anti-tank ditch	2	Medium	3	Yes
1-2	Military	Anti-tank ditch	1	Medium	3	Yes
1-3	Military	Anti-tank ditch	2	Medium	3	Yes
1-4	Military	Marcham Bombing Range	1	Low	2	No
1-5	Military	Bombing decoy	1	Low	2	No
1-6	Military	RAF Grove	2	Medium	3	Yes
1-6	Military	RAF Grove	3	Low	1	No
1-7	Military	Steventon Depot, including infilled land in SE	1	High	4	Yes
1-8	Military	Gun emplacement	1	Low	2	No
1-9	Military	United States Army Ordnance Depot	1	Low	2	No
2-1	Sewage Works	Sewage Works	3	Medium	1	No
2-2	Sewage Works	Sewage Works	2	Medium	2	No
2-3	Sewage Works	Sewage Works	2	Medium	2	No
2-4	Sewage Works	Steventon Depot Sewage Works	1	Medium	3	Yes
2-5	Sewage Works	Bradford Farm Sewage Works	2	Medium	2	No
2-6	Sewage Works	Abingdon Sewage Works	1	Medium	3	Yes
2-7	Sewage Works	Abingdon Corporate Sewage Works	2	Medium	3	Yes
2-8	Sewage Works	Drayton Sewage Works	1	Medium	3	Yes
3	Landmead Air Strip	Landmead Air Strip	1	Low	2	No
4	Disused canal	Wilts & Berks Canal	1	Medium	3	Yes
5-1	Unspecified Tank	Historic tank (1994)	1	Medium	3	Yes
5-2	Unspecified Tank	Current farm tank (1974 to 1994)	1	Medium	3	Yes

ID No.	Group	Source name	Zones	Risk	Impact	Further assessment
5-3	Unspecified Tank	Historic tank (1877 to 1912)	1	Medium	3	Yes
5-4	Unspecified Tank	Historic farm tank (1974)	1	Medium	3	Yes
5-5	Unspecified Tank	Historic tank (1875)	3	Medium	1	No
5-6	Unspecified Tank	Historic tank (1974 to 1994)	3	Medium	1	No
5-7	Unspecified Tank	Historic tank (1974 to 1994)	3	Medium	1	No
5-8	Unspecified Tank	Historic tank (1875 to 1912)	1	Medium	3	Yes
5-9	Unspecified Tank	Historic tank (1899)	2	Medium	2	No
5-10	Unspecified Tank	Historic farm tank (1974 to 1994)	1	Medium	3	Yes
5-11	Unspecified Tank	Historic tank (1877)	1	Medium	3	Yes
5-12	Unspecified Tank	Historic tank or trough (1877)	1	Medium	3	Yes
5-13	Unspecified Tank	Current farm tank (1974 to date)	1	Medium	3	Yes
5-14	Unspecified Tank	Historic tank (1887 to 1912)	2	Medium	2	No
5-15	Unspecified Tank	Current tank (1970 to 1994)	2	Medium	2	No
5-16	Unspecified Tank	Historic tank (1877)	2	Medium	2	No
5-17	Unspecified Tank	Historic tank (1994)	2	Medium	2	No
5-18	Unspecified Tank	Historic tank (1912)	1	Medium	3	Yes
5-19	Unspecified Tank	Historic tank or trough (1877)	1	Medium	3	Yes
5-20	Unspecified Tank	Current tank (1970 to 1994)	2	Medium	2	No
5-21	Unspecified Tank	Historic tank (1970 to 1994)	2	Medium	2	No
5-22	Unspecified Tank	Historic tank (1912 to 1933)	1	Medium	3	Yes
5-23	Unspecified Tank	Historic tank (1936 to 1973)	3	Medium	1	No
5-24	Unspecified Tank	Current industrial estate tank (1996)	3	Medium	1	No
5-25	Unspecified Tank	Historic tank (1974)	3	Medium	1	No

ID No.	Group	Source name	Zones	Risk	Impact	Further assessment
5-26	Unspecified Tank	Historic tank (1974)	3	Medium	1	No
5-27	Unspecified Tank	Historic tank (1899 to 1994)	3	Medium	1	No
5-28	Unspecified Tank	Historic tank (1875)	3	Medium	1	No
5-29	Unspecified Tank	Historic tank (1994) at firewood supplier site	2	Medium	2	No
5-30	Unspecified Tank	Historic farm tank (1997)	3	Medium	1	No
5-31	Unspecified Tank	Historic tank (1973) at equestrian centre	3	Medium	1	No
5-32	Unspecified Tank	Historic farm tank (1974 to 1994)	3	Medium	1	No
6	Abingdon Marina	Abingdon Marina	2	Medium	2	No
7	Brick and tile works	Brick and tile works	2	Low	1	No
8	Chemical Works	Chemical works	3	High	2	No
9-1	Depot	Storage depot	2	Low	1	No
9-2	Depot	Unspecified depot	2	Medium	2	No
9-3	Depot	Historic Transport Depot	2	Medium	2	No
9-4	Depot	Drayton Highways depot	2	Medium	2	No
10	Coal yard	Coal yard	2	Low	1	No
11-1	Electricity substation	Electricity substation	3	Low	1	No
11-2	Electricity substation	Electricity substation	2	Low	1	No
11-3	Electricity substation	Electricity substation	3	Low	1	No
11-4	Electricity substation	Electricity substation	3	Low	1	No
11-5	Electricity substation	Electricity substation	3	Low	1	No
11-6	Electricity substation	Electricity substation	3	Low	1	No
11-7	Electricity substation	Electricity substation	3	Low	1	No
11-8	Electricity substation	Electricity substation	3	Low	1	No
11-9	Electricity substation	Electricity substation	3	Low	1	No
11-10	Electricity substation	Electricity substation	3	Low	1	No
11-11	Electricity substation	Drayton Substation	1	Medium	3	Yes
12-1	Engineering Works	Williams Grand Prix Engineering	2	Medium	2	No
12-2	Engineering Works	Motor works	2	Medium	2	No
12-3	Engineering Works	Various engineering buildings	2	Medium	2	No

ID No.	Group	Source name	Zones	Risk	Impact	Further assessment
13-1	Landfill	Landfill south of A34 at Drayton	2	High	3	Yes
13-2	Landfill	Drayton Golf Course landfill	2	High	3	Yes
13-3	Landfill	Southern Town Park landfill	2	High	3	Yes
13-4	Landfill	Sutton Wick No.1 landfill	1	High	4	Yes
13-5	Landfill	Sutton Wick Landfill (phase 1a)	2	High	3	Yes
13-6	Landfill	Sutton Wick Landfill (phase 1b)	3	High	2	No
13-7	Landfill	Sutton Wick Landfill	2	High	3	Yes
13-8	Landfill	CAMAS Land landfill	1	High	4	Yes
14-1	Burial grounds and cemeteries	St Paul's Church and burial ground	2	Medium	2	No
14-2	Burial grounds and cemeteries	St Michael's church and burial ground	2	Medium	2	No
14-3	Burial grounds and cemeteries	South Oxfordshire Crematorium and Memorial Park	2	Medium	2	No
15-1	Garages	Pete Read Services	2	Medium	2	No
15-2	Garages	Historic garage	2	Medium	2	No
15-3	Garages	Garages	2	Medium	2	No
15-4	Garages	Garages	2	Medium	2	No
15-5	Garages	Garages	2	Medium	2	No
15-6	Garages	Garages	2	Medium	2	No
15-7	Garages	Garages	3	Medium	1	No
15-8	Garages	Garages	2	Medium	2	No
15-9	Garages	Garages	2	Medium	2	No
15-10	Garages	Garages	2	Medium	2	No
15-11	Garages	Garages	3	Medium	1	No
15-12	Garages	Garages	2	Medium	2	No
15-13	Garages	Garages	3	Medium	1	No
16	Goods shed	Goods shed near railway	1	Low	2	No
17-1	Historic blacksmiths	Historic blacksmith	2	Low	1	No
17-2	Historic blacksmiths	Historic blacksmith	3	Low	1	No

ID No.	Group	Source name	Zones	Risk	Impact	Further assessment
18-1	Historic railway stations	Wantage Road Station	1	Medium	3	Yes
18-2	Historic railway stations	Challow Station	1	Medium	3	Yes
19	Hospital	Abingdon Community Hospital	2	Medium	2	No
20-1	Petrol filling stations	Tesco Petrol Station	2	High	3	Yes
20-2	Petrol filling stations	Filling Station	2	High	3	Yes
20-3	Petrol filling stations	Shell Petrol Station	2	High	3	Yes
20-4	Petrol filling stations	Esso Filling Station	2	High	3	Yes
20-5	Petrol filling stations	Rowstock Corner Garage	2	High	3	Yes
21	Mineral excavation	Oday Hill gravel pit (active)	1	Medium	3	Yes
22-1	Infilled pits, quarries and claypits	Historic gravel pit (now waterfilled) 1980 to 1991	1	Medium	3	Yes
22-2	Infilled pits, quarries and claypits	Quarry 1898 - 1950s	2	Medium	3	Yes
22-3	Infilled pits, quarries and claypits	Quarry	2	Medium	2	No
22-4	Infilled pits, quarries and claypits	Clay pit near brick and tile works	3	Medium	1	No
22-5	Infilled pits, quarries and claypits	Mineral excavation	1	Medium	3	Yes
22-6	Infilled pits, quarries and claypits	Mineral excavations near Sutton Wick area	2	Medium	2	No
22-7	Infilled pits, quarries and claypits	Pit at Sutton Wick (operational 2015), currently filled with water	1	Medium	3	Yes
22-8	Infilled pits, quarries and claypits	Gravel pit 1899	2	Medium	2	No
22-9	Infilled pits, quarries and claypits	Gravel pit 1912	2	Medium	2	No
22-10	Infilled pits, quarries and claypits	Gravel pit south 1899	2	Medium	2	No
22-11	Infilled land	Infilled pit near Drayton East Way	2	Medium	2	no
23-1	Light Industry	Brewery and associated malthouses	2	Low	1	No

ID No.	Group	Source name	Zones	Risk	Impact	Further assessment
23-2	Light Industry	Malthouse	3	Low	1	No
24-1	Mill	Marcham Corn Mill	2	Low	1	No
24-2	Mill	New Cut Mill	2	Low	1	No
24-3	Mill	Mill	3	Low	1	No
24-4	Mill	Mill	3	Low	1	No
24-5	Mill	Venn Mill	2	Low	1	No
24-6	Mill	Ock Mill	2	Low	1	No
24-7	Mill	Sawmill	2	Low	1	No
25-1	Nurseries	Willowdene Nurseries	1	Low	2	No
25-2	Nurseries	Hyde Farm Nurseries	2	Low	1	No
25-3	Nurseries	Steventon Nurseries	1	Low	2	No
25-4	Nurseries	Unidentified Nurseries	2	Low	1	No
26-1	Scrap yards	Scrap yard	2	Medium	2	No
26-2	Scrap yards	Scrap yard	3	Medium	1	No
26-3	Scrap yards	Scrap yard	2	Medium	2	No
27-1	Solar farms	Landmead Solar Farm	1	Low	2	No
27-2	Solar farms	Steventon Solar Farm	1	Low	2	No
27-3	Solar farms	Goose Willow Solar Farm	1	Low	2	No
27-4	Solar Farms	Hill Farm Solar Park	2	Low	1	No
27-5	Solar Farms	Elm Farm Solar Park	3	Low	1	No
28-1	Waste Site	Drayton Waste and Recycling Centre	2	Medium	2	No
28-2	Waste Site	Asbestos Transfer Station	2	Low	1	No
29-1	Works	Works	2	Low	1	No
29-2	Works	Works	3	Medium	1	No
30	Fire Station	Abingdon Fire Station	3	Medium	1	No
31-1	Allotments	Drayton Road allotments	1	Low	2	No
31-2	Allotments	West End Allotments	1	Low	2	No
31-3	Allotments	Allotment gardens	3	Low	1	No
31-4	Allotments	Allotment gardens	3	Low	1	No
31-5	Allotments	Allotment gardens	2	Low	1	No
31-6	Allotments	Allotment gardens	3	Low	1	No
31-7	Allotments	Allotment gardens	2	Low	1	No

ID No.	Group	Source name	Zones	Risk	Impact	Further assessment
31-8	Allotments	Allotment gardens	2	Low	1	No
31-9	Allotments	Drayton Road allotments	1	Low	2	No
32-1	Pumping station	Drayton Pumping Station	2	Medium	2	No
32-2	Pumping station	Windpump	2	Low	1	No
32-3	Pumping station	Pumping station	3	Medium	1	No
32-4	Pumping station	Sewage pumping station	2	Medium	2	No
32-5	Pumping station	Pumping station	3	Medium	1	No
32-6	Pumping station	Pumping house	2	Medium	2	No
33-1	Historical fires	Barn fire	1	Medium	3	Yes
33-2	Historical fires	Pub fire	2	Medium	2	No
34	Current railway	Great Western Railway	1	Medium	3	Yes
Notes Those in bold have had more assessment.						



It's everyone's water