

13.20 The radon risk at the site has been assessed using the UK Public Health England interactive radon¹⁶ map. The interactive radon map shows that the site is in an area where 0 % to 1 % of homes are above the UK Action Level for radon. Therefore, based upon Building Research Establishment guidance¹⁷ radon protection measures are not required for the site.

Landfills

13.21 The closest recorded or suspected landfill is located approximately 270 m to the north of the site, at the former Overwood Quarry which was licensed to receive 'generally inert' materials.

13.22 The Envirocheck report recorded several areas of infilled land, the closest to the site was recorded approximately 202 m south of the site and dates from 1975 (infilled quarry or pit).

Registered Waste Transfer or Disposal Sites

13.23 A waste transfer site is located approximately 230 m north of the site. The licence holder for the waste transfer site is William Hamilton and Sons Limited, the maximum waste input is no greater than 10,000 and less than 25,000 tonnes per year and has been operational since 1999. The type of waste authorised at the waste transfer suite includes biodegradable waste as green waste consisting of plant matter and gully pot wastes.

Unexploded Ordnance (UXO)

13.24 The online Zetica Unexploded Bomb (UXB) map¹⁸ identifies the site as being at a low risk from unexploded ordnance.

Sources of Contamination

13.25 The historic and current uses of the site give rise to the potential for the following types of contaminants to occur at the site, both within soil and groundwater:

- Organic: Total petroleum hydrocarbons (TPH), Polycyclic Aromatic Hydrocarbons (PAHs), Volatile Organic Compounds (VOCs), Semi Volatile Organic Compounds (SVOCs), pesticides, herbicides and phenols;
- Acid mine drainage from mining activities (when the rock containing sulphide minerals are oxidised due to lowering of groundwater, and then react with groundwater when groundwater levels rise resulting in generation of acidic sulphurous waters which causes

¹⁶ Health Protection Agency (November 2007) - Indicative Atlas of Radon in England, Wales and Scotland

¹⁷ BR 211(2015) Radon - Guidance on Protective Measures for New Buildings

¹⁸ <https://zeticauxo.com/downloads-and-resources/risk-maps/>. Date accessed 14/12/2020.

increased leaching of contaminants such as heavy metals into groundwater)), (iron sulphide, sulphates, heavy metals);

- Inorganic: metals, asbestos, cyanide; and
- Ground gases.

Sensitive Receptors

13.26 The following sensitive receptors have been identified:

- Water environment (surface water features including ecological receptors within the surface waterbodies);
- Construction workers;
- Groundwater beneath the site (aquifers); and
- Future site users.

Potential Effects

13.27 Tables 13.1 and 13.2 set out the potential effects which are anticipated and justification for the absence of significant effects. Reference should also be made to the Water Resources and Flood Risk assessment provided below.

Table 13.1: Potential Construction Effects

Potential Effect*	To be assessed in the EIA (Y/N)	Commentary
Exposure of construction workers to contaminated soil	N	Standard construction control measures, including provision of personal protective equipment ("PPE") to prevent direct exposure to contaminants. Including the implication of the CEMP.
Generation of dust and potentially contaminated dusts, including asbestos.	N	
Exposure of construction workers to ground gases	N	Site is likely to be underlain by Made Ground, Coal Measures and potential mine workings, and as such there is potential for ground gases to be generated. This will be determined by ground investigation.

Potential Effect*	To be assessed in the EIA (Y/N)	Commentary
		However, the risks to construction workers will be mitigated through standard construction control measures, including provision of PPE and confined spaces protocol to remove (and where not possible, manage) risk of staff being exposed to ground gases.
Risks to the underlying groundwater and surface water from the historic mine and underground workings, particular acid mine drainage.	N	An intrusive ground investigation (including groundwater monitoring) will be undertaken to determine the risks to the underlying aquifer and surface water.
Contaminants introduced by construction activities through leakages/spillages	N	Standard construction and control measures such as management of materials on site.
The development includes a 5 m deep bunker (from a general development level of 152m AoD), therefore, groundwater maybe encountered during the excavation works which will require management during construction. The aquifer may be disturbed during construction of the bunker.	N	The groundwater levels at the site will be determined by the intrusive ground investigation, which will determine the risk of encountering groundwater. The development will be designed to provide a water-tight structure and thus mitigate the requirement for long-term dewatering of structures constructed below the groundwater table. The provision of a watertight structure will also mitigate impacts from waste placed in the bunker leaking and thus affecting the water quality of the aquifer. During construction, any abstracted groundwater would be managed to ensure that groundwater impacted by contamination is not mobilised into other waterbodies. Assessment will be made, following intrusive investigations, into the presence of groundwater contaminants and whether the proposed works could create or mobilise e.g. acid mine waters. If present, measures would be designed to mitigate environmental risks from creation of and/or mobilisation of contaminated waters.
Changes in ground level as a result of earthworks and cut and fill activities may increase vulnerability	N	The proposed development will include hardstanding therefore, the risks to the underlying aquifer is reduced.