



Permit Application Section 3 - HRA High Pole Farm

Document Reference: 313/1--R1.1 - HRA



Minerals
Waste
Environment

The Mineral Planning Group Ltd.
The Rowan Suite, Oakdene House,
Cottingley Business Park, Bingley,
West Yorkshire BD16 1PE

01274 884599/884699
headoffice@mpgyorks.co.uk

www.mpgyorks.co.uk

Document Title: Permit Application Section 3 - HRA
Document Reference: 313/1--R1.1 - HRA
Site / Project: High Pole Farm
Client: Graeme Thomas

Document Versions

1.1 15/03/2021

Prepared by: MS
Checked by: JMS, CH
Approved by: CH Director

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SECTION 3: Hydrogeological Risk Assessment

3.1 Introduction

3.1.1 The proposed recovery operation cannot be carried out under a Standard Rules Permit due to the proximity of the watercourse that crosses The Site as well as the proximity of private water supplies. Therefore, the bespoke application includes the following Hydrogeological Risk Assessment (HRA).

3.1.2 All other environmental risks are assessed separately under the Environmental Risk Assessment (ERA) for the proposals, included as Section 4.

3.1.3 This Risk Assessment will be carried out on a Source – Pathway – Receptor (SPR) basis, utilising The Site’s Conceptual Site Model (CSM), shown in Drawing ref: 313/1 – CSM-1.

3.2 Risk Assessment

3.2.1 There is only one Source in this case; non-conforming materials within the imported waste. The Receptors are the small stream that crosses The Site, and groundwater. The pathways identified are surface water run-off that has contacted the waste that then enters the stream, and direct percolation into groundwater.

3.2.2 The wastes that would be permitted to be deposited at The Site (shown below in Table 1) are those stipulated in the approved Waste Recovery Plan. These are inherently low risk, as they are all inert wastes and are by definition unlikely to

cause pollution. This means that, along with strict adherence to Waste Acceptance Procedures, the Source can, effectively, be removed from the model. However, there is always a very small potential for ‘rogue loads’ of non-permitted waste to arrive at The Site, despite the very strict Waste Acceptance Procedures. These may include potentially polluting materials. The strict Waste Acceptance Procedures (WAP) seek to reduce this risk to near negligible levels, however, the risk assessment is based on a ‘worst case scenario’.

Waste Code	Description
17	Construction and demolition wastes
17 01 01	Concrete
17 01 02	Bricks
17 01 03	Tiles and ceramics
17 01 07	Mixtures of concrete, bricks, tiles and ceramics
17 05 04	Soils and stones
20	Municipal wastes
20 02 02	Soil and stones

Table 3.1: Permitted Waste Codes

- 3.2.3 It is noted that the total quantity of waste required (6,560 tonnes) is relatively low in the context of recovery on land projects. As such, the reasonably anticipated volume of accidental inclusions of non-permitted materials be imported to The Site, is likewise concluded to be extremely low.
- 3.2.4 The pathway to surface water identified relies on precipitation falling directly onto the waste materials, collecting potential contaminants either in solution or by suspension / saltation, and transporting them to the stream. It is proposed, therefore, that no works are undertaken during winter months Nov – Feb inclusive. The engineering works are likely to only require 1 – 2 months to complete. Therefore, the total volume of precipitation landing on site is considered to be to very low, meaning only an extremely small quantity of potential contaminants could be transported to the stream. Once waste has been deposited, this would be covered by a layer of topsoil and seeded, removing the pathway to surface water.
- 3.2.5 Additionally, the eastern element of The Site would have the stream entirely culverted prior to the waste operation commencing, closing the pathway, or, effectively removing the receptor in this area of The Site.
- 3.2.6 It has been concluded, from the above considerations, that the risk to the surface water course within The Site is **very low**. This is due to a combination of the lack of a viable Source and negligible volumes of potential contaminants, coupled with, the lack of pathway if the works are carried out during spring / summer months. The eastern area of The Site can be considered to have no Pathway or Receptor as the stream would have been culverted.

3.2.7 The potential pathway to groundwater would be direct percolation through the underlying lithologies. The site owner has farmed the surrounding land for many years and informs us that beneath thin soils (20 – 40cm) there are substantial depths of clays (glacial boulder clay). There is, therefore, a form of natural ‘liner’ beneath The Site that would significantly impede any potential percolation into permeable geological horizons beneath the clay deposits.

3.2.8 Additionally, it is reasonably considered that groundwater flow beneath The Site is likely to mirror topographical features. Groundwater would, therefore, flow in a northerly direction, with the flow shifting slightly towards the northeast, north of The Site. The nearest private water supply is some 60 – 70m east of The Site, and not in the likely direction of groundwater flow. A further supply is located 140 – 160m to the northwest of The Site. It is considered that groundwater flow would be to a more northerly / north easterly direction at this distance, and not towards this private water supply¹.

3.2.9 In addition to the above considerations, it is noted that The Site is not within a Source Protection Zone or any form of drinking water safeguarding zone. Whilst the depth to groundwater is not known, it is considered likely to be, at least, several metres beneath the ground surface, as the ground falls away towards the stream by 4-5m with no localised springs reported.

3.2.10 The risk to groundwater is, therefore, also considered to be **very low**.

3.2.7 The Risk Assessment is summarised in Table 3.2, below.

¹ Plan reference 313/1 – Water-1 shows the locations of these water supplies, however, it is a confidential plan and is supplied separately.

Source	Receptor	Pathway	Risk Management Technique	Probability of Exposure	Consequence	Overall Risk
Non-permitted waste materials ('rogue loads')	On-site surface water course	Surface water run-off	No winter working. Strict WAP.	Very low	Potential contaminants reach surface water course. Nature of contaminants would determine environmental effects, but may include effects on water chemistry.	Very low
Permitted waste – suspended solids	On-site surface water course	Surface water run-off	No winter working. Strict WAP and WAC	Low	Suspended solids reach water course, affecting flow rates and volumes, or negatively affecting aquatic life.	Low
Non-permitted waste materials ('rogue loads')	Groundwater (and private water supplies)	Direct percolation and groundwater flow	Strict WAP and WAC	Very low	Potential harmful effects on groundwater chemistry, pollution of private water supplies.	Very low

Table 3.2: Hydrogeological Risk Assessment summary. Note that this risk assessment is referenced in The Site's overall environmental risk assessment.