

**CUADRILLA RESOURCES  
LIMITED**



**APPENDIX - K**

**FLOOD RISK ASSESSMENT**

**Cuadrilla Resources Limited**  
**January 2010**

Lower Stumble Hydrocarbon Exploration Site  
Planning Application [January 2010].  
Prepared by Phil Mason

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**CUADRILLA RESOURCES LIMITED**  
**LOWER STUMBLE EXPLORATION SITE**  
**RED - LINE PLAN**



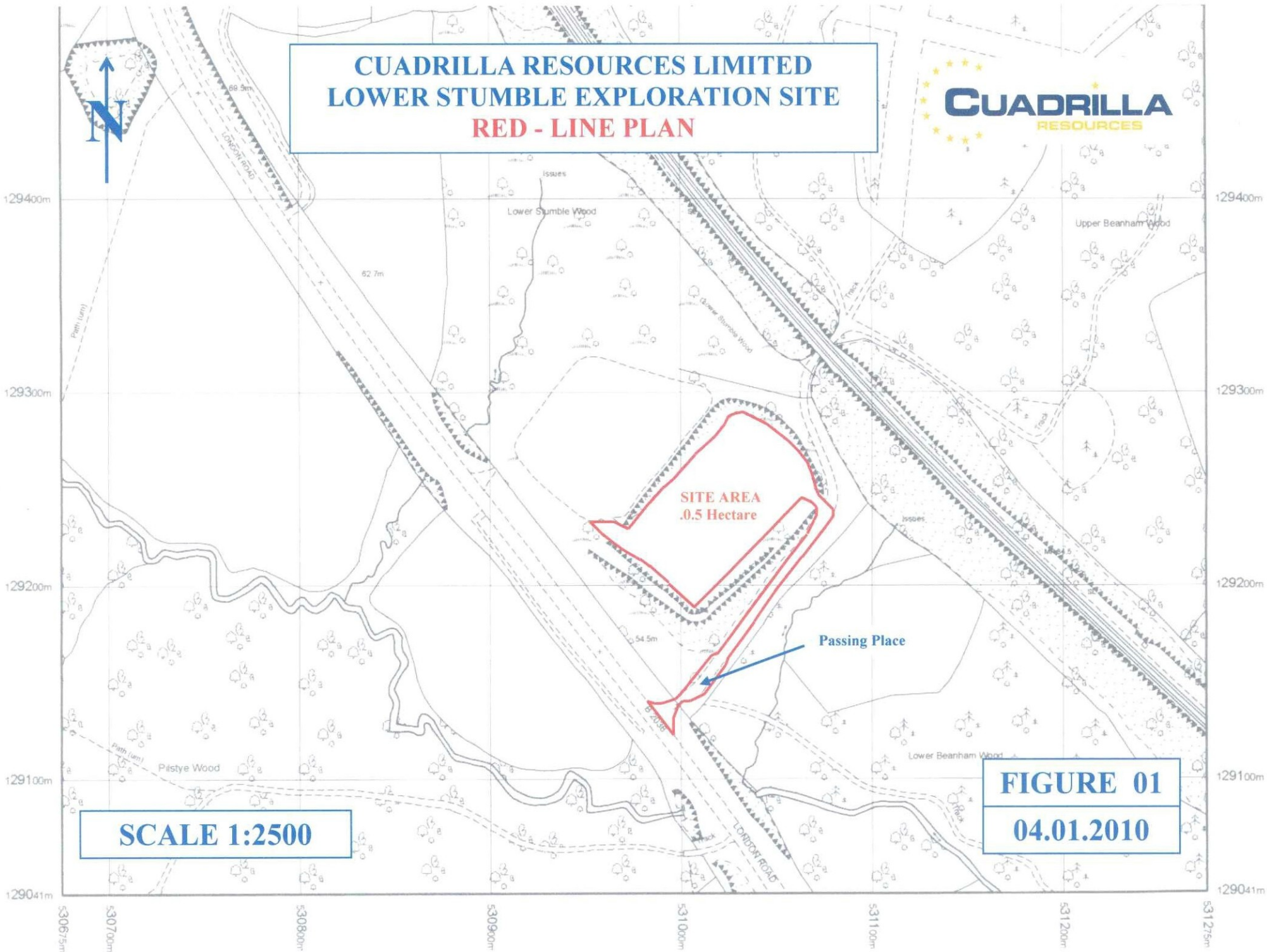
129400m  
129300m  
129200m  
129100m  
129041m

S30675m  
S30700m  
S30800m  
S30900m  
S31000m  
S31100m  
S31200m  
S31275m

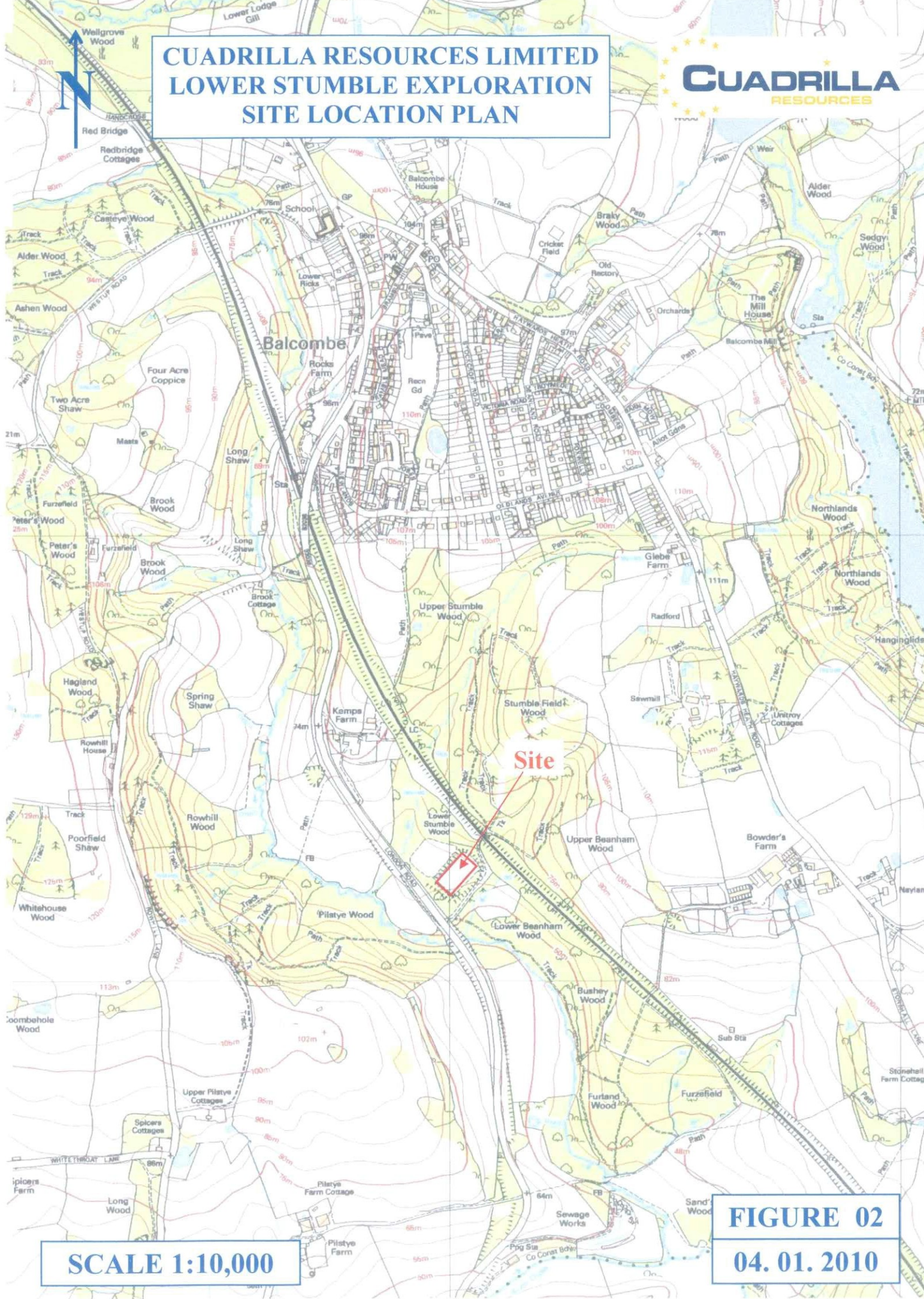
129400m  
129300m  
129200m  
129100m  
129041m

**SCALE 1:2500**

**FIGURE 01**  
**04.01.2010**



# CUADRILLA RESOURCES LIMITED LOWER STUMBLE EXPLORATION SITE LOCATION PLAN



SCALE 1:10,000

FIGURE 02  
04. 01. 2010

## **FLOOD RISK ASSESSMENT**

Proposed Development :

**CONSTRUCT A HYDROCARBON EXPLORATION SITE, TOGETHER  
WITH OTHER ANCILLARY WORKS ON LAND AT LOWER STUMBLE,  
BALCOMBE, NR HAYWARDS HEATH, WEST SUSSEX.**

**Dated : 5 January 2010**

**PROPOSED TEMPORARY CONSENT TO CONSTRUCT A  
HYDROCARBON EXPLORATION SITE, TOGETHER WITH OTHER  
ANCILLARY WORKS ON LAND AT LOWER STUMBLE, BALCOMBE, NR  
HAYWOODS HEATH, WEST SUSSEX.**

**DESK TOP STUDY ON FLOOD RISK ASSESSMENT**

**General Note**

This desk top study sets out the relevant points for consideration under PPS 25 for the general intended proposed use.

The proposal the subject of this assessment is to construct an exploratory drill site to include plant, buildings and equipment; the use of the drill site for the drilling of an exploratory borehole and the subsequent short term testing for hydrocarbons; the erection of security fencing and the carrying out of associated works to an existing access and track all on land of some 0.95 ha. area, for a temporary period of up to 3 years, with subsequent restoration to forestry use.

**Flood Zoning**

The development site lies within Flood Zone 1, as defined for mapping purposes in the Environment Agency's (EA) Flood Zones. The Agency considers the application site is land assessed as having a less than 1 in 1000 annual probability of river flooding in any year (>0.1%) and is classified as **(Low Probability)**. All uses for land are appropriate in this zone. The south western end of the approach access to the application site is partially located within Flood Zone 3 according to the EA Flood Maps which is land assessed as having a 1 in 100 (>1%) or greater annual probability of river flooding in any year. The application land is however well distant from any potential flooding influence.

**Flooding History**

There is no record of any flooding of the application site as would be expected for a location sited within Flood Zone 1. The land additionally was not the subject of any specific inundation on account of any abnormal run-off, such as was experienced in July 2007.

**Proposed Layout**

The layout of the proposed drilling rig arrangement is as shown on the enclosed drawings with access onto the London Road.

### Levels

The site, which has an area of approximately 0.95 Ha, has contour levels ranging between 59.170 AOD to the north and 59.472 AOD to the south, with the rig compound level to be set at an agreed datum. It will be bunded to levels as shown on the attached drawings and sealed off. The access to the application land slopes downwards, in a south westerly direction, to London Road as denoted earlier, to a level of approximately 53.34 AOD, with road levels either side of 53.50 AOD and 53.65 AOD

The configuration and level of the rig site will require the consent of the local authority as a condition to be part of any planning consent issued.

The EA have advised that the modelled 1 in 100 year flood level including climate change at the point of the access road to the London Road is 57.01 AOD, which is well below the level of the application site. This point however as indicated on the flood map does not tally with the existing ground level at this location, which is approximately 53.34 AOD. From this one must deduce that the modelling criteria used is not borne out nor confirmed by the existing ground levels.

### Off-site Implications

The surface water run-off from the site is to be recycled with the facility of a separator and used in conjunction with the drilling operations process. Where this may not always be practical on account of site processes, or when the rig is not in use, then the method of disposal of such run-off will be agreed with the local authority. This will generally be via the onsite separator, and if deemed suitable after analysis, through french drains into the existing adjacent land drainage system.

The runoff from the profiled access road will be achieved by filtration using permeable surfacing material. This aspect will need to be confirmed by sub-soil testing for porosity characteristics. If this cannot be maintained in its entirety then attenuation arrangements will be put in place to drain at greenfield run-off into the adjacent watercourse. This aspect will again be part of any planning consent condition and be agreed with the local authority.

The disposal of foul water will be into sealed cess tanks, as is usual for an operation of this kind, with the disposal to be arranged to the satisfaction of the local authority.

### Compensation

The nature of this proposed development within Flood Zone 1 does not create a footprint within the flood plain, and therefore a compensation facility is not relevant here.

### Access

The access to the site will be directly off the southern end of the application site onto the London Road.

### **Residual Risks and safe access**

When the schematic lay-out is compared to the EA flood map it can be seen that access off the accessway to the north east is all within Flood Zone 1. This means that a dry escape route is always available in that direction.

However in view of the circumstances as regards a slight flood risk to the access road as set out in this study, the temporary works will be a subscriber to the EA Flood Watch initiative, and also to relevant evacuation procedures if deemed necessary by the local authority (see evacuation procedures below)

It should also be noted that in the event of the access road to the application site being inundated then the exploration site would not be used, and therefore the flood risk would not practically occur.

### **Groundwater Evaluation**

No information is available from site investigations but in its hydrological mapping the Royal Geographical Society reports that the area is generally composed of silty gravel with limestone deposits. The RGS reports that over a wide area within this location groundwater vulnerability is "low". This would equate with local anecdotal evidence.

### **Other matters**

In respect of other relevant matters these will be dealt with as generally indicated below.

#### **Potential contaminant impact on groundwater.**

This aspect is addressed by others.

#### **Pollution Prevention:**

This will be complied with according to best practice and as agreed.

#### **Decommissioning of Borehole:**

A statement will be supplied by others.

#### **Surface pollution prevention measures:**

The entire application site will be sealed and all standing water from whatever source will be contained and disposed of subject to detail arrangements to the satisfaction of the local authority.

#### **Waste disposal;**

This will be agreed by the applicant with the local authority.

### **No Flood Risk:**

This element has been referred to in this study and demonstrates that there will be no increase in flood risk resulting from the proposed development, and that it is in accordance with the relevant parts of PPS 25.

I am of the opinion therefore that the temporary proposal for the site can be considered wholly suitable for the temporary development envisaged and coupled with the measures as outlined can be safely accommodated within the advices contained in **PPS 25** proposed use

### CONCLUSION

The site will be afforded protection to a level in accordance with the provisions of **PPS 25**, particularly in respect of the requirements of Annex E which have been taken into account in this desk top study as appropriate, and it is unlikely that any meaningful inundation will occur to prejudice this temporary development.

In view of all the factors considered in this appraisal I consider they are wholly reasonable and are in line with those contained in **PPS 25** as relevant.

P P FEARNSIDE FICE

5 JANUARY 2010

*Three Counties Flood Risk Assessment*





Environment Agency Flood Map (extract)