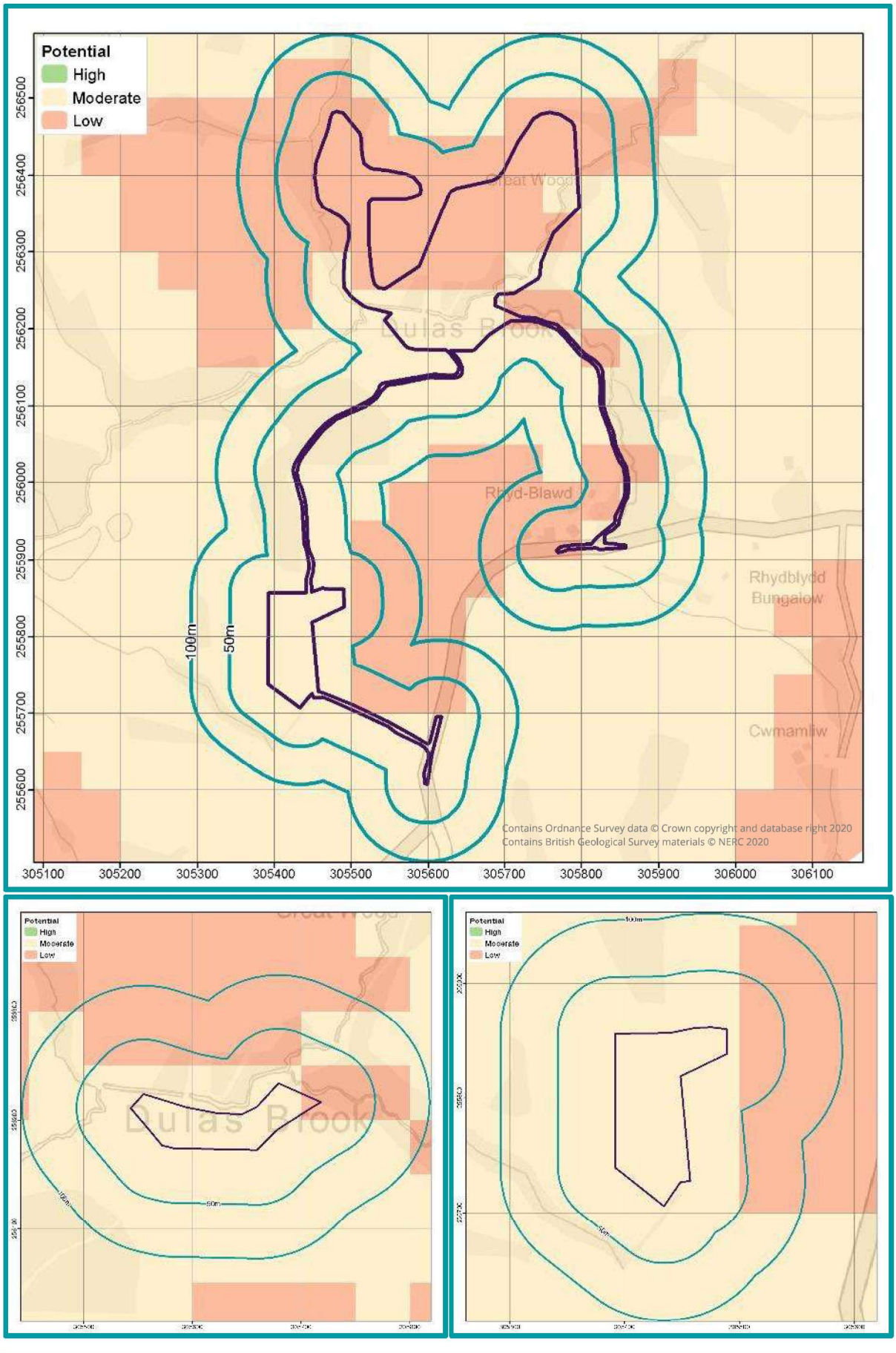
5. Infiltration Suitability (SD50)



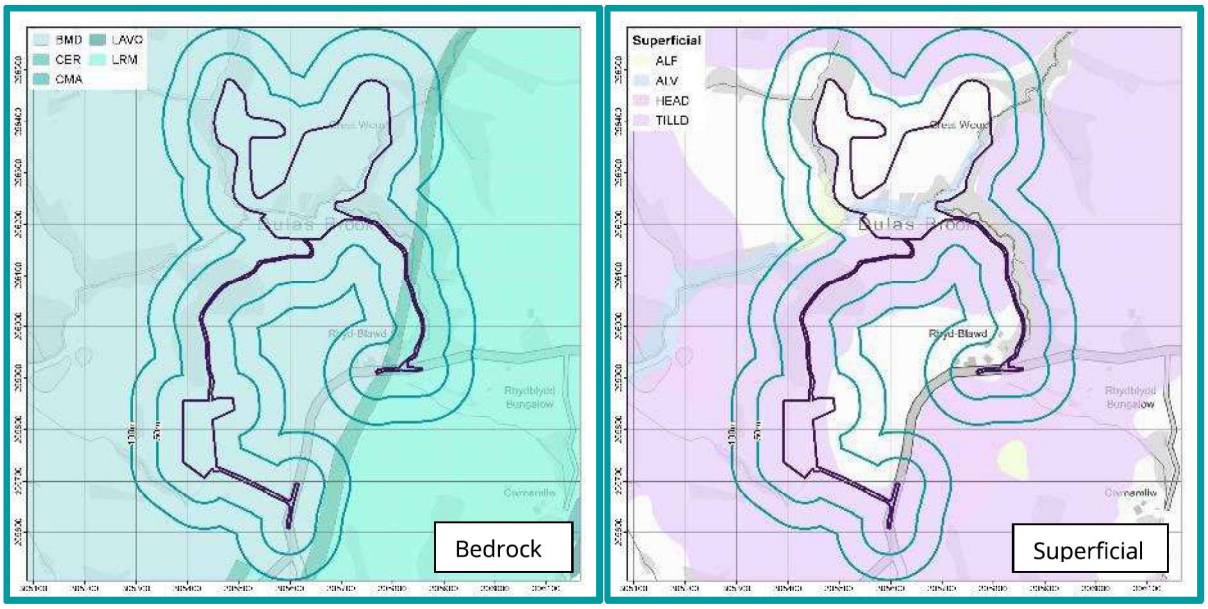
The GeoSmart Infiltration Suitability Map (SD50) screens the potential for infiltration drainage at the Site. The map combines information on the thickness and permeability of the underlying material and the depth to the high groundwater table. It supports conceptual Site drainage design and the planning of further Site investigation.

There is a Low to Moderate potential for infiltration across the wider Site, and a Moderate potential for infiltration in the areas proposed for development. It is therefore possible that the underlying geology at the Site has a variable permeability, which could constrain the effectiveness of a proposed infiltration option. As such a ground investigation was undertaken at the Site in April 2021 in order to confirm the infiltration potential and the feasibility of disposing of treated effluent to ground.

Percolation testing

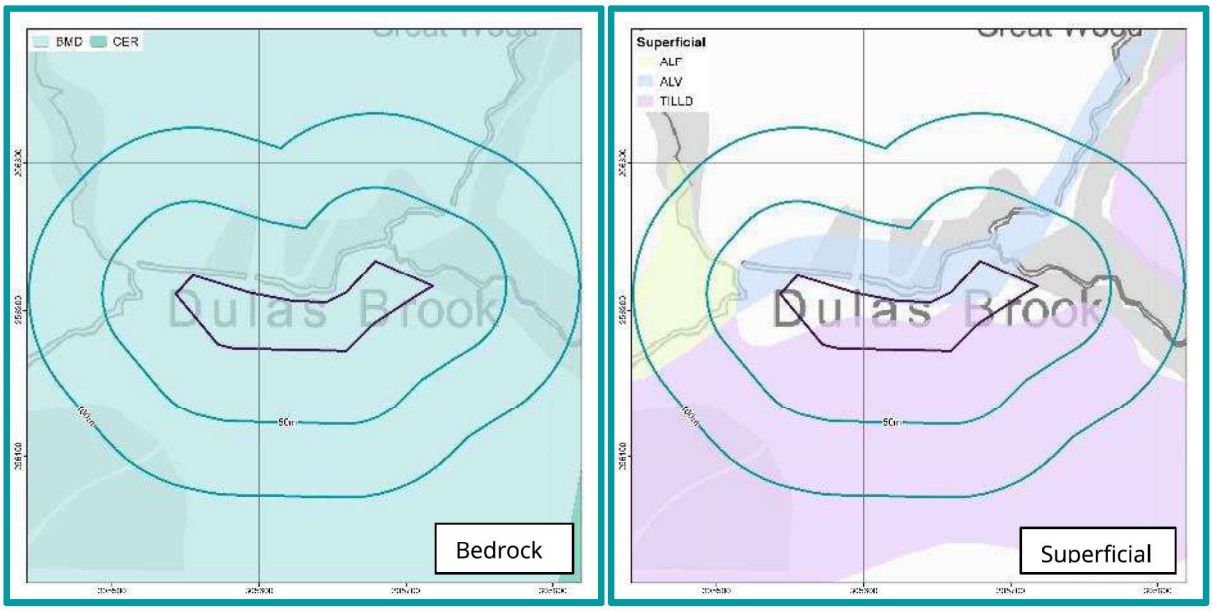
The ground investigation report and results of percolation testing are presented in Appendix C. In summary, ground conditions at the Site are not suitable for infiltration to ground with all percolation tests failing due to the presence of very low permeability geology.

6. Geological Conditions

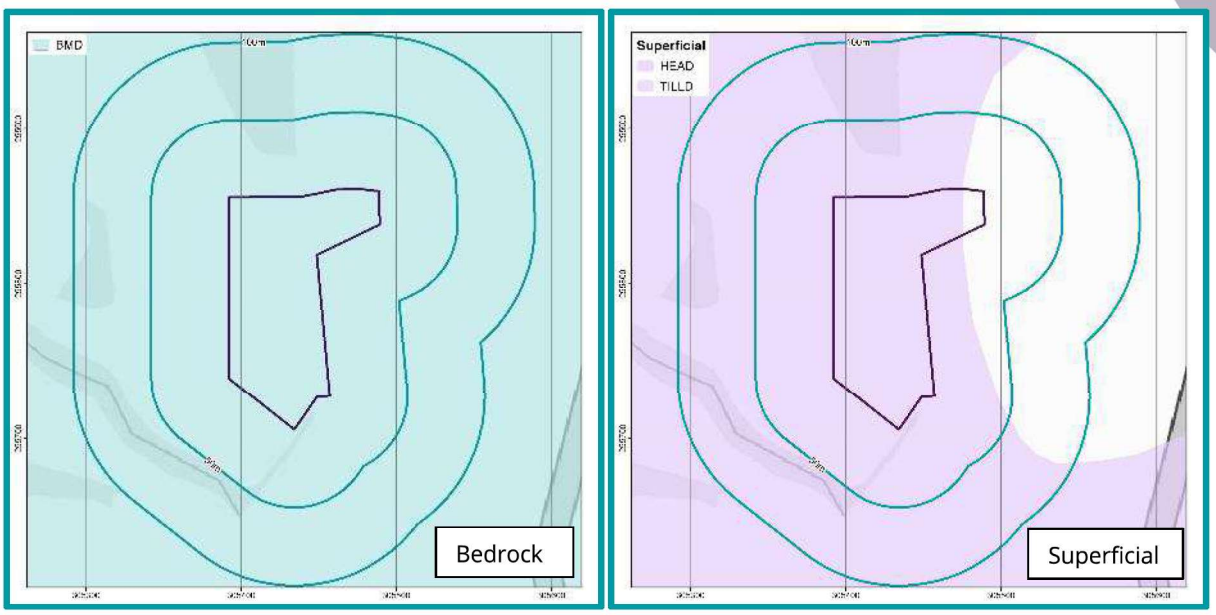


The geological conditions identified at the Site are based upon British Geological Survey (BGS) bedrock and superficial geology mapping. The bedrock geology is comprised predominantly of Builth Mudstones Formation - Mudstone and Laminated Hemipelagic Mudstone, Interbedded (Sedimentary Bedrock), with Llanfawr Mudstone Formation located within the eastern access track.

The superficial geology is comprised of Alluvium - Clay, Silt, Sand and Gravel associated with the Dulas Brook and Till, Devensian – Diamicton across the rest of the Site. Superficial deposits are not mapped in the north, south and some isolated areas of the Site (BGS, 2020).



The bedrock geology in the location of the Moto X Experience Centre reception is comprised of Builth Mudstones Formation and the superficial geology is comprised of Alluvium - Clay, Silt, Sand and Gravel associated with the Dulas Brook and Till, Devensian – Diamicton across the rest of the Site. Superficial deposits were not mapped in the north of the Site (BGS, 2020).

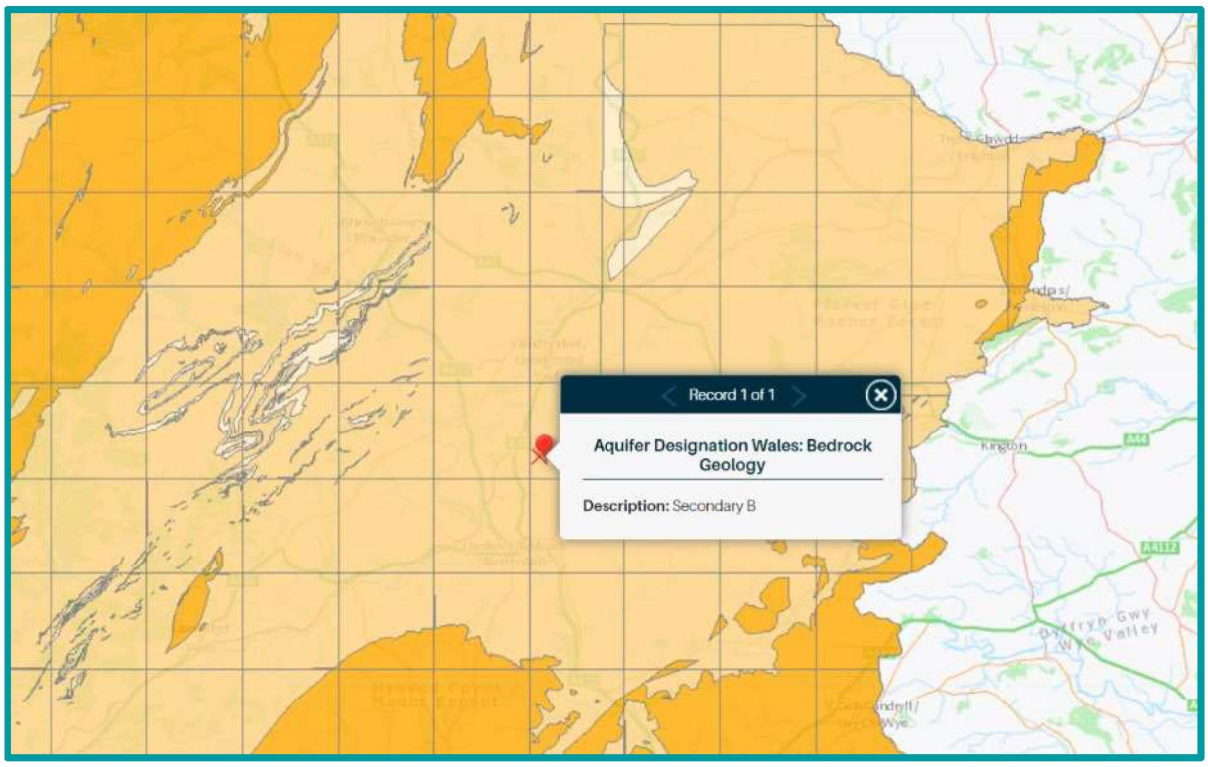


The bedrock geology in the area proposed for the lodges is Builth Mudstones Formation, the superficial geology in the area proposed for the lodges is comprised predominantly of Glacial Till, Devensian – Diamicton (BGS, 2020).

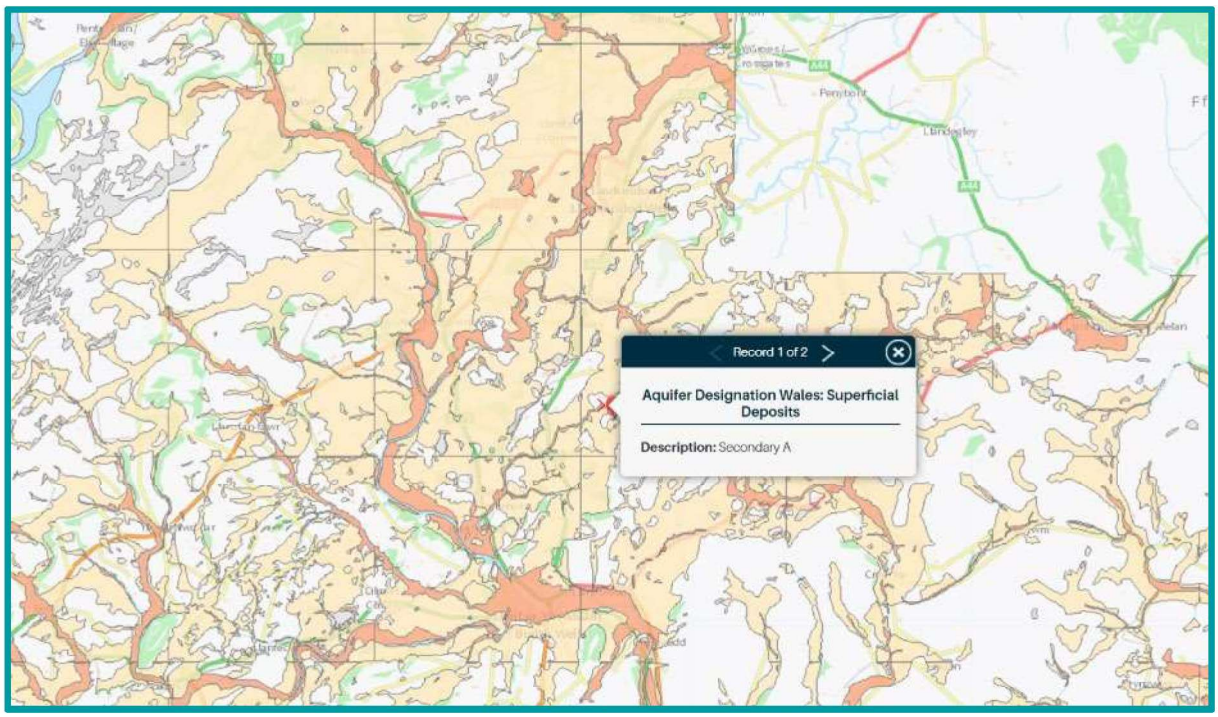
Ground investigation

A ground investigation was undertaken in April 2021 (Appendix C) overall this confirmed the presence of low permeability superficial and bedrock geology corresponding with the mapped geology.

7. Bedrock and Superficial Aquifer designations

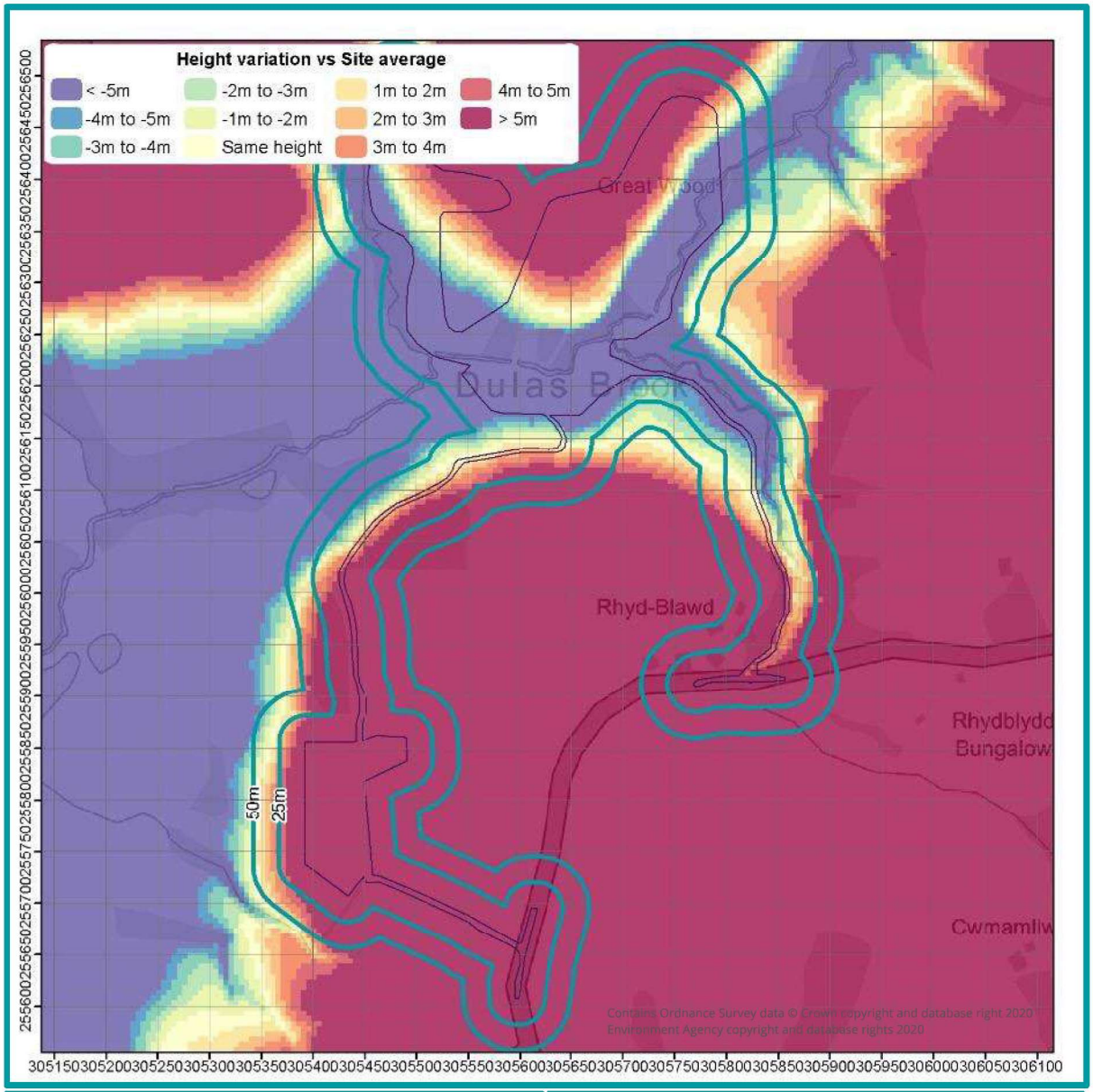


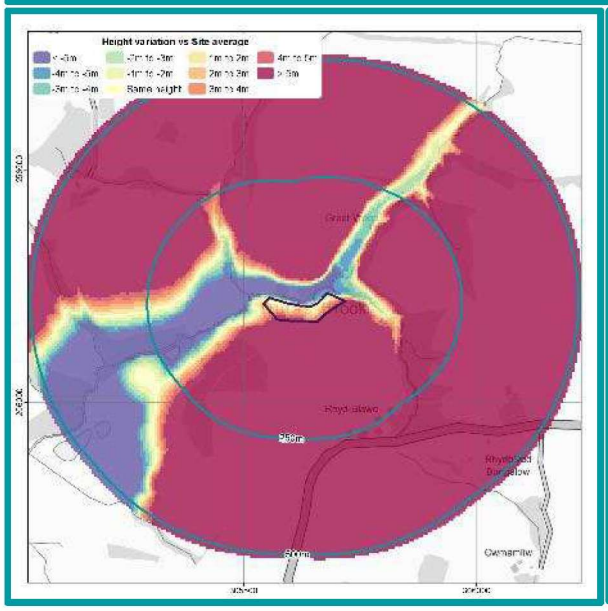
According to the BGS data, the Builth Mudstone bedrock is a Secondary B Aquifer (BGS, 2020).

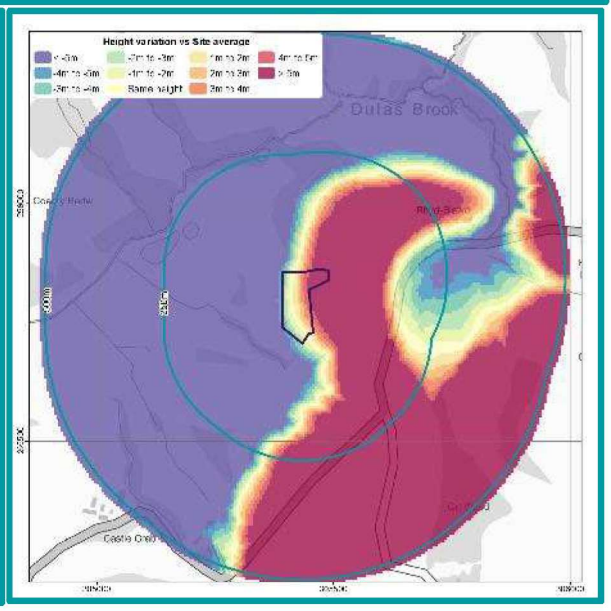


According to BGS data the Alluvium is a Secondary A aquifer and the Glacial Till is Secondary Undifferentiated Aquifer (BGS, 2020).

8. Site Topography



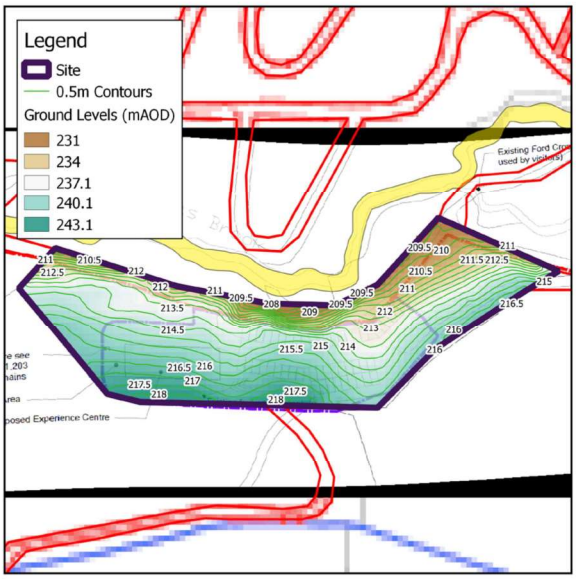


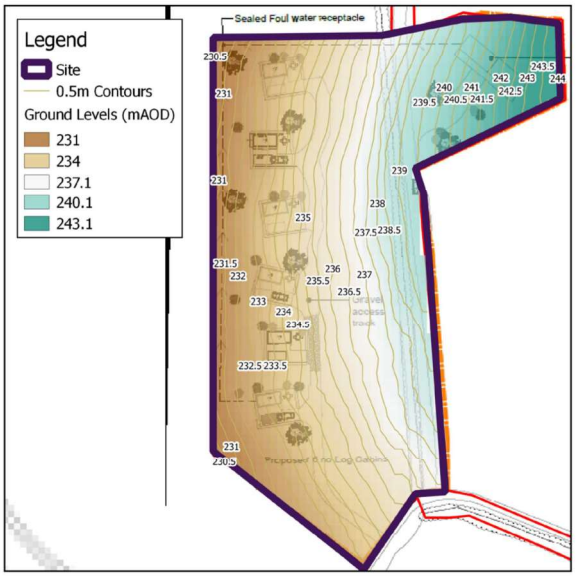


An assessment of the topography at the Site has been undertaken using LiDAR 1M DTM elevation data and a site-specific topographic survey (Appendix A) to identify the general slope and any localized depressions. The mapping shows a comparison between average ground levels on the Site with ground levels in the surrounding area.

The mapping confirms the Site is located within multiple valleys which drain to the Dulas Brook. The Experience Centre reception (including existing car parking) drains in a northerly direction towards the Dulas Brook. The area proposed for the lodges drains in a westerly/south westerly direction, broadly draining to a small watercourse to the southwest of the area.

LiDAR ground elevation data shown below confirms the ground levels in the area proposed for the reception building and car park range from approximately 218 mAOD to 208 mAOD. Ground levels in the area proposed for the lodges are between 244 and 230.5 mAOD.





Site visit observations

Observations made during a visit to the Site in April 2021 confirm that there is a significant variation in elevation between the proposed development area at Area A and the level of the Dulas Brook, with the two features being separated by a very steep and at some points vertical bank. The elevation difference is estimated to be around 5 to 10 m.

Observations at Area B confirm the mapping, with the addition of a shallow valley feature noted in the field to the north west.

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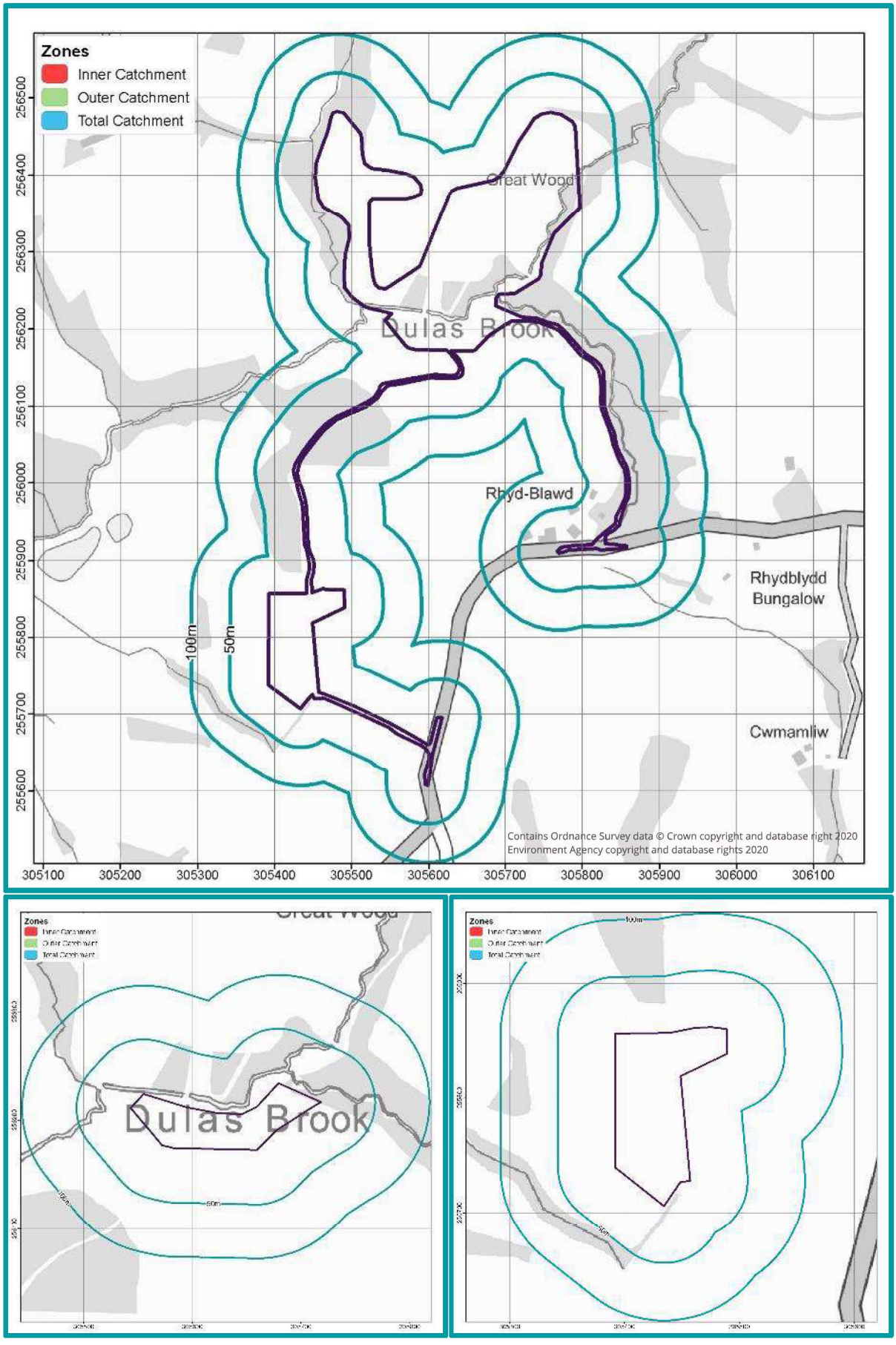
9. Source Protection Zones



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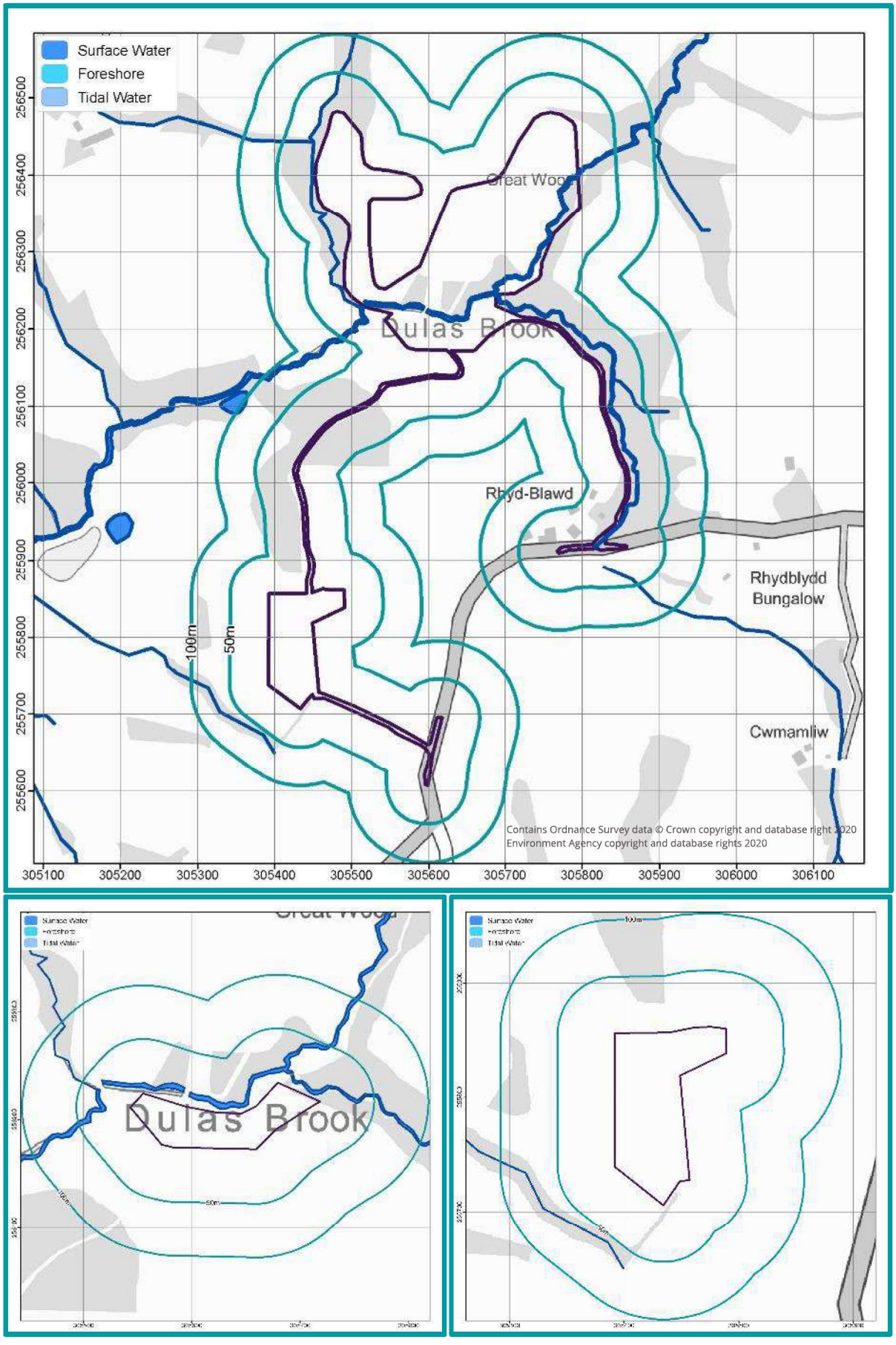
An assessment of the NRW's groundwater Source Protection Zones (SPZs) has been undertaken within the vicinity of the Site and confirms the Site is not located within an SPZ.

Infiltration would be acceptable providing risk screening identifies suitable mitigation measures, if required, to prevent an impact on water quality from the proposed effluent treatment system. However, infiltration is not proposed due to the geological conditions.

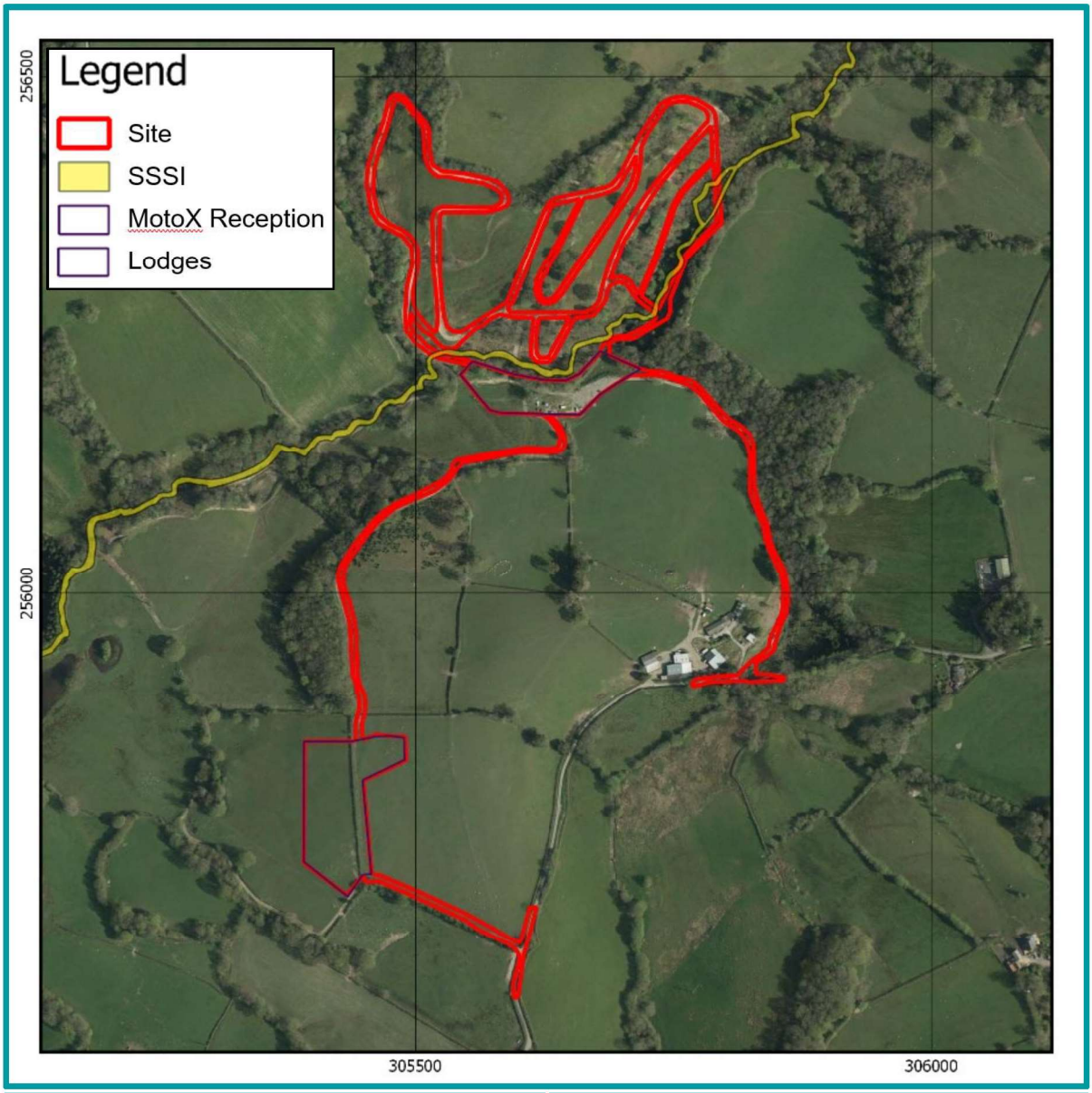
10. Surface Water Features

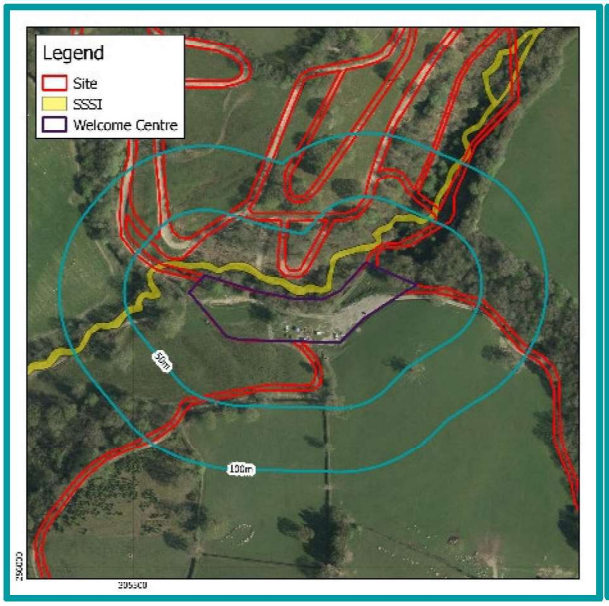


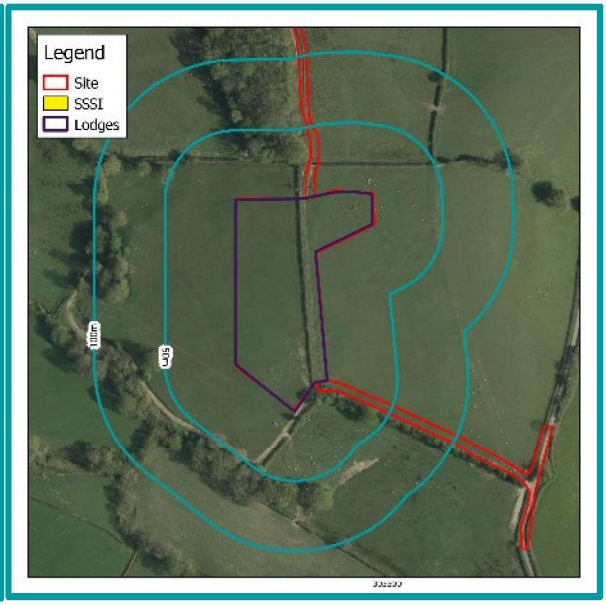
The mapping confirms there are multiple surface watercourses or features within 100 m of the Site, which drain to the Dulas Brook.

The surface waters on and in the vicinity of the Site have both national and international environmental designations (see following section) and will require appropriate protection.

11. SSSI and SAC







The River Wye forms one of the longest rivers in England and Wales. From its source to its confluence the main channel is 250kms long, drains a catchment of 4,136km^2 and has the fourth largest flow of any river in England and Wales. Rising at an altitude of 680m on Pumlumon Fawr in Powys the Wye meanders down through Wales, Herefordshire and Gloucestershire, finally entering the Severn Estuary at Chepstow.

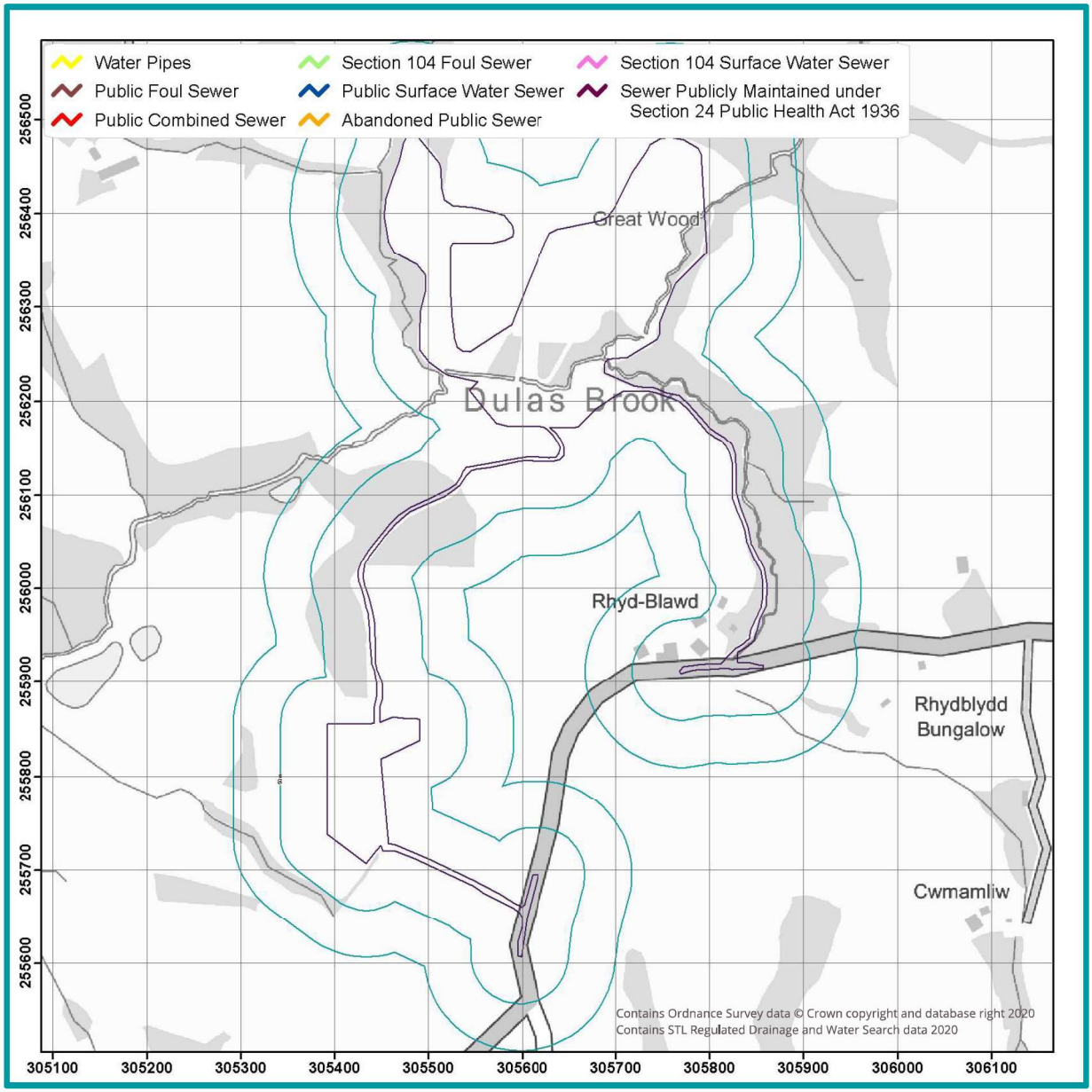
The Site is located within the River Wye SAC and the Dulas Brook, which flows through the Site, is designated under the Wye Valley Tributaries SSSI.

SSSI Citation extract:
https://naturalresources.wales/media/663017/SSSI_1342_Citation_EN00132f4.pdf

"Between Builth Wells and Llyswen the river cuts through more base-rich rocks and the aquatic and riparian flora is rich and varied. Characteristic species here include alternate water-milfoil, river water-crowfoot, yellow loosestrife Lysimachia vulgaris, monkeyflower Mimulus guttatus, water forget-me-not, hemlock water-dropwort, reed canary-grass, amphibious bistort Persicaria amphibia, lesser spearwort, bittersweet Solanum dulcamara, the mosses Amblystegium fluviatile, Cinclidotus fontinaloides, Fontinalis squamosa, Rhynchostegium riparioides, Schistidium alpicola var. rivulare and Thamnobryum alopecurum, the liverworts Chiloscyphus polyanthus, Conocephalum conicum, Lunularia cruciata and Marchantia polymorpha, the filamentous alga Lemanea fluviatilis and lichens of the genera Dermatocarpon and Verrucaria. The nationally scarce moss Campylopus subulatus, occurring on sand and gravel in rock crevices, reaches its lowest station on the Wye at Erwood.

Regular flooding scours scrub from riverside rocks to create open conditions. A number of rare and scarce species are found in this pioneer habitat including rock cinquefoil Potentilla rupestris, chives Allium schoenoprasum, rock stonecrop Sedum forsterianum, lesser meadow-rue Thalictrum minus, the hawkweed Hieracium vagense, the dandelion Taraxacum varchellii and the moss Grimmia rectracta. Rocks within the river channel support fine aquatic lichen and bryophyte communities, including a number of nationally rare and scarce species such as Collema dichotomum, Porocyphus kenmorensie, Pyrenocollema strontianense, Dermatocarpon leptophyllum, Porella pinnata and Fissidens rufulus."

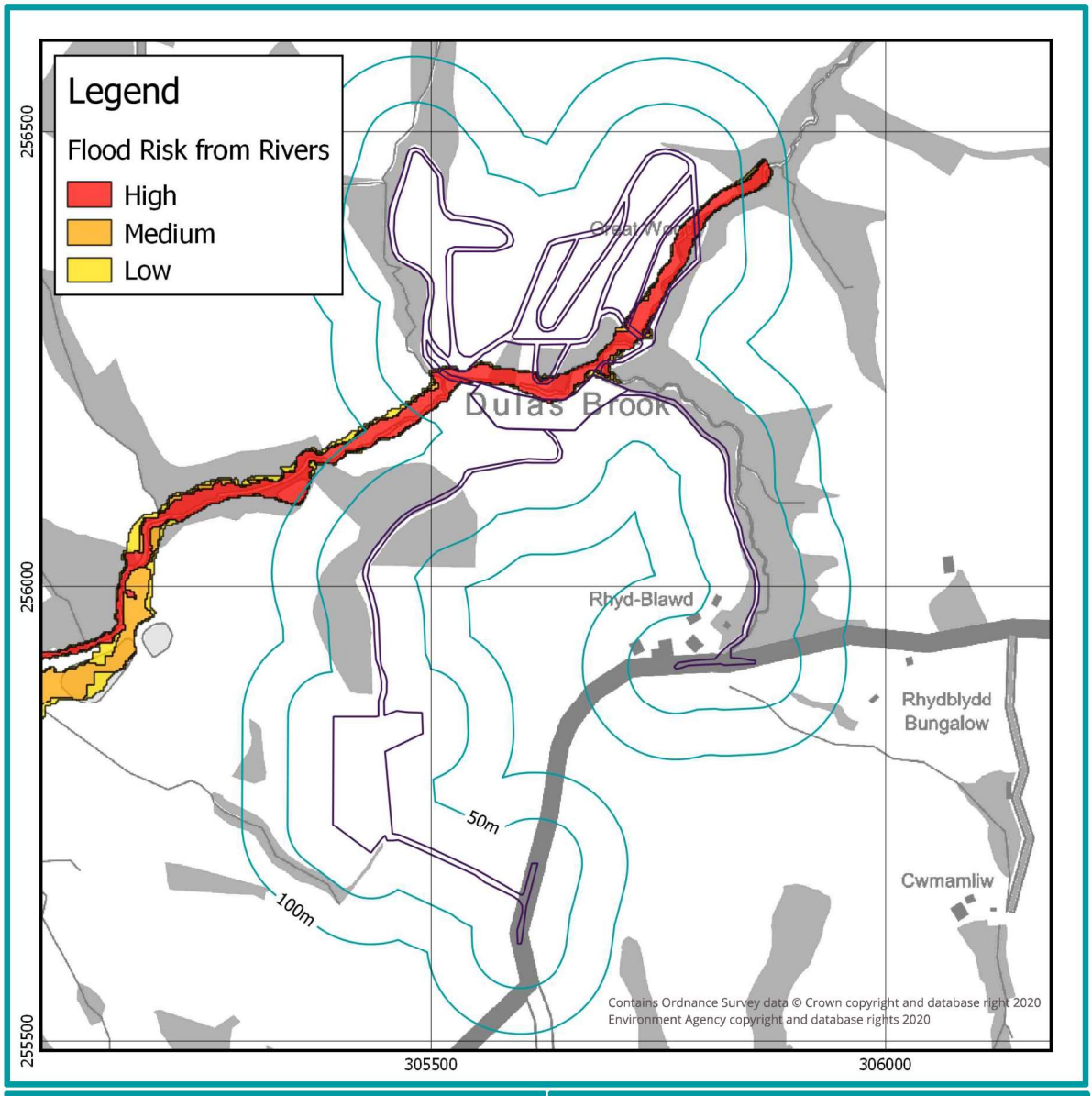
12. Sewer Features

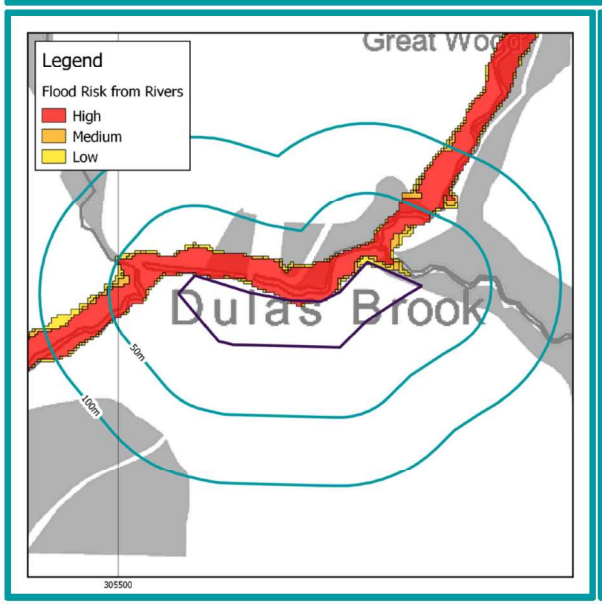


Asset location plans have been requested from Dwr Cymru (Appendix B) to identify the presence and location of any public foul or public combined water sewers located within the vicinity of the Site. There are no Dwr Cymru sewer assets within 500m of the Site.

In order for a non-mains foul drainage system to be considered, the distance from the Site to the closest public foul sewer connection point must be less than the number of properties to be built on the Site (8) multiplied by 30m (240m) (Foul Drainage Assessment Form FDA1). The closest mains sewer connection point is in excess of 500 m from the Site. Therefore, a non-mains system would be acceptable subject to environmental permitting requirements.

13. Risk of Flooding from Rivers and Sea





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According to the NRW's Risk of Flooding from Rivers and the Sea map, both the areas proposed for the Moto X Reception and Lodges have a Very Low risk of flooding from fluvial and coastal flooding, with less than 0.1% annual probability of flooding.

There is a medium to high fluvial flood risk adjacent to the northern Site boundary of Area A, but this is confined to the Dulas Brook river channel ~5-10 m below the Site level and as such will not impact any of the areas proposed for development and associated foul drainage features.

The foul water drainage systems will not be affected by fluvial flooding.