

Flood Consequence Assessment & Drainage Strategy Report – Rev.A

May 2025

1 INTRODUCTION

- 1.1 This document has been prepared on behalf of Bluefield Land in support of a planning application for a proposed residential development at the site of the former Swelco Factory off Heol y Gors, Cwmgors, Neath Port Talbot SA18 1RR.
- 1.2 This document provides a flood consequence assessment and summary of the proposed drainage strategy associated with the proposed development.

2 EXISTING SITE

- 2.1 The location of the site and surrounding area is shown in Figure 2.1 below.
- 2.2 The application site is currently Brownfield, being the site of the former Swelco Factory, and has an approximate area of 1.78 hectares (ha). The site currently comprises circa 0.69 hectares of impermeable surfaces, including roofs, access road and hardstanding areas.
- 2.3 The site is located to the western edge of Cwmgors, approximately 6km northwest of Pontardawe at a National Grid Reference of 270329,210613.

The site is irregular in shape. The boundaries of the site are defined by the dismantled railway line and undeveloped land to the west, the continuation of the dismantled railway and residential development to the north, residential development – Heol-y-Gors and undeveloped land to the east and undeveloped land to the south.

The site is situated on a relatively level development plateau created as part of the factory construction at levels between 161m AOD and 165m AOD. An embankment forms the eastern boundary of the site with levels raising up to approximately 168m AOD.

Access to the site is from Heol-y-Gors via the northeast corner of the site. The access road crosses the site towards the main former works building which is located approximately within the centre of the site. There are areas of hardstanding around the building and the remaining floor slab of a former building which has been demolished top the south of the main building.

The area of the site to the north and south of the existing factory building and hardstandings is heavily vegetated and the who site densely wooded and/or vegetated around the boundaries.

A culvert is located crossing the site to the north of the existing factory building.

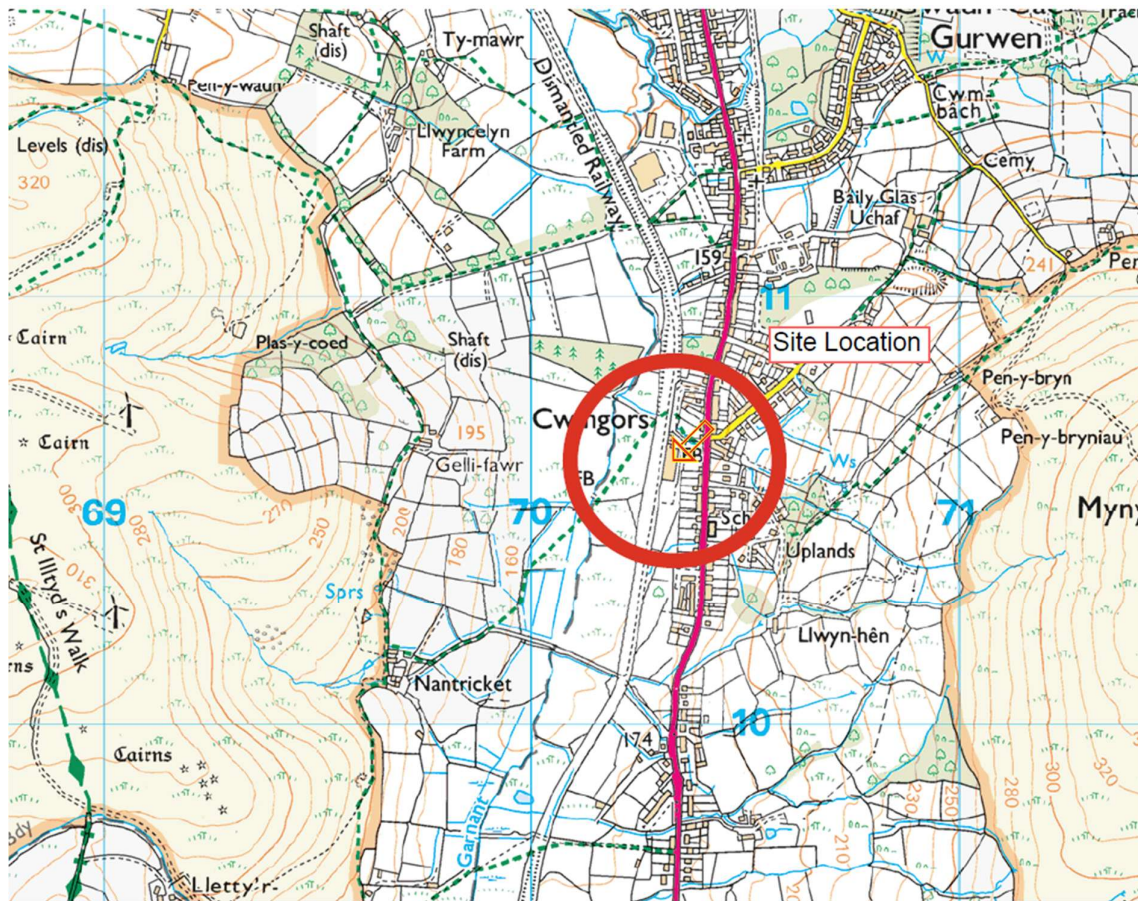


Figure 2.1 – Site Location

Existing Surface Water Drainage

- 2.4 The site is crossed by a minor watercourse which is culverted across its whole length where it traverses the application site to the north of the existing factory building. There is another minor watercourse located approximately 5m outside the southern site boundary and an existing 225 dia outfall pipe discharges surface water onto the existing embankment just within the eastern site boundary, south of the existing factory building.
- 2.5 The existing factory building and associated hardstanding areas are served by an existing surface water drainage system which outfalls to an existing headwall approximately 16m outside the western site boundary. This headwall is also the outfall for the culverted watercourse noted in 2.4 above. The route of the existing surface water system is indicated at **Appendix A – Existing & Proposed Impermeable Area Plan**. A CCTV survey of the existing 225 dia outfall pipe was undertaken by Drintech Surveys Ltd in January 2024. A copy of the survey report and plan can be found at **Appendix B**.

The existing site access road does not appear to be positively drained but, rather, drains to adjacent soft/vegetated areas.

Existing Ground Conditions

- 2.6 Soil infiltration testing was undertaken by Integral Geotechnique in September 2024. The tests were undertaken within 5no. trial pits across the site. The results of the soil infiltration tests are provided at **Appendix C**.

The soil infiltration tests undertaken within all trial pits were terminated due to negligible infiltration rates.

Note that the results are specific to the locations and depths of the tests undertaken. However, due to the cohesive and impermeable nature of the superficial soils, the use of sustainable drainage systems may not be deemed suitable at this site.

Brownfield & Greenfield Runoff

- 2.7 As noted in Section 2.5 above, it has been evidenced that the existing factory building, and associated hardstand areas are currently served by a surface water drainage system that discharges to an existing headwall to the west of the application site. The existing surface water network has been modelled using Causeway Flow hydraulic modelling software, and the results for the existing brownfield runoff rates for various storm events are summarised below. Note that these brownfield discharge rates do not allow for additional greenfield runoff from the remaining vegetated site.

Table 2.1 – Pre-development Brownfield Runoff Rates

Return Period	Runoff Rate (l/s/ha)	Volume (m ³ / ha)
Qbar	54.1	301
Q1 Years	47.6	
Q30 Years	67.2	
Q100 Years	69.5	

- 2.8 However, in response to the SAB pre-application made to Neath Port Talbot SAB, the SAB suggested that *‘given the majority of the site (at least 66%) appears to be undeveloped land, the use of the greenfield rate is more appropriate for this development’*.

Accordingly, greenfield run off rates (per hectare) have been calculated using HR Wallingford’s ‘Greenfield Runoff Rate Estimation Tool’ – see **Appendix D**. The resulting rates are summarised in Table 2.2 below.

Note that a WRAP soil type value of 5 has been used to calculate the greenfield runoff rate. This is based on the results of on-site infiltration testing, and the fact that a conservative and robust strategy is being employed by using the greenfield rate in lieu of the actual brownfield discharge rates.

Table 2.2 – Greenfield Runoff Rates

Return Period	Runoff Rate (l/s/ha)
Qbar	17.9
Q1 Year	15.7
Q30 Years	31.8
Q100 Years	39.0

3 FLOOD RISK

- 3.1 Natural Resources Wales' Flood Map for Planning in **Appendix E** identifies that the application site has no risk of flooding from rivers and sea – Tan 15 Flood Zones for the River Garnant being outside the application site area.

However, the Flood Map does identify areas of the application site as being at medium and high risk from Surface Water and Small Watercourses flooding.

- 3.2 An exercise has therefore been undertaken, overlaying the Flood Map information over the existing site topographical survey in order to assess likely causes of the existing surface water flooding - see drawing 2625-750 at **Appendix E**. Fall arrows indicating the direction of fall of the existing ground surface have been added to the overlay which identifies that the areas of flooding are generally contained within low-lying areas of the plateaued site, with higher risks of flooding largely occurring in the hardstanding areas surrounding the existing factory building.
- 3.3 The development proposals aim to provide a general fall across the ground surface from east to west across the development, thereby providing an unhindered route for overland flow from the east to the undeveloped land and River Garnant to the west and removing the risk of surface water flooding within the proposed development. Land drainage will also be employed at the base of the existing embankment along the eastern site boundary to convey any overland flows to existing watercourses, and away from proposed properties.
- 3.4 There is an area of existing high surface water flood risk adjacent the site access road, and within the rear gardens of nos. 149 to 153 Heol-y-Gors. It is considered that this area of flooding is partly due to the area in question being a low-lying area bounded to the north and west by the existing access road which is elevated above the gardens. It would appear that run off from the existing access road currently contributes to the surface water flooding at this location. The construction of the new, adoptable access road would alleviate some of this flooding, as runoff from the new highway would be conveyed downstream via a new adoptable highway drainage system.
- 3.5 Flood exceedance overland flow routes for the proposed development have been assessed and are provided on drawings 2625-748-1 and 2625-748-2 at **Appendix E**.

- 3.6 Proposed surface water flows will be managed on site with discharge rates restricted to the pre-development Q_{bar} greenfield runoff rate. Therefore, the development should pose no risk of flooding to adjacent land and properties.

4 DEVELOPMENT PROPOSALS

- 4.1 The planning application is for the re-development of the former Swelco factory site to provide a new residential development of circa 45 no. affordable housing units and associated access roads, parking, green spaces and Sustainable Urban Drainage (SuDS) areas. Site access will be maintained via the existing site access point off Heol-y-Gors.
- 4.2 The proposed Site layout and Drainage Strategy is shown on the proposed Engineering layout drawing included at **Appendix F**.
- 4.3 Based on the proposed site layout, the post-development impermeable area for the development, including proposed roof, yard and highway areas would be approximately 0.770ha. See **Appendix A – Existing & Proposed Impermeable Area Plan**.

5 SURFACE WATER DRAINAGE

- 5.1 The proposed drainage strategy is included on the proposed Engineering layout drawings at **Appendix F**.
- 5.2 As set out in Section 2.6, soil infiltration testing has been undertaken at various location on site with negligible infiltration recorded with all trial pits. Therefore, the use of infiltrating sustainable drainage systems may not be deemed suitable at this site due to the cohesive and impermeable nature of the superficial soils.
- 5.3 In accordance with the drainage hierarchy, it is therefore proposed to discharge surface water runoff from the site to the existing storm water outfall headworks, located to the west of the application site, via a new chamber to be located on the existing culverted length of watercourse. Note that a CCTV survey of the existing culvert length has been programmed in order to ascertain the condition of the existing structure.
- 5.4 In accordance with relevant guidance and SAB requirements, it is proposed to discharge surface water runoff from the site at a similar rate to a pre-development Greenfield scenario.
- 5.5 The post-development rates and volume from the proposed development are summarised in Table 5.1 below, whilst further details are set out on the calculations included at **Appendix G**.

Table 5.1 – Post Development Discharge Rates & Volume

Return Period	Discharge Rate (l/s)	Volume (m³)
Q1 Years	20.3	498
Q30 Years	23.1	
Q100 Years	23.3	
Q100 +40% Years	24.0	

- 5.6 Table 5.2 below demonstrates that the proposed surface water strategy will generally provide significant betterment in comparison to the Greenfield scenario in terms of discharge rates from the site.

Table 5.2 – Comparison of Pre and Post Development Discharge Rates & Volume

Return Period	Greenfield Rate (1.3966ha catchment)	Post-Development Discharge Rate	Pre & Post development comparison
Q1 Years	21.9 l/s	20.3 l/s	-1.6 l/s
Q30 Years	44.4 l/s	23.1 l/s	-21.3 l/s
Q100 Years	54.5 l/s	23.3 l/s	-31.2 l/s
Qbar	25.0 l/s		

- 5.7 All surface water runoff is to be attenuated within a SuDS detention basin, linear SuDS basins and open graded sub-base located beneath permeable parking areas. Note that the detention basins storage volumes have been designed based upon the assumption that infiltration to ground is not feasible. However, the basins *could* remain un-lined to provide a 'leaky' system, thereby taking advantage of any infiltration that may occur. The attenuation detention basin locations and volumes are indicated on the Engineering Layout plans in **Appendix F**.

Water Quality

- 5.8 As part of the surface water strategy for the development, it is proposed to utilise various SuDS methods including permeable paving, rain gardens/SuDS pods, linear basins and a detention basin to provide sufficient water treatment.
- 5.9 As shown in Table 5.3 below, guidance set out in SuDS Manual Chapter 26: *Water Quality*, indicates the pollution hazard level for the proposed development is considered to be 'low' to 'Very Low'.

Table 5.3 – Pollution hazard indices for Residential land use

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05

Driveways, low traffic roads	Low	0.5	0.4	0.4
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- 5.10 As shown in Table 5.4 below, the SuDS mitigation indicates suggest the proposed use of an online detention basin will ensure the surface water runoff is sufficient treated prior to being discharged to the relevant outfalls.

Table 5.4 – SuDS mitigation indices for discharge to surface waters

Type of SuDS component	Mitigation Indices		
	TSS	Metals	Hydrocarbons
Porous Pavement	0.7	0.6	0.7
Swale	0.5	0.6	0.6
Detention Basin	0.5	0.5	0.6

- 5.11 It is therefore considered the proposed development will not have an adverse impact on the receiving watercourse.

Maintenance

- 5.12 A suggested maintenance regime will be provided at detailed design stage. However, it is assumed that the detention basin and linear basins would be conveyed to the SAB, whilst responsibility for maintenance of the remaining 'domestic' SuDS features would remain with the Housing Authority in perpetuity.
- 5.13 Full details of the proposed surface water proposals for the development will be submitted to Neath Port Talbot SAB for formal SAB approval.

6 FOUL DRAINAGE

- 6.1 The proposed foul drainage strategy is shown on the Engineering Layout drawings included at **Appendix F**.
- 6.2 DCWW's Public Sewer Map provided in **Appendix H**. The sewer maps indicate a 225 dia foul water sewer to the rear of the properties an Heol y Gors, which crosses the proposed development site at the site access. Another 225 dia foul water sewer is located in Heol y Gors itself. DCWW have been consulted regarding the proposed development, and have confirmed that capacity exists within the existing sewer network to accept foul water flows from the new development. A copy of the correspondence is also included in **Appendix H**.

- 6.3 Due to the topography of the site, a foul pumping station and rising main sewer are required to discharge foul flows from the site.
- 6.4 The new foul water sewer network, including pumping station and rising main will be adopted by DCWW under a Section 104 Agreement.

7 CONCLUSION

- 7.1 It is concluded that a suitable surface water and foul drainage strategy can be achieved with no adverse impact on the receiving watercourse or Combined sewer network.