1 Overview

This technical note provides a baseline assessment for hydrology and flood risk for the proposed redevelopment of land at Land at Lambs Business Park, Terra Cotta Road, South Godstone.

Lambs Business Park is identified for allocation in the emerging Tandridge District Local Plan. The proposed allocation (Policy SES003) primarily concerns employment generating uses, but there is also recognition that the western parcel is suitable for waste management uses. Tandridge District Council also consider that there are the exceptional circumstances to justify the sites release from the Metropolitan Green Belt. In addition, Surrey County Council are also proposing to allocate the north western portion of the site for waste management uses in their emerging Waste Local Plan (Policy 11a refers).

The purpose of the note is to address the flood risk and water resources aspects of Q111 of the Inspector’s Questions for the Surrey’s strategic waste plan. This is to inform the Examination in Public, which commences in September 2019. For this, the criteria set in Policy 14 of the Surrey Waste Local Plan (SWLP) must be met.

**Question 111 - Is the Council confident that the development of the site would be able to meet the requirements of Policy 14 of the SWLP (Surrey Waste Local Plan), including in relation to potential impacts on the environment and local communities, such as those relating to flood risk, public rights of way, contamination, water resources, noise, illumination, fumes and odour? How has this been assessed?**

Additionally, according to the NPPF, a flood risk assessment is required for any site greater than 1ha in area.

1.1.1 Policy 14

**Policy 14 of the SWLP is concerned with addressing adverse impacts that might arise during the construction, operation and, where relevant, demolition and restoration of a waste management facility to ensure that significant adverse impacts do not occur.**
1.1.1.1  Flood Risk

- Responsibility for flood risk management is divided between the Environment Agency and the county council in its role as the Lead Local Flood Authority (LLFA). The Environment Agency is responsible for taking a strategic overview of the management of all sources of flooding, and has specific responsibility for the management of flood risk from main rivers and from the sea.

- The LLFA is responsible for managing the risk of flooding from surface water and groundwater, and is responsible for the management of ordinary watercourses (i.e. small, local watercourses that are not designated as main rivers).

- Development should be directed away from areas at the highest risk of fluvial or surface water flooding. Where development on land at risk of flooding is necessary, its acceptability will be determined through the application of the sequential test and, if necessary, the exception test.

- Waste treatment (excepting landfill and hazardous waste facilities) is classified as a ‘less vulnerable’ form of development with reference to flood risk, and is generally appropriate in areas designated as Zone 1 and Zone 2 for fluvial flood risk. Landfill and hazardous waste facilities are classified as ‘highly vulnerable’ forms of development and are generally only appropriate in areas designated as Zone 1 for fluvial flood risk.

- Development on land identified as being at substantial risk of flooding from surface water or groundwater should be discussed with the LLFA at the earliest possible stage of project development.

1.1.1.2  Water Resources

- Developers should take account of the presence of relevant water quality designations (e.g. groundwater Source Protection Zones (SPZs)), and the condition of surface watercourses and waterbodies and of groundwater bodies that could be affected by their proposals. For water quality, consideration should be given to the likely effect of the development on the achievement of ‘good’ status, or the potential for this, for nearby or underlying waterbodies and watercourses, and on the availability of water as a resource.

- Proposals should consider the proximity of surface water and groundwater resources and the potential risk for contamination. For example non-inert landfill must not be located in areas covered by SPZ 1 designations, and should be directed to areas underlain by unproductive strata. For non-landfill waste development the susceptibility of the surrounding and underlying water environment to contamination should be assessed, and appropriate controls incorporated into the design of the scheme.

- The developer should provide an assessment which explains how the water environment, both above and below ground, would be affected by the development and identifies the measures that would be used to avoid significant adverse impacts.

1.2  Design Standards/ Reference Documents

The following design standard and best practice guidelines have been used in developing this Flood Risk Assessment (FRA);
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- National Planning Policy Framework (NPPF) and Planning Policy Guidance (PPG) relating to flood risk and drainage;
- Surrey County Council (SCC) – Level 2 Strategic Flood Risk Assessment (SFRA)
- Surrey County Council – Preliminary Flood Risk Assessment (PFRA)
- Tandridge District Council (TDC) – Level 1 Strategic Flood Risk Assessment
- Tandridge District Council – Level 2 Strategic Flood Risk Assessment
- Surrey County Council Minerals and Waste Planning Policy – Surrey Waster Local Plan (SWLP)
  - Part 1 – Policies Submission Plan
  - Part 2 – Sites and Areas of Search
- Tandridge District Council – Our Local Plan: 2033 (Regulation 22 Submission).
- Tandridge District Council – Our Local Plan: 2033 (Regulation 19 Submission).
2 The Site

2.1 Existing

The total area of the site is 13.4ha and is divided into two distinct parcels. The eastern land parcel (5.4ha) comprises several commercial units and buildings associated with the former brickworks. The western parcel (8ha) comprises a quarry that benefits from permission for clay extraction, inert landfill and a depot for handling re-sealable redundant spent railway ballast.

A 300m railway siding is located to the north of the site, and is owned by WT Lamb. This siding is connected to the rail network via Network Rail live points and signalling. In addition to this, the main railway track operated by Network Rail has a further siding of 300m in length which is directly connected to WT Lambs own siding.

The site generally slopes from northwest towards the south.
2.2 Proposed

It is proposed that the current commercial units are to be improved to provide higher value, and new facilities are to be added. The new facilities will include two data centres and a combined cycle energy centre. The former pit areas will be landscaped into a flood alleviation and nature reserve.
Figure 3. Proposed Master Plan [LRM Planning]
3 Flood Risk

3.1 Fluvial Flood Risk

The site is located at the catchment boundary between the Rivers Medway to the east and the River Mole to the west.

The main part of the site lies within the catchment of the Ray Brook, the watercourses leaving the site to the east outfalling via the Ray and Eden Brooks to the River Eden at Edenbridge. The River Eden is a tributary of the River Medway, which it joins at Penshurst, 9km upstream of Tonbridge. The south western portion of the site however appears to just straddle the topographic catchment boundary and sheet flows in extreme conditions may outfall into the headwaters of a tributary of the River Mole to the west, which the watercourses join via the Salfords Stream between Horley and Reigate. In addition, discharge from a surface water attenuation facility located in this low part of the site could discharge to the western catchment.

The site is located in Flood Zone 1 as can be seen from the EA figure below. According to the Environment Agency, Flood Zone 1 means that the site is having less than 1 in 1,000 annual probability of river or sea flooding. The nearest watercourse with a risk of flooding is circa 500m away towards the south west. Therefore, the fluvial flood risk is considered to be very low.

Figure 4. Flood Zones [EA River and Sea Flood Map - Aug. 2019]
In accordance with NPPF, and as the site is in Flood Zone 1, it is concluded that a sequential test is passed.

3.2 Tidal Flooding

Tandridge’s Level 1 SFRA indicates that the rivers in Tandridge District are of fluvial nature, the risk of tidal flooding is not present. Additionally, the site is circa 30km away from the River Thames and nearly 50km away from the nearest coastline.

![Figure 5. EA Flood Risk from Rivers or the Sea [EA - Aug. 2019]](image)

3.3 Surface Water Flood

The EA also produces maps highlighting the risk of flooding from surface water, which relates to flooding that occurs quickly during, or shortly after, high intensity storms. It occurs when rainfall cannot soak into the ground or drain into local drains or river quickly enough, and leads to flooding in low-lying areas.

As shown on the map below, the risk of surface water flood to the site is generally low. However, there are areas of medium to high risk at the quarry site. This is due to local depressions in the ground where water would naturally accumulate.
Figure 6. Surface Water Flooding [EA Maps - Aug. 2019]

Low risk means that each year this area has a chance of flooding of between 0.1% and 1%. Medium risk is for chance of flooding of between 1% and 3.3%, whilst high risk is for a chance of flooding of greater than 3.3%.

Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding. For example the EA plans below for the ‘low probability’ suggest that the origin of the surface water risk is the railway line to the north.

Proposed levels are to be designed to ensure that excess water is directed away from buildings and into areas with less sensitivity within the site boundary. Overland flood routes to be considered and developed at the next design stage.
Figure 7. Surface Water Flooding - Low Risk: Depth [EA Maps - Aug. 2019]

Figure 8. Surface Water Flooding - Low Risk: Velocity [EA Maps - Aug. 2019]
3.4 Groundwater Flooding

Tandridge’s Level 1 SFRA indicate that the site is deemed as having a negligible risk of flooding from groundwater due to the nature of the local geology.

The site is not within any Groundwater Vulnerability or Source Protection Zone, and there are no superficial or bedrock aquifer designations covering the area.
Figure 10. Bedrock Aquifer [EA Maps - Aug. 2019]

Figure 11. Superficial Drift [EA Maps - Aug. 2019]
Figure 12. Groundwater Vulnerability Map [EA Map - Aug. 2019]

Figure 13. Source Protection Zones [EA Maps - Aug. 2019]
3.5 Flood Risk from other Resources

There is no risk of flooding from reservoirs to the site, as can be seen from the figure below. The maximum extent of flooding from reservoirs is approximately more than 2km away from the site.

![Risk of Flooding from Reservoirs](https://example.com/image.jpg)

There are no known foul or surface water flooding incidents in close proximity to the site. The site postcode is RH9 8LJ; Tandridge’s SFRA indicates that the number of recorded sewer flooding incidents in the postcode RH9 are between 11-20 incidents. However, Table 4-3 of the SFRA records no incidents in this same postcode. The risk is to be confirmed with SES Water.

It is worth noting that the Green Belt Assessment by TDC recognises that the site as being in Flood Zone 1, but has a risk of surface water flooding due to the topography of the quarry. Also, flooding is not recognised as a key development issue for Lambs Business Park by Surrey Council’s SWLP. Both TDC and SCC’s local plans recognise the site to be of high potential in terms of employment, waste allocation and energy production. Therefore, sustainable design and robust drainage solutions are key for the future of this development.

Given the information above, it is concluded that the site is in a very low risk zone from the flood types; fluvial, surface water and from reservoirs. Flood risk from sewers will be confirmed with SES Water, and local flood risks shall be discussed with SCC and TDC.
3.6 Flood Risk from the Site

It is envisaged that the design of the site would be undertaken to provide a balance of sustainability, health and safety, cost, design life, maintenance and the user requirements. The surface water drainage strategy has been developed to meet the following objectives:

- As the site is already developed (brownfield), the surface water runoff will be restricted to the existing flows as a minimum, and a betterment will be provided for all return periods; 1 in 1, 1 in 30, and 1 in 100 year return period. The exact requirements shall be agreed with the council.

- In accordance with Appendix 2 of the NPPF, the western parcel of the site (former quarry) is considered to be a greenfield site, as it is “land that has been developed for minerals extraction or waste disposal by landfill, where provision for restoration has been made through development management procedures”. Therefore, surface water runoff in this area is likely to be restricted to greenfield runoff rates. Exact requirements shall be agreed with the council.

- Both SCC and TDC’s SFRA’s indicate that climate change allowances shall be accounted for when modelling the surface water drainage design. Their recommendations are indicated on the tables below (Tandridge SFRA).

Table 6-1: Climate change allowances (% increase in river flow)

<table>
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<th>River basin borough</th>
<th>Allowance category</th>
<th>Total potential change anticipated for the ‘2080s’ (2070 to 2115)</th>
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<td>South East</td>
<td>Upper end</td>
<td>105%</td>
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<td></td>
<td>Higher central</td>
<td>45%</td>
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<tr>
<td></td>
<td>Central</td>
<td>35%</td>
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<tr>
<td>Thames</td>
<td>Upper end</td>
<td>70%</td>
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<tr>
<td></td>
<td>Higher central</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>Central</td>
<td>25%</td>
</tr>
</tbody>
</table>
Table 2 of the NPPF indicates that sites used for primary power generation are considered ‘Essential Infrastructure’. However, the proposed power generation from the development will be local, and therefore can be considered as ‘More Vulnerable’. The development is also in Flood Zone 1 (south east), meaning that the central allowances for climate change can be used for both the river flow and rainfall (35% and 20%, respectively). The upper allowances shall be used for sensitivity checks only.

It is noted that the impermeable area will increase as a result of the redevelopment. The runoff will be controlled to meet the criteria above to prevent any adverse impact on the outfalls. Additionally, the quarry area will be landscaped, and the southern part will act as a storage area for flood alleviation.

Proposed levels are to be designed to ensure that excess water is directed away from buildings and into areas with less sensitivity within the site boundary. Overland flood routes to be considered and developed at the next design stage.

The detailed surface water management scheme will be developed in due course. It is envisaged that this would be subject to a condition that approval to final details should be approved by the local planning authority before development commences.
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4 Conclusion

- The site is situated in Low Probability Flood Zone 1 (<0.1% AEP / 1 in 1000 year RP);
- Neither a Sequential Test or an Exception Test is required for development on the site;
- A low probability surface water flood risk is shown potentially affecting the site. Detailed landscape and surface water design will accommodate this shallow sheet flow and include it into the on-site flood storage attenuation before discharge to downstream watercourses;
- National Policy and Local Core Strategy Policies encourage the provision of additional flood storage;
- The reinstatement of the former quarry on the site provides the opportunity for restricting flows from the overall development site to existing greenfield discharge rates or better, and catering for future climate change impacts;
- The detailed quarry reinstatement and landscaping proposals which will be developed in due course will include measures to ensure that development plots within the site have a level of protection of better than 0.1% AEP (1 in 1000 year RP) from all sources of flood risk. In addition, pass on and site surface water discharges will be further restricted to contribute to reduction of flood risk downstream; and
- A condition may be attached to any planning permission to require the approval of the detailed surface water management arrangements before development commences.

DOCUMENT CHECKING (not mandatory for File Note)

<table>
<thead>
<tr>
<th>Prepared by</th>
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<tr>
<td>Name</td>
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<td>Salma Hussein</td>
<td>Andrew Chalmers</td>
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