

## **7. Drainage**

### **7.1 Introduction**

7.1.1 THDA Limited prepared this statement on the hydrology of the site and proposals for foul and surface water drainage. It is based on its visit to the site guided by the farmer, a study of sewerage records purchased from Severn Trent Water, and reviews of Internet data on the web sites of the Environment Agency and British Geological Survey.

7.1.2 A plan titled "Drainage Principles", appended, shows contours within the site at five metre spacing, the area in which the British Geological Survey shows the presence of diamicton till superficial deposits, the location of the watercourse serving the site, and provisional principal surface water and sewage drainage routes proposed to serve the development.

### **7.2 Baseline Condition**

7.2.1 British Geological Survey mapping shows that near surface bedrock beneath the site is a mixture of sandstone or conglomerate. Superficial deposits of diamicton till are present over a substantial area of the northern part of the site. In the vicinity of the only natural principal watercourse within the site (which is a headwater of the Crane Brook), there are superficial deposits of glaciofluvial sands and gravels.

7.2.2 A number of records for boreholes drilled within or close to the site are publicly available from British Geological Survey. These records show that locally the water table is at considerable depth and that deeper rocks mainly comprise various red sandstones.

7.2.3 Environment Agency mapping confirms that the bedrock beneath the site is a major aquifer, from which there is a public water supply abstraction located to the south east of the site. A small area of land in the south eastern corner of the site is classified as Source Protection Zone 2, and the remainder of the site is classified as Source Protection Zone 3. The type of development proposed is compatible with these Zones, but reasonable care will be needed with development drainage and control of pollution in general.

7.2.4 The farmer advised that the land in the northern part of the site has a sandy top soil and has occasional clay content and has field drains installed that are connected to the principle watercourse on the site to aid drainage. The area of land served by this drainage is similar to the area where diamicton till is indicated as present. The remainder of the land is very free draining, as witnessed during the site visit.

7.2.5 The principal watercourse is culverted under Lichfield Road with a 300 mm diameter pipe. The invert of the pipe is about 1.2 metres below ground level at the south east of the site.

- 7.2.6 Contours confirm that there is one valley line within the site to which all parts of the site fall with a minimum general gradient of about 1:68. The lower end of the valley contains the principal watercourse.
- 7.2.7 Environment Agency mapping also shows that whereas there are historic and authorised landfills beyond the site boundary, none is recorded within the site. The entire site is classified as Flood Zone 1. Reservoir flood routes have been removed from the Environment Agency website, so have not been checked, but are thought to be not relevant to the site.
- 7.2.8 As the entire site is Flood Zone 1, and it is not an area with special drainage problems, the development is proposed in the best flood risk location and is not subject to a Sequential Test.
- 7.2.9 No other flood risks to the development became apparent as a result of the site visit and desktop research.
- 7.2.10 Severn Trent Water serves the urbanised areas to the south, west and north of the site with foul and surface water sewerage. The foul sewers in Chester Road and Lichfield Road are 150mm and 225mm diameter. Based on 1,500 dwellings a foul flow of approximately 70 litres per second would be expected, so it is unlikely that the existing sewers would have spare capacity. Typically a 300mm diameter pipe would be needed to convey a flow of this magnitude.
- 7.2.11 Dwellings in Lichfield Road to the south of the site are served by a sewage pumping station. There is a 125 mm diameter rising main from this station which is located under the southern edge of the site.

### **7.3 Proposed Drainage Strategies**

- 7.3.1 The outline proposal for disposing of sewage from the development is to provide a sewerage network discharging to a single purpose built on site pumping station located in the valley line. This will pump sewage through the site along a line similar to that shown on the Principles Plan to a Severn Trent 1050 mm diameter foul sewer in Lindon Road. In due course Severn Trent will need to be approached to agree this or any other point of connection, to ensure their networks have adequate capacity, and to agree the timescales for both development and potential network improvements.
- 7.3.2 There are many options for disposing of surface water from the development. The site benefits both from permeable strata and has access to a principal watercourse. As such much of the site can be drained directly to ground, or can be taken directly to the watercourse. Good land gradients and large areas of suitable located open space will allow suitably sized ponds to be located – these ponds can either be used to infiltrate or attenuate the flow prior to discharge to the water course.

7.3.3 Details of surface water drainage and disposal will be dependent mainly on the results of site investigation, planning decisions on what water features may be required as amenity, ensuring compliance with current and emerging SuDS guidance, and the advice as yet to be given by the Environment Agency about the balance between using infiltration to sustain the aquifer and discharge to watercourse to sustain riverine ecology.

7.3.4 Where ground conditions allow, typically roofs could be drained direct to soakaways. Typically roads would drain to the watercourse, thereby allowing implementation and maintenance of the longer treatment trains required. Swales and infiltration lagoons would be a viable and economic alternative.

#### **7.4 Conclusion**

7.4.1 This preliminary appraisal of water related environmental factors, including flood risk, groundwater/abstraction and drainage, fully supports the draft master plan for the development as drawn.