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9.11.22

For the Attention of Anna Horn

Planning Officer

Sevenoaks District Council

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Application 22/02645/OUT. Outline Application for the development of 50 Dwellings on Land South of Larches, Ashgrove Road, Sevenoaks, Kent.

Dear Ms Horn

I refer specifically to the document "Flood Risk Assessment and Drainage Strategy" prepared by Odyssey (July 2022) on behalf of Sigma Strategic Land Ltd in support of the above application. I am responding in my capacity as a professional geoscientist with some 45 years experience including groundwater and slope studies. I also reference KCC Flood and Water Management letter (Reference SEDC/2022/092261).

Odyssey have purported to undertaken a preliminary design to mitigate against flood risk. This design is based on cursory reference to available geology maps, two soakability pit tests and preliminary modelling of regional data. Based on this very limited review Odyssey assert that *"it is proposed that surface water generated by the roofs of the dwellings and garages in the western side of the site will be attenuated and infiltrated into the ground using individual soakaways for each dwelling. It is proposed that the remainder of the impermeable area on the western side of the site and all of the impermeable areas on the eastern side of the site will be attenuated in two basins and a tank. Flows would then be discharged to the Thames Water public surface water sewer located at the junction between Ashgrove Road and Hopgarden Lane. The discharge rate from site would be controlled using a vortex control device to restrict the surface water discharge to Qbar. This discharge rate of 7.8l/s has been agreed with Thames Water"*

I have undertaken a review of the available information and highlight the following points:

- **The proposed development site location is over 16m above the Hogarden-Ashgrove Road junction and all surface run off and groundwater will move down to that point principally along a steep gradient on Ashgrove Road.**
- During periods of high rainfall there is a history of poor surface water drainage in the lower parts of Ashgrove Road, all of Hopgarden Lane and Grassy Lane. The drainage network basically takes all water from the junction down Hopgarden to the main soakaway in Grassy Lane. The Ashgrove – Hopgarden junction receives all surface water and debris from the

road (the two steepish hills either side on Ashgrove cause a rush of water downslope) and down from the bridleway up to Oak Lane . The situation is exacerbated by the fact that the roadside gulleys are no longer routinely cleared by Kent Highways, the heavy leaf fall in Hopgarden Lane and the use of impermeable materials on long driveways. It is likely that the surface water sewer pipe does not meet the latest standards as it would have been installed many years ago. I attach relevant photos for reference with respect to runoff, downslope, in this area.



Water accumulation near Ashgrove farm and run off down the road from the field



Flooding at the Grassy Lane Soakaway at the end of Hopgarden Lane

- There is also a history of blockages occurring in the foul water sewer in the vicinity of the proposed connection in Hopgarden Lane and at the main soakaway in Grassy Lane. With respect to the Hopgarden connection a neighbour in Model cottage outlined the following:

“About two years ago I called Thames Water to a sewer blockage. The operator who took the call said that the manhole had a history of blockages. Thames Water treated the report as an emergency. A subsidiary sewer (of more modern origins) runs from Woodside in a semi-circle serving Ashgrove Farm, Ashgrove Farm Cottage and Model Cottage. The pipe runs through Model Cottage garden near the house and discharges to the main sewer. This pipe was adopted by Thames Water after the good condition of the pipe had been verified. This pipe sometimes shows, through sewerage adhering to the benching in the manhole, that the outflow into the main sewer may be limited by poor flow rates in the main sewer”. It should also be noted that there are many incidents of blockages at the main, Grassy Lane soakaway at the other end of Hopgarden and that the drainage network links this to the said junction.

- Odyssey only undertook two infiltration tests using soakaway pits over a 400 minute duration, one in the NW portion of the field near the highest point (SP1) and one in the SE portion at the lowest elevation (SP2) . There was no infiltration in pit SP2 which located in clay and gave the following test result: *“After 400 minutes the water level had not decreased and as such the geology in his location is not considered suitable for shallow soakaways”*. Based on a broad geology map and only two soakaway pits Odyssey assume filtration for the top section of the field and no infiltration for the lower portion of the field. Clearly there are not enough test sites to make this assumption. The strike of the geological contact between the sandstone and clay is only broadly known from BGS maps. The dip will be shallow (10-15 degrees) with potential movement of water along the geological contact. Further work is required to understand the geology and filtration characteristics before any valid assumptions can be made. **At this stage it is not possible to understand run off versus filtration characteristics and therefore it is not possible to calculate how much water may require retention and therefore subsequent discharge volumes to the Hopgarden-Ashgrove Junction water sewer.**
- **What will be the volume of water that will not be captured in the retention ponds and will run off down through the proposed new development driveways and pathway via steps onto the bridleway and out through the entrances into Ashgrove Road?** The ponds do not cover the length of housing development. **What impact will this have on these downslope area during high periods of rainfall?**
- The norther retention pond is 1.7m depth and covers a larger area. This will be excavated into clay. **What will be the risk of shear failure within the clay due to water pressure related to a large volume of water in this pond during high periods of rainfall?** If the retention pond collapsed what would be the risk downslope? Who would be responsible for maintaining it and legally liable for any water that escapes the site and causes damage if the pond fails?
- In periods of heavy rainfall (3-4 days of continuous rain) the discharge rates from attenuation tank via pond 2 could exceed what Thames Water says is permissible (7.8 L/s in total using Vortex control). **Would there will be an automatic discharge above the specified discharge rate if the water in the ponds exceeds a certain level? What would the impact of this be at the Hopgarden-Ashgrove junction? Could this cause a sewage discharge and therefore flooding? Again whose responsibility would it be to maintain the retention ponds, and for sewage discharges and any foul flooding?**
- **At this stage there is no accurate hydrological model for the volumes of water related to this housing development in terms of discharge versus filtration.** There is no empirical

understanding of groundwater flows using piezometer testing to determine hydraulic head directions particularly in relation to the dip of the sandstone-clay contact.

In Summary the work completed to date by Odyssey is very preliminary in nature and is based mainly on regional assumptions and very limited real data. **The plan outlined does not take into account the rapid relief change, the history of the flooding at the Ashgrove-Hopgarden junction and the risk related to the addition of large volumes of water into a local sewage network. Flooding is therefore a risk at the Hopgarden-Ashgrove junction relating to: discharge exceeding the specified 7.8 l/s, overflow or collapse of one or both of the proposed retention ponds or excessive run off downslope of water not captured in the ponds.**

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