

12 June 2023

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Land East of Knowle Lane, Fair Oak, Hants SO50 7DZ, F/23/94668
Surface Water Drainage Treatment Train

Dear Sirs

We have reviewed Cowan Consultancy Drainage Plan 393640-500P9, the Cowan Consultancy response to EBC Ecologist comments 25th May 2023 and the EBC Ecologist comments 8th June 2023 and have made our observations below:

1. The scheme is for extension/changes to a previous permission for a housing, offices and business park scheme for which a surface water drainage scheme as developed, approved by EBC (following alterations required by their own specialist consultant) and implemented. The current proposal introduces no new usage types so the land use pollution indices remain as for the extant use.
2. The EBC Ecologist demonstrates a fundamental misunderstanding of the underlying principle of water treatment. Treatment relies on controlling water velocity. If the flow rate is controlled upstream of the treatment train then the water treatment infrastructure is inherently smaller in size. If the flow rate into the infrastructure is unattenuated then the treatment infrastructure is inherently larger as it needs a big enough body of water to check the velocity and allow precipitation of suspended material and solids and hydrocarbons to adhere to surfaces and volatilise. In this proposed development attenuation storage and hydraulic control occur upstream of the treatment infrastructure so the treatment infrastructure is small. The proposed development does not propose to increase the extant system flow rate so the extant sizing remain appropriate (as previously agreed and approved by EBC)
3. A single pond stage treatment providing a mitigation index of 0.7/0.7/0.5 meets the land use pollution index for all uses except delivery yard hydrocarbons. There is however (i) no delivery yard indicated which suggests that an intensive commercial yard use is not foreseen as clearly the pavement is laid out for car parking, (ii) inclusion of the index for a second stage ie Pond 2 or the swale would meet the land use pollution index for such a yard, (iii) the lower courtyard would receive the pavement runoff and comprises porous pavement so would actually provide a fourth stage. The site is not in a Drinking Water Protection Zone. There are 3 treatment stages (4 for pavement runoff) of which 2 are enough to meet mitigation index requirements and 1 more (2 for pavement) provide extra treatment with respect to local environmental sensitivity. The 3 stages pond/pond/swale meet EBC requirements for the count of treatments stages required.
4. As previously approved by EBC there are two ponds hydraulically separated by a weir. In dry weather scenario there is no runoff to treat, no input into pond 1, so not output from pond 1 over

the weir into pond 2, and no output from pond 2. The ponds are hydraulically separate bodies. When runoff from the upstream development occurs a regulated flow from the upstream controls and infrastructure enters pond 1 which is sized to limit the velocity in the pond (Stokes Law of sedimentation). For every litre of water entering pond 1, a litre of water will leave pond 1 over the weir and the process will repeat in pond 2 and a litre of water will leave the far end of pond 2. We suspect that the EBC Ecologist has failed to read the drawing fully as it is readily apparent that Pond 1 is 100mm higher than Pond 2. Making the weir permeable will remove the hydraulic isolation between the ponds and would therefore remove 1 treatment stage from what is presently there. The only exception to that would be if the weir were a sand filter. However the mitigation index for a sand filter of 0.4/0.4/0.4 is worse than that of the second pond 0.7/0.7/0.5. We do not consider it would be appropriate to remove the weir.

Yours Sincerely,

Aqua Callidus Consulting Ltd

Andy Traves