Peter Bond
Hampshire County Council
via email

24 May 2022

Our ref: 331201108pbond001.Docx

Dear Peter,

Re: Proposed extraction of sand and gravel at Hamble Airfield: response to consultee queries

Stantec UK Ltd (Stantec) has been forwarded the following documents for response by CEMEX UK Operations Ltd. (CEMEX).

- Letter from the Flood and Water management team, Economy, Transport & Environment Department, Hampshire County Council, reference SWM/2022/0033,
- email from the Ecology Team, Economy, Transport & Environment Department, Hampshire County Council dated 28 February 2022, and
- Letter from Natural England dated 3 March 2022, reference 381357.

Stantec undertook the hydrogeological and hydrological assessments that supported the planning application and we have been asked to respond on the points raised in relation to hydrology and hydrogeology.

Flood and Water management team letter

Operational phases

We confirm that soakaway testing, in accordance with BRE365 will be undertaken to support the assumptions made in the application documents a regarding infiltration rates. We note that water currently infiltrates to ground at the Site, and we would not expect this to change whilst the sand and gravel is being extracted.

With respect to groundwater depths, there are three cross sections presented in Chapter 8 of the Environmental Statement. Of the seven locations presented that have groundwater level data, only one shows the *maximum* water level within 1m of the ground surface. This is BHC/08 and it shows the shallowest groundwater levels at the Site, as shown on Figure 8.15 of Volume 2, Chapter 8 of the planning application.

We have plotted the hydrographs to the current time in Figure 1 (superficial deposits) and Figure 2 (solid strata). This shows that it is only the pair BHC/08 and W03 which are located in the northeastern extent of the Site that occasionally rise above 1 m below ground level (see Figure 8.14 in Volume 2, Chapter 8 of the planning application for locations). In this area, infiltration is less likely to occur in the wettest periods. However, around the rest of the perimeter there is sufficient unsaturated zone for infiltration to occur at all times of the year. Drainage calculations have demonstrated that the overall site discharge will not exceed that of the greenfield runoff rate, as per CIRIA guidance.

We also note that there is relatively little groundwater present within the superficial deposits and the gaps in the hydrographs indicate that the wells are frequently dry.

Figure 1 Superficial deposit hydrographs – depth below ground level

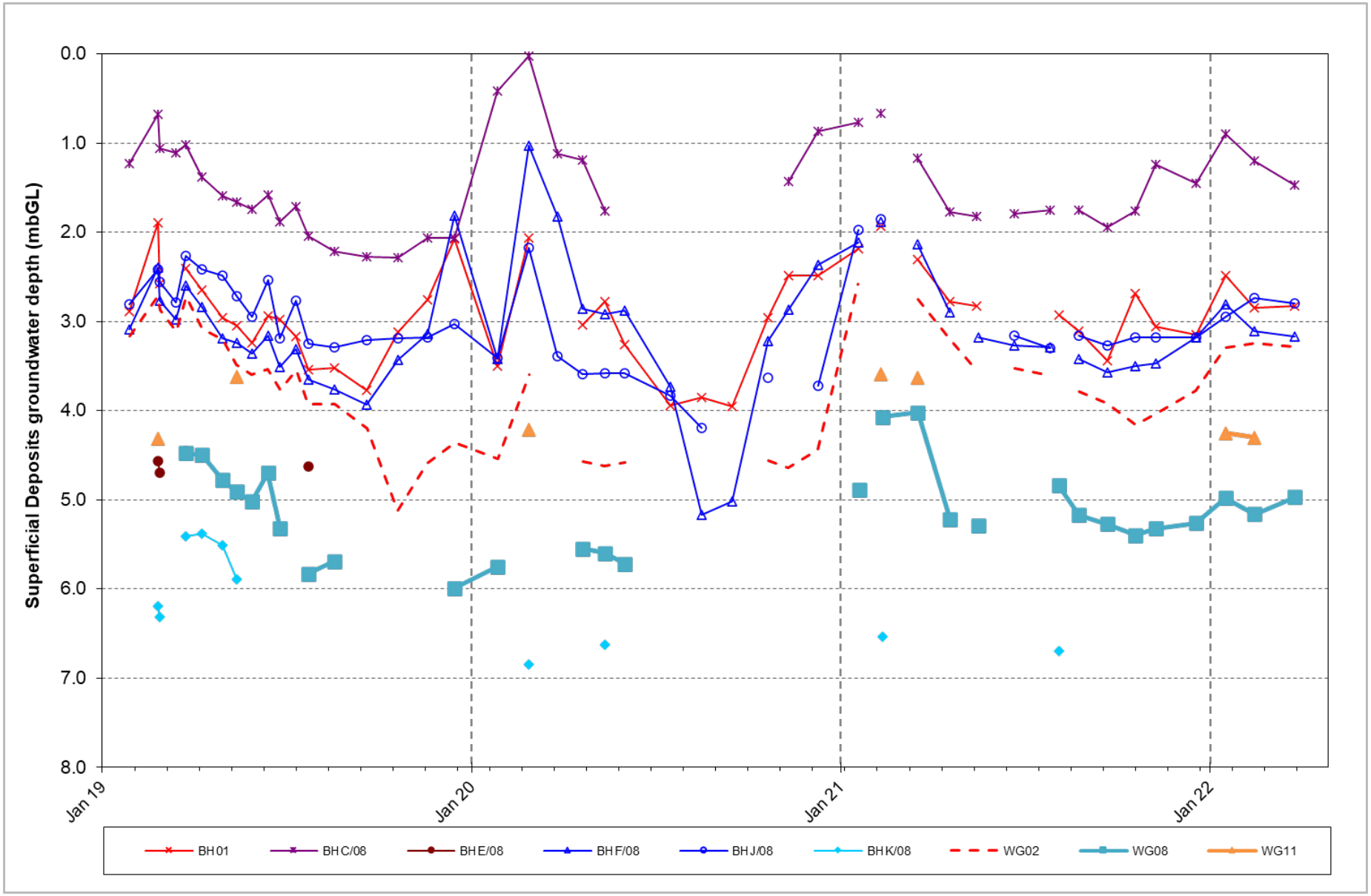

Figure 2 Solid strata hydrographs – depth below ground level

In relation to the statement *"Discharging surface water runoff directly into the water table is not something that we would support as the hydraulic capacity and structural integrity of the infiltration features will be compromised."*, we highlight that the surface water runoff discharges to the watertable in the pre-development scenario. This mechanism is intended to remain the primary mechanism during the operational phase of the project, whereby the groundwater will be exposed through the active quarry void created through extraction operations. The voids will not be infiltration features, they will be voids which expose the groundwater table, and so the exposure of water at their base will not compromise their hydraulic capacity. Calculations of the performance of the voids under the design storm event are provided in the FRA Section 8.2.2.

Runoff from the processing plant area and undeveloped northern part of the Site will be directed to the northern lagoons (Freshwater Lagoon and Silt Lagoon), which will be sited on the existing sand and gravel geology. Water will either infiltrate to ground or be abstracted for use in the processing plant.

In relation to the statement "*We would also highlight that the Flood Risk Assessment identifies current runoff to be directed to the borders of the site and reference is made to minor surface watercourses. Please clarify where these are in relation to the site as this can indicate that infiltration is not viable*", we refer you to Figure 2.1 in the Flood Risk Assessment (FRA) which shows surface water features around the Site. We can confirm that there are no surface water features within or immediately adjacent to the Site that currently, or could in the future, accept surface water runoff. The features we refer to in the FRA are distant from the Site and may intercept groundwater discharges as spring flows on the steeper ground to the east and west of the Site.

<u>Restored Site</u>

Our reference to evapotranspiration in this section of the FRA is not a discharge option. We are simply stating that as infiltration through the lower permeability restoration materials will be limited, there will be greater losses to evapotranspiration from the ponds and wetlands. As stated in the FRA, overflows from the pond and wetland will convey surplus water to infiltration features located outside the fill material and this is the discharge option.

We note that it is not possible to undertake a detailed ground investigation / hydrogeology assessment report of the filling material as it has not yet been placed. Given the lack of groundwater within the superficial deposits (other than in the northeast corner of the Site) we do not consider that changing or blocking groundwater movement through the site, thus increasing groundwater flood risk into adjacent sites, will be an issue. However, this is a matter that we would expect the Environment Agency to comment on.

As the site will be progressively developed, the surface water features included within the restoration plan - A combination of ponds, infiltration trenches and an infiltration basin - will be implemented as the site progresses through to the post-restoration phase. As mentioned, the operational phase is not considered to impact surface water flood risk. The southern area of the site will be operational first, meaning that it will be restored to the post-restoration phase, with the largest surface water pond before the second area to the north is made operational. Therefore, the post-restoration arrangement will be implemented in a conservative fashion.

In relation to the statement *"The current plans indicate potential for the catchment areas to be adjusted so further evidence is required to ensure no additional flows are directed to alternative locations."*, the FRA Table 7.3 gives details of the post-restoration catchment areas. It is demonstrated that the change in surface water runoff catchment areas are minimal; with catchments R2 and R5 (18.75 ha) draining to the west, and R1, R3 and R4 (42.31 ha) draining to the east. Therefore, the post restoration phase indicates that 10.14 ha will be redirected to the eastern catchment:

Table 1 Catchment Areas over time (table 7.3 in FRA)

Phase	Catchment	Area (ha)	Notes
Greenfield/ Current	C1	32.21	Eastern catchment
	C2	28.89	Western catchment
Operational	O1	8.31	Eastern catchment
	O2	6.10	Western catchment
	O3	30.62	Southern catchment draining to active void
	O4	16.06	Northern catchment draining to lagoons
Restored	R1	14.17	Eastern catchment (draining to infiltration trenches)
	R2	11.44	Western catchment (draining to infiltration trenches)
	R3	10.19	Catchment draining to southern water feature
	R4	17.95	Catchment draining to large central water feature
	R5	7.31	Catchment draining to north-western infiltration basin and trench

As outlined in Section 8 of the FRA, the SuDS features in the restored site limit the surface water runoff to be below the greenfield surface water runoff rates for both the existing catchment areas.

Furthermore, as the site is 1.9 km from the confluence of the River Hamble and Southampton Water, and both watercourses are tidal and have much larger catchment areas than the site (over 100 km^2 for each receiving waterbody), the wider impact of adjusting the catchment areas of the site are considered to be negligible.

Ecology team letter

The ecology team has raised concerns in relation to surface runoff from the Site impacting designated sites adjacent to Southampton Water and the River Hamble.

As noted above and shown on Figure 2.1 of the FRA there are currently no surface water features within the footprint of the proposed Site. All rainfall within the Site will discharge to groundwater. CEMEX will undertake soakaway tests to confirm the infiltration capacity of the ground.

During the operational phases, water collecting within the worked void will be pumped to other parts of the Site where it will infiltrate to ground. However, there is not expected to be a significant quantity of groundwater present within the superficial deposits that are to be extracted (with the exception of the northeastern part of the Site, see comments above and Paragraph 8.4.68 of Volume 2, Chapter 8 of the planning application) and the volumes of water requiring to be pumped will be small. A proportion of the water will also be collected within the lagoons constructed in the north of the Site (see Figure 8.1 in the FRA). This water will be utilised for washing the mineral. This process consumes very little water (CEMEX consider that 5% of the water used for gravel washing will be consumed by the process) with the balance returned to the lagoons where it will be able to infiltrate to ground. Thus, during the operational phases of the Site we expect little net change in the balance of water discharged via surface water or groundwater.

Following restoration, the permeability of the fill material used to restore the Site will be lower than that of the sand and gravel reserve extracted and therefore we expect infiltration rates across the Site to be lower. To mitigate against this, the FRA describes the attenuation ponds and conveyance structures to perimeter infiltration trenches. Thus, the majority of rainfall to the Site will continue to

infiltrate to ground, albeit at the perimeter of the Site rather than within it. Therefore, we also expect little net change in the balance of water discharged via surface water or groundwater.

The letter refers to groundwater contamination. The planning application sets out the mitigation methods to ensure there is no contamination of surface water or groundwater during the operational phases, such as from vehicle fuelling, etc. We also note that the Site will be restored with imported materials under an Environmental Permit (EP). This will provide for any necessary measures, such as attenuation layers, to ensure that there is no discharge of hazardous substances from the imported material to controlled waters and no pollution by non-hazardous pollutants. Thus we do not expect any groundwater contamination as a result of this scheme.

Natural England Letter

Hydrological impacts

The letter makes reference to the risk to Lincegrove and Hackett's marshes SSSI, which shows a natural transition from unimproved pasture through to saltmarsh, and therefore could potentially be impacted by changes to groundwater flows. We note that this SSSI is located to the northeast of the Site. Section 8.5 of Volume 2, Chapter 8 of the planning application shows likely groundwater flow directions from the Site. A relatively small component of groundwater flow is anticipated to the northeast. The SSSI is also to the north of Badnam Creek which is where we would expect groundwater emanating from the northeastern corner of the Site to discharge. Therefore, we do not consider that the Site development will have any significant impact on this SSSI.

With respect to potential hydrocarbon contamination, only two of the 2008 boreholes (BHE/08 and BHG08) recorded suspected hydrocarbon. This could be related to the time when the Site was an operational airfield. Any such residual contamination is likely to comprise longer chained hydrocarbon compounds, sorbed onto soil particles as the shorted chained, more volatile components will have been lost to the gaseous phase and more soluble components to groundwater in the past. Testing for hydrocarbon contamination in groundwater was undertaken in February 2021 at the current monitoring wells (as shown on Figure 8.14 of Volume 2, Chapter 8 of the planning application. Very low concentrations (ranging between 13 and 14 µg/l of C16-C21 Diesel Range Organics) were detected at BHJ/08, W02 and WG08. Such longer chained hydrocarbon compounds are not mobile in groundwater and are very unlikely to pose any significant risk to groundwater away from their source area.

Environmental Management Plan

With respect to an Environmental Management Plan, it is standard practice to operate quarries according to such plans. CEMEX has a long history of operating quarries with high environmental controls and standards in place and we would expect the same operations at this Site.

Sustainable Urban Drainage (SuDS)

We note that the restoration of the Site will be operated under an EP which will stipulate the necessary groundwater level and quality monitoring to be undertaken.

Summary

We trust that the comments made above resolve the concerns raised about the drainage strategy to be employed at the Site. Should you have any outstanding queries, we recommend a meeting to discuss them.

Yours sincerely

Robert Sears

PRINCIPAL CONSULTANT