

Our Ref: Lt.2302016.001.02
Your Ref:



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Dear Catherine

ROYAL ELM PARK, READING – 160199/HYB

Further to the submission of various documents to Reading Borough Council as listed below, and our recent discussions during the meeting on Thursday 15th June, we are pleased to be able to provide a full written response.

1. Discharge of conditions application letter – Barton Willmore now Stantec, dated 30th March, 2023, ref. 32690/A3/CS/slh
2. Royal Elm Park Planning Enactment – Proposals for discharge of Planning Conditions relating to Contamination and Ground Gases – Ramboll, dated 30th March 2023, ref. 1620013486.Version 0.1
3. Additional information re discharge of conditions application 230448 letter – Barton Willmore now Stantec, dated 7th June 2023, ref.35537/A3/CS/JEH/dw
4. A technical letter response - Ref Royal Elm Park, TEC letter dated 19 March 2023, ref Lt.2302016.001.01 – Ramboll, dated 26th May 2023.
5. Royal Elm Park Summary of Groundwater Quality and Ground Gas Results – Ramboll, dated 31st May 2023, ref.1620013486.Revision 4
6. Royal Elm Park Ground Gas Assessment – Ramboll, dated 31st May 2023, ref.1620013486.Issue 1.0

The recent submissions are understood to directly relate to partial (and in some cases full) discharge of conditions applications for conditions 3, 4, 7, 68, 70, 71, 72, and 73, with specific regard to the proposed single pile foundation associated with Phase 1 (Multi Storey Car Park) of the proposed Royal Elm Park development. Therefore, for clarity, Section 1. of this letter provides detailed technical queries/comment related to the above submissions whilst Section 2. responds to the conditions discharge requests. Please also note that Section 3. specifically discusses condition 69, which is relevant to the piling works and will need to be discharged in full, prior to commencement of piling at the site and has not been addressed in any of the above recent communications.

1. TECHNICAL FEEDBACK IN RESPONSE TO THE SUBMITTED INFORMATION LISTED ABOVE

General feedback related to the Geoenvironmental Appraisal of the site (Condition 3 and 4)

The response provided below confirms the technical feedback to all of the above submissions, combined as one response (with reference to the specific documents each query relates to included where relevant).

Within document 2, a brief summary of the 2017-2021 groundwater and ground gas monitoring results has been provided, which confirms that concentrations of key contaminants (Ammoniacal Nitrogen and Potassium), and ground gases methane and carbon dioxide, are consistent with those recorded pre-2017. Comment has also been provided that the risk assessment detailed in the Arup Environmental Strategy is still relevant and appropriate for discharge of Planning Condition 3. Planning



Condition 3 cannot be discharged either partially or fully based on the re-submission of the Arup Environmental Strategy, because the Planning Conditions were applied, following review of this document and therefore re-submission of this original document does not progress the conditions discharge.

As Appendix 3. of document 2. Ramboll have included new report 'Summary of Groundwater and Ground Gas Results' dated March 2023, which has then been superseded by Document 5. Therefore, for the purposes of this response, detailed comments relating to the current version (document 5, dated May 2023), together with the response provided by Ramboll in document 4 listed above has been compiled into the sections entitled 'Groundwater' and 'Ground Gas' below.

Groundwater

To enable partial/full discharge of Planning Conditions 70, 71, 72, and 73 which directly relate to groundwater the following remains outstanding:

- a) Full factual data including all borehole logs, groundwater monitoring results and laboratory test data is required. This should also include groundwater level data from all monitoring locations (including an assessment of the groundwater level monitoring, recorded during the gas monitoring visits as an additional line of evidence). Within document 2. It has been stated that the 2017 Arup Environmental Strategy assessed groundwater and ground gas up to and including 2016; however, within the recent meetings and within TEC's letter dated 19th March 2023, it has clearly been requested that an updated groundwater risk assessment including a full assessment of the groundwater monitoring data from 2015 to the present (2023) should be prepared in accordance with updated and current guidance.
- b) Discrepancies in the monitoring dates listed within the summary tables presented within document 5 have been identified, and no factual data to support the report has been provided. As a best case, the monitoring data has only been assessed up to February 2023, which is now over 4 months ago, so not the most up to date information as previously requested, and further clarification is therefore required.
- c) A full groundwater interpretative report is required which should include as a minimum:
 - Full interpretation of the ground conditions for the site with specific reference to the hydrogeological ground conditions. This data should be presented into a format which is clear and presented in a way which will enable an expedited review of the information which is directly relevant to the proposal for the construction of the first pile. It is recommended that this includes a summary table based on regional data review, ground conditions identified in all phases of intrusive investigation to date, and should also include detailed cross sections of the site;
 - The interpretative report should include confirmation of the ground conditions recorded, response zones and groundwater conditions recorded in each borehole location, together with justification as to why each location has been appropriately targeted to investigate the pollutant linkages identified within the updated conceptual site model for the proposed end use of the site (as requested in Conditions 3, 4 and 7).
 - Full clarification on the groundwater levels recorded across the site is required. For consistency this should be presented in AOD, due to potential discrepancies, which have been identified in the groundwater depths stated in previous reports.
 - A detailed assessment of the groundwater flow direction (s) acting upon the site is also required in order to design the new leachate abstraction well lines, and to design the groundwater monitoring strategy.
 - Full assessment of the regional groundwater conditions, with supporting evidence (from up gradient monitoring locations) of contamination of the regional groundwater with ammoniacal nitrogen, potassium and any other contaminants of potential concern which are believed to be present at background levels and potentially providing contribution from an off-site source is required.
 - A detailed (and up to date) conceptual site model is required, which should be based on the findings of the ongoing groundwater/leachate monitoring.
 - A full list of the contaminants of potential concern, which will be used to determine the background concentrations and applied to the ongoing monitoring regime to set compliance trigger values relevant to the proposed development (and, where relevant the existing landfill permit). It has been confirmed that the current trigger levels focus on ammoniacal nitrogen; however, there are other elevated contaminants of potential concern which do not appear to have been discussed within the recent reporting (such as potassium), which are elevated. Please provide copies of Environment Agency correspondence, which confirms that Ammoniacal Nitrate is the only contaminant of potential concern for which trigger levels need to be agreed (as referenced in Groundwater point 5. of Document 4).
 - Forward modelling to provide an indication as to how the proposed development will affect the current groundwater regime. Whilst it is understood that the current proposal is to create a fully impermeable

capping to the surface of the site, there will be impacts to the groundwater regime following development, caused by the introduction of new capping materials, changes in the geotechnical loading of soils at the site which could impact on leachate and groundwater levels and contaminant concentrations and flows.

Ground Gases

To enable full discharge of Planning Condition 7, which directly relates to ground gas the following remains outstanding:

- a) For the purposes of this planning application and discharge of the associated Planning Conditions, the ground gas risk assessment should focus on the potential risks to current and proposed end users of this site and any identified off-site receptors which may be impacted by contamination sourced from the site, rather than for the purposes of compliance with the existing landfill permit. It has been noted that insufficient data has been provided for the gas risks across the surface of the landfill, with the majority of the monitoring undertaken to date from perimeter locations for the purposes of permit compliance. Whilst the monitoring data for the permit provides useful background information, this is not necessarily directly relevant to the current or proposed end users of the site or the gas levels which will be present immediately below the proposed buildings and structures on the site, therefore an updated ground gas investigation focussed on the body of the landfill site and associated gas risk assessment is required.
- b) Please provide full and up to date factual data for the site, which includes details of all of the borehole installations, depths of response zones and confirmation of the purpose of each monitoring location, installation and targeted response zone. Please also provide a full summary of which boreholes are currently being monitored, which are no longer serviceable, and reasons for the selected monitoring frequency and locations.
- c) The factual data submission should also include ground gas monitoring up to the present time, which has been undertaken in accordance with current guidance and best practice, for example British Standards, CIRIA, CL:AIRE, NHBC Foundation etc.
- d) Given the likely complexity and risks associated with redevelopment of landfill sites, it is strongly recommended that as well as periodic ground gas monitoring, multiple lines of evidence are gathered to assist in the development of a robust ground gas risk assessment. This approach is outlined in various recent guidance documents such as CL:AIRE RB13 (The utility of continuous monitoring in detection and prediction of 'worst case' ground-gas concentrations), RB17 (A pragmatic Approach to Ground Gas Risk Assessment), TB17 (Ground Gas Monitoring and 'worst-case conditions'), and TB18 (Continuous Ground-Gas Monitoring and the Lines of Evidence Approach to Risk Assessment).
- e) A full interpretative gas risk assessment report is required, which presents the borehole hazardous gas flow rate (Q_{hg}) for each borehole location and then a gas screening value (GSV) based on the Q_{hg} data and takes consideration of the Conceptual Site Model (CSM) and any other additional lines of evidence to provide an overall worst-case classification for the site, or zones of the site in accordance with the above listed guidance and best practice.
- f) It is expected that full details of each of the proposed structures including the structural details, building use (for example commercial/residential/retail etc) and, where relevant, proposed management regimes will be provided, and that each building type will be correctly classified into the structure outlined within BS8485. This has also been identified as a requirement within section 10.3.2 of the original Environmental Strategy.

Specific comments regarding the review of ground gas monitoring outlined within Document 5 are as follows:

- A statement has been provided in 3.1 which confirms that the ground gas assessment included with the report is for indicative purposes only and not intended for use as a detailed ground gas risk assessment. It is not clear, therefore why this document would assist in the partial or full discharge of Planning Condition 3, 4 and 7.
- Please confirm which monitoring wells are combined/dual screened and which are being monitored for gas only, together with the monitoring strategy (i.e. process for each monitoring visit) for the site.
- Please confirm where monitoring well V is located as this could not be identified on the Monitoring Boreholes Location Plan.
- It would be useful for reference, to be provided with a copy of the Environmental Permit monitoring requirements so that these can be cross referenced against monitoring requirements for compliance with BS8485.
- Within 2.6 comment has been provided, that gas concentrations and flow rates presented in the report are steady state. Please provide justification as to why only steady state concentrations have been reported (particularly for methane) when peak concentrations may be more appropriate to assess the short term/acute risks of, for example, ignition of methane causing an explosion.

- Gas monitoring data has only been summarised up to June 2018 for the GW series monitoring wells. Please confirm why recent data has not been assessed and  monitoring wells are no longer being monitored, please provide justification as to why this is the case.
- Within 2.6.2 only gas monitoring results from R, S, T and U have been assessed, and there is no reference to the dates for the data assessed  these locations. Please also confirm the dates for monitoring undertaken for the perimeter wells (2.6.3).
- As more general feedback, please confirm why recent gas monitoring does not appear to have been undertaken/assessed from the body/surface of the landfill, which is directly relevant to the contaminant linkage which would affect proposed structures on the site through vertical migration of gas. 
- Please provide further details as to how the 'conservative case' scenarios been categorised within Table 3.1. Is this based on site locations, expected source, zones within the landfill, proposed end use or another factor - as this detail is not clear from the report. Following on from this, how have the GSVs been calculated? Please present the factual data clearly and provide detailed assessment of how conclusions have been drawn as to the conservative worst case GSVs for parts of the site. Please also provide comment where data has been discounted/considered to be non-representative and the reasons why. Inconsistencies have been identified within the data presented in Tables 2.1-2.3 and 3.1, which is not possible to check, because no factual data has been provided (for example the worst case flow rate of 5.4 for perimeter wells A-O and V in Table 3.1 is not identified within Table 2.3). 
- Within the results and discussion section, there is no reference to the building types which are proposed for the site (with reference to Table 3 of BS8485). There is also comment that Characteristic Situation 5 (CS5) is applicable for industrial/commercial and high-rise residential development, which is not necessarily the case. Standard high rise residential buildings would fall under Type B building classification and would not usually be suitable to be constructed on a site with Classification of CS5 or above. It should be noted that as laid out within BS8484, active gas protection measures are unlikely to be acceptable for any proposed private residential dwellings, due to potential maintenance liability issues following occupation, and the health and safety impacts in the event of a system failure, which could result in the necessity to evacuate proposed buildings and structures.
- Due to the fact that there has been minimal recent monitoring from locations targeting the landfill mass (most of the historic gas monitoring data relates to perimeter monitoring locations which have been installed for the purposes of the landfill permitting requirements, rather than to gather data relevant to the CSM for the proposed site redevelopment), the Ground Gas Assessment is not considered to be sufficiently robust to enable partial or full discharge of any of Planning Conditions 3, 4 and 7.

2. APPLICATION TO FULLY OR PARTIALLY DISCHARGE CONDITIONS 3, 4, 7, 68, 70, 71, 72 AND 73.

Referring back to the application to discharge specific contaminated land conditions in turn we are able to provide the following response:

Condition No. 3 (Site Characterisation) – for full discharge

Throughout the above submissions (Documents 1-6) there is reference to the Arup Environmental Strategy Report 'Environmental Strategy, Rev C, dated 7 December 2017'. Which has been re-submitted in support of discharge and partial discharge of conditions relating to the installation of a single pile within the footprint of the multi storey car park within Phase 1. Whilst re-submission of this original document is useful as background information, it should be noted that the planning permission was granted, and conditions (including Condition No 3) were applied in response to this original 2017 Environmental Strategy. As a result, re-submission of this document does not progress the discharge of Condition No. 3.

Within the objectives of the Environmental Strategy (1.1 Objective), it is stated that the primary objective of the report was to assess risks and potential environmental impacts predominantly to groundwater, associated with earthworks and piling for the proposed redevelopment. The conceptual site model (CSM) presented within the Environmental Strategy only covers the potential (and identified) pollutant linkages associated with piling and earthworks during the construction phase. This document is therefore not sufficient to address the requirements of Condition No. 3, which relates to the potential pollutant linkages associated with the completed future development rather than the specific environmental risks associated with the piling and earthworks.

To enable full discharge of this Condition please provide a full and updated Stage 1: Risk assessment of contamination (including both gas and groundwater) in accordance with current and up to date guidance such as current British Standards, LCRM and other authoritative guidance. This report should include a summary of the previous ground investigations and assessments undertaken for the site, full details and interpretation of the existing factual information pertinent to the site and all monitoring data up to the present time.

Please also note that the primary focus of this assessment should be for the identified receptors associated with the proposed redevelopment of the site, and not based on the requirements of the ongoing environmental permit monitoring. It may therefore, be necessary to undertake additional investigation and characterisation of the development site with a renewed focus on the current status of the landfill mass with regards to the contamination impacts on future site users, rather than monitoring the perimeter for migration of leachate and ground gas to potential off-site receptors.

Condition No. 4 (Submission of Remediation Scheme) – for full discharge

Following completion of the additional assessment of the site in accordance as outlined within Condition No. 3, a detailed LCRM compliant Stage 2: Options appraisal and Stage 3: Remediation Strategy is required, which will bring the site to a condition suitable for the intended use by removing unacceptable risks to human health, proposed buildings and structures and the natural and historic environment. Please note that as stated within Condition No. 3 above, re-submission of the Environmental Strategy by Arup dated 7th December 2017 does not address this condition, as the condition was applied following review of the Environmental Strategy to request additional information.

Condition No. 7 (Long Term Management, Monitoring and Maintenance – 7 (a) in full, 7(b) and 7(c) for partial discharge.

Condition No. 7 follows on from the updated site characterisation assessment and remediation scheme for the site, referenced within Condition 3. and 4. Therefore, all of these conditions are linked and should be discharged in sequence, if Condition 3 and Condition 4. Have not been discharged, Condition No. 7 cannot be discharged either. A management plan for the proposed development outlining the following details has not yet been provided and should include:

- Frequency and type of monitoring of ground gases to be undertaken to include on and off-site gas migration;
- Frequency and method of reporting the results; and
- What remedial actions will be taken in the event of results and readings showing a worsening of earlier readings.

As a result of the above, Condition No. 7(a) cannot be discharged in full at this stage.

A management plan detailing the proposed gas mitigation measures for the buildings, type, and frequency of monitoring within the buildings and the operations and maintenance procedures/regime for the proposed mitigation measures cannot be prepared or approved until Conditions 3 and 4 have been addressed therefore Condition No. 7(b) cannot be partially discharged at this stage.

As Condition 7(a) and 7(b) cannot yet be discharged partially, or in full, Condition 7(c) remains applicable to the development, as this relates to the management company who will undertake the monitoring, reporting, management, and maintenance of the for the gas protection systems, which has not yet been confirmed.

Condition No. 68 (Piling) – for partial discharge

Full details for the proposed piling method have not been provided to date, part (a) and (b) of this condition relate to the same information required to discharge Conditions 3 and 4 discussed above, and also to Conditions 69 – 73 discussed below. Therefore, these parts of the condition cannot be partially discharged at this stage. The summary included within section 1.4 of document 2 is not considered to be sufficiently detailed to enable partial discharge of this condition specifically related to the single pile within Phase 1 of the development.

Please confirm whether the installation of the single pile will be undertaken under independent supervision/inspection by a suitably qualified third party to ensure that the pile is installed to the correct depth and that all environmental control measures to prevent any breaches of the impermeable strata underlying the landfill are reported and, if required, remediated to prevent impact to groundwater.

No comment has been provided as to how the landfill capping will be re-instated between completion of the installation of the first pile and completion of the associated floor slab. Will a temporary landfill capping system be installed, how will this installation be verified, what is the CQA process for these works and have the EA requested a permit variation be completed for these works. Please provide written confirmation from the EA of their approval of the suggested Planning Enactment Works, both in terms of this planning application and the existing Environmental Permit.

With regards to part (c) of this condition, it is not clear from a review of the information submitted to date, that a clear understanding of the ground conditions underlying the landfill mass have been defined thoroughly enough to plan the proposed piling depths. As stipulated within Section 7.1 of the Environmental Strategy and outlined within Condition 7 (c), piling will not penetrate further than the maximum of 3m into the underlying Lambeth Group. Therefore, part (c) of the condition cannot be partially discharged at this stage until additional information is submitted.

Condition No. 70 (Groundwater monitoring plan) – for partial discharge

From review of the submitted information, partly because borehole logs do not appear to be available, it is not clear what the proposed monitoring plan for the two aquifers below the site is likely to be. As a reminder, the requirement is to undertake 3

sets of groundwater monitoring in the River Terrace Gravels in 4No. locations, and from 2No. chalk boreholes at monthly intervals at least 2 months prior to commencement of construction (in this case for the purpose of installing a single pile). During construction the same boreholes should be monitored on a monthly basis until the site surface (capping) is safely re-instated on completion of the construction phase. Following completion of construction, monthly monitoring should be undertaken from the same locations (relevant to each phase) on a monthly basis for 12 months on completion of the ground slabs.

Generally speaking, best practice is to undertake such monitoring from at least 1No. upgradient and 2No. downgradient monitoring locations to determine both background concentrations and the concentrations of leachate contaminants migrating from the potential landfill source. Due to the fact that the groundwater flow direction has not been defined and it is not clear which boreholes are proposed to be monitored, specifically covering the area of the Detailed application site, further information is required, which includes justification for the selected monitoring well locations with regards to the potential groundwater flow direction and phasing approach.

Part (b) of this condition cannot be partially discharged, until the overall monitoring plan has been agreed, due to the fact the Action Plan is linked to the groundwater monitoring plan. The required action plan has also not been submitted for review at this stage.

It is acknowledged that the first pile is likely to be installed significantly in advance of continuation (and completion) of construction on the site. However, a detailed strategy is still required to confirm any temporary works, which will be undertaken on completion of the pile, to mitigate against the short to medium term impact on the landfill capping system. Only after this has been approved can partial discharge of Condition 70 in relation to the single pile construction be considered.

Condition No. 71 (Groundwater trigger values) – for partial discharge

Proposed trigger values for groundwater monitoring have not yet been agreed for the following reasons:

- As noted above, proposals to install the new leachate abstraction wells across the site have not yet been received or approved therefore deciding on which monitoring wells are appropriate to undertake the long-term monitoring from is not possible at this stage.
- The overall groundwater flow directions at the site have not been sufficiently defined to design the monitoring approach and to determine background concentrations of Contaminants of Potential Concern (CoPC). It has been noted within Section 3 of Document 5 that groundwater flow directions at the site will be established and used to confirm which boreholes require trigger levels; however, within Document 4 (Groundwater 8.b.) it is stated that further assessment of groundwater flow directions is not required, please provide further comment.
- Further to our recent discussions, it is possible that detailed borehole logs are not available for many of the existing monitoring well locations, please provide the available information to accompany the report and support the justification of which monitoring wells are relevant to each aquifer type.
- Trigger levels do not appear to have been produced for locations U, V and BH1-BH3, please provide further comment.
- The locations for the selected groundwater monitoring locations have not yet been agreed (insufficient information has been provided to confirm which boreholes will be selected relevant to the Detailed application site and the single pile (including 4No. locations targeting the River Terrace Deposits and 2 No. locations targeting the Chalk), including at least 1No. upgradient and 1No. downgradient of the site.
- Confirmation is required as to why only ammoniacal nitrogen is considered a CoPC in terms of the groundwater monitoring. Review of the monitoring data to date indicates that other potential CoPC's have been identified within the permit compliance monitoring which has been undertaken to date. Please provide copies of any communications from the EA confirming that Ammoniacal Nitrogen is the only CoPC in relation both to the Environmental Permit and in relation to this planning application.
- It has been noted that concentrations of ammoniacal nitrogen within the groundwater have been rising, since the nearby brewery abstraction well ceased in 2009/2010. Further information is required to substantiate this theory, and also to confirm the mitigation strategy in the event that levels of ammoniacal nitrogen rise further during construction.
- Within the May 2023 Summary of Groundwater Quality and Ground Gas Results report by Ramboll, only a summary of the data has been provided. A full copy of all the available factual data is required to accompany the main report.
- It is noted that Leachate Wells LW01, LW02 and LW03 have not been monitored since 2018 therefore in terms of a summary of the recent monitoring data, these locations are not considered to be representative of current conditions at the site. A summary of the monitoring results from locations screened within the River Terrace Gravel has been provided up to February 2023, please provide the original factual data to accompany the summary report. Review of

Graph 4.2 appears to indicate that some of the locations are no longer being monitored. Full justification as to why this is the case is required.

- Wells screened into the more permeable layers within the Lambeth Group and the Chalk have been assessed as one potential groundwater receptor. Given the requirement specifically to undertake monitoring from 2No. monitoring wells targeting the chalk further clarification is required. A summary of the monitoring results from locations screened within the Lambeth Group and Chalk has been provided up to February 2023, please provide the original factual data to accompany the summary report. As with Graph 4.2, it has been noted within Graph 4.3 that several of the monitoring locations within the permeable bedrock are no longer being monitored. Full justification as to why this is the case will be required.
- Given the observed fluctuations in concentrations of ammoniacal nitrogen in the summer and winter months, please provide further comment as to the likely impact on the trigger levels which will be relevant at the time of construction and how the potential seasonal variation in trigger levels will be accounted for within the pile construction method statement for the site.
- Please check the borehole references for consistency throughout the report as referencing does not appear to be consistent (for example is BH2 the same as BH02 within the main table and the notes section of Table 5.2?). Please also check the monitoring dates which have been listed in the top row of the summary tables for consistency (for example Table 4.2 confirms results between 2016 and February 2023 and Table 5.2 confirms maximum trigger levels between 2016 and 2021, the same discrepancy has been identified within Table 4.3 and 5.3). If trigger levels have not been calculated for the monitoring undertaken between 2021 and 2023, please confirm why this is the case. Trigger levels should be based on the most recent data, and as stated within the Environmental Strategy this should be data from the 3 months immediately preceding the commencement of construction works.
- The derived trigger values should be agreed with the LPA at least 3 months prior to commencement of construction, therefore in order to commence piling works prior to the November deadline, these trigger values will need to be agreed prior to the end of August 2023.

Condition No. 72 (Groundwater action plan) – for partial discharge

The final detailed Action Plan as specified within 11.2.5 of the Environmental Strategy has not been provided either for the entire site or the part of the site covered within the Detailed application boundary. The Action plan referred to within 11.2.5 is an 'outline summary', and a final Action Plan therefore remains outstanding. Therefore, this condition cannot be partially discharged at this stage.

Condition No. 73 (Groundwater dewatering system) for partial discharge

As outlined above, substantial information relevant to the strategy for the groundwater/leachate dewatering system remains outstanding and it is not clear whether the EA are satisfied with the current proposals. Until this has been agreed, the full dewatering/leachate abstraction system cannot become operational, and inspections of the system cannot be undertaken by either the EA or RBC, therefore this condition cannot be partially discharged at this stage.

Ramboll have confirmed that Line 4 (or Section 4) of the existing Perimeter Dewatering Well Points will be the only section brought into readiness for the proposed initial piling installation. Review of the location of this section of perimeter dewatering wells indicates that whatever the direction of groundwater flow in the location of the proposed pile, this line will not surround the perimeter of the proposed pile location and will therefore not be effective in drawing down leachate to the base of the landfill mass in this area, for the duration of the works.

With regards to the proposal to discharge landfill leachate directly into the foul sewer, please provide copies of the relevant environmental permits and discharge consents for this activity together with details of any pre-treatment requirements for the leachate.

3. PLANNING CONDITION 69 REQUIREMENTS

In addition to the above, during a re-review of the original Application for Full Planning Permission in the context of the proposed works, it should be noted that condition 69 is also applicable for the purposes of the installation of a single pile within the Phase 1 part of the development and has not been discussed within recent communications. For ease of reference a summary of the outstanding information required to fully, or partially discharge of this condition is provided as follows:

Condition No. 69. (Leachate extraction prior to piling)

No piling shall take place until the new leachate abstraction wells are installed within the full depth of the landfill waste across a) the Detailed (north eastern part of the development site) and then Outline stages (south western part of the development site) of Hybrid Planning Application 160199 (as outlined in red on Planning drawing 24116-RG-M-A155 Rev A) and the leachate collection system is operational.

As background to this condition, please also cross reference the Environment Agency (EA) letter response ref. WA/2016/122101/07-L01, dated 13 February 2018, which confirms that the proposal from Arup to install the leachate abstraction wells in a multi-phase approach is not acceptable. The stated reason for this is, that in order to protect the underlying aquifers, the EA requires the developer to pump out all the leachate from the landfill site, prior to commencement of piling. The EA have agreed to a 2-phase approach to this work, but not to a multi-phase approach, because multiple phases are likely to be small, and technically it will be extremely challenging to draw down leachate from a phase of limited area/volume, without also drawing down the leachate from the wider site, which would potentially continue to re-charge throughout the abstraction process. This could result in difficulties in achieving sufficient drawdown of the leachate prior to commencement of piling.

The proposed single pile location is within the Detailed (north eastern part) of the application site, when considering the agreed 2 phase approach. Therefore, as a minimum, to allow partial discharge of this condition specifically for the purposes of installation of the first pile, it will be necessary to provide full details of the new leachate abstraction wells proposed across the Detailed application area. Following submission (and approval) of this documentation, it will then be necessary to ensure that the agreed leachate collection system is operational, with the above agreed by the local planning authority prior to commencement of the piling works (for the single pile). An approach to verification and Construction Quality Assurance (CQA) process of the leachate extraction system installation and operation has yet to be agreed, therefore further information is required.

We would also bring to your attention reference within the Arup Environmental Strategy (pg. 12) to 'new deep leachate collection wells which will be installed into the historic land raise waste locally to each phase of the development'. Section 10.1.2 also indicates that 'new leachate collection wells will be constructed to the base of the historic land raise to remove leachate from the full depth of waste material'. This is also referenced by both the EA in the letter dated February 2018, and within the original condition wording reference to 'new' leachate abstraction wells, indicating the expectation at the time the planning permission was granted, that additional leachate abstraction wells will be specified and agreed and then operational across the entirety of the Detailed (north eastern) application site. This is also noted within the above referenced Environment Agency letter which confirms that as of February 2018, the EA did not know how many leachate collection wells the developer proposes to put across the site, suggesting that significant additional information was required to follow on from the Arup Environmental Strategy, which was dated December 2017. Please, therefore provide the outstanding information, in advance of the commencement of piling works (including the first single pile in a limited part of the site).

We have also noted that the location of the proposed first pile is very close to the Outline application boundary in south western part of the site, and that the practicalities of drawing down leachate only from the Detailed application site will be challenging in the context of the first pile. It may be more practical, and less technically challenging to select an alternative pile location (further from the Detailed application boundary) within the Detailed application site. Alternatively, given the time constraints associated with enacting the planning application (it has been stated that the enactment works are programmed to commence in July 2023), it may be necessary to consider an alternative enactment approach to piling, which does not include penetration of the landfill capping, or base of the landfill mass, therefore not potentially impacting on the underlying aquifers over the short to medium term.

4. SUMMARY

As a general observation, it would be highly unusual for a site to be redeveloped (particularly for residential end use) and handed over to end users in advance of an Environmental Permit surrender. This is mainly from the perspective of the ongoing liabilities associated with a landfill site with an active Environmental Permit, and how these liabilities would be transferred to building owners/residents. Within some monitoring locations, the Characteristic Situation (CS) for gas is as high as CS5, and the Environmental Permit Surrender Application cannot be submitted until monitoring results over a period of 24 months are CS2 or lower, it would therefore be useful to provide an estimate of the time duration for permit surrender to be achieved.

The current proposals could also cause challenges in achieving compliance with the Building Regulations (in particular Part C of the Approved Documents) in due course, as any potential failures in the ongoing landfill gas and leachate management and monitoring systems could result in an imminent Health and Safety risk (and the potential for evacuation requirements) for the end users of the buildings, which could prevent issue of Building Control final certificates on completion of construction.

Of particular concern are the proposals to link the landfill capping membrane and construction to the gas protection measures proposed for the buildings and structures on the site. This would, in effect mean that the proposed structures form part of the landfill capping system, which is likely to present issues with ongoing liabilities for both building end users, and the landfill permit holder, in the event of any failures of the landfill capping system. Failures could be caused by construction of the proposed development in the short term, and any ongoing and long term developmental issues such as differential settlement of the landfill (which could be caused by a number of factors including changes to the groundwater regime, adjusting the finished site layout and changing the final levels at the site during any proposed earthworks etc, together with adjusting the drainage and surface water discharge system at the site, to enable the proposed development). Differential settlement around the margins of any piled structures (which may also need to include drainage) could apply tension (and cause failure) at the junctions of the

landfill capping membrane and the gas resistant membrane applied to the footprint of the structures on the site thereby causing breaches of the landfill capping.

As a result of the above, it is strongly recommended that engagement with any such stakeholders is undertaken alongside engagement with the Local Authority and EA through the planning and Environmental Permitting processes.

Yours sincerely



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For and on behalf of
TEC

