Environment Agency
Permitting and Support Centre
[redacted]

7745/Red/DAW295-21

For the attention of [redacted]

13 April 2021

Dear [redacted]

WALLEYS QUARRY LANDFILL SITE – APPLICATION NUMBER: EPR/DP3734DC/V003

Further to receipt of the Schedule 5 Notice of request for more information, relating to the above application.

We set out below our response to the queries raised using the same nomenclature as the Notice.

Hydrogeological Risk Assessment (HRA)

Items 1 to 7 - please find enclosed/attached an updated version of the HRA which includes the information requested. We also attach a pdf document that points you to the relevant sections of the report that address the queries raised in the Notice.

Leachate Management Plan (LMP)

Item 8 – please find our response below.

The current status of each well is set out in the table below, this identifies that 5 No. wells are currently used for monitoring/collection/extraction and 4 No. for monitoring, with 2 No. blocked.

Cell	Well Reference	Monitoring or Collection	Pump (Y/N)
1	WAL_LS1B	Monitoring	Blocked
1	WAL_LS2B	Monitoring	Blocked
2	WAL_LS3	Monitoring	Y
2	WAL_LS4	Collection	Y
2	WAL_LS5	Monitoring	Y
3	WAL_LS6	Collection	Y
3	WAL_LS7	Monitoring	N
4	WAL_LS8	Monitoring	N
4	WAL_LS9	Collection	Y

Cell 1 originally had a sidewall riser installed as the designated collection point. However, this was laid at an angle such that it had to be terminated to facilitate the upper section of sidewall lining being installed.

Cell 2 has the requisite 1 No. collection point and 2 No. monitoring points. Regarding Cells 3 and 4, we believe that due to the small basal area for each cell only 1 No. collection point and 1 No. monitoring point were constructed. This must have been done with the knowledge of the EA at the time as both the CQA Plan and CQA Validation Report were agreed prior to and post construction. Each of these cells has a concrete Target Pad installed but these are located adjacent to the collection point.

As noted in the table above LS1B & LS2B are blocked and unable to be used for either monitoring or extraction. These chambers are both re-drills to replace previous failed chambers LS1A & LS2A (also re-drills). These further failures clearly demonstrate that re-drilling of chambers at the site is not effective during the operational phase of the site and it is therefore proposed that any re-drill or installation of additional wells is undertaken once waste placement in their proposed location is completed.

Currently raw leachate is extracted via electric submersible pumps installed in WAL_LS3 (leachate monitoring point) in Cell 2, WAL_LS4 (leachate collection point) in Cell 2, WAL_LS5 (leachate monitoring point) in Cell 2, WAL_LS6 (leachate collection point) in Cell 3 and WAL_LS9 (leachate collection point) in Cell 4. The electric submersible pumps are float controlled and are fed from mains power. The leachate is pumped to a 30,000 litres steel bunded leachate storage tank located on Cell 1 via pipework. Leachate from the leachate storage tank is pumped to the bunded 80m3 Raw Leachate Balancing Tank (RLBT) located in the Leachate Treatment Plant (LTP) compound. From the RLBT leachate can either be tankered off site to a suitably licenced facility or can be fed to the LTP for treatment with the treated leachate being discharged to sewer via effluent.

Stability Risk Assessment (SRA)

Items 9 to 13 - please find enclosed/attached an updated version of the SRA which includes the information requested. We also attach a pdf document that points you to the relevant sections of the report that address the queries raised in the Notice.

ICoP Variation

Item 14 a) - The requested Appendix 2 of the Annual monitoring report dated January 2020 contains landfill gas monitoring data collected during 2019 review period as per the Permit Schedule 3 Table S3.5 LFG in external monitoring points. The Appendix is enclosed.

Item 14 b) - The 'ICoP variation' refers to an application to vary assessment criteria for methane in borehole 17d and carbon dioxide (CO2) in perimeter monitoring points. Landfill gas Management Plan (ref: EEL.7745.R03.002, February 2020), contains in section 4.3.1 the statistical analysis of the gas monitoring data (CH4 and CO2) using the reference method in ICOP: Perimeter Soil Gas Emissions Criteria and Associated Management (January 2011) in reference to Technical Report P1-471 Techniques for the Interpretation of Landfill Monitoring Data.

The statistical analysis of the 22-month CO2 data set (January 2018-October 2019) is enclosed with this document. Also enclosed is a clarification on the proposed CH4 assessment level in borehole 17D.

Below is an example of how the outliner test has been applied. Please refer to ICOP CO2 Assessment.pdf, which is enclosed.

<u>CO2 in WAL_104</u>

- Mean value of CO2 dataset: 0.433;
- Standard Deviation (SD) of CO2 dataset: 0.679;

- Standardised data values: mean value was subtracted from each data value and then divided by the SD. For example, the standardised values of 0.1%v/v CO2 is -0.491 and 2.8%v/v CO2 is 3.485.
- No. of data points (background data): 18;
- Critical value (P=1%) for 18-point dataset:2.88 (Taken from Report P1-471);
- Most Extreme standardised value of 3.485 is greater than the Critical value (P=1%) of 2.88 and is an outlier. The 2nd most extreme value 1.129 is less than the Critical value (P=1%) of 2.88 and is not an outlier. Therefore, the second highest concentration which corresponding to the 1.129 standardised datapoint is 1.2%v/v CO2 and is the true Tmax concentration.

The same approach was applied when assessing the background concentration of methane (CH4) in borehole 17D. This monitoring location is known to periodically detect methane in elevated concentrations even before the landfill operations began on this site in 2006. Therefore, it is important to set up the appropriate assessment level. The ICOP assessment of methane used an extended 140-point dataset of the monitoring data from April 2008 to October 2019. The assessment results are shown in ICOP CH4 Assessment.pdf, which is enclosed.
Based on the assessment of true Tmax, the Action Level for CH4 should be set based on stable datasets as shown in Table 6a (Tmax +0.5%). Therefore, we seek to make a correction to the Action Level proposed in Table 7 in the LFG Management Plan (from 6.2% to 6.7%).

Table 7:Proposed CH_4 Action Level in Perimeter Borehole BH17D (based on a 140-month data set)

Monitoring Point	CH_4 Tmax (%v/v)	Action Level CH_4 (%v/v)
17D	6.2	6.7

Gas engine – Air emissions impact assessment (submitted on 15 January 2021)

Item 15 - The information which is pertinent to air quality risk assessment can be found in the following submitted documents:

1. Stack Gas Emissions Impact Assessment (EEL.6246.R04.002, December 2020) and the accompanying Appendices
2. LFG Risk Assessment (EEL.7745.R03.001, February 2020)
3. LFG Management Plan (EEL.7745.R03.002, February 2020)

In particular, the combustion emissions points are located in the Gas Unitisation Compound as shown drawing 5883.GA.D02.

The proposed 4th engine will be a 625kWe Jenbacher (JGS312 GS-L.L). It will operate at 75% capacity (500kWe) during 97% of time from 2021.
Technical parameters of the 4th gas engine used in Gassim are summarised below:

Coordinates	Capacity(m3/h)	Exhaust Height (m)
383258 345845	213-303	7.3

A list of the nearest human receptors is provided in Table 2 Walleys Landfill Site – Local Receptors, in the LFG Risk Assessment report. Their locations are shown on Drawing EEL.7268.D03.001 also included in the LFG Risk Assessment.

The gas risk assessments (documents 1 and 2 above) were carried out for local receptors, which include human receptors in domestic dwellings and other occupied buildings, general public accessing the adjacent cemetery, garden centre, allotments and green fields/grazing paddock. There are no ecological designated areas and other sensitive habitats within 5km from the Site.

The site boundary was also set up as a receptor in Gassim 2.5. The Tier 1 module of Gassim uses Environment Agency AQMAU defined criteria to screen out insignificant impacts; for which the model uses the distance between source and receptor. Tier 1 emissions screening was carried out for the site boundary (as a receptor) and those discreet receptors which are situated at the shortest distance from the gas plant and the operational area. Those gases which were not screened out as insignificant, were further modelled in Tier 2 atmospheric dispersion modelling at the site boundary. The results of this staged risk assessment showed that short-term and long-term ground level concentrations of NOx and SO2 along the site boundary did not exceed the relevant air quality standards. This in turn means that the proposed addition of the fourth gas engine (of a smaller capacity plant which will be operated at 75% of its capacity) will continue to have low and insignificant impact on local air quality. There is also no need to carry out further Tier 3 detailed dispersion emissions modelling of the stack gas emissions points at this site.

Gas Engine Noise Risk Assessment

Item 16 - please find enclosed/attached a Noise Risk Assessment which includes the information requested.

We trust the above and enclosed adequately addresses your Schedule 5 request. However, if you have any questions regarding the above/enclosed or require any further information please do not hesitate to contact me.

Yours sincerely,

[redacted]

[redacted]
Managing Director
Egniol Consulting Ltd.