i) REQUEST FOR ADDITIONAL FEE

Prior to submitting the application, Enovert sought advice via the Environment Agency's permit support centre. The breadth and scope of the application was outlined, and we were advised that the variation would be a standard variation – hence the fee submitted.

Whilst we agree that there are a number of areas of the permit which we are looking to amend, of the 10 changes referred to in your letter (ref: EPR/PP3939DN/V006, dated 23rd October 2020), several of them are simply re-arrangement of submission dates; removal of redundant conditions; or the proposing of new monitoring locations to replace ones which are no longer present (i.e. SW monitoring locations).

Notwithstanding this, we will forward the balance of the fee required based on us having already paid £11,388 of the £20,498 fee for a substantial variation. This leaves a balance of £9,110 to pay, which will be transferred electronically as per the initial payment.

ii) HABITAT ASSESSMENT

Given the nature of the changes, the degree of environmental protection already in place, and the absence of any requirement to undertake assessments under the Habitats Regulations during previous permitted operations at Barling, we had not envisaged that any additional assessment would be required. However, we acknowledge the Environment Agency's desire for such an assessment to undertaken and agree to pay an additional fee of £779 to cover this process.

This will be added to the outstanding application fee payment (£9,110) making a total additional payment of **£9,889**. As per the payment details set out in Form F of the application, the reference for the payment will be **PSCAPPENOVE393**.

1) FINANCIAL PROVISION

In view of the proposed changes you need to provide updated expenditure plan for Financial Provisions to take account of the proposed changes. No assessment has been undertaken to determine whether proposals will result in increasing the length of the aftercare period. It is possible higher leachate head will saturate the waste which could slow the rate of biodegradation of waste.

Having reviewed our existing provision for the long-term aftercare of the site, we can confirm that it is not affected by any of the changes requested in the application. The provision currently in place, continues to fully meet requirements, and has adequate cover to cope with the full aftercare period. At the time of permit application, it was always envisaged that the long-term leachate management scenario for the site would be one where groundwater levels had fully rebounded, and site leachate levels had risen above the level of the groundwater. The financial provision agreed with the Environment Agency at the time of permitting covered such a scenario, as well as effects associated with these conditions (i.e. landfill gas generation), and the proposals made in our application remain consistent with this.

Landfill gas generation rates are generally predicted using Gassim, a software tool developed for the Environment Agency in order to provide a systematic and consistent approach to LFG modelling. The model predicts LFG generation rates based on waste composition, waste quantities, waste input rates, and site operational controls, and allows the Operator of a facility to ensure that LFG collection and management infrastructure is sufficiently sized to maintain effective control over LFG.

Gassim has options for variable modelling of waste moisture contents, which allows comparisons to be made as to the effect of waste saturation (i.e. by leachate) on LFG production. Enovert have carried this out for a range of waste moisture contents, the results of which are shown in the graphs and tables below.

Figure 1 (below) shows the LFG generation rates when modelled using a range of waste moisture contents including 'dry', 'wet', 'saturated', 'super wet' and 'average'. In addition, as a check on the accuracy of the model, the actual rate of LFG extraction is plotted as well. It is clear from the graph that whilst there are differences both in the timing and peak of LFG generation rates, the curves are broadly consistent, with little overall difference. What is evident is that a wetter waste mass means the peak LFG production rate is earlier and greater, but subsequent residual LFG generation rates are lower. The drier the waste, the lower and later the peak LFG production rate is, but the subsequent residual rate of production remains higher for longer. What is important is the total LFG volume generated (which can be represented by the area below the plotted curve) remains the same. The waste retains the same biodegradable component, and can only generate a set volume of LFG, but the rate at which it does so can change.

Figure 2 (below) shows the same curves, generated from the same modelling, but extended forward (until 2063) to show a fuller picture of long-term residual LFG production. The data used to generate the curves in Figures 1 and 2 is presented in Table 1.

The following can be deduced from this exercise;

- The actual rates of LFG extraction measured at the site compare favourably with the modelling, especially when an 'average', 'wet' or 'super wet' waste moisture content is used.
- Wetter waste returns a greater and earlier peak of LFG production, ***but a lower residual production rate***.
- The modelled peak of LFG production at Barling occurred almost 10 years ago (2012) and LFG generation rates at Barling are reducing.
- Similarly, the rate of LFG extraction peaked around 5 years ago (2015) and is reducing.
- In terms of long-term aftercare (and therefore financial provision), a wetter waste mass results in a lower long-term LFG generation rate, requiring less infrastructure and less LFG management costs. The existing agreed level of financial provision currently in place is therefore considered adequate.

2) MONITORING DATA

Please provide electronic copies of the raw monitoring data and geographical plots used in the application in excel format:

- *leachate level and quality monitoring data (where relevant);*
- *groundwater level and quality data; and*
- *surface water quality data*

A full and comprehensive routine of environmental monitoring has been ongoing since the initial development at the site began. This constitutes a significant volume of data which, certainly in the early days, is not readily available in excel format. We have collated all surface water, leachate and groundwater sampling results, as well as all leachate depth measurements, for the period 2008 to present, and these will be forwarded to the Environment Agency electronically.

FIGURE 1 - Barling LFG Generation Rate (m³/hr) - for a range of waste moisture contents (MC%)

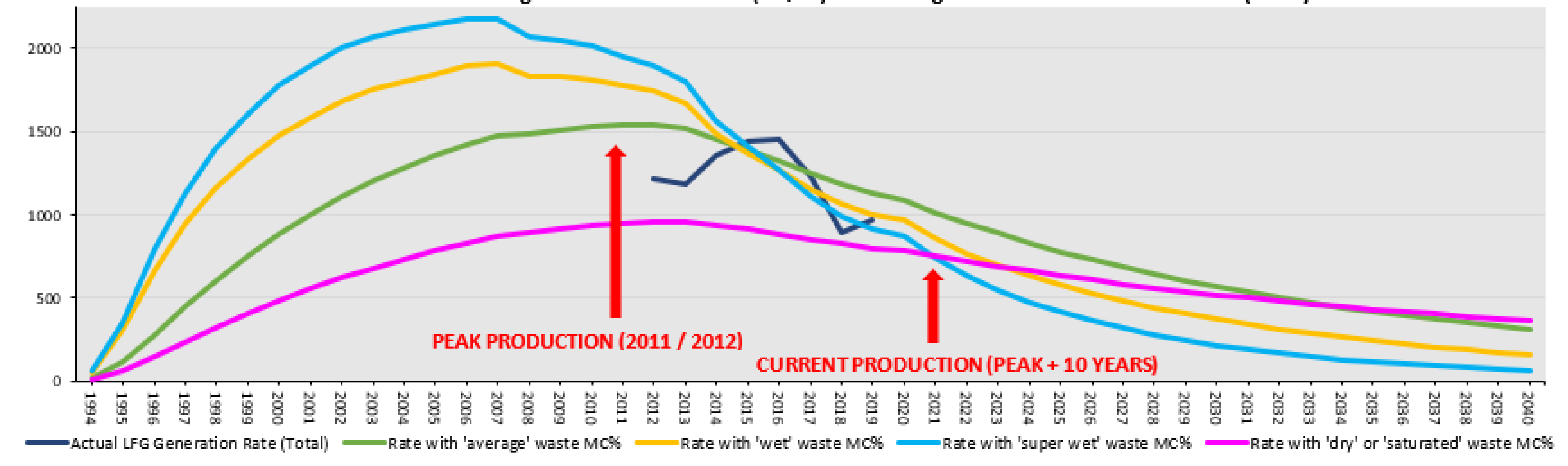

FIGURE 2 - Barling LFG Generation Rate (m3/hr) - for a range of waste moisture contents (MC%) - LONG TERM PROJECTION

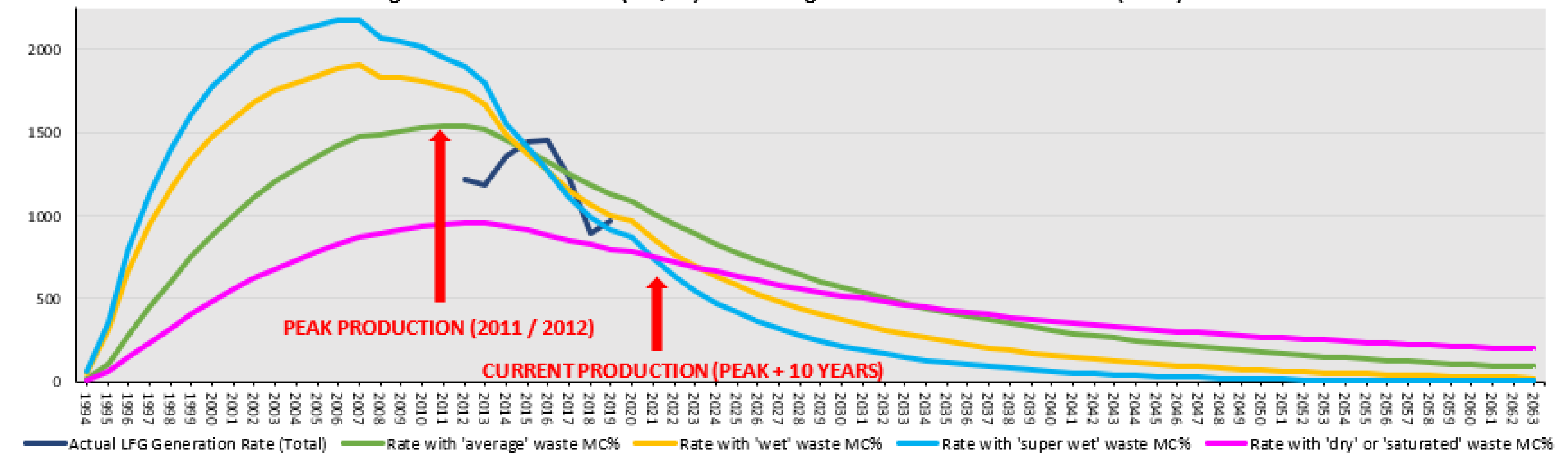

TABLE 1 – LFG GENERATION RATES (M³/HOUR) FOR A RANGE OF WASTE MOISTURE CONTENTS (MC%)

YEAR	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
average' MC%	18	112	280	447	606	749	884	1002	1110	1203	1282	1351	1416	1472	1484	1511	1533	1538	1539	1520	1450	1391	1326	1251
dry or saturated MC%	9	59	147	237	325	406	485	556	622	682	735	783	830	871	890	916	938	951	962	962	935	913	887	855
wet' MC%	57	306	667	942	1164	1330	1476	1587	1682	1750	1801	1845	1890	1906	1830	1829	1814	1772	1743	1670	1481	1370	1269	1150
super wet' MC%	65	356	792	1130	1402	1602	1774	1898	1999	2066	2107	2139	2172	2174	2067	2046	2014	1950	1897	1794	1556	1407	1268	1111
Actual LFG Generation Rate																			1214	1187	1359	1443	1454	1225

YEAR	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
average' MC%	1183	1127	1086	1016	950	888	831	779	730	684	642	603	566	532	501	471	444	418	394	371	350	331	312
dry or saturated MC%	825	801	785	752	720	690	661	635	609	585	562	541	521	501	483	466	449	434	419	405	392	379	367
wet' MC%	1061	1001	964	856	768	696	633	578	529	485	444	408	374	343	315	290	266	245	225	207	190	175	161
super wet' MC%	993	915	870	739	633	548	477	417	365	321	282	248	218	192	169	149	131	116	102	90	80	71	62
Actual LFG Generation Rate	897	971																					

YEAR	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
average' MC%	295	279	263	249	235	223	211	200	189	179	170	161	153	145	137	130	124	117	111	106	101	96	91
dry or saturated MC%	355	344	334	324	314	305	297	288	280	273	265	259	252	245	239	233	228	222	217	212	207	202	198
wet' MC%	148	136	126	116	107	98	91	83	77	71	65	60	56	51	47	44	40	37	34	32	29	27	25
super wet' MC%	55	49	43	38	34	30	27	24	21	19	16	15	13	11	10	9	8	7	6	6	5	4	4
Actual LFG Generation Rate																							

3) HYDROGEOLOGICAL RISK ASSESSMENT REVIEW

Please provide the electronic copy of the Hydraulic Containment Model used in the Hydrogeological Risk Assessment Review should be provided.

Hydraulic containment modelling set out in the HRA review submitted as part of the application has, in reality, stayed the same since 2005. This 2005 HRA included modelling for three leachate / groundwater scenarios;

- Leachate levels above groundwater level during the early operational life of the site whilst active groundwater dewatering was ongoing. This ceased once waste levels were such that the quarry engineered side slopes were fully supported and the risk of groundwater heave was removed. This stage is considered no longer relevant.
- Leachate levels below groundwater levels following the cessation of groundwater removal and after groundwater rebound. This is the hydraulic containment scenario applicable for the later stages of the operational life of the site.
- Leachate levels above groundwater levels - an outward hydraulic gradient modelling scenario envisaged for the site as it ceased operations and moved towards closed status.

Since the 2005 HRA, very little within it has changed. The 2020 review contained broadly similar contents to the 2005 version, other than to reflect the full rebound of the groundwater body, updated information from continued environmental monitoring, and the inclusion of hydraulic-attenuation equations based on an outwards hydraulic gradient. Modelling demonstrates that there is no risk of pollution from leachate at an elevation of 4m above groundwater around the majority of the site.

As requested, the hydraulic containment modelling will be submitted electronically, along with an amended copy of the 2020 HRA review which contains the embedded excel spreadsheet containing the modelling parameters. We are unsure of the exact meaning of the Agency's reference to 'geographical plots' in the context of this HRA modelling but have assumed that this refers to the physical locations (i.e. co-ordinates and datum levels) of monitoring points referenced. As such, we are submitting an amended version of the most recent Environmental Monitoring Plan with the addition of a table showing monitoring point references, co-ordinates and datum levels.

4) LANDFILL GAS EXTRACTION

An assessment of the depth of unsaturated waste from which landfill gas may be abstracted by the existing landfill gas system must be submitted.

In order to answer this request, it is important to understand the relationship between existing leachate control levels, proposed leachate control levels, and actual leachate levels.

LFG Generation Rates and LFG Extraction System Capacity

The LFG extraction system has been in place at the site for many years, and as discussed earlier in Section 1, both modelling results and actual site LFG flow records indicate that the peak of LFG generation passed several years ago. LFG generation rates are now declining, and a system which was handling nearly 1500m^3/hour LFG at its peak is now handling around 1000m^3/hour, a reduction of over 30%. Modelling suggests that this will continue to decline, falling to around 750m^3/hour in 5 years, and 500m^3/hour 5 years after that. The LFG extraction system was designed to operate at flows in excess of 1500m^3/hour, and whilst LFG flares and engines are modular and can be switched in and out in order to match available LFG flows, the extraction infrastructure within the site (wells, carrier mains, pipework etc.) is fixed. This means that there is a significant amount of redundancy naturally built into the system.

Proposed Leachate Control Levels vs Actual Leachate Levels

In addition to this, in order to evaluate the potential effects of a rise in permitted leachate levels on the ability to extract and manage LFG, it is important to fully understand the present nature of the leachate body at the site. On face value, the leachate control levels proposed in the variation do appear to be significantly different to those currently permitted and suggest that the level of leachate within the site in the future will be significantly higher.

However, in reality the actual leachate levels within the site are considerably in excess of the current levels contained within the permit, and can be considered to be broadly similar to the levels being proposed in the variation. The proposed variation is not seeking to significantly increase the volume or level of leachate within the site, rather it seeks to change the permitted leachate levels to reflect the existing conditions, and move the site towards the long-term leachate management scenario that is contained within the HRA.

At this point it is important to note that the leachate levels proposed are consistent with the modelling of the closure period of the site in the 2005 HRA (and subsequent iterations). It has always been envisaged that once the site moved towards closure, leachate levels would rise towards and above rebounded groundwater levels, and the site would operate on the basis of an outwards hydraulic gradient.

The relationship between the current permitted leachate control levels, the proposed leachate control levels and the actual leachate levels within the site is shown in Figure 3 below. This shows two cross sections taken lengthways and crossways across the site, and clearly shows that the leachate control levels being proposed will not result in any significant changes to the extent of the leachate body.

Effects of Changes on Removal Efficiencies of LFG Extraction Wells

As requested, Table 2 (below) shows the results of comparing the **current permitted leachate levels** and the **proposed leachate levels**, to evaluate the effect that this difference may have on the accessibility of the slotted section of the LFG wells, and their ability to remove LFG.

Given the actual leachate levels present at the site over recent years, this comparison (current permitted leachate levels to proposed leachate levels) will not accurately predict the potential effects of the permit variation. Leachate levels at Barling are already broadly consistent with the levels being proposed in the variation, so the proposed changes will have little net change in the leachate levels. A more accurate assessment of the potential effect that the proposed variation will have on the current ability to extract LFG would be to compare the **current actual leachate levels** with the **proposed leachate levels**.

This comparison (the potential effect of proposed leachate compliance levels against existing leachate levels) is presented in the final column of Table 2.

The results of this exercise are interesting in that whilst the calculations could suggest that LFG extraction ability should be affected, the actual situation on site is very different. Measured leachate levels have been broadly consistent at the site for a significant period, yet there has been no discernible effect on the ability to manage the LFG body. The volumes of LFG extracted match the volumes predicted, and the site has consistently seen good LFG extraction rates.

If level readings from leachate monitoring wells are accurately reflecting the true leachate level throughout the waste mass, and leachate levels are really this high, this would suggests that there is more than sufficient over-provision in the LFG extraction system infrastructure, i.e. the system was designed to cope with far higher volumes of LFG than was necessary. It is possible that the initial design capacity was sufficiently high that a large degree of redundancy was built into the system and significant sections could be incapacitated without having any deleterious effect on the ability to control the gas field.

It is more likely that leachate level readings from leachate wells are over-estimating the volume and level of leachate within the site, and that leachate is collecting preferentially in the open space of the leachate well. Anecdotal evidence, both from Barling and elsewhere, suggests that leachate levels measured in leachate wells are not reflected in the actual leachate levels in the waste mass itself. Logging undertaken during the drilling of LFG wells at Barling has repeatedly shown that dry waste is encountered where leachate well readings alone suggested the presence of the leachate body. This clearly indicates that there remains significant absorptive capacity within the waste body available for utilisation in a future leachate recirculation scheme.

Summary

The consistent volumes of LFG passing through the LFG plant clearly demonstrates that the performance of the LFG extraction system is in no way compromised by the level of leachate found within the site. Actual LFG volumes closely match predicted volumes and the extraction system currently removes 1000m^3/hour of LFG from the site despite the apparent saturation of the slotted sections of many of the extraction wells. The actual net changes on leachate levels under this variation are negligible, and there is nothing to suggest that the effectiveness of the LFG extraction system will change.

LFG extraction rates are carefully monitored, and the system is modified as and when required in order to match LFG extraction capacity to LFG availability. The models used to predict LFG generation rates are routinely re-assessed to ensure accuracy, and when extracted LFG volumes appear to depart from predicted LFG volumes, the extent and condition of the LFG extraction system is checked. This includes the routine review of individual well performance. Where wells are seen to be underperforming, or where areas of the site appear to have insufficient extraction capacity, wells are replaced, or additional wells installed.

The environmental permit requires that routine monitoring is undertaken across the site to assess the level of control over LFG within the waste This includes monthly LFG field balancing, annual LFG Plant monitoring, monthly perimeter LFG monitoring and annual FID monitoring to determine if LFG is venting to the atmosphere via the landfill cap or cap penetrating infrastructure. The results obtained during these visits are used to provide feedback as to the level of control over the LFG body, and allow changes to be made as and when required.

In addition to permitting requirements, it is important to recognise that LFG is a valuable commodity and is a vital revenue stream for the business, especially following the cessation of waste acceptance. There is therefore a strong financial incentive to ensure that all available LFG is removed from the site.

5) GAS MANAGEMENT PLAN

A revised Gas Management Plan is required where Leachate re-circulation is proposed as a method of leachate management.

Whilst leachate recirculation has been proposed as the most likely long-term leachate management scenario, this has not been decided, and leachate management could be dealt with by means of extraction and disposal at a suitably licensed facility. The exact nature of any leachate recirculation scheme, and the implications this would have on the Gas Management Plan (GMP) would require close negotiation between Enovert as the landfill permit holder, EDL as the LFG scheme permit holder, and the Environment Agency as the Regulator. This could require a considerable period of time, especially given the current difficulties around meeting on site due to Covid-19, and this is beyond the timescale of this information request.

In addition to this, the development stage of the site is such that the site is effectively closed, and the waste body has been capped apart from one limited area. Designing and implementing a long-term recirculation scheme before these works are completed is difficult. Whilst leachate recirculation is a possible option, no works will be commenced until such time that a scheme had been agreed between the Environment Agency and Enovert. We had requested that the requirement to agree this scheme be dealt with by means of an improvement condition to be included in the permit. Until such time that this agreement is in place, no leachate recirculation works will be allowed to commence on site, and leachate management will be limited to removal and off-site disposal only.

Enovert can confirm that any leachate recirculation proposals submitted under the requested improvement condition will include a full assessment of the implications of the proposals on LFG control at the site. This would include the effects of '…*leachate recirculation on gas management…'* and will contain a *'…Gas Action Plan which sets out the actions that will be undertaken in the event of potential impact on landfill gas management'.* If necessary, the improvement condition requiring details of the recirculation scheme could be worded to specifically require the submission of a revised LFG Management Plan that fully covers the

6) LANDFILL GAS ICOP

Please provide the electronic copies of the raw data and ICoP data interpretation and statistical analysis in excel format showing how the outlier test was undertaken to standardise the data and establish the background gas concentration.

In accordance with the procedure set out in the ICoP, statistical analysis was used to derive suitable action levels for CO_2 in perimeter LFG monitoring boreholes. Over the life of the site, ground gas conditions have been shown to be heavily influenced by the changing groundwater regime around the site as groundwater levels dropped as the site was dewatered and rose again following the cessation of this activity. In order to use the most relevant data, action levels were calculated using monitoring results obtained for the period 2017 – present, i.e. the period following groundwater recovery and the stabilisation of any ground gas trends.

The data and the calculations will be submitted in excel format to accompany this response.
implications of any proposed leachate recirculation scheme.

7) STABILITY RISK ASSESSMENT

Please provide a revised Stability Risk Assessment which considers the impact of the proposed changes to the leachate level on the landfill infrastructure.

Leachate levels in the proposed variation are consistent with the aftercare / closure scenarios set out in the original application (i.e. rebounded groundwater level and leachate levels at the rim of the void). The initial Stability Risk Assessment submitted as part of the application assessed the full range of scenarios, and this proposal represents no significant change.

Figure 3 – Site Cross Sections Comparing Existing Permitted Leachate Level, Proposed Leachate Level, and Actual Leachate Levels

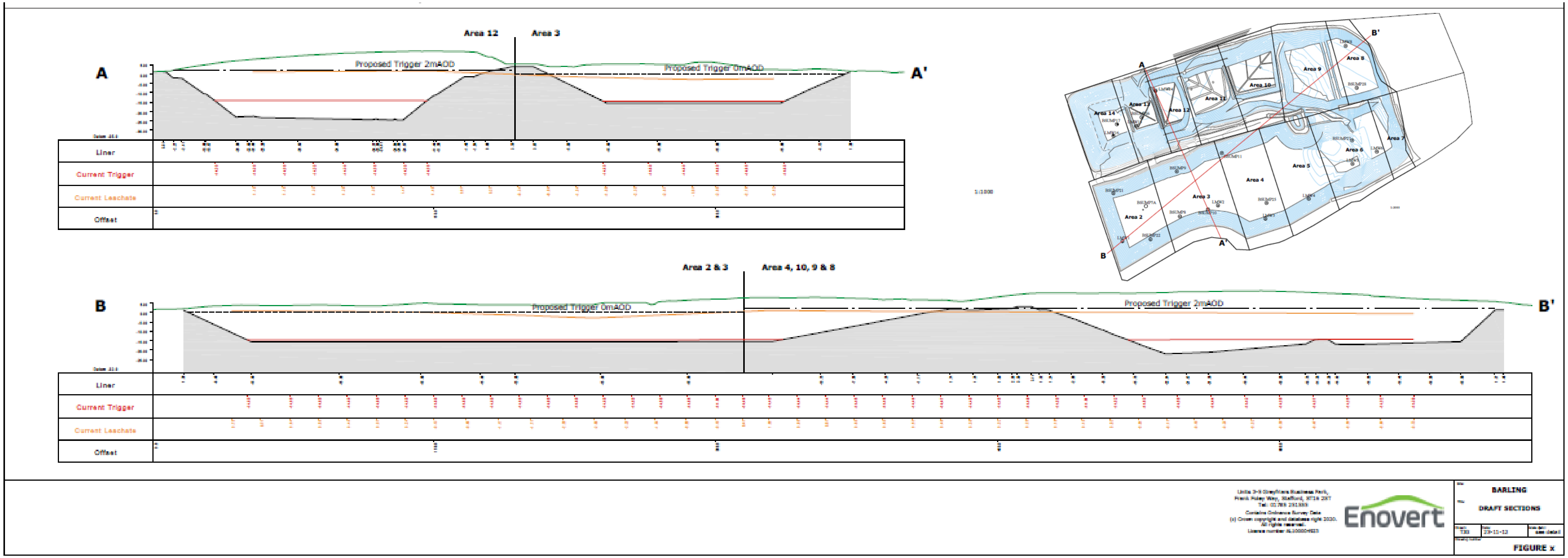

Figure taken from drawing ‘bar 12-20 Long Sections_A1La’ submitted electronically with this document

Table 2 – LFG Extraction Well Installation Detail and Calculated Saturated / Unsaturated Zones

LFG Well ID	Cell	Easting (m)	Northing (m)	Ground Level (mAOD)	Depth (m)	Plain Pipe Length (m)	Slotted Pipe Length (m)	Current Leachate Level (mAOD)	Current Permit Trigger (mAOD)	Proposed Trigger (mAOD	Slotted section top level (mAOD)	Slotted section bottom level (mAOD)	Slot length exposed (m) **CURRENT TRIGGER**	Actual Slot length exposed (m) **CURRENT LEACHATE LEVEL**	Slot length exposed (m) **PROPOSED TRIGGER**
1901	11	593956.2	190585.6	11.56	26.50	7.00	19.50	0.99	-14.30	2.00	4.56	-14.94	18.86	3.57	2.56
1902	11	593913.3	190567.2	12.44	33.50	8.50	25.00	1.28	-14.30	2.00	3.94	-21.06	18.24	2.66	1.94
1903	11	593920.2	190613.1	8.35	28.00	7.00	21.00	1.01	-14.30	2.00	1.35	-19.65	15.65	0.34	0.00
1904	12	593877.1	190600.4	10.94	31.50	8.50	23.00	1.28	-14.30	2.00	2.44	-20.56	16.74	1.16	0.44
1905	12	593906.2	190652.9	5.55	24.50	6.00	18.50	0.93	-14.30	2.00	-0.45	-18.95	13.85	0.00	0.00
1906	12	593861.1	190648.1	6.59	22.50	6.00	16.50	1.04	-14.30	2.00	0.59	-15.91	14.89	0.00	0.00
1907	13	593845.5	190560.0	11.32	30.50	7.50	23.00	1.03	-14.30	2.00	3.82	-19.18	18.12	2.79	1.82
1908	13	593826.6	190605.5	9.37	29.00	7.50	21.50	1.40	-14.30	2.00	1.87	-19.63	16.17	0.47	0.00
1909	14	593780.6	190594.1	8.85	28.00	7.00	21.00	1.48	-14.30	2.00	1.85	-19.15	16.15	0.37	0.00
1910	14	593800.1	190547.8	10.78	30.00	7.50	22.50	1.32	-14.30	2.00	3.28	-19.22	17.58	1.96	1.28
2001	13	593824.4	190641.3	6.23	12.00	5.00	7.00	0.99	-14.30	2.00	1.23	-5.78	15.53	0.24	0.00
2002	13	593785.3	190630.5	5.95	12.00	5.00	7.00	1.07	-14.30	2.00	0.95	-6.05	15.25	0.00	0.00
2003	14	593746.1	190615.4	5.66	15.00	6.00	9.00	1.49	-14.30	2.00	-0.34	-9.34	13.96	0.00	0.00
2004	14	593746.4	190575.4	8.54	27.50	9.00	18.50	1.79	-14.30	2.00	-0.46	-18.96	13.84	0.00	0.00
2005	14	593761.6	190538.1	9.67	28.50	9.00	19.50	1.55	-14.30	2.00	0.67	-18.83	14.97	0.00	0.00
2006	14	593789.9	190508.4	10.48	18.00	7.00	11.00	1.22	-14.30	2.00	3.48	-7.52	17.78	2.27	1.48
2007	13	593831.0	190523.5	11.20	19.50	7.00	12.50	0.54	-14.30	2.00	4.20	-8.30	18.50	3.66	2.20
2008	12	593881.0	190541.4	11.65	21.00	7.00	14.00	0.66	-14.30	2.00	4.65	-9.36	18.95	3.99	2.65
A276	11	593897.7	190541.5	7.20	11.83	3.10	8.73	0.99	-14.30	2.00	4.10	-4.63	18.40	3.11	2.10
B013	2	593805.5	190302.7	3.48	10.00	4.00	6.00	0.66	-14.60	0.00	-0.52	-6.52	14.08	0.00	0.00
B018	3	593921.1	190344.3	2.83	12.80	4.00	8.80	-0.78	-14.60	0.00	-1.18	-9.98	13.43	0.00	0.00
B021	3	593931.7	190400.4	3.04	13.04	4.00	9.00	-1.74	-14.60	0.00	-0.96	-9.96	13.64	0.78	0.00
B022	2	593834.4	190419.0	4.24	11.13	4.13	7.00	-0.27	-14.60	0.00	0.11	-6.89	14.71	0.38	0.11
B027	3	593997.9	190401.0	2.03	9.00	4.00	5.00	-2.82	-14.60	0.00	-1.97	-6.97	12.63	0.84	0.00
B030	3	593985.0	190437.8	2.84	12.84	4.00	8.84	-1.83	-14.60	0.00	-1.16	-10.00	13.44	0.67	0.00
C277	3	593888.4	190422.8	4.50	14.50	4.00	10.50	-1.37	-14.60	0.00	0.50	-10.00	15.10	1.87	0.50
C278	2	593864.7	190390.6	4.36	13.60	3.60	10.00	-0.11	-14.60	0.00	0.76	-9.24	15.36	0.87	0.76
E055	4	594077.7	190478.3	3.25	12.00	7.00	5.00	0.65	-14.40	2.00	-3.75	-8.75	10.65	0.00	0.00
E263	4	594033.1	190403.5	2.10	12.10	4.00	8.10	-1.47	-14.40	2.00	-1.90	-10.00	12.50	0.00	0.00
E264	3	594066.9	190414.1	2.52	12.52	4.00	8.52	0.17	-14.60	2.00	-1.48	-10.00	13.12	0.00	0.00
E265	3	594018.5	190366.2	2.07	12.07	4.70	7.37	-0.89	-14.60	0.00	-2.63	-10.00	11.97	0.00	0.00
E266	4	594059.0	190373.3	2.05	9.80	3.80	6.00	-0.91	-14.40	2.00	-1.76	-7.76	12.65	0.00	0.00
E267	4	594095.2	190387.8	2.78	12.78	4.00	8.78	0.52	-14.40	2.00	-1.22	-10.00	13.18	0.00	0.00

Table 2 (continued) – LFG Extraction Well Installation Detail and Calculated Saturated / Unsaturated Zones

LFG Well ID	Cell	Easting (m)	Northing (m)	Ground Level (mAOD)	Depth (m)	Plain Pipe Length (m)	Slotted Pipe Length (m)	Current Leachate Level (mAOD)	Current Permit Trigger (mAOD)	Proposed Trigger (mAOD	Slotted section top level (mAOD)	Slotted section bottom level (mAOD)	Slot length exposed (m) **CURRENT TRIGGER**	Actual Slot length exposed (m) **CURRENT LEACHATE LEVEL**	Slot length exposed (m) **PROPOSED TRIGGER**
F102	2	593849.5	190294.3	2.33	10.00	4.00	6.00	0.23	-14.60	0.00	-1.67	-7.67	12.93	0.00	0.00
F106	2	593761.7	190380.7	3.68	10.00	4.00	6.00	0.96	-14.60	0.00	-0.32	-6.32	14.28	0.00	0.00
F109	2	593889.2	190311.1	1.94	11.00	3.00	8.00	0.39	-14.60	0.00	-1.06	-9.06	13.54	0.00	0.00
G056	5	594128.4	190483.6	2.77	11.50	4.80	6.70	0.38	-14.60	2.00	-2.03	-8.73	12.57	0.00	0.00
G121	6	594297.6	190444.0	3.01	7.14	5.00	2.14	0.78	-14.90	2.00	-1.99	-4.13	12.91	0.00	0.00
J075	8	594275.5	190678.4	4.94	14.00	6.00	8.00	-1.14	-14.30	2.00	-1.06	-9.06	13.24	0.07	0.00
J272	8	594303.1	190701.4	3.99	17.04	5.80	11.24	-1.30	-14.30	2.00	-1.81	-13.05	12.49	0.00	0.00
K084	6	594309.6	190486.7	3.66	13.00	5.30	7.70	0.97	-14.90	2.00	-1.65	-9.35	13.26	0.00	0.00
K089	6	594341.4	190523.3	3.56	15.50	4.73	10.77	1.73	-14.90	2.00	-1.17	-11.94	13.73	0.00	0.00
K162	6	594355.8	190477.4	3.28	7.69	5.69	2.00	2.29	-14.90	2.00	-2.42	-4.42	12.49	0.00	0.00
K270	7	594351.8	190559.8	3.88	8.30	6.00	2.30	1.45	-13.60	2.00	-2.12	-4.42	11.48	0.00	0.00
K271	7	594381.7	190533.4	3.88	8.50	6.00	2.50	2.62	-13.60	2.00	-2.12	-4.62	11.48	0.00	0.00
L119	5	594224.9	190410.5	3.06	6.00	4.00	2.00	0.10	-14.80	2.00	-0.94	-2.94	13.86	0.00	0.00
Q245	9	594145.3	190728.9	5.92	16.17	3.70	12.47	0.00	-14.50	2.00	2.22	-10.25	16.72	2.22	0.22
Q246	9	594187.5	190736.6	6.69	14.00	2.50	11.50	-0.15	-14.50	2.00	4.19	-7.31	18.69	4.34	2.19
Q247	9	594230.4	190736.0	6.93	14.24	4.00	10.25	-0.27	-14.50	2.00	2.93	-7.32	17.43	3.20	0.93
Q248	9	594167.0	190697.0	7.88	21.00	4.00	17.00	0.03	-14.50	2.00	3.88	-13.12	18.38	3.85	1.88
Q249	9	594209.9	190699.5	8.26	21.00	2.58	18.42	-0.10	-14.50	2.00	5.68	-12.74	20.18	5.78	3.68
Q250	8	594259.5	190705.5	3.58	10.00	6.00	4.00	-0.49	-14.30	2.00	-2.43	-6.43	11.88	0.00	0.00
Q251	9	594189.5	190661.2	9.01	26.30	2.50	11.50	0.08	-14.50	2.00	6.51	-4.99	21.01	6.43	4.51
Q252	9	594233.6	190665.6	8.91	23.39	4.00	19.39	-0.58	-14.50	2.00	4.91	-14.48	19.41	5.49	2.91
Q253	9	594169.6	190624.7	9.95	23.30	3.30	19.90	-0.02	-14.50	2.00	6.65	-13.25	21.15	6.68	4.65
Q254	9	594211.2	190629.2	9.22	19.50	3.50	16.00	-0.69	-14.50	2.00	5.72	-10.28	20.22	6.40	3.72
Q255	9	594269.2	190634.5	5.16	20.25	6.00	14.25	-1.63	-14.50	2.00	-0.84	-15.09	13.66	0.79	0.00
T258	6	594226.7	190552.7	4.00	8.50	4.70	3.80	-0.46	-14.90	2.00	-0.70	-4.50	14.20	0.00	0.00
T259	6	594269.6	190563.6	4.23	6.69	5.20	1.49	-0.78	-14.90	2.00	-0.97	-2.46	13.93	0.00	0.00
T260	6	594220.9	190515.0	3.83	17.73	5.60	12.13	-0.03	-14.90	2.00	-1.77	-13.90	13.13	0.00	0.00
T261	6	594265.7	190519.5	4.02	12.00	6.00	6.00	-0.26	-14.90	2.00	-1.98	-7.98	12.92	0.00	0.00
T262	6	594304.6	190536.1	4.82	13.73	5.00	8.73	0.11	-14.90	2.00	-0.18	-8.91	14.72	0.00	0.00
T268	9	594204.6	190593.3	4.57	6.55	5.20	1.35	-0.98	-14.50	2.00	-0.63	-1.98	13.87	0.35	0.00
T269	6	594238.4	190592.9	5.51	9.28	5.40	4.03	-1.10	-14.90	2.00	0.11	-3.93	15.01	1.20	0.00
W273	11	594032.5	190578.6	9.10	7.71	3.30	4.41	0.79	-14.30	2.00	5.80	1.39	20.10	5.01	3.80
W274	11	593984.4	190580.6	8.25	14.71	3.40	11.37	0.93	-14.30	2.00	4.85	-6.52	19.15	3.93	2.85
W275	11	593990.3	190660.2	7.32	20.50	5.50	16.00	0.66	-14.30	2.00	1.82	-14.18	16.12	1.16	0.00

The site is effectively completed; waste infilling has finished, and the site is capped and restored apart from the area around the most recent phases. As such there are no sections of the site with unsupported waste slope, internal waste flanks, exposed basal or sidewall liners etc. There are no sections of the site where the waste mass can become unstable, and the majority of waste settlement is nearly completed across much of the site. As such it is difficult to envisage a scenario whereby the leachate trigger levels proposed can affect the structural integrity of the site in its current form and stage of development.

The exact nature of the waste slopes and profiles is shown in the perimeter landform cross sections set out in Figure 4 (above).

Further evidence that the proposed changes to leachate compliance levels will have no effect on the stability of the site comes from the way in which the site performs now.

Current leachate levels across the site (as outlined in Section 5 and in Figure 3) are broadly consistent with the leachate levels proposed in the application, and have been at such levels for several years. Throughout this period there have been no issues with stability at the site, and no indication that the presence of elevated leachate has caused structural problems or issues with the integrity of the engineering, the waste body or any of the site infrastructure (i.e. LFG and leachate collection systems).

Whilst the application did propose an increase in permitted leachate control levels, it is not seeking to significantly increase the actual volume or level of leachate within the site. The variation aims to change the permitted leachate levels to reflect the existing conditions, and move the site towards the long-term leachate management scenario that is contained within the HRA.

8) LEACHATE MANAGEMENT PLAN

Please provide an updated Leachate management plan in support of the application. This should include clear presentation of: a) proposed leachate compliance levels; b) proposed site-specific action levels below the proposed compliance limits; c) review of the suitability of leachate collection, extraction and monitoring infrastructure; d) detail of how leachate will be managed at the proposed higher levels; e) detail of how leachate elevations management reflects: i. leachate pumping or extraction rates and volumes; ii. water balance calculations, or equivalent; iii. relationship with leachate recirculation where this takes place at a site. f) proposed actions as a result of: i. operational problems/failure; ii. abnormal/unexpected changes in leachate level; iii. extreme weather events; iv. leakage/spillage of leachate; and v. Impacts to controlled waters

An outline / draft LMP is attached, but it cannot be finalised without the details of any leachate recirculation scheme that still needs to be determined. As indicated in Section 5, the development of a leachate recirculation plan requires input from Enovert, EDL and the Environment Agency, and the timetable for undertaking this work lies outside of the period given to collate this data request.

In addition to this, the outline / draft LMP acknowledges that additional leachate monitoring and extraction boreholes may be required to supplant those already present and ensure adequate coverage of the site. This will also require liaison between Enovert and the Environment Agency team who regulate the site.

Because details of the leachate recirculation proposal are a vital component of the LMP, it is proposed that the submission of the recirculation scheme (or any improvement condition linked to it) include a requirement to submit a finalised version of the LMP.

Figure 4 – Perimeter Landform Cross Sections

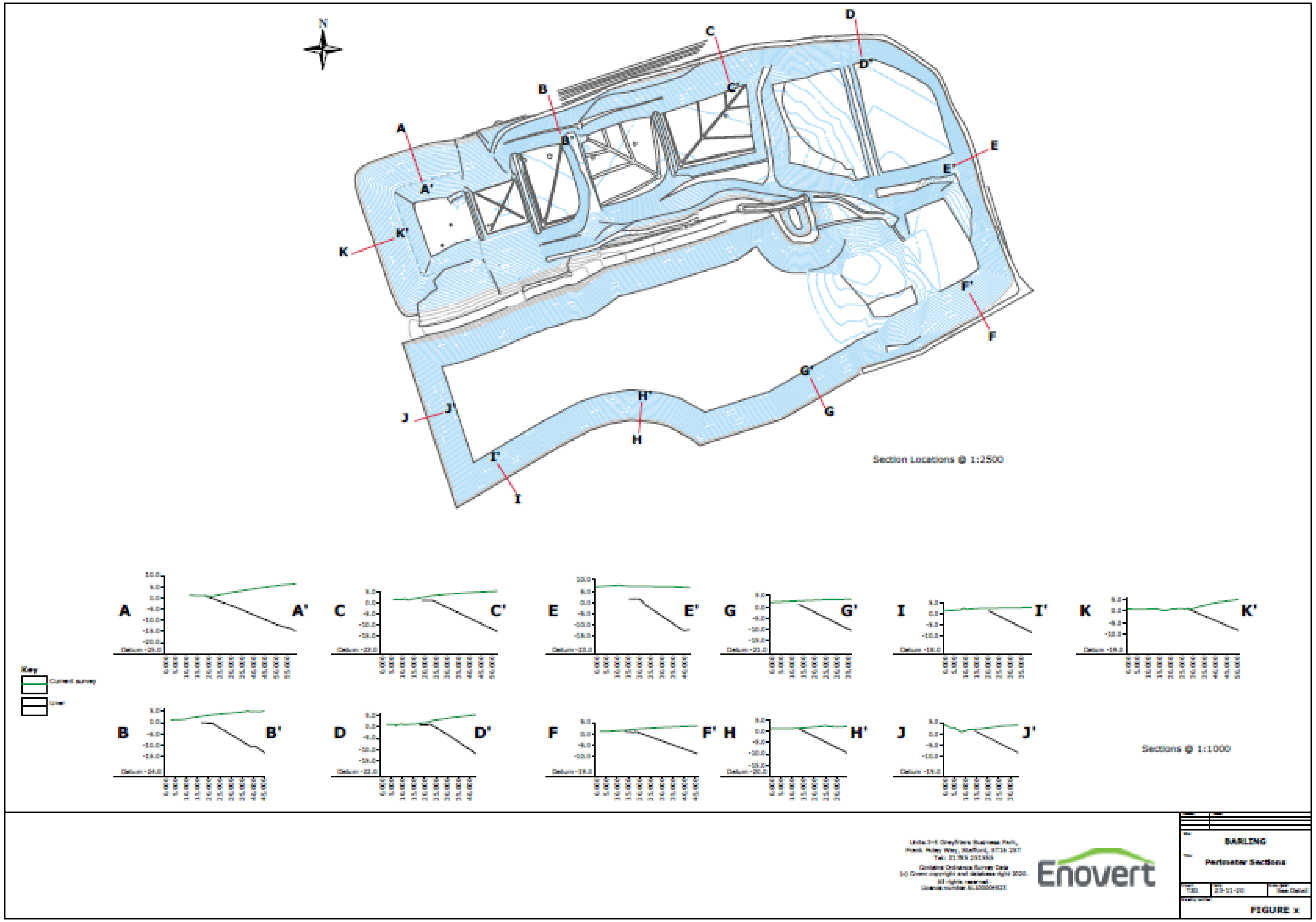

Figure taken from drawing 'bar 11-20 Perimeter Sections_A2La' submitted electronically with this document