

Response to WRAP consultation on the option paper

	Option	Do you agree?	Comments?
1	Retain current scope for PAS110, which <u>excludes</u> aerobic digestates as outputs eligible for certification to PAS110	Yes	We agree that aerobic digestates should be excluded from the scope of PAS 110. Having spoken with a member of REA who operates an aerobic digestion plant, we understand that aerobic digestates cannot be regarded as fit for purpose or fully recovered, as they are still very active and odorous. However, PAS 110 should allow the AD process to utilize thermophilic aerobic digestion (TAD) for the sanitization step. This is already allowed under PAS 100, but it sits better within the PAS 110 as the output resulting from a TAD plant is liquid and, thus, particularly suited to anaerobic digestion. In addition, TAD output has still a considerable residual biogas potential which makes it very attractive to AD operators as an input material.
2	Retain current approach to pasteurisation, as outlined in Clauses 7.2.2 and 7.2.4 in PAS110:2010; or	No	The Government's plan is to boost on-farm anaerobic digestion. However the current approach in PAS 110 is very onerous: the level of investment required to satisfy the existing pasteurisation requirements cannot be sustained, particularly within the context of farm AD. In addition, under the existing regulatory framework, energy crops derived digestates are regarded as 'product', thus, they can be applied to agricultural land with no need for a pasteurisation step. We are not aware that farm assurance schemes are currently concerned about the applications of non PAS 110 energy crops derived digestates to land. As highlighted in WRAP's option paper and in WRAP's funded trials conducted by Aquaenviro, the risk that untreated plant material could be present in the digestate when no pasteurisation has taken place is relatively small and, in our opinion, the cost of pasteurisation would significantly outweigh the benefits in terms of risk reduction given by the addition of a pasteurisation step. In summary, given the capital and operational costs of pasteurisation and the Government's plan to boost on-farm anaerobic digestion, we would recommend that the current approach is not retained.
3	Amend the current exemptions from pasteurisation (listed in Clauses 7.2.2 and 7.2.4 in PAS110) to allow such digestates to also be used within a co-operative (or equivalent) from which the non-pasteurised feedstocks arose; or	Yes	Any non ABP inputs in a co-operative scenario should be exempt from pasteurisation on condition that all of the digestate produced is used within the holdings within the co-operative. The members of the co-operative would need to sign an agreement that they have collectively accepted to spread the digestate on their own land and that they accept the small risk that may arise from the lack of a pasteurisation step. If unpasteurised non ABP materials are to be allowed under co-operative scenarios, we would recommend that a minimum retention time under mesophilic conditions should be specified (e.g. 35 days) to ensure

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			the risk of plant pathogens is reduced to a negligible level. Finally, the PAS 110 should include a clear and unambiguous definition of the terms co-operative, holding and premise to ensure that this exemption is not abused. Please note that such an exemption may not be necessary if a cost effective phytohygiene testing regime is introduced to allow relevant facilities to adopt novel time/temperature regimes that are not currently listed in Annex A of PAS110:2010.
4	Amend the current exemptions from pasteurisation (listed in Clauses 7.2.2 and 7.2.4 in PAS110) to allow digestates derived from non-pasteurised silage maize to be used in the same way as any other 'fully pasteurised' PAS110 digestates.	No	We would propose that further evidence is gathered before this step is taken, particularly in light of recent issues occurred in Scotland with regard to digestate quality. The agricultural market for digestate is vitally important to the AD industry, so it is crucial that this is not undermined.
5	Retain current options for pasteurisation approaches, as listed in Annex A of PAS110:2010; or	No	See comment below.
6	Include a phytohygiene validation regime in PAS110 to allow relevant facilities to adopt novel time/temperature regimes that are not currently listed in Annex A of PAS110:2010.	Yes	PAS 110 should include phytohygiene validation regime to enable validation of novel pasteurisation conditions and to demonstrate the effectiveness of the process to reduce the risks to plant health. This approach should be introduced in PAS 110 as it provides more flexibility to the industry, provided it is not too burdensome. An evaluation of the impacts in term of costs associated to validation and post-validation for this kind of approach should be undertaken before this is introduced as an alternative, viable option. If the cost of this option is too prohibitive, no AD operators will be able to afford it and, consequently, having this option will not make any difference at all. We recommend the use of only one plant pathogen indicator to make this approach cost effective.

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7	Remove the requirement to pasteurise non-ABP inputs, where it can be demonstrated that they arise from (or have previously been subjected to) processes that include a documented thermal treatment phase equivalent to (or in excess of) 70°C for one hour – and where these processes are covered by a suitable Quality Management System that can be made accessible to audit as part of the PAS110 certification process.	Yes	<p>Non ABP materials that have been subjected to a thermal treatment equivalent to the pasteurisation requirements specified in PAS 110 should be exempt, on the provision that they can prove equivalence. Feedstock eligible for such exemption should:</p> <ul style="list-style-type: none"> • be supplied under an input material supplier agreement signed by the supplier of that material, confirming that only input materials that have undergone a thermal treatment equal to or exceeding one of the PAS 110 table A.1 regimes will be supplied to the AD operator; and • be subject to a pre-acceptance procedure that requires the input material supplier to provide evidence to the AD operator (e.g. HACCP plan) which shows that the materials from that supplier always undergo a thermal treatment equal or exceeding one of the PAS 110 table A.1 regimes. <p>The meeting of such conditions should ensure that risks associated with animal, human and plant pathogens are acceptably controlled.</p> <p>Certification scheme checks: The certification body's audit of the AD operator would include checks on the signed input supplier agreement and supplied evidence of satisfactory thermal treatment at the supplier's premise. The certification body would reserve the right to also inspect the input material supplier's premise, which is likely to be done in the event that information from the input material supplier is unclear, deficient or known or suspected to be misleading.</p> <p>We have suggested the above from experience of a few cases of by-product arising from a food / beverage manufacturing process where the material has been subject to a thermal treatment process which is believed to be equal to or exceeding one of the PAS 110 table A.1 regimes.</p>
8	Retain current (dry matter) limits for PTEs; or	No	This approach is not suitable for liquid digestates, as these have very low DM, making it difficult to guarantee passes. However soil loading rates (g/ha) of heavy metals are extremely low compared to those from composts and other organic materials commonly applied to land (biosolids) with higher dry matter content.
9	Set new PTE limits for digestates on a fresh weight basis.	Yes	Same comments as above.

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10	Set new PTE limits based on loadings that are achieved by the majority of digestate samples (as determined by the Steering Group); or	No	See comment below.
11	Set new PTE limits based on loadings that are allowed for PAS100 composts.	Yes	The benchmark should be equivalent for all organic materials applied to land. The aim should be protecting the soil and keeping agricultural land in good condition.
12	Retain a single set of PTE limits, covering all digestate fractions; or	No	Although this approach would be simpler, it would be difficult to set a single set of limit levels which is applicable to both, solid and liquid fractions. This approach may result in limit levels that are too stringent or too relaxed for one of the two fractions.
13	Adopt two different sets of PTE limits, depending upon whether the digestate dry matter content is above or below a pre-defined threshold; and	Yes	See comment above. It is possible that fibre digestate (25% DM) will be dried down (e.g. to 85%DM) as there is a economic advantage in doing so. The PTE limits should take account of this.
14	Set the threshold for defining types of digestate at 15% dry matter.	Yes	There needs to be a clear definition on what is classed as liquid and what is classed a solid for the purpose of determining the appropriate limit values.
15	Set an N-tot threshold, below which different PTE limits would apply; or	Yes	The limiting factor will depend on the properties of the receiving soil. However we believe that an approach based on either N-tot or P loading rates depending on the soil would be too complex and may be misunderstood by farmers who take PAS 110 digestates. We would recommend that the limiting factor used is N-tot as the industry is currently mainly regulated on this factor (digestate spreading is based on nitrogen load per hectare), so it would be simpler to keep the same basis for determining the correct PTEs levels. This would also enable AD operators to show to their customers that they comply with the relevant regulations.
16	Set PTE limits based on P loading rates.	No	See comment above. Some soil types have very high P levels and moving to P loading rates could create issues on spreading digestate in such areas

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17	Set a zinc fresh weight limit for digestate based on zinc loadings that could result from spreading compost that has a zinc concentration of 600mg/kg dry weight; or	No	As highlighted above, the benchmark should be the same for all organics materials applied to land: maximum allowed PTEs loadings should be equivalent for composts and digestates. In addition, it would be difficult to justify limit levels based on a draft EoW proposal which may never be adopted. If and when adopted, the limit levels set in the EU End of Waste will supersede and limit levels set in PAS 100 and PAS 110 specifications in any case.
18	Set zinc fresh weight limits for digestate as described in either of Options [10] or [11] above.	Yes	See comment above.
19	Set a lead fresh weight limit for digestate based on lead loadings that could result from spreading compost that has a lead concentration of 120mg/kg dry weight; or	No	See comment above.
20	Set lead fresh weight limits for digestate as described in either of Options [10] or [11] above.	Yes	See comment above.
21	Retain current approach, requiring PTE determination in all digestate fractions according to BS EN 13650; or	Yes	The repeatability of this test method (BS EN 13650) is higher than that of the BS 15587-1:2002.
22	Adopt BS 15587-1:2002 for whole and liquor digestates, and retain BS EN 13650:2001 for fibre digestates.	No	See comment above.
23	Retain current (dry matter) limits for physical contaminants; or	No	See comment below.

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24	Set new physical contaminant limits on a fresh weight basis.	Yes	Following our and WRAP discussions with the National Farmers Union of Scotland about their concerns regarding the quality of digestate, we strongly recommend that the limit levels for physical contaminants are not made any less stringent. Physical contaminant limits should be set on a fresh matter basis; the maximum loadings allowed for digestates should be equivalent to the maximum loadings allowed for PAS 100 composts. As highlighted before, the benchmark needs to be the same for all organic materials applied to land as product, whether it is expressed on a dry matter or on a fresh matter basis. Quality digestates should contain negligible amount of physical contaminants if we are to ensure that their market acceptability is not undermined.
25	Implement a new test methodology that discriminates between biodegradable / compostable, and other plastics – and excludes the former from calculation of physical contaminant levels.	Yes	Novamont (Tony Breton) has kindly provided a testing protocol which would enable to differentiate between biodegradable and non-biodegradable plastics. It appears to be quite simple and the difficult / time consuming / expensive part is separating the plastic fragments in the first place. However, since this has to be done any way then the solvent part of the test attached could just be bolted on at the end and thus it shouldn't be prohibitively expensive. We believe it is worth that the methodology discriminates between biodegradable plastics, although both categories should count towards the limit level. The AD operator should be given the option to declare the proportion of plastics that is biodegradable / compostable once the digestate has been spread to land.
26	Retain current approach (as set out in Clause 6.1); or	No	Note: Source separation is a basic requirement for end of waste status - we should not remove it in its entirety because the EA will not accept it. We should retain the principle of source separation of input materials but as set out below, allow packaging to be removed at defined stages in the process, not just at the front end. We should retain the requirement to exclude contaminated wastes, products or materials. If we do not, we may be allowing contamination from such sources as medicines, paints etc

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27	Discuss options for and implications of change to PAS110:2010 Clause 6.1 with the environmental regulators, and agree an approach that maintains digestate quality.	Yes	<p>We recommend that this clause is deleted. It is common knowledge across the industry that de-packaging is necessary to safeguard the process. However it should be left to the operator's discretion how and where in the process to deal with compostable and/or digestible packaging according to their Quality Management System and HACCP plan. Post-digestion screening in addition to up-front de-packaging could be employed to remove any residual compostable packaging / bioplastics to an acceptable level, so that the digestate complies with the PAS 110 minimum quality criteria. Testing the digestate for physical contaminants against the PAS 110 minimum quality criteria will be the ultimate verification that the HACCP plan and quality control system is working effectively in reducing any contamination to an acceptable level. It is important to allow waste feedstocks to be accepted in compostable and/or digestible bags/liners without the requirement for them to be removed at the front end. Removal of compostable and/or digestible bags/liners at the front end should not be required if an operator can successfully operate the plant and achieve the required digestate quality at the back-end. PAS 110 should not be prescriptive as to how the operator achieves that quality as this will stifle innovation and introduce unnecessary technical and financial burdens. REA highlights that there are AD operators in the UK that do not remove the liners at the front end, but who have instead invested in back end technologies and are still able to meet the requirements of PAS 110. Imposing a requirement of having front end technologies would have serious implications for the operators in terms of capital expenditure. Finally, please note that liners, bags and sacks used for biowaste collections are not legally classed as 'packaging' so the terminology used in the PAS 110 should be accurate to ensure the requirement is correctly interpreted and consistently implemented by the operators.</p>
28	Monthly sampling over a period of twelve months, testing for a sub-set of PAS110 digestate quality parameters at each interval (pH, total N, total P, total K, ammoniacal N, Cd, Cu, Cr, Hg, Ni, Pb, Zn PTE contents) with remaining parameters tested at quarterly intervals; or	No	This option is excessively onerous

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29	Monthly sampling over a period of three months, testing for the entire suite of PAS110 determinands on each occasion; or	No	See comment below.
30	Another approach, to be agreed by the Steering Group, based on the data that are available.	Yes	<p>It is important that any minimum specified interval between two consecutive samples takes into account the time taken by the lab to return the results and the time taken by the operator to evaluate these results and apply corrective actions if required prior to sampling and testing additional portions of production. PAS 110 should only specify the minimum number of samples required during validation. However it should be left to the operator to decide and justify an adequate sampling protocol that takes into account potential fluctuations in the input materials and enables the operator to evaluate the test results between one sample and the next one. The minimum interval between samples should one month. An AD operator noted that the cost of analysis is very high, and testing should reflect a risk based approach depending on feedstock. Maize and vegetables should not need the same sampling regime as source segregated municipal waste.</p>
31	Retain current approach to (absolute) limits for quality parameters; or	Yes	<p>This approach is consistent with that taken with respect to other organic and non organic materials that are spread to land as products in the UK. It is also the approach adopted in the JRC EoW proposals, the fertiliser regulations and the EU Ecolabel for Soil Improvers and Growing media. We propose a rolling/moving average approach to evaluate compliance with the limit levels.</p> <p>Based on such approach, compliance is evaluated on the basis of the average calculated from a suitable number of samples' results (it would need to be a moving average, based on a sufficient number of samples, and they would need to discount any past samples produced according to different Critical Limits at the Critical Control points). This would be the same concept as JRC-ITPS has proposed for the EC EoW criteria for composts and digestates. According to a very recent discussion with the JRC (15/10/2013), the approach the JRC will propose for EoW is as follows: mean + 1.69 standard deviation (95% confidence interval) should be within the specified limit level at all times. When the mean + 1.69 standard deviation is above the limit levels, the operator should take remedial action and deal with the digestate as non-conforming material.</p>

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			An 'averages' approach should encourage more AD operators to try producing PAS 110 digestate because AD operators perceive that the likelihood of having to obtain 'back-up' customers with Environmental Permits to landspread failed portions of production as 'waste' is lower. Operators report that the time involved in making back-up arrangements in the event of test result failures adds significant cost and workload beyond the benefits associated with gaining/regaining certification.
32	Make allowance for variability resulting from testing procedures, and build this around limit values (this would require precision data from laboratories); or	No	See comment above about the rolling average approach.
33	Retain current thresholds but apply 'error bounds' to both testing and sample parameters (this would require data for multiple samples at each point of testing from a number of different AD facilities); or	No	See comment above about the rolling average approach.
34	Another approach, to be agreed by the Steering Group, based on the data that are available.	Yes	See comment above about the rolling average approach.
35	Rely on good practice to minimise potential for release of offensive odours from digestate during use.	Yes	Odour measurement is too subjective. In addition, concerns about odour release from digestates when applied to land should be minimised if good agricultural practice and 'low emission spreading' techniques are followed. The AD Quality Protocol requires that good practice and low carbon emissions spreading techniques are followed when spreading digestate, which should suitably control the risk of odour emissions during landspreading of digestate. Action to mitigate odours should be related to the recording of odour complaints. This is already required under the QMS.

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36	Remove requirement for digestates to be covered at the digestion facility from PAS110.	Yes	<p>We understand the importance of covering the digestate, although we do not believe that PAS 110 is the right place to cover this requirement. Standard Permit 2010 N.15 for AD states that digestate shall be stored within covered containers or covered lagoons. Covering digestate is good practice, as it allows to preserve the digestate agronomic properties and to avoid losses of N due to volatilisation. In addition, open tanks may be more expensive overall as storage capacity cannot be fully utilised. Finally a digestate that has been stored in an open tank is likely to be more diluted and much less consistent in quality. d or not. Coverage of digestate storage on site is required to reduce "off gas" or "fugitive emissions" to a minimum in order to retain the GHG reductions which underpin government support for AD. Allowing release of biogas from storage on site would undermine the justification for AD as a climate change mitigation technology. Coverage also prevents pollution from rainwater, birds etc. Floating coverage should be allowed, but with fixed coverage, there should be measures to recover the biogas for use in combustion or storage. Finally sustainability criteria do not actually cover emissions at present but DECC prices the cost of mitigation in cost per tonne. This underpins their support for small on-farm AD – if there are uncontrolled emissions, then this undermines the argument for small scale deployment.</p>
37	Retain flexibility in the definition of 'significant change'.	Yes	The operator should be left to define what represent a significant change in their relevant QMS documents.
38	Retain current approach to sampling for digestate quality at the point where it is intended for supply to the customer.	Yes	This approach should be retained for parameters other than the RBP test. If the PAS 110 review committee decides that the RBP test is to be retained given that the main aim of the test is to demonstrate full recovery, it makes sense that only the whole digestate is tested (it is the form of digestate that corresponds with 'full treatment', with the exception of any subsequent step to separate liquid from solids).
39	Remove requirement to declare concentrations of water soluble sodium (Na ⁺) and chloride (Cl ⁻) from PAS110	Yes	This parameter is not currently perceived as crucial, particularly within the context of agricultural use of digestate. It may be relevant in the future for use of digestate in the horticultural market.
40	Retain current PAS110 suite of digestate quality parameters; or	Yes	See comment below.

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41	Introduce a fitness-for-purpose test or tests, to be agreed by the Steering Group, based on the data that are available.	No	The availability of a test method to test the fitness-for-purpose of digestate would be welcome, but not as a mandatory test. If such a test is available, it should be given as an option to AD operators that are treating feedstocks that may potentially contain residues of herbicides and where digestates is applied to land used to grow sensitive crops.
42	Retain reduced suite of determinands for digestates that are <i>made only from manure, unprocessed crops, processed crops, crop residues, glycerol, and/or used animal bedding that arise within the producer's premises or holding</i> ; or	Yes	It is unlikely that PTEs other than Zinc and Copper are present in these types of digestates at significant concentrations.
43	Remove reduced suite of determinands for digestates that are <i>made only from manure, unprocessed crops, processed crops, crop residues, glycerol, and/or used animal bedding that arise within the producer's premises or holding</i> , and require that all digestates be tested against the same suite.	No	See comment above.
44	Require that all digestates be subject to any specific 'end of waste' test (or tests) in PAS110; or	No	See comment below.
45	Exempt 'non-waste' digestates from any specific 'end of waste' test (or tests) in PAS110.	Yes	Our two main reasons for supporting such an exemption are as follows: 1) even outside PAS 110 regime, non-waste digestates are not regarded as waste, hence it is difficult to justify why an End of Waste test would be needed under the PAS 110 regime, and 2) energy crops fed AD plants do not rely on gate fees unlike commercial AD plants, thus, they would normally have retention times as long as possible to maximise biogas production. A test to demonstrate full recovery should not be needed in this scenario, as it is highly unlikely that a farm based AD plant would simply push input materials fast through the system, as this would not be financially viable.
46	Retain current approach to setting PTE limits, based on 'total' concentrations; or	Yes	See comment below.

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47	Where data support the approach, set PTE limits on a bioavailable basis.	No	Bioavailability is site specific, so we are unsure on how this approach would work and it may be too complex. As far as we know, PTE limit levels currently specified in the EU and national regulatory framework and specifications are all set on a total concentration basis. Examples are the current draft EoW proposal, fertiliser regulations, sludge directive, mobile plant permit for landspreading etc. If PTE concentrations for digestates were to be set on bioavailability, it may be difficult to compare PTE concentrations in digestate with those in other organic materials and it may be challenging to verify compliance with existing regulatory framework and/or specifications.
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