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Evaluating PAS110, the Anaerobic Digestate Quality Protocol and ASRS

Edinburgh 12th December
Bristol, December 13th
London, December 15th

Review or evaluation?

Review or evaluation?

- Quality Protocol is being reviewed
  - This process is led by the EA
  - Changes will probably need to be notified to Europe
- PAS110 is being evaluated
  - EU EoW process is underway
  - Need to ensure that the PAS remains fit for purpose
  - Streamlining the actual review process

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Context

PAS110

- Source-segregated inputs
  - Packaged food wastes
- Pasteurisation step needed for most processes
- Process and output parameters consulted and agreed with industry
  - Indicator pathogens, PTEs, stability, physical contaminants and agronomic declarations
- Digestates from anaerobic processes only

Since PAS110 was published

- Two plants certified
  - Around a dozen more on the scheme
- WRAP / ZWS AD technical programme
  - PAS110 / agriculture risk assessment
  - Biofertiliser matrix
  - Minimal toxicological risks mean that pasteurisation is used as main category
  - QMS and RTA have their own matrices

AD Quality Protocol

- The Waste Protocols project and its aims
- Quality Protocol development process
- Quality Protocol requirements
- WPP now and looking ahead

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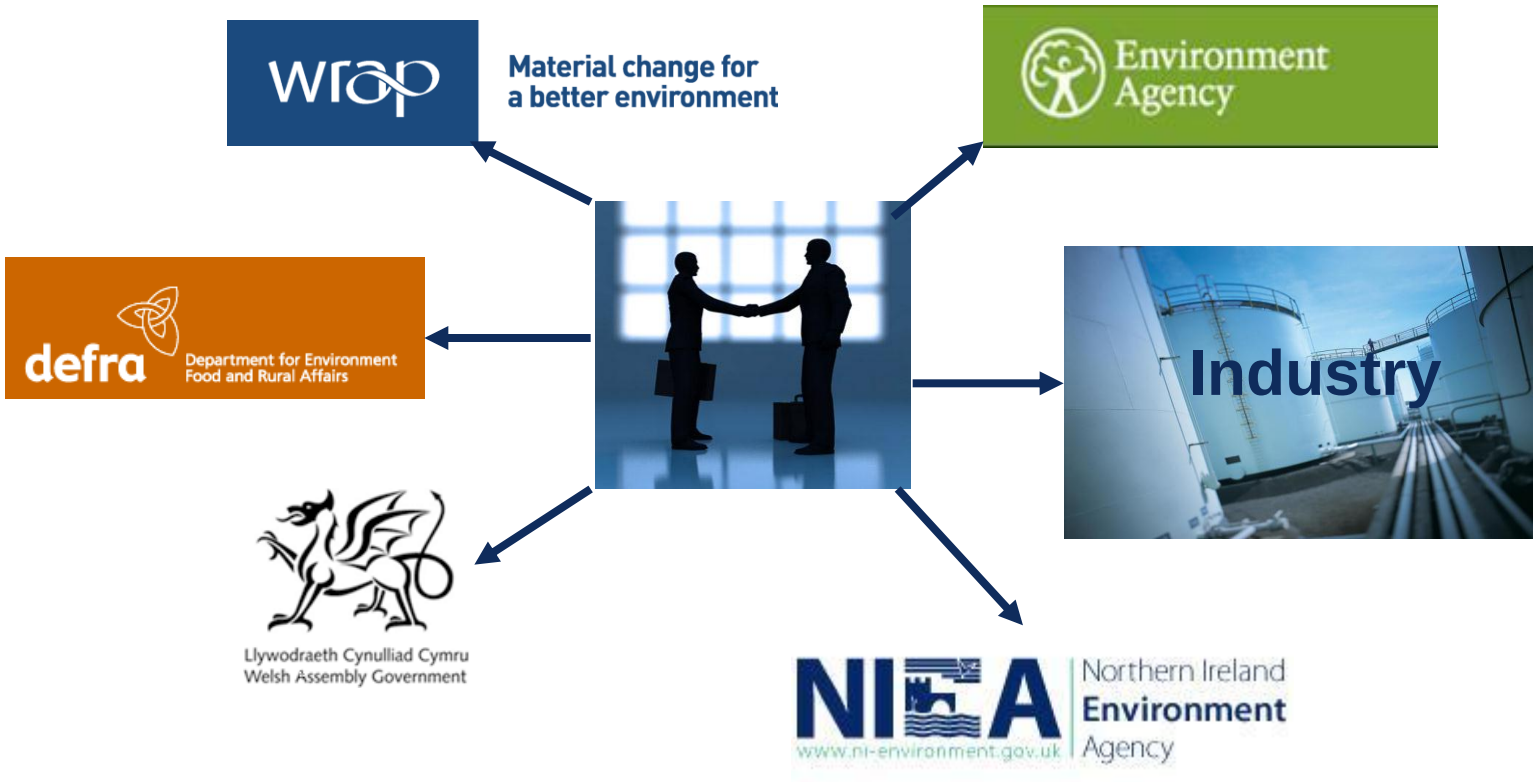
The Waste Protocols Project Partners



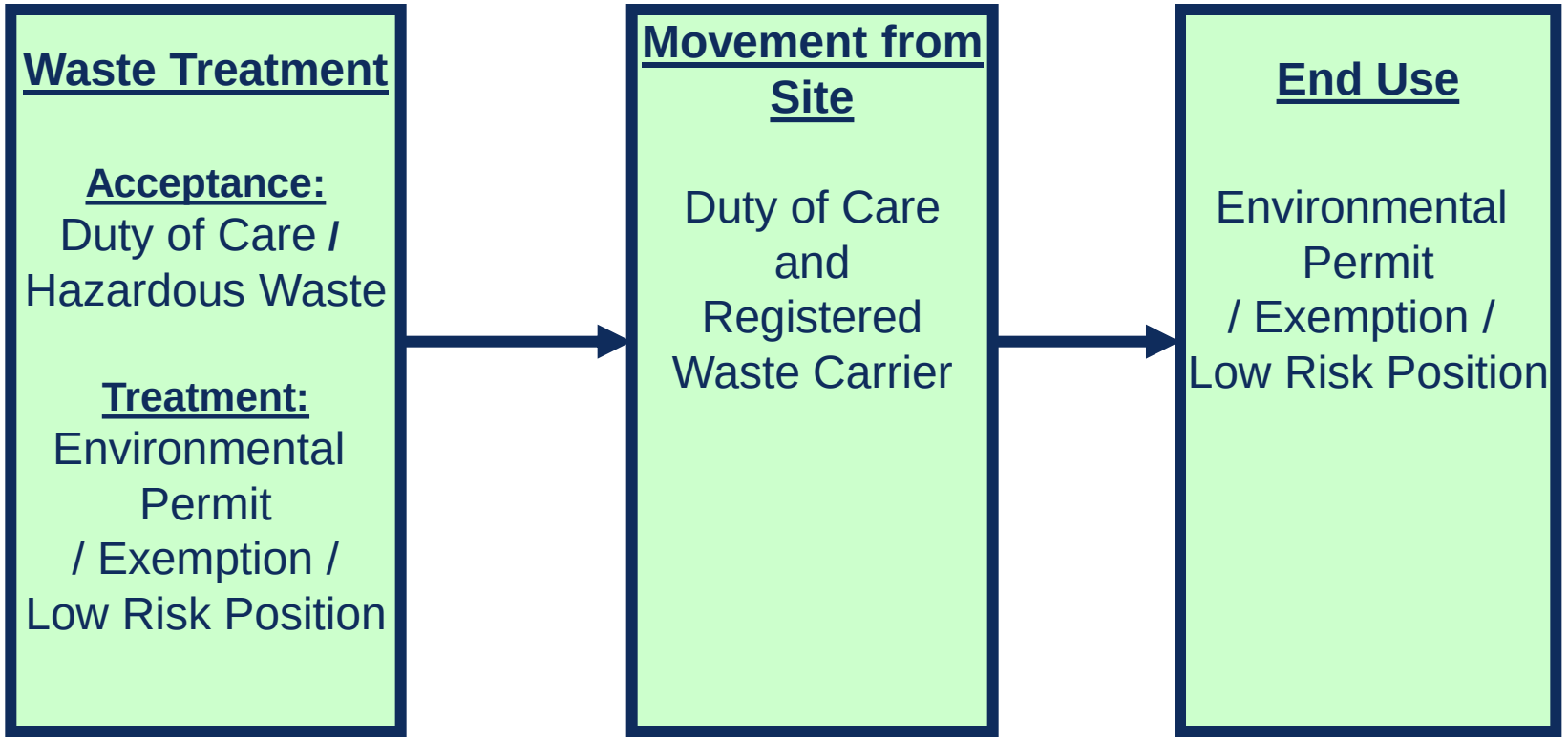
Barriers for Industry

Production process

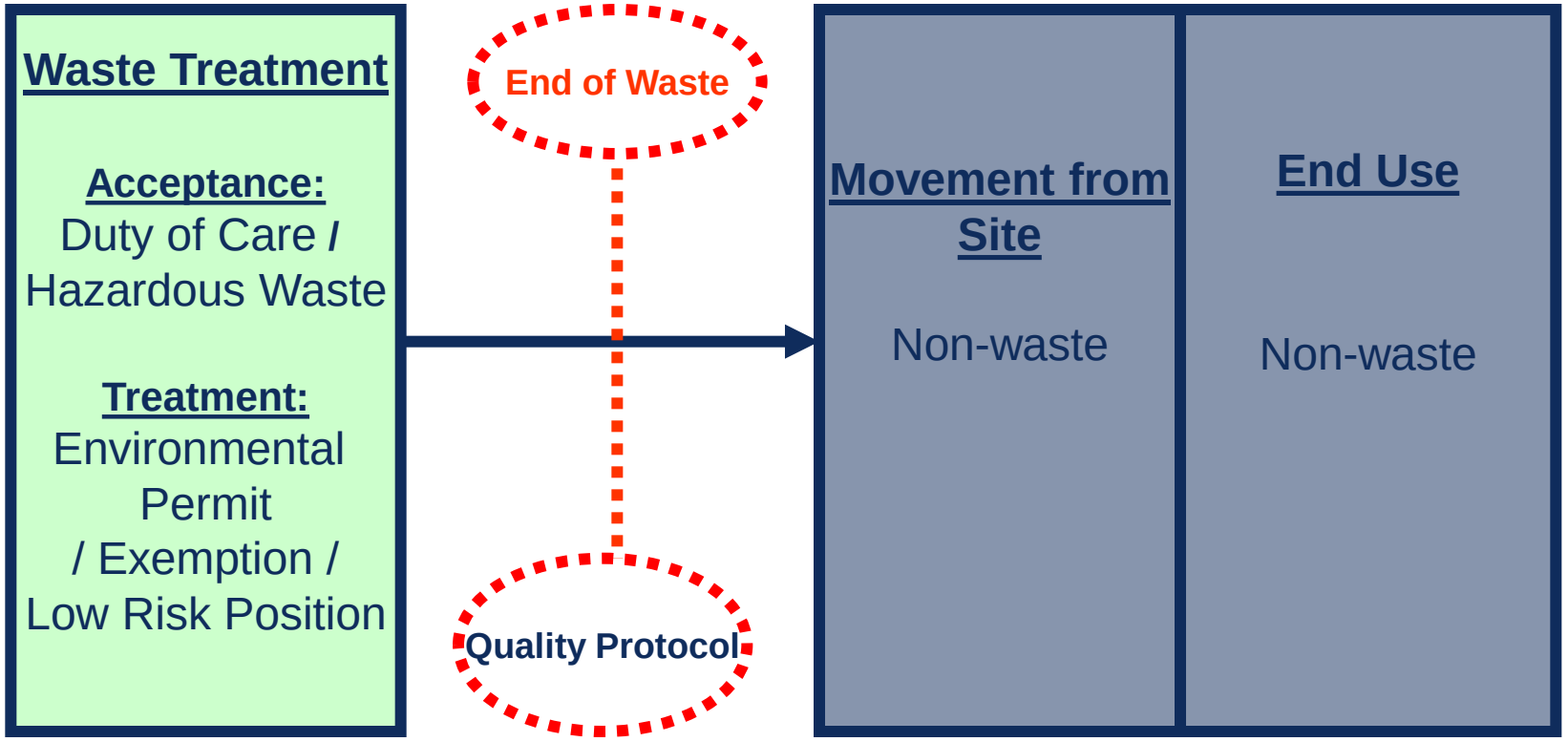
The waste label = red tape = lack of customer confidence = uncertain markets = difficulty securing investment.

What does a Protocol achieve?

Regulations



End of Waste


Waste Treatment
Acceptance:
Duty of Care / Hazardous Waste
Treatment:
Environmental Permit / Exemption / Low Risk Position
End of Waste
Quality Protocol
Movement from Site
Non-waste
End Use
Non-waste

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How is a Protocol achieved?

Inputs

Environment Agency

wrap — Material change for a better environment

Technical Advisory Group:

Evidence Gathering

- Risk Assessment
- Financial Impact Assessment
- Technical Report

Outputs

Environment Agency

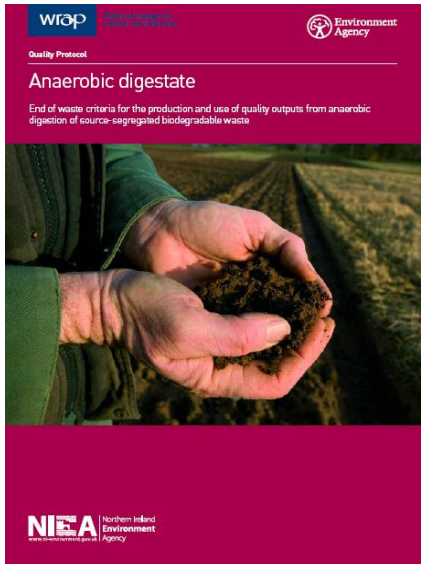
↓

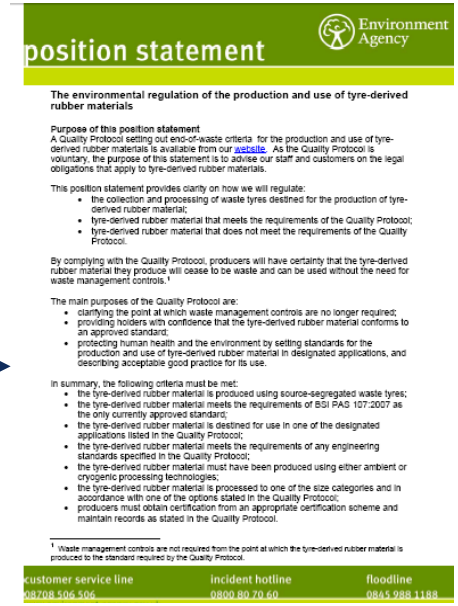
Evaluate the evidence

↓

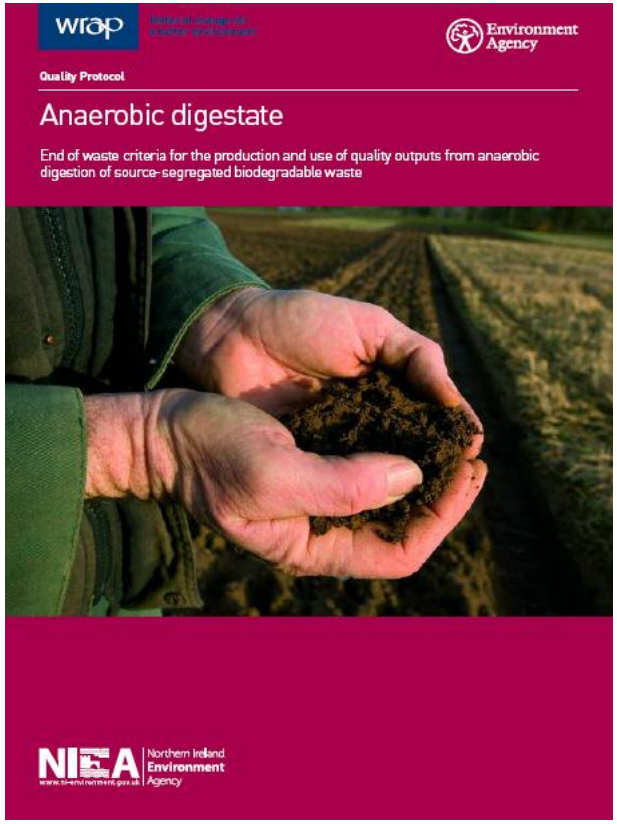
End of waste?

← **YES** | **NO** →





Quality Protocol Requirements



- Waste Inputs
- Standards
- Records Management
- End Uses
- Good practice
- Certification Scheme

Summary

- Purpose to determine point of end of waste
- Based on robust evidence for key documents to be produced
- Partnership working between EA, WRAP and industry
- Results in
  - improved quality
  - reduced regulatory burden and cost saving

Current status

- Waste Protocol Programme 'closed'
- Finalise outstanding QPs
- Reviews – every 2 years

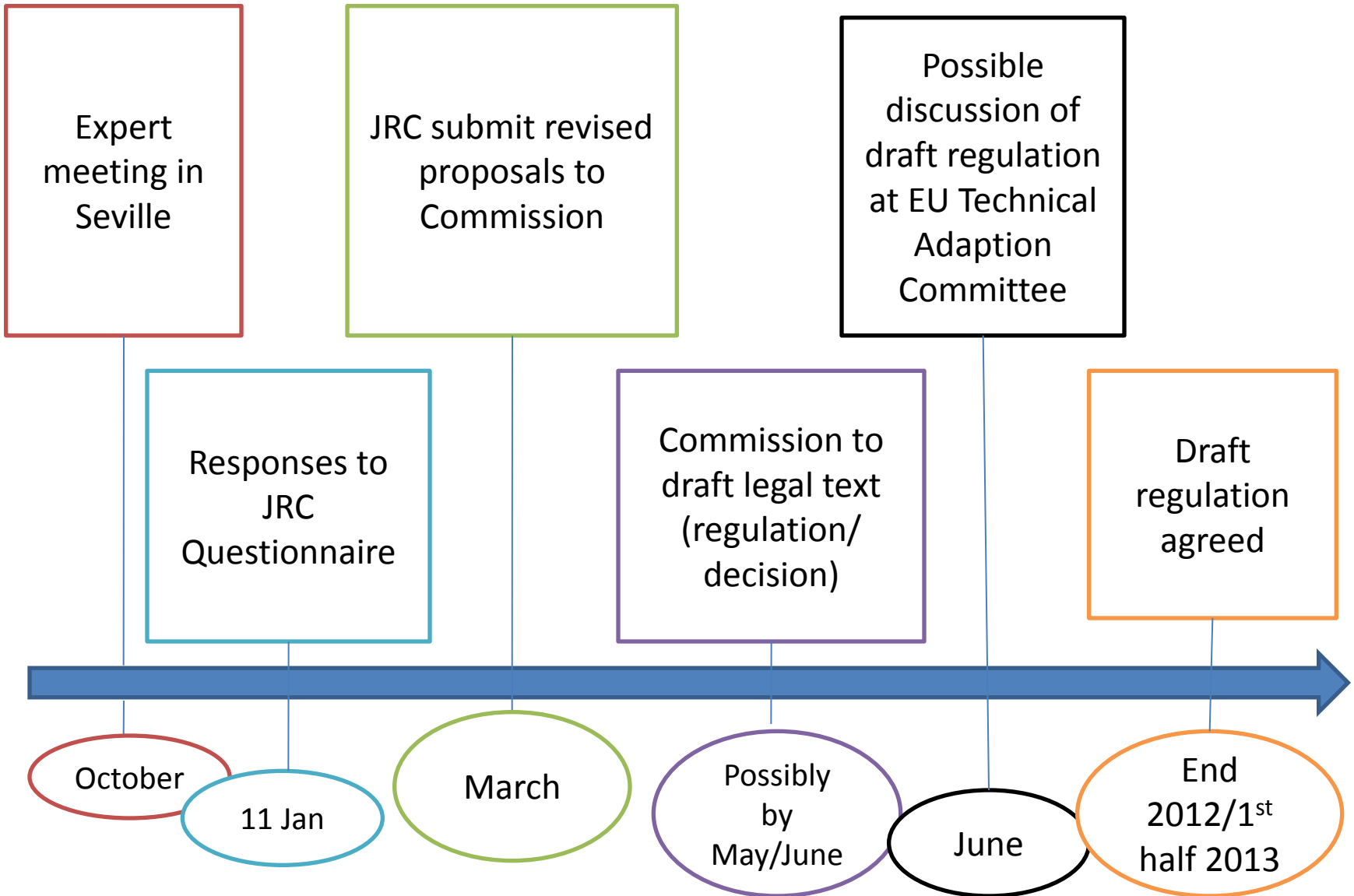
EU End of Waste Proposals

- Revised Waste Framework Directive
- Introduces new procedure for defining end of waste
- Biowaste chosen as one of the first wastes to be developed
- Others finished include ferrous metals and copper.

What does it mean

- It will be a pan European set of criteria – ie the same for every one.
- The UK is the only member state to have developed it's own end of waste process
- Others have existing standards and certification schemes
- The European criteria will eventually replace the UK criteria

EU End of Waste – Timeline



The process so far

- Initial documents circulated in March
- Technical group discussion
- Request for loads of information
- Second document circulated in October just before the second working group
- New questionnaire issued November
- No new document.

Where are we now

- JRC need response to the new questionnaire by 11th January
- This relates mostly to digestate but covers some other issues.
- Separate spreadsheet on the waste types to be allowed under the positive list
- If you would like to see the documents please contact Rachel who will send them to you.
- Please send any thoughts, data and information to your REA, AFOR or ADBA who will collate them.
- We are asking JRC for a bit more time.

Things we know

- Proposal is QP shaped…..
- ….but detail is different
- Positive list
- QMS
- Set determinand list

- We have quite a lot of the data that they are asking for but not all.

But –

- Some determinands different
- Some use different methods
- Some have different limit values
- Difference in required reporting and information to be supplied to the customer
- Determination of sampling regime is left to regulator and certifying body.
- Sewage sludge and MBT residues are excluded.

Things to do between now and Christmas

- Please look carefully at:
  - The positive list
  - The individual questions in the questionnaire
  - The specific requirements for QMS

- Provide any information at all on impact assesment (question 24)
- Likely to go back to JRC and tell them that this it is not possible to undertake a full impact assesment in the timescale and we will continue to do this seperately.

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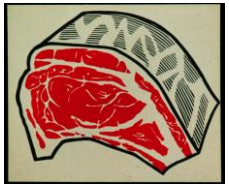
ADQP review

Source-segregated biodegradable materials



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Appendix B

Appendix B Biowaste types acceptable for the production of quality digestate

Input materials shall be biodegradable and may include non-waste biodegradable materials. The latter types are not listed in this Quality Protocol. Waste input materials may only be accepted if they are listed in table B1 below and they have been source-segregated (kept separate from any other wastes).

Biodegradable polymers, bags and packaging or other products made of such material shall be permitted only if they conform to all relevant parts of the quality standard BS EN 13432 or either of the similar standards DIN V 54900 or ASTM D6400. 'Home compostable' plastics and packaging shall be permitted only if they conform to a standard that is accepted by the Environment Agency and NIEA. Packaging that consists of natural fibres only is not required to meet the requirements stated in this paragraph; examples are plain cardboard and paper packaging items.

Wood and wood-derived wastes impregnated with preservatives, painted, or with any non-biodegradable layer shall not be permitted.

If producers have any doubt over whether an input material is compliant, they should discuss the issue with the certification body.

The Waste Protocols Project are working with the certification body to agree a methodology which will allow additional input materials to be added to this list in the future. *Please check the Environment Agency website for the most up to date list.*

Table B1 lists those waste categories to which this Quality Protocol applies.

Table B1. Types of wastes suitable for anaerobic digestion from EWC categories

Type	EWC code[11]
Wastes from agriculture, horticulture, hunting, fishing and aquaculture primary production, food preparation and processing	**02**
Primary food production wastes	02 01
Sludges from washing and cleaning	02 01 01
Food processing waste, food washing waste	
Animal tissue waste	02 01 02
Category 3 animal by-products or rendered Category 2 animal by-products digested in accordance with Article 15 of the ABPR at a facility subject to approval under the ABPR and the UK legislation making provision for the administration and enforcement of the ABPR[12].	
Plant tissue waste	02 01 03
Husks, cereal dust, waste animal feeds	
Animal faeces, urine, manure including spoiled straw, collected separately[13]	02 01 06
– Poultry droppings – Pig and cattle slurry – Manure – Old Straw Quality digestate derived from these wastes are subject to ABPR[12] requirements.	
Wastes from forestry	02 01 07
Green waste, plant tissue	
Non specified	02 01 99
Residues from commercial mushroom cultivation	

[11] European Waste Catalogue code

[12] Regulations 13 and 14 of the ABPR 2005 in England and Regulations 13 and 14 of the ABPR (Wales) 2006 No 1293 (W.127) in Wales. Regulations 13 and 14 of Animal By-Products Regulations (Northern Ireland) 2003 SR 495

[13] Quality digestate derived from animal by-product wastes of this type is subject to the requirements of Article 5(2)(e) of the ABPR. Regulation 5(3) of the Animal By-Products Regulations (S.I. No. 2347) and Regulation 5(3) of the Animal By-Products (Wales) Regulations 2006 No. 1293 (W. 127) and Regulation 5(3) of the Animal By-Products Regulations (Northern Ireland) 2003 (SR 495) provide that these animal by-products may be applied to land provided the Secretary of State or the National Assembly for Wales or the Department for Agriculture and Rural Development (Northern Ireland) have not imposed any animal health restrictions in relation to them.

Wastes from preparation and processing of meat, fish and other foods of animal origin	**02 02**
Sludges from washing and cleaning	02 02 01
Process water and food washing waste	
Animal tissue waste	02 02 02
Allowed only if: • Category 3 animal by-products, rendered Category 2 animal by-products or catering waste in either of these categories, digested in accordance with Article 15 of the ABPR at a facility subject to approval under the ABPR and the UK legislation making provision for the administration and enforcement of the ABPR[12]; • former foodstuffs (Category 3 animal by-products) produced in accordance with Article 15 of the ABPR at a facility subject to approval under the ABPR and the UK legislation making provision for the administration and enforcement of the ABPR[12]; and • catering waste only, that comprises Category 3 material or rendered Category 2 material, digested in accordance with Article 15 of the EU ABPR at a facility subject to approval under ABPR and the UK legislation making provision for the administration and enforcement of the ABPR[12] EWC code 02 02 02 may include animal blood.	
Materials unsuitable for consumption or processing	02 02 03
– Coffee, food processing waste, jam, kitchen waste, fruit, vegetable oil, tobacco, tea, vegetable waste – Waste fat from processing of meat or fish	
Non Specified*	02 02 99
– Sludges from gelatine production – Animal gut contents	
Wastes from fruit, vegetables, cereals, edible oils. Cocoa, tea and tobacco preparation and processing; conserve production	**02 03**
Sludges from washing, cleaning, peeling, centrifuging and separation	02 03 01
Sludge from food processing and animal gut contents	
Sludges from washing, cleaning, peeling, centrifuging and separation	02 03 02
Coffee, mushroom compost, food processing waste, food washing waste, tobacco	
Materials unsuitable for consumption or processing	02 03 04
– Out-of-date foodstuffs – Tinning process residues – Tobacco dust, veins, sludge – Defective cigarette batches – Residues from processing coffee, tea, cocoa – Oilseed residues – Glycerol residue from biodiesel manufacture from non-waste vegetable oils	
Effluent from the processes referred to in sources of waste	02 03 05
– Sludge from production of edible fats and oils – Seasoning residues – Molasses residues – Residues from production of potato, corn or rice starch	
Wastes from sugar processing	**02 04**
Sludges from on site effluent treatment	02 04 03
Biological sludge	

[12] Regulations 13 and 14 of the ABPR 2005 in England and Regulations 13 and 14 of the ABPR (Wales) 2006 No 1293 (W.127) in Wales. Regulations 13 and 14 of Animal By-Products Regulations (Northern Ireland) 2003 SR 495

* 'Non specified' categories are included in some sections above to allow additional categories of input materials.

Appendix B Biowaste types acceptable for the production of quality digestate (continued)

Other biodegradable wastes	02 04 99
Allowed only if no chemical agents added and no toxin residues	
Wastes from dairy products industry	**02 05**
Materials unsuitable for consumption or processing	02 05 01
– Includes raw milk. – May be Category 3 animal by-products or former foodstuffs that are allowed only if digested in accordance with Article 15 of the EU ABPR at a facility subject to approval under ABPR and the UK legislation making provision for the administration and enforcement of the ABPR[12]	
Sludges from on site effluent treatment	02 05 02
As above in sludge form	
Wastes from baking and confectionary industry	**02 06**
Materials unsuitable for consumption or processing	02 06 01
May be Category 3 animal by-products or former foodstuffs that are allowed only if digested in accordance with Article 15 of the EU ABPR at a facility subject to approval under ABPR and the UK legislation making provision for the administration and enforcement of the ABPR[12]	
Sludges from on site effluent treatment	02 06 03
As above in sludge form treatment	
Wastes from production of alcoholic and non-alcoholic beverages (except tea and coffee)	**02 07**
Wastes from washing, cleaning and mechanical reduction of raw materials	02 07 01
– Brewing waste, food processing waste, fermentation waste	
Wastes from spirits distillation	02 07 02
– Spent grains, fruit and potato pulp – Sludge from distilleries	
Materials unsuitable for consumption or processing	02 07 04
– Brewing waste, food processing waste, fermentation waste, beer, alcoholic drinks, fruit juice stored for too long	
Non specified*	02 07 99
– Malt husks, malt sprouts, malt dust – Spent and sludge from breweries – Sludge from wine making – Yeast and yeast-like residues – Waste types in this section allowed if biodegradable material only, no chemical agents added	
Wastes from wood processing and the production of paper, cardboard, pulp, panels and furniture	**03**
Wastes from pulp, paper and cardboard production and processing	03 03
Green liquor sludge	03 03 02
Paper sludge and green liquor	
Wastes from sorting of paper and cardboard destines for recycling	03 03 08
Cardboard, newspaper, tissues, paper	
Fibre rejects and sludges	03 03 10
Paper pulp (de-inked only), paper fibre	

[12] Regulations 13 and 14 of the ABPR 2005 in England and Regulations 13 and 14 of the ABPR (Wales) 2006 No 1293 (W.127) in Wales. Regulations 13 and 14 of Animal By-Products Regulations (Northern Ireland) 2003 SR 495

* 'Non specified' categories are included in some sections above to allow additional categories of input materials.

Wastes from leather, fur and textile industry	**04**
Wastes from the leather and fur industry	04 01
Wastes from leather industry	04 01 01
Fleshings may also be described as leather shavings. Allowed only if hides and skins, or parts of them, originating from animals that did not show clinical signs of any disease communicable through that product to humans or animals, and are digested in accordance with Article 15 of the EU ABPR at a facility subject to approval under ABPR and the UK legislation making provision for the administration and enforcement of the ABPR[12]	
Tanning liquor free from chromium	04 01 05
Tanning liquor free from chromium	
Sludges, in particular from on site effluent treatment free of chromium	04 01 07
Sludges not containing chromium	
Wastes from the textiles industry	**04 02**
Wastes from the textiles industry	04 02 10
– Organic matter from natural products, e.g. grease, wax – Allowed only if no chemical agents added and no toxin residues	
Waste plastic	04 02 13
See second paragraph at start of Appendix B for restrictions	
Wastes packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified*	**15**
Packaging (including separately collected municipal packaging waste)	15 01
Packaging	15 01 01
Paper and cardboard packaging (see second paragraph at start of Appendix B for restrictions)	
Packaging	15 01 02
Plastic (see second paragraph at start of Appendix B for restrictions)	
Packaging	15 01 03
Wooden (see second paragraph at start of Appendix B for restrictions)	
Packaging	15 01 04
Composite (see second paragraph at start of Appendix B for restrictions)	
Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use	**19**
Wastes from physiochemical treatments of waste	19 02
Combustible wastes other than those mentioned in 19 02 08 and 19 02 09	
Glycerol	
Wastes from the aerobic treatments of wastes (sources separated)	19 05
Wastes from the anaerobic treatment of wastes (source separated)	19 06
Waste types in this section are allowed only if derived from input types allowed by this Quality Protocol. If the input wastes to the anaerobic treatment system include animal by-products, they are allowed only if digested in accordance with Article 15 of the EU ABPR at a facility subject to approval under ABPR and the UK legislation making provision for the administration and enforcement of the ABPR[12]	

[12] Regulations 13 and 14 of the ABPR 2005 in England and Regulations 13 and 14 of the ABPR (Wales) 2006 No 1293 (W.127) in Wales. Regulations 13 and 14 of Animal By-Products Regulations (Northern Ireland) 2003 SR 495

* 'Non specified' categories are included in some sections above to allow additional categories of input materials.

Appendix B Biowaste types acceptable for the production of quality digestate (continued)

Wastes from waste water treatment plants not otherwise specified*	**19 08**
Grease and oil mixture from oil/water separation containing edible oils and fats	19 08 09
Grease and oil mixture containing only edible oils and fats	
Sludges from biological treatment of industrial waste water other than sludges containing dangerous substances from biological treatment if industrial waste water	
Sludge from industrial biological treatment, allowed only if no chemical agents added and no toxin residues	19 08 12
Municipal wastes and similar commercial, industrial and institutional wastes including separately collected fractions	**20**
Separately collected fractions	20 01
Paper and cardboard	20 01 01
Cardboard, newspaper, office paper, paper towels, tissues (only soiled materials where recycling is not possible; high gloss papers and toxic dyes excluded). Not allowed if any non-biodegradable coating or preserving substance present	
Biodegradable kitchen and canteen waste	20 01 08
Kitchen waste from canteens, restaurants, dairy products (liquid and solid) canteen waste, beer, biscuits, chocolates, alcoholic and non-alcoholic drinks	
Edible oil and fat	20 01 25
Cooking oil and animal fat	
Wood other than that mentioned in 20 01 37	20 01 38
Not allowed if any non-biodegradable coating or preserving substance present. Allowed only if no chemical agent added and no toxin residues.	
Garden and park wastes (including cemetery waste)	**20 02**
Biodegradable waste	20 02 01
Animal faeces, manure, garden waste, green waste, horticulture waste, plant tissue, parks and garden waste, hedge and tree trimmings, grass cuttings and leafy materials. Allowed only if no chemical agents added and no toxin residues	
Other municipal wastes	**20 03**
Mixed municipal waste	20 03 01
– Separately collected biowastes from private households. – Separately collected biowastes from commercial, industrial and institutional sources, which because of their nature and composition are similar to separately collected biowastes from households	
Waste from markets	20 03 02
– Allowed only if source segregated biodegradable fractions. Examples are plant material, fruit and vegetables – Former foodstuffs (Category 3 ABP) from a market source are allowed only if digested at a biogas plant subject to approval under Article 15 of the ABPR and the UK legislation making provision for the administration and enforcement of the ABPR[12] – Packaging waste from a market source is allowed only if it complies with the restrictions stated in the second paragraph at the start of Appendix B – Plastic waste from a market source is allowed only if it complies with the restrictions for the corresponding waste (waste category 15 01 02)	

[12] Regulations 13 and 14 of the ABPR 2005 in England and Regulations 13 and 14 of the ABPR (Wales) 2006 No 1293 (W.127) in Wales. Regulations 13 and 14 of Animal By-Products Regulations (Northern Ireland) 2003 SR 495

* 'Non specified' categories are included in some sections above to allow additional categories of input materials.

Inputs - issues for the review

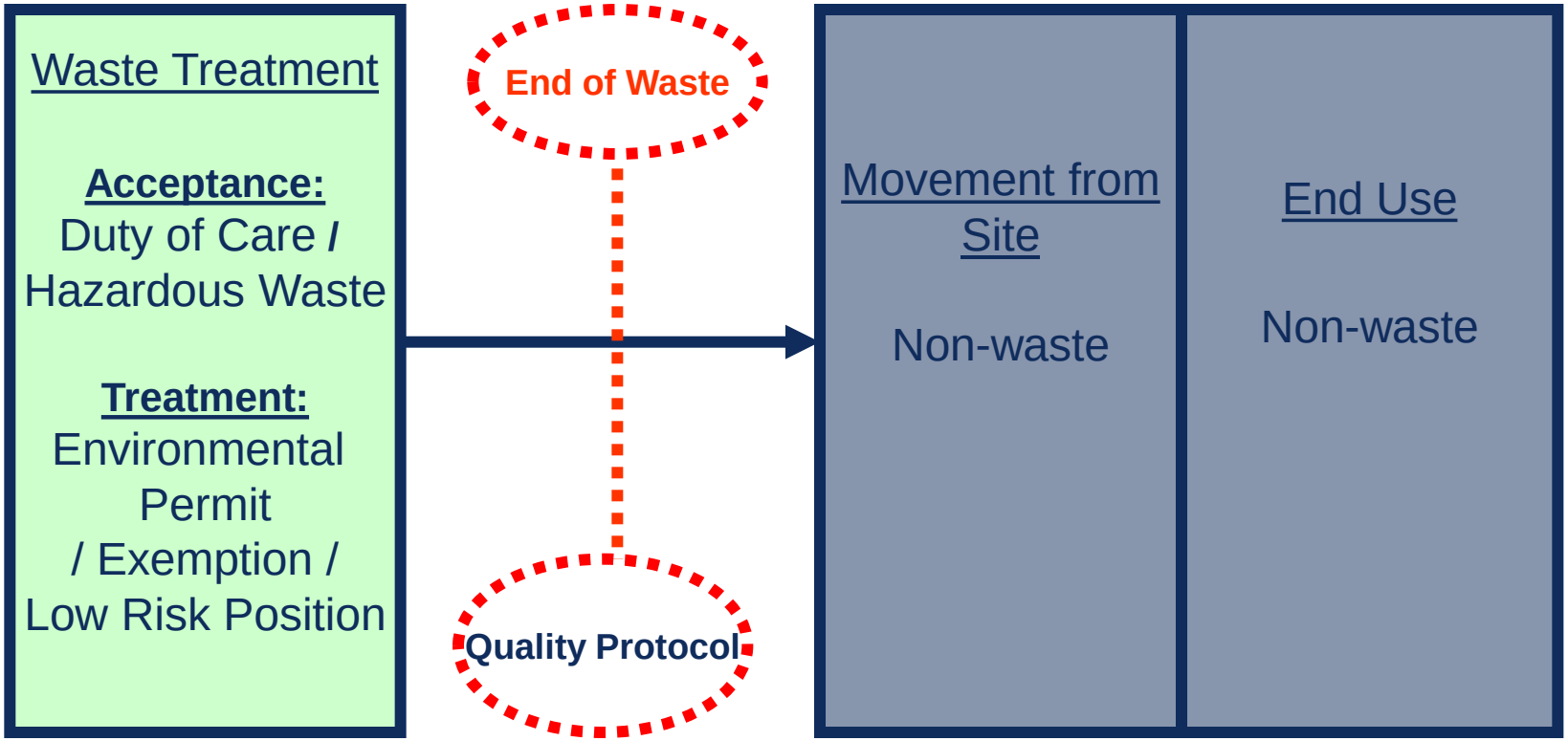
- Clarification and oversights e.g. codes
- Additional inputs
  - Which wastes?
  - What issues?
  - What evidence?

End uses – designated market sectors

- Agriculture, forestry and soil/field-grown horticulture; and land restoration

- Issue for the review - additional uses?
  - Which uses?
  - What issues?
  - What evidence?

End of waste & record management



Reminder – start of a process

- Evidence gathering
- Develop proposals
- Public consultation
- European 'notification'

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Additional Scheme Rules for Scotland (ASRS)

Additional Scheme Rules for Scotland

David Collins

Biofertiliser Certification Scheme

12th December 2011

http://www.biofertiliser.org.uk

RENEWABLE ENERGY ASSOCIATION


Westray, in Orkney, is the second largest island of the North Isles. It used to have a population of 700 but this has fallen to around 560 in the last 20 years
Westray
ORKNEY ISLANDS
10 miles
Renewed interest
Westray will be self-sufficient for energy by 2012
POWER PLANT
Fuelled by slurry and household waste
WIND
SOLAR PANELS
ENERGY SOURCES
These include wind turbines, solar panels, ground heating systems and proto-type tidal and wave power devices
TIDAL AND WAVE POWER
GREEN TRANSPORT
Hydrogen-fuelled cars will replace diesel and leaded ones. An electric minibus will be charged by wind turbines
SLURRY
Produces energy by breaking down methane gas
Digestate Standard
Why?

Renewable Energy Assurance Ltd

- wholly owned by REA
- REAL Code of Conduct for renewable energy installers who are MCS certified
  - The Microgeneration Certification Scheme certificates microgeneration technologies used to produce electricity and heat from renewable sources.
  - The MCS is also linked to financial incentives which include Feed in Tariffs.
- REAL Green Gas Certification Scheme
- REAL Biofertiliser Certification Scheme (PAS110 & ADQP & ASRS)

RENEWABLE ENERGY ASSOCIATION

Renewable Energy Assurance Ltd REAL

Choose CB

Approved Labs

Oversight Panel

Certifying Bodies

Appeals Committees

UKAS

Quality Digestate

YES

ASRS - SEPA & PAS110

NO

Waste

Current ASRS - SEPA Position for Digestate Producers for End of Waste






- Specifications contained in PAS110
- Conditions of the SEPA Regulatory Position
- Certain conditions extracted from the ADQP:
  - Appendix A – Definitions
  - Appendix B – List of Biowastes (EWC)
  - Appendix F – Records to be kept
  - Appendix G – Supply documentation

REA
RENEWABLE ENERGY ASSOCIATION

REAL Contacts

Biofertiliser certification scheme

David Collins - dcollins@r-e.a.net

07973 111 972

Ciaran Burns - cburns@r-e-a.net

REAL CEO Virginia Graham

http://www.biofertiliser.org.uk

http://www.biogas.org.uk

REA RENEWABLE ENERGY ASSOCIATION

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PAS110 evaluation

Have we thought of everything?

- Residual Biogas Potential test
- Pasteurisation requirement
  - For non-ABP inputs
- PTE limits
- Any other topics?

Topics arising at other workshops

- Dry digestion – does it fit?
- TAD – does it fit, and do we know enough about quality?
- Storage / coverage requirements
- Sampling processes / protocols
- Distillery wastes – different pasteurisation / test suite?
- Acceptability of food wastes in glass / glass limits
- Corn starch bags
- Meaning of the word 'arising' wrt imported produce
- Status of digestate between commissioning and PAS accreditation?

Residual Biogas Potential Test

- Designed to show stability as a proxy for prior digestion
- Limit based on RBP of small number of other land-applied materials (livestock slurries)
  - No permitted variance developed
- Test does not formally consider environmental outcomes

Questions: RBP test

- What are the issues with the current test?
- RBP limit?
  - If so – why, and how should it change?
- Cost of test?
- The test does not deliver real-time feedback to AD operators who may be adjusting permitted feedstocks to maximise gas yields
- Separate process and product tests?

Pasteurisation requirement

- Intended to minimise risk from microbiological hazards
  - Human, animal and plant
- Applies to all AD processes within PAS110
  - Except where inputs arise, are digested and used on the same holding
- Site-specific criteria set by AHVLA
- Non-ABP operators can opt for one of the three standard approaches in the UK ABPRs
- No deference to thermo or mesophilic

Questions: pasteurisation

- CAPEX and OPEX
- Seen as important by those who influence digestate markets
- Not required for non-ABP inputs when digestates spread as waste (non-PAS110)
- Should some input materials be exempted?
  - If so, which and why?
- Could 'pasteurisation equivalence' be allowed, or a wider range of options?

Pasteurisation – ABPR

System	UK A*	UK B*	EU
Maximum particle size (mm)	50	60	12
Minimum temperature (°C)	57	70	70
Minimum time spent at minimum temperature (hours)	5	1	1

*Applies to catering waste only, and must be followed by minimum 18 days storage

Pasteurisation – sewage sludge

Process	Descriptions
Sludge Pasteurisation	Minimum of 30 minutes at 70°C or minimum of 4 hours at 55°C (or appropriate intermediate conditions), followed in all cases by primary mesophilic anaerobic digestion
Mesophilic Anaerobic Digestion	Mean retention period of at least 12 days primary digestion in temperature range 35°C±3°C or of at least 20 days primary digestion in temperature 25°C±3°C followed in each case by a secondary stage which provides a mean retention period of at least 14 days
Thermophilic Aerobic Digestion	Mean retention period of at least 7 days digestion. All sludge to be subject to a minimum of 55°C for a period of at least 4 hours
Lime stabilisation	Addition of lime to raise pH to greater than 12.0 and sufficient to ensure that the pH is not less than 12 for a minimum period of 2 hours. The sludge can then be used directly

PTE limits

Parameter	Units	Upper limit
Heavy metals / potentially toxic elements		
Cadmium (Cd)	mg/kg dry matter	1.5
Chromium (Cr)	mg/kg dry matter	100
Copper (Cu)	mg/kg dry matter	200
Lead (Pb)	mg/kg dry matter	200
Mercury (Hg)	mg/kg dry matter	1.0
Nickel (Ni)	mg/kg dry matter	50
Zinc (Zn)	mg/kg dry matter	400

Questions: PTE limits

- Limits are on a dry matter basis
  - Whole and liquor digestates have very low DM, making it difficult to guarantee passes
  - However, PAS110 includes an option for SUA application limits to be used
- Should the SUA opt-out remain?
- Are there any alternatives?
  - If so, what should the limits be?