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| **Anaerobic Digestion** |
| Revision Summary |
| Version 1, April 2016 |



**CIWM/WAMITAB**

**Continuing Competence**

**Part of the CIWM/WAMITAB**

**Operator Competence Scheme**

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# Introduction

## About WAMITAB

WAMITAB is an awarding organisation and charity that develops qualifications for those working in cleaning; street cleansing; facilities management; resource management and recycling and parking from operative through to management level.

Since it was formed in 1989, WAMITAB has evolved in line with the convergence between the sectors with a clear focus on promoting and supporting environmental sustainability.  With over 120 qualification pathways and 70 quality assured centres, WAMITAB offers an unrivalled specialist network to support staff development.

## What is Continuing Competence?

The CIWM/WAMITAB continuing competence scheme is designed to ensure that the technically competent person (holds a certificate of technical competence, units or a qualification that is part of the CIWM/WAMITAB Operator Competence Scheme) on a waste site has knowledge and skills that keep pace with changes made across the waste management industry, such as the introduction of new legislation, technologies and techniques.

The CIWM/WAMITAB continuing competence scheme requires technically competent people in England and Wales to pass an assessment that demonstrates individuals have kept their competence up to date.

Keeping competence up to date is becoming increasingly important across the UK as society starts to recognise the crucial role waste and resource management industry professionals play in ensuring that the 434 million tonnes of waste generated every year can be treated, reused and recycled to produce a product that will contribute to further economic growth.

## About this Revision Summary

WAMITAB recognise the diverse needs of learners within the sectors we represent. To support those individuals undertaking their Continuing Competence test, we have developed this revision summary.

This revision summary is designed to support you preparation by linking the learning outcomes with the areas that may come up during the Continuing Competence test.

# 1. Waste Acceptance Procedures C:\Users\Helen\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FJ1S42NY\MC900432680[1].png

## Learning Outcomes

1.1 Know what information, checks and records required prior to accepting waste.

1.2 Know the acceptance procedures for waste that arrives at the anaerobic digestion facility.

1.3 Know the requirements for waste reception and storage at the anaerobic digestion facility.

1.4 Know the procedures for rejection at an anaerobic digestion facility.

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## Where do I find this information?

[GOV.UK: How to comply with your environmental permit (v6 June 2013)](https://www.gov.uk/government/publications/how-to-comply-with-your-environmental-permit)

[WRAP – PAS110 (2014)](http://www.wrap.org.uk/content/bsi-pas-110-specification-digestate) (Please note you will need to request this document from WRAP, but it is free of charge)

## Notes

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# 2. C:\Users\Helen\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FJ1S42NY\MC900432680[1].pngFeedstocks

## Learning Outcomes

2.1 Know the types of feedstocks available for anaerobic digestion.

2.2 Know the characteristics that should be tested as part of a detailed feedstock characterisation.

2.3 Know the consequences of using contaminated feedstocks for the anaerobic digestion process.

2.4 Know how the residual wastes from an anaerobic digestion facility should be controlled and managed.

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## Where do I find this information?

[GOV.UK: AD Quality Protocol](https://www.gov.uk/government/publications/quality-protocol-anaerobic-digestate)

[SR2012No11: Anaerobic Digestion facility including use of the resultant biogas](https://www.gov.uk/government/publications/sr2012-number-11-anaerobic-digestion-facility-including-use-of-the-resultant-biogas)

[SR2012No11: Anaerobic Digestion facility including use of resultant biogas (Waste recovery operation – capacity less than 100 tonnes of waste per day)](https://www.gov.uk/government/publications/sr2012-no12-anaerobic-digestion-facility-including-use-of-the-resultant-biogas-waste-recovery-operation)

## Notes

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# 3. C:\Users\Helen\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FJ1S42NY\MC900432680[1].pngAccepting Animal By-Products

## Learning Outcomes

3.1 Know the requirements for handling materials covered by Animal By Product Regulations.

3.2 Know how a Hazard Analysis Critical Control Point plan can benefit a Animal By Products Regulations facility.

3.3 Know the potential hazards to be assessed in relation to a Hazard Analysis Critical Control Point plan.

3.4 Know the control measures required for feedstocks containing meat.

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## Where do I find this information?

[The Animal By-Products (Enforcement) (England) Regulations 2013](http://www.legislation.gov.uk/uksi/2013/2952/pdfs/uksi_20132952_en.pdf)

[GOV.UK: Animal by-products categories, site approval and hygiene](https://www.gov.uk/guidance/animal-by-product-categories-site-approval-hygiene-and-disposal)

[GOV.UK: using animal by-products at compost and biogas sites](https://www.gov.uk/guidance/using-animal-by-products-at-compost-and-biogas-sites)

## Notes

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# 4. Emission Control and Abatement

## Learning Outcomes

4.1 Know the requirements for managing point source emissions to air.

4.2 Know when the majority of fugitive emissions to air are likely to occur.

4.3 Know the main methods of preventing point source emissions to air.

4.4 Know the factors that determine the degree of odour pollution.

4.5 Know the options for odour monitoring.

4.6 Know the methods used to prevent odour pollution and minimise its impact.

4.7 Know what information should be included in an odour management plan.

4.8 Know where there is a risk of bioaerosols release from the anaerobic digestion process and how to mitigate it.

4.9 Know the requirements for control of emissions to surface water, groundwater and the sewer.

4.10 Know the control measures to supress dust creation and dispersion.

4.11 Know control measures to minimise the emission of noise and vibration.

4.12Know what information is required if noise issues become relevant.

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## Where do I find this information?

[Organics Recycling Group – An industry guide for the prevention and control of odours at biowaste processing facilities](http://www.organics-recycling.org.uk/dmdocuments/Industry_guide_for_prevention_and_control_of_odours.pdf)

[Environment Agency – How to comply with your Environmental Permit ( 2013)](http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/LIT_7123_79744e.pdf)

[Environment Agency – H4: Odour Management (March 2011)](http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geho0411btqm-e-e.pdf)

[Environment Agency – Generic Environment Risk Assessment for AD SR2010No15](http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/geho1011buil-e-e.pdf)

[SR2012No11: Anaerobic Digestion facility including use of the resultant biogas](https://www.gov.uk/government/publications/sr2012-number-11-anaerobic-digestion-facility-including-use-of-the-resultant-biogas)

[SR2012No11: Anaerobic Digestion facility including use of resultant biogas (Waste recovery operation – capacity less than 100 tonnes of waste per day)](https://www.gov.uk/government/publications/sr2012-no12-anaerobic-digestion-facility-including-use-of-the-resultant-biogas-waste-recovery-operation)

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# C:\Users\Helen\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FJ1S42NY\MC900432680[1].png5. Standards

## Learning Outcomes

5.1 Know the key principles of PAS 110.

5.2 Know the treatment requirements for compliance with PAS 110.

5.3 Know what is required in order to class an output from the anaerobic digestion process as a non waste material.

5.4 Know the limitations and legislative compliance requirements if outputs are not certified as meeting PAS 110 and the Anaerobic Digestion Quality Protocol.

5.5 Know what wastes (including bioplastics) are permitted in order to comply with PAS 110 and the AD Quality Protocol.

5.6 Know what records need to be kept in order to comply with PAS 110 and the Quality Protocol.

5.7 Know the principles of a Hazard Analysis Critical Control Point plan and when it may apply.

5.8 Know the maximum amount of contaminants permitted under PAS 110.

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## Where do I find this information?

[AD Quality Protocol](https://www.gov.uk/government/publications/quality-protocol-anaerobic-digestate)

[WRAP – PAS110 (2014)](http://www.wrap.org.uk/content/bsi-pas-110-specification-digestate)

## Notes

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# C:\Users\Helen\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FJ1S42NY\MC900432680[1].png6. AD Process Principles

## Learning Outcomes

6.1 Know the principles of anaerobic digestion treatment.

6.2 Know what pre-treatment may be required for different types of feedstock.

6.3 Know what key factors need to be monitored during the digestion process.

6.4 Know the pH range for feedstock and how to manage it.

6.5 Know the consequences of having too much nitrogen within the anaerobic digestion process.

6.6 Know the issues surrounding the production, storage, treatment and use of biogas.

6.7 Know the requirements for pasteurization.

6.8 Know how to identify the organic loading rate of the process.

6.9 Know the options for disposal of biogas condensate.

6.10 Know the requirements for use of an auxiliary flare under a permit.

6.11 Know the regulatory and process requirements that need to be managed in case of plant and equipment breakdown.

6.12 Know the recommended nutrient ratios for an anaerobic digestion process for optimum methane production.

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## Where do I find this information?

[WRAP – PAS110 (2014)](http://www.wrap.org.uk/content/bsi-pas-110-specification-digestate)

[SR2012No11: Anaerobic Digestion facility including use of the resultant biogas](https://www.gov.uk/government/publications/sr2012-number-11-anaerobic-digestion-facility-including-use-of-the-resultant-biogas)

[SR2012No11: Anaerobic Digestion facility including use of resultant biogas (Waste recovery operation – capacity less than 100 tonnes of waste per day)](https://www.gov.uk/government/publications/sr2012-no12-anaerobic-digestion-facility-including-use-of-the-resultant-biogas-waste-recovery-operation)

[HSE – Confined Spaces (published 01/13)](http://www.hse.gov.uk/pubns/indg258.pdf)

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# C:\Users\Helen\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FJ1S42NY\MC900432680[1].png7. Digestate

## Learning Outcomes

7.1 Know the requirements for the storage of digestate:

* PAS 110 compliant.
* Non PAS 110 compliant.

7.2 Know the regulatory requirements for the storage of digestate in a lagoon.

7.3 Know when digestate sampling and testing may be required.

7.4 Know what digestate treatments may be required, their benefits and their uses.

7.5 Know the legal requirements for use of digestate not meeting the PAS 110 and the Anaerobic Digestion Quality Protocol.

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## Where do I find this information?

[SR2012No11: Anaerobic Digestion facility including use of the resultant biogas](https://www.gov.uk/government/publications/sr2012-number-11-anaerobic-digestion-facility-including-use-of-the-resultant-biogas)

[SR2012No11: Anaerobic Digestion facility including use of resultant biogas (Waste recovery operation – capacity less than 100 tonnes of waste per day)](https://www.gov.uk/government/publications/sr2012-no12-anaerobic-digestion-facility-including-use-of-the-resultant-biogas-waste-recovery-operation)

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# C:\Users\Helen\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\FJ1S42NY\MC900432680[1].png8. Health and Safety

## Learning Outcomes

8.1 Know the hazards and risks associated with carrying out maintenance in a digester.

8.2 Know of the control measures to mitigate the risk of fire, explosion and the other harmful physical effects from dangerous substances as required by the Dangerous Substances and Explosive Atmospheres Regulations 2002.

8.3 Know what should be included in a formal accident management plan.

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## Where do I find this information?

[HSE – DSEAR Guidance (published 2013)](http://www.hse.gov.uk/pubns/priced/l138.pdf)

<http://www.hse.gov.uk/pubns/books/l138.htm>

[HSE – Confined Spaces (published 01/13)](http://www.hse.gov.uk/pubns/indg258.pdf)

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