DIGESTATE BIOFERTILISER CERTIFICATION

DBPAS 05 Version 1

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Bioenergy Association

Contents

Legal Disclaimer:

Producers of digestate are not legally obliged to obtain digestate biofertiliser certification. Certification is voluntary for those producers who wish to label their product as meeting specified quality standards. If producers do not wish to obtain certification of their digestate product, the liquid outputs from anaerobic digestion will normally be considered a waste material and legislative and regulatory waste controls will apply to their handling, transport and application.

Please note that within this document the terminology 'digestate biofertiliser' and 'biofertiliser' are used interchangeably.

While not a statutory requirement consent authorities may choose certification as an acceptable path to demonstrating compliance with statutory requirements.

The purpose of this document is to assist producers demonstrate compliance for the anaerobic digestion of biodegradable organic materials to produce Fertmark certified digestate biofertiliser.

Compliance with this publication cannot confer immunity from legal obligations.

When a biofertiliser is labelled with the Fertmark certificate this solely represents the producer's declaration regarding conformity. It is important to note that the accuracy of this claim is the sole responsibility of the person or organisation making it.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application. In addition to the requirements of this, attention is drawn to the following statutory requirements:

Animal Products Act 1999

Animal Products Regulations 2021

Agricultural Compounds and Veterinary Medicines Act 1997

Biosecurity (Ruminant Protein) Regulations 1999

Resource Management Act 1991

Document Control

This is a controlled document.

It must be reviewed and updated as it is considered appropriate.

Triggers for review could include new information from research including field trials, pollution incidents, a change in the market, a change in legislation or case law.

Updates to will only be made if approved jointly by the Bioenergy Association and the Fertiliser Quality Council.

Each version of the document will have a version number and a control sheet which will record its status and a brief comment about the changes that have been made to it.

The document and any associated papers will be published on www.biogas.org.nz

Version	Status	Bioenergy Association approval	Fertiliser Quality Council approval	Date	Significant changes from previous version
1	Consultation draft	Brian Cox		24/1/24	Initial establishment of the Digestate Biofertiliser Certification Scheme

1.0 Introduction

Compliance with the digestate biofertiliser certification requirements set out in this document enables biofertilisers to be made and supplied in a way that minimises risks to land, food safety and animal welfare.

How does a producer obtain digestate biofertiliser certification?

To obtain certification requires producers to ensure their digestate can meet the minimum quality criteria set out within sections 4.0 and 5.0 of this document. For producers of digestate to demonstrate that their product meets these criteria, producers must have established a Risk Management Programme for their facility to demonstrate they will consistently produce compliant digestate.

The Risk Management Programme consists of:

- A **Quality Management System**
- A **Hazard Analysis Critical Control Point (HACCP) Plan**
- A **Facility Management Plan**

Certification of the biofertiliser product is then completed through application to and auditing by Fertmark. The certification process is designed to assure users that the product meets both the requirements of producing a biofertiliser to Fertmark and Bioenergy Association specified performance standards, and the need to demonstrate the facility's ability to safely handle and treat biodegradable organic materials in accordance with the current regulatory controls within:

- The Animal Products Act 1999 and Animal Products Regulations 2021
- The Agricultural Compounds and Veterinary Medicines Act 1997
- The Biosecurity (Ruminant Protein) Regulations 1999

2.0 Scope

Certification covers **whole digestate**, **separated liquor** and **separated fibre** fractions from the anaerobic digestion of biodegradable organic materials. Producers should note that the addition of other materials or wastes to the process not listed in Table 2 will result in the digestate falling outside the scope for certification by Fertmark.

This Certification guidance document covers:

1. Characterisation of digestates suitable for certification
2. Producer systems and documentation required for certification
3. The steps for Fertmark digestate biofertiliser certification

Terms with specific definitions are highlighted in bold where they first appear within this document with their meaning found in section 11.0 Terms and Definitions. Furthermore detailed guidance and examples of the necessary documents for certification can be found on the Bioenergy Association's website[1].

It is important producers make themselves familiar with the Bioenergy Association's *Technical Guidance 8 (The Production and Use as Biofertiliser of Digestate Derived from Source Segregated Organic Waste*), herewith referred to as 'TG8' which details current best practice for anaerobic digestion. TG 8 can also be found on the Bioenergy Association's website[2]

3.0 Does your Digestate meet the Criteria?

The first crucial step is to ensure your digestate meets the biofertiliser quality requirements. Only digestate that complies with these requirements can progress towards being certified by Fertmark as a biofertiliser.

The digestate quality requirements are:

- The input materials originate from the sources listed in Tables 1 and 2
- Digestate meets the specified nutrient, physical, biological and chemical characteristics listed in Tables 3-7 in section 5.0

Once the producer is satisfied that their digestate meets both the input material and minimum output quality criteria, and they have documented the facility's Risk Management Programme, they may apply to Fertmark for certification of the digestate as a digestate biofertiliser.

[1] https://www.biogas.org.nz/resource/biofertiliser-certification-scheme

[2] https://www.biogas.org.nz/resource/tg08-production-and-use-digestate-biofertiliser

4.0 Feedstock Materials

Table 1: Input materials able to be feedstocks for digestate biofertiliser

Industry	Approved Materials
Agriculture and Primary Processing Residues	Fruit and/or vegetables from the field not intended for human consumption
	Plant parts like leaves or tops free from clopyralid and aminopyralid herbicides
	Purpose grown supplementary crops free from clopyralid and aminopyralid herbicides
	Abattoir and butchery by-products from healthy animals free from disease and not able to be sold as a higher value product. Must comply with conditions 1 and 2 below (Table 2). These by-products include: paunch grass, carcasses/body parts, hides, skins, hooves, horns, feathers, wool, hair, hatchery by products including eggs and eggshells, unhatched poultry in its shell, aquatic animals, and invertebrates
	Shells from shellfish with soft tissue
Domestic and Commercial Garden waste	Organic materials commonly found when working in a domestic garden or commercial green space such as tree branches, pruning from trees and hedges, weeds, lawn clippings, plants, shrubs, leaves and cut flowers. Must comply with condition 3 below (Table 2).
Food and drink processing residues	Residue and by-product material from the manufacture of food products containing meat, fish, dairy. Must comply with condition 4 below (Table 2). Includes material of animal origin that has been passed as fit for human consumption in an abattoir or butchery but for commercial reasons or due to problems of manufacturing or packaging defects or other defects cause no risk to public or animal health. For example, product is passed its use by date, it is damaged or soiled.
	Residue materials from the manufacture of drinks and other beverages
	Reject fruit and vegetables from commercial pack houses
	Brewers' grain/chaff, grape marc (skins, pulp, stems, seeds left over from grape pressing)
Domestic and commercial food waste Must comply with Condition 4 below	Domestic household kitchens e.g. kerbside food scrap collections
	Retail premises, restaurants, cafes, hotels, catering facilities, commercial kitchens
	Food markets, supermarkets, butchers, and bakers
	Schools and workplaces

Table 2: Conditions for Input Materials

Condition 1	The abattoir by-products have been passed as fit for human consumption but are not intended for human consumption either because they are parts of animals we normally do not eat (e.g., hides, bones) or for commercial reasons.
Condition 2	Only meat from processing facilities that are approved for export to the UK and Europe and are compliant with appropriate MPI and EU legislation such that the spinal cord and brain matter are removed separately prior to further processing will be accepted. These processing facilities have Specific Risk Material (SRM) removal systems in place to meet market requirements. All SRM material is treated as high risk, is separated, and sent to rendering with condemned material.
Condition 3	Lawn clippings carry the risk of containing the herbicide clopyralid. Ideally this feedstock should be free of clopyralid. However, if clopyralid is detected, then markets for the biofertiliser will need to exclude high risk crops.
Condition 4	Only meat and meat products which were once acceptable for human consumption is exempt from the SRM material certification requirement, e.g., originating from butchers, supermarkets, restaurants, food processing factories, and kerbside food scraps collections. For clarity this may include (but not limited to) product which is no longer within its use by date, damaged stock and/or meal leftovers.

5.0 Digestate Minimum Quality Criteria

Quality testing for nutrients and chemical, biological and physical characteristics of digestate must be carried out according to the accredited test methodologies in laboratories accredited to NZS ISO/IEC 17025 and/or recognised by IANZ (International Accreditation New Zealand, formerly TELARC). Other tests must be carried out accordingly to the test methodology prescribed in NZS 4454:2005 or according to alternate accredited test methodology in accredited laboratories. Sampling protocols to be followed are specified within Sections 9.1-9.8 within *NZWWA Guidelines for the Safe Application of Biosolids to Land in New Zealand (2003)*.

Table 3: Digestate Nutrient Characteristics (minimum nutrient limits for Biofertiliser)

Parameter	Standard	Authorised Analysis Methodology
Nitrogen Phosphorus Potassium Magnesium Calcium Sulphur	Aggregate of all parameters > or equal to 0.6% dry weight	N, P, K, Mg and Ca APHA Nitric Acid Digestion

Source: Fertmark Code of Practice/ BANZ

Note: Calculated using the 6-month rolling average of sampling data. Tolerance limits for these nutrient concentrations is +/- 20% on a dry weight basis once production facility reaches steady state (digestion and input feedstocks)

Table 4: Digestate Chemical Characteristics (heavy metal limits for Biofertiliser)

Parameter	Concentration Limit mg/kg dry weight	Authorised Analysis Methodology
Arsenic	30	NZS ISO 17025 (or IANZ) accredited laboratory using accredited test methodologies
Cadmium	10	
Chromium	1500	
Copper	1250	
Lead	300	
Mercury	7.5	
Nickel	1500	
Zinc	135	

Source: Beneficial Use of Organic Materials on Productive Land Vol 1 Guide, 2017 and NZS 4454:2005 Composts, Soil Conditioners and Mulches

Table 5: Digestate Biological Characteristics (pathogen limits for Biofertiliser)

Parameter	Standard	Authorised Analysis Methodology
E coli	Less than 100 MPN/g	Part 9221 F (modified) Standard Methods for the Examination of Water and Wastewater (APHA, 23rd ed. 2017)
Campylobacter	Less than 1/25g	Enumeration of Thermotolerant Campylobacter in Biosolids (A. Donnison, AgResearch Limited) Appendix 1 Biosolids Guidelines
Salmonella	Less than 2 MPN/g	Salmonella sp bacteria: Part 9260 D, Standard Methods for Examination of Water and Wastewater, (APHA, 1988), or Detection and enumeration of salmonella and Pseudomonas aeruginosa (Kenner and Clark, 1974)

Source: PAS 110:2014 Specification for whole digestate, separated liquor and separated fibre derived from the anaerobic digestion of source-segregated biodegradable materials

Table 6: Digestate Physical Characteristics (allowable physical contaminant limits for Biofertiliser)

Total N of Biofertiliser	Kg/t	<1	1-1.9	2-2.9	3-3.9	4-4.9	5-5.9	6-6.9	7-7.9	8-8.9	9 or more
Total Contaminants >2mm	**Kg/t**	0.00	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03
Total Stones >5mm	**Kg/t**	3.2	6.4	9.6	12.8	16	19.2	22.4	25.6	28.8	32
Authorised Analysis Methodology NRM method JAS-497/001 declared on a fresh weight basis or Accredited methodology at accredited laboratory (NZS ISO/IEC 17025 and/or recognised by IANZ)											

Source: PAS 110:2014 Specification for whole digestate, separated liquor and separated fibre derived from the anaerobic digestion of source-segregated biodegradable materials

Table 7: Digestate Stability Characteristics (allowable stability limits for Biofertiliser)

Parameter	Standard	Authorised Analysis Methodology
Stability of whole digestate, separated liquor or separated fibre		
Volatile Fatty Acids	0.774g COD / g VS	Gas Chromatography

Source: BANZ

Note: Alternative methods (excluding the alkalinity method) for determining stability as set out in Table 7 may be used, where those alternatives demonstrate an equivalent limit to that set in the table.

6.0 Facility Risk Management Programme

To demonstrate the reliability and consistency of digestate production, producers must establish a Risk Management Programme. This is necessary for Fertmark to have confidence that samples taken during certification and routine monitoring are representative of the digestate as a whole. Figure 1 below illustrates how the plans and systems form the facility's Risk Management Program.

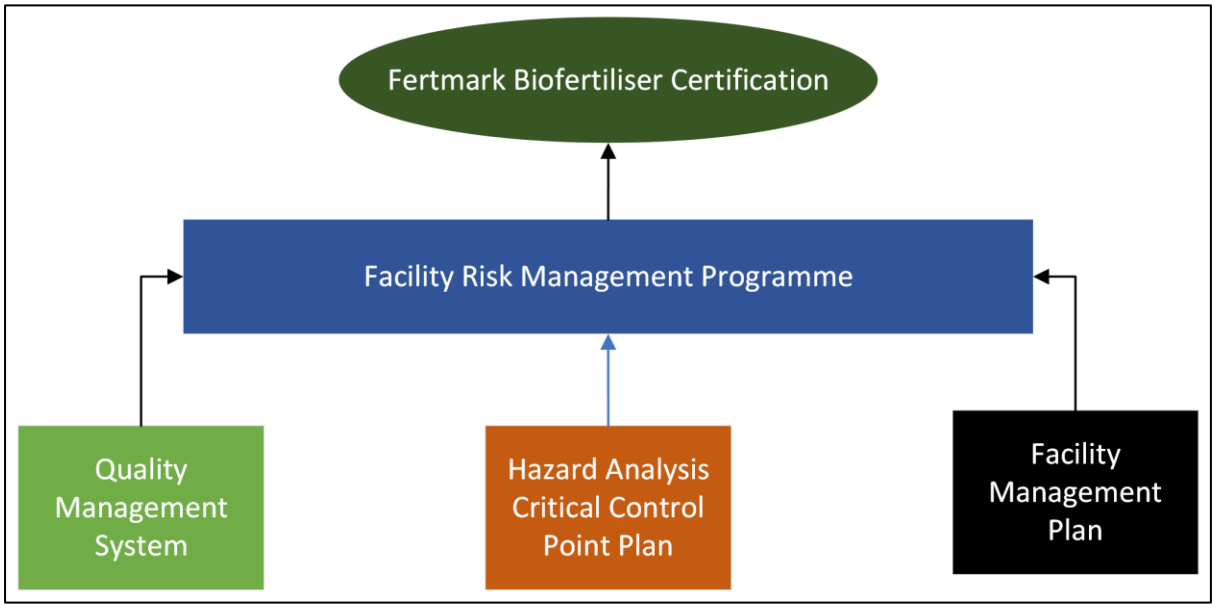

Figure 1: Risk Management Plan requirements for Biofertiliser Certification

Table 8 below details the components that make the Risk Management Programme.

Table 8: Components of your Risk Management Programme

Quality Management System	HACCP Plan	Facility Management Plan
1. Management engagement and leadership 2. Adequate resourcing, staff training, and contingency planning. 3. Clear roles and responsibilities 4. Quality commitment 5. Effective communication 6. Regular reviews 7. Reporting 8. Document control	1. **Hazard analysis** 2. **Critical control points** (CCPs) 3. **Critical limits** 4. **Monitor**ing systems to control the CCPs 5. Corrective actions when monitoring systems indicate a CCP is not under control 6. Verification procedures 7. Documenting procedures and records	1. Facility details 2. Process safety management, feedstock separation and storage 3. Process equipment 4. Process monitoring 5. Sampling of digestate 6. Actions in the event of test failure 7. Distribution & Storage

7.0 The Quality Management System (QMS)

Demonstrating compliance requires that all producers establish and maintain a quality management system (QMS). A QMS must consist of the following sections:

1. Management engagement and leadership
2. Adequate resourcing, staff training
3. Clear roles and responsibilities including contractor training and control
4. Quality commitment
5. Effective communication
6. Regular reviews
7. Reporting
8. Document control

The requirements of each section are explained in detail below.

1. Management Engagement and Leadership

   Senior management must appoint a member of the organisation's management who, irrespective of other responsibilities, must have responsibility and authority that includes:
   - Ensuring that QMS processes are established, implemented and maintained
   - Reporting to senior management on the performance of the QMS and any need for improvement
   - Ensuring the promotion of awareness of customer requirements throughout the organisation

2. Adequate resourcing:

   Senior management must:
   - Ensure sufficient resources for the establishment, implementation, maintenance and improvement of the QMS

3. Clear roles and responsibilities

   Senior management must:
   - Ensure that the responsibilities and authorities are defined, using as a minimum a staff organogram, and that these are communicated throughout the organisation
   - Determine the necessary competencies for personnel performing work affecting digestate quality
   - Ensure that each person whose duties affect digestate quality must be trained, instructed and supervised commensurate with those duties, such that he/she is competent.
   - Ensure training includes the subjects of QMSs and HACCPs, at least for the competent person(s) with overall responsibility for the QMS.
   - Ensures that the individual/s who lead the organisation's training on QMSs and HACCP must receive appropriate training from an experienced training provider.
   - Ensure that contractors are suitably trained regarding site and equipment safety, equipment operation, and that their access on site is controlled.

4. Quality commitment

The producer must:
- Establish a quality policy for digestate produced under this QMS

The producer's quality policy must include:
- Clear identification of the location of the digestion equipment within the site, the type/s of processes employed, and what digestate output types are produced
- The producer's commitment to achieving the corresponding minimum quality specified in TG8 for each digestate certified output
- The producer's commitment to fulfilling customers' requirements regarding its fitness for purpose for each digestate output certified through Fertmark including any additional quality requirements

5. Effective communication

Senior management must:
- Communicate to the organisation that the digestate produced under this QMS must be **fit for purpose**
- Ensure that the appropriate communication process is established within the organisation and that communication takes place regarding the effectiveness of the QMS
- The quality policy and relevant parts of the QM must be communicated to all personnel whose activities affect digestate quality.
- All personnel whose activities affect digestate quality must be made aware of the relevance and importance of their activities, and how those activities contribute to the achievement of the producer's commitments set out in its quality policy.

6. Regular reviews

The producer must:
- Conduct and record internal audits at planned intervals, at least annually, to determine whether the QMS conforms to its QMS plan for the production of digestates that are fit for purpose and whether the QMS is effectively implemented and maintained.
- Establish and document a procedure that defines the responsibilities and requirements for planning and conducting audits, establishing records and reporting results.
- Review whether the QMS, HACCP plan and FMP continue to be effective.
- Ensure than any necessary corrections and corrective actions are taken without undue delay to eliminate detected nonconformities and their causes.
- Ensure that follow-up activities include verification of the actions taken and reporting and recording of verification results.

In the event of any significant, non-temporary change in input materials, production process management or required digestate quality occurs, producers must:
- Ensure the production process is revalidated
- Review and record the significance and temporary or non-temporary nature of any change including the producer's justification for each decision.
- Sample and test the relevant digestate output types if working towards certification or if operating after certification, as appropriate, to determine the effects of those changes on the digestate(s).

The audit programme must:
- Be planned
- Take into consideration the status and importance of the processes and areas to be audited
- Take into consideration the results of previous audits
- Have a defined audit criteria, scope, frequency and methods
- Ensure the selection of auditors and the conduct of audits are objective and impartial
- Ensure that an auditor does not audit his/her own work

The audit must cover:
- QMS procedures and processes
- The digestate production process
- **Operating procedures** that describe it
- Digestate quality
- Procedures relating to the allocation of QMS responsibilities, human resources, training, infrastructure, customer-related processes, data handling, communications and improvement of the QMS

Producers must complete regular reviews that include:
- Results of audits by the producer's personnel and any external auditors
- AD process performance
- Digestate quality (i.e. its conformance to the quality policy, including fitness for purpose)
- Status of preventative and corrective actions
- Follow-up actions from previous management review
- The continuing suitability of the QMS including the HACCP plan, CCPs and CLs and the FMP and operating procedures in relation to changing conditions and information
- Any complaints and concerns expressed by interested parties, including personnel, customers, clients and regulatory authorities and their outcomes

The output from the management review must include any decisions and actions relating to:
- Improvement in the effectiveness of the QMS, including its procedures
- Improvement of digestate quality as per customer/user requirements and
- Resource needs

Please note:
Significant change is a matter of interpretation, and can relate to input materials, production process management, required digestate quality of other factors that affect its quality.

7. Reporting

For each person, including the competent person(s) with overall responsibility for the QMS, a record must be kept of the:
- Training topic
- Training date or period
- Name and role of the person who received the training on that topic
- Person and organisation who delivered the training (which can be the producer); and
- Any certificate or qualification achieved

The producer must record:

- All accidents and other incidents that occur at the facility, the known or suspected cause(s) and the actions taken. The need for preventative action must be considered, and any such action taken must be recorded.
- All complaints and concerns, any necessary action in response to any complaints or concerns expressed by interested parties, including personnel, customers, clients and regulatory authorities, about quality or usability of the whole digestate, and any separated liquor and separated fibre fractions.
- The name and contact details of the person who expressed concern or made the complaint
- Specific subject(s) of the concern or complaint
- Date and time the concern or complaint was communicated to the producer and the name of the person to whom it was communicated
- Nature and date(s) of any actions and checks and who carried them out
- Nature and date(s) of any response to the person who expressed a concern or made a complaint; and
- Name of the person who communicated the response

8. Documents and Document Control

Producers must:

- Establish and use documents appropriate to the scope of the QMS
- Ensure these are subject to document control
- Be aware that existing documentation and records may be used as part of the QMS if they meet the requirements of certification
- Ensure any document of external origin in use within the QMS must be identified and its distribution must be controlled.
- Ensure any obsolete document must be promptly removed from all places where it is used and, where appropriate, replaced with the current revised and approved version.
- Ensure any obsolete document retained for any purpose must be identified as obsolete.
- Maintain records specified within this Scheme that demonstrate effective control of input materials, production and storage of digestate.
- Ensure records are readily identifiable, legible, genuine, collated and maintained such that they are readily retrievable
- Ensure records are stored in good condition for at least two years

Each document of internal origin that is in use within the QMS must:

- Be the current version approved as adequate by the person with responsibility for document control.
- Be legible and available at its relevant place(s) for use
- Include a title, version number, date of issues and the name of the person who issued it

Please note:

- Records generated by a weighbridge system that relies on software programming which the producer is not easily or cost-effectively able to change are exempt from the requirements above.
- This exemption is conditional upon each weighbridge system record being assigned a unique record number.

8.0 Hazard Analysis and Critical Control Point Plan

To demonstrate compliance, producers must establish and maintain a Hazard Analysis Critical Control Point (HACCP) Plan that is specific to their facility's digestion process, feedstocks, and the resultant whole digestate and any separated liquors and fibre. A HACCP Plan must consist of the following sections:

1. Hazard analysis
2. Critical control points (CCPs)
3. Critical limits
4. Monitoring systems to control the CCPs
5. Corrective actions when monitoring systems indicate a CCP is not under control
6. Verification procedures
7. Documenting procedures and records

The requirements of each section are explained in detail below.

1. Hazard Analysis

   Producers must:
   - Conduct a Hazard Analysis listing the **steps** in the process and identifying where significant hazards are likely to occur with a focus on hazards that can be prevented, eliminated, or controlled by the HACCP plan.
   - Ensure that the Hazard Analysis assesses human, animal and plant (vegetation) health hazards associated with intended uses of the digestate output type(s) for which certification is claimed, conformance is claimed, or is intended to be claimed
   - Report the justification for including or excluding the hazard and the possible **control measures** identified

   The hazards assessed must include:
   - Pathogens and toxins in the biofertiliser that adversely affect human and animal health
   - Odours offensive to people who live or work in close proximity to the location of use of the biofertiliser
   - Inert materials such as **stones** and any man-made particles that might damage equipment for handling, mixing or applying digestate or blended materials that contain it
   - **Sharps** that might adversely affect human and animal health

2. Critical Control Points

   For each of the hazards identified above, producers must:
   - Identify one CCP in the digestate production process
   - Establish the CCLs of the control measure(s) at the CCP
   - Ensure the same requirement are applied to each further hazard specified above and any other hazards identified by the producer
   - Ensure all whole digestate undergoes the CCP(s) for each hazard applicable to whole digestate

   Please note:

- A critical control point (CCP) is a point, step or procedure at which control can be applied and a safety hazard can be prevented, eliminated or reduced to ''acceptable'' levels.
- Acceptable level is equivalent to the minimum digestate quality required in this document.
- The number of CCP's needed depends on the processing steps and the control needed to assure product safety.
- All steps of the digestate production process from input material receipt to digestate dispatch should be considered when identifying the CCP for a specific hazard.
- This does not mean that every step in the production process is a CCP.
- More than one control measure might be required to control a specific hazard.
- The requirements relating to complaints and their review are specified with the QMS section of this document.
- At each CCP, operating conditions must be monitored and maintained within the CCP's CLs.
- Establish procedures for verification that the HACCP plan and its implemented CCPs and CLs are under control and that the HACCP system is working effectively.
- Ensure the HACCP plan and related procedures are documented and reviewed as part of the QMS review as instructed earlier.

3. Critical Limits

Producers must:
- Establish the Critical Limits for each CCP within the process

Please note:
- A critical limit (CL) is the maximum and/or minimum value to which a biological, chemical, or physical parameter must be controlled at a CCP to prevent, eliminate, or reduce to an acceptable level the occurrence of a product or safety hazard.

4. Monitoring systems to control the CCPs

Producers must:
- Establish monitoring procedures for the measurement of the critical limit at each critical control point.
- Ensure monitoring procedures describe how the measurement will be taken, when the measurement is taken, who is responsible for the measurement and how frequently the measurement is taken during operation.

5. Corrective actions when monitoring systems indicate a CCP is not under control

Producers must:
- Establish a **Corrective Actions** process
- Ensure that procedures are followed when a **deviation** in a critical limit occurs to prevent potentially non-compliant digestate from being produced
- Ensure that the steps needed to correct the process are taken

Please note:
- This usually includes identification of the problems and the steps taken to assure that the problem will not occur again.

6. Verification procedures

Producers must:

- Maintain monitoring procedures for each CCP to ensure that the facility is operating as designed and that end product is compliant with product limits
- Establish verification procedures to ensure that the monitored results are accurate
- Ensure the timing of verification testing is set out in the HACCP plan
- Ensure that the verification procedures cover activities, other than monitoring that determine the validity of the HACCP plan and that the system is operating according to the plan

Please note:

- Verification activities can include auditing of CCP's, record review, instrument calibration and product testing as part of the verification activities.

7. Documenting procedures and records

Producers must:

- Establish record-keeping procedures in order to secure information that can be used to prove that the digestate was produced safely.
- Ensure the records include information about the HACCP plan, product description, **flow diagrams**, the hazard analysis, the CCP's identified, Critical Limits, monitoring system, corrective actions, record keeping procedures, and verification procedures

9.0 Facility Management Plan

To demonstrate compliance producers must establish and maintain a Facility Management Plan (FMP) that is specific to their facility/ digestion process and the resultant whole digestate and any separated liquors and fibre. A FMP must consist of the following sections:

1. Facility details
2. Input controls
3. Process management, separation and storage
4. Process equipment
5. Process monitoring
6. Sampling of digestate
7. Actions in the event of test failure
8. Storage: Storage and use of whole digestate, separated liquor and separated fibre

The requirements of each section are explained in detail below.

1. Facility Details

   Producers must:
   - Ensure the following information is recorded within their FMP:
     - Producer name
     - Facility address
     - Name of business (if different to Producer)
     - Business description

2. Input Controls

   Producers must:
   - Ensure all biodegradable organic material **feedstocks** are source separated or sourced from a single origin
   - Ensure a written **Supply Agreement** for feedstock materials is agreed between the Biofertiliser producer and the feedstock supplier
   - Work with the supply chain to eliminate or minimise plastic entering the feedstock (public education, visual inspections, de-packing technology)
   - Ensure feedstock does not contain any non-biodegradable materials or residues of any toxic substances, e.g. veneer, paint, laminate and wood preservatives
   - Ensure each feedstock load is visually inspected for quality prior to storage or processing
   - Ensure for every load of feedstock delivered to the AD facility, they record:
     - Weight of each load
     - Type of material
     - Supplier
     - Date delivered
     - Acceptance/ rejection
     - Delivery location on site/where it was sent if rejected
   - Ensure rejected materials are stored away from the processing AD facility and removed as soon as practicable
   - Ensure the volume/ weight of the rejected material is recorded

Producers must ensure Feedstock Supply Agreements include:

a) Type and source location of all material delivered
b) Product descriptions (odour and colour)
c) Product contaminants (physical, chemical and biological)
d) Amount (volume and weight)
e) Collection, pretreatment and handling practices
f) Handling and storage instructions
g) Date delivered
h) Any additional arrangements associated with actions taken to remove or reduce physical contamination or other unsuitable content prior to digestion
i) Criteria for delivery acceptance (inspections)
j) Criteria that trigger feedstock material rejection and procedure to be followed
k) Declaration that each feedstock material is fit for purpose and is free from any contaminants specified by the AD operator
l) Condition that supplier must notify the Biofertiliser producer of any significant change in the quality of feedstock material

Please note:

- A written feedstock supply agreement is not required where a farm or co-operative produces biofertiliser from material sourced within its own premises
- Where physically and economically viable, feedstock can be pumped to the AD facility using individual pipework

3. <u>Process management, separation and storage</u>

Producers must ensure each **batch or portion of production of digestate**, separated liquor or fibre is:

- assigned a unique product identifier code for quality management purposes
- the quantity produced in each batch or portion of production is recorded
- treatment process and analysis results are recorded for each batch or portion of production

Producers must ensure they have procedures that cover:

- Tracing and recall of out of spec product
- Conducting a simulation recall event
- When and how to recall product
- Notification of Fertmark and customers

Producers must ensure that:

- The site has an **Incident Management Plan** in place to manage pollution incidents and emergencies
- The Incident Management Plan is tested annually
- Staff are fully conversant in the IMP
- Odours are controlled and do not cause a nuisance to adjacent properties
- Pests are controlled and do not cause a nuisance to adjacent properties
- Any other nuisances are controlled and do not cause a nuisance to adjacent properties
- Complaints are registered and appropriate actions are taken to address these

Producers must ensure:
- Digestate handling and storage facilities are ''clean areas'' where no contact with the raw feedstock material or equipment can occur
- Anything used in the storage and handling of digestate that has the potential to been in contact with raw feedstock material is disinfected prior to use (clothing, equipment)
- Cross contamination between customers is prevented by using dedicated trucks and days/times of services
- Trucks are washed down prior to use if it has been used for the transportation of other materials such as feedstocks
- In the event of biosecurity concerns, truck wash down must also include sanitation

Producers must ensure all digestates produced by an AD process includes:
- A pasteurisation step capable of heating all material to at least 70°C for one hour; or
- An equivalent alternative treatment validated for its efficacy at reducing a suitable plant pathogen indicator species
- The process used is documented within the FMP
- Staff are fully conversant in the pasteurisation process

Please note:
Three types of feedstocks are exempt from pasteurisation if the associated conditions can be met (detailed in Table 9 below).

Table 9: Details of feedstocks exempt from pasteurisation requirements

Feedstock	Condition
Type 1 Digestates made only from unprocessed crops, processed crops, crop residues and/or glycerol that arises within a single or co-operative's premises or holding	After digestion, digestates must be returned to and used entirely within the originating single or co-operative's premises or holding
Type 2 Type 1 digestates mixed with pasteurised biodegradable materials	After digestion, digestates must be returned to and used entirely within the originating single or co-operative's premises or holding.
Type 3 Feedstocks derived from prior processes that include thermal treatment(s) equivalent to at least 70°C for one hour	Product must be labelled and customers notified that product has not been pasteurised.

4. <u>Process equipment</u>

Producers must:
- List all process equipment
- Provide a statement of annual feedstock material throughput quantity (estimate)
- Provide a statement of annual digestate output quantity (estimate)
- Prepare a process flow diagram illustrating the digestate production system (annotated)

- Ensure each treatment and storage vessel/area are clearly labelled as described in the site's documents and flow diagram
- Ensure material flows one way through the system
- Ensure the site and digestate production system is designed and managed to prevent contamination between materials

5. Process monitoring

Producers must:
- Control and monitor all processes within the facility within the acceptable operating levels specified for the critical performance parameters
- Provide pasteurisation of feedstock or digestate product unless exempt
- Provide and maintain equipment in good working order for the processes required
- Specify how often equipment is checked, what checks will be carried out and contingency arrangements in the event of equipment failure
- Avoid cross contamination of the final digestate product with untreated, partially treated, unwanted or rejected material
- Justify and record and changes in the feedstock material, production process or required digestate quality
- Understand any significant change in production that results in products not meeting the specification will trigger re-certification

6. Sampling of digestate

General requirements

Producers must ensure:
- Sampling occurs after digestate has completed the full AD treatment cycle
- Sampling occurs when the product is ready for use (after full separation, treatment or maturation if sampling separated liquors or fibre)
- Samples are taken from storage tank before any new batch of digestate enters the storage vessel (if stored before dispatch from site)
- Each sample is representative of the **batch** or **portion of production**
- Samples are homogenous (storage tanks must be adequately mixed to ensure representative samples can be obtained)
- Sampling and analysis follow the methods detailed in Tables 3-7
- Stability testing occurs at the end of the anaerobic digestion process, prior to dispatch
- For each batch or portion of production which is not sampled for testing, the quality management process is followed (QMS, HACCP, FMP)

Please note facilities that receive domestic and commercial garden residues feedstocks must test biofertilisers for the presence of the herbicides Clopyralid and aminopyralid at the frequencies specified in Tables 10 and 11 found on the following pages. A detection of Clopyralid and/or aminopyralid within the biofertiliser must be addressed according to section 7 of this Certification document 'Actions in the event of Test Failure'. In the event that a retest or reprocessing still has clopyralid, this should be noted by the Producer and they must have documented processes to ensure that the biofertiliser affected is not sold for application to sensitive crops.

Sampling requirements

Producers must record for each sample taken:

- Sampling date and time
- Sample type (whole digestate, separated liquor, fibre)
- Product identifier e.g. Batch code
- Prior mixing time
- Digestion facility name
- Name of person who carried out the sampling

Sampling regime

Producers must ensure that initial product monitoring is completed:

- Before applying for certification
- When a new process is commissioned
- When a change from non-animal product feedstocks to animal product feedstocks occurs
- When changes are made to an existing process
- When any of the routine samples do not meet the requirements set out in Tables 3-7

Table 10 below details the number of samples required to be taken during the initial product monitoring phase.

Table 10: Initial product monitoring frequency

<table>
<tr><th>Parameter</th><th>Facilities accepting feedstocks
with
animal product</th><th>Facilities accepting feedstocks
without
animal products</th></tr>
<tr><td>Nutrients</td><td rowspan="2">The 3 most recent samples meet the quality requirements in Tables 3 & 4</td><td rowspan="4">The 3 most recent samples meet the quality requirements in Tables 3 - 7</td></tr>
<tr><td>Chemicals

Heavy Metals
Clopyralid
Aminopyralid</td></tr>
<tr><td>Biological (Pathogens)</td><td>The 5 most recent samples are below the limits in Table 5</td></tr>
<tr><td>Physical (Contaminants)</td><td rowspan="2">The 3 most recent samples meet the requirements in Tables 6 & 7</td></tr>
<tr><td>Stability</td><td></td></tr>
</table>

Please note:

1. Biofertiliser made from feedstock materials arising within a single or co-operative's premises used entirely within the same premises, biological (pathogen) tests are only required if any feedstock material contains or is at risk of containing human and/or animal pathogens.
2. For digestates made only from unprocessed crops, processed crops, crop residues and/or glycerol that arises within the producer's/co-operative's premises or holding no physical (contaminant) testing will be required. The digestate shall be used entirely within the same premises or holding.

After certification has been obtained, digestate must continue to meet the biofertiliser product quality limits. The routine test frequencies for each parameter are shown in Table 11 below. The digestate quality requirements remain the same as previously detailed (Tables 3-7).

Table 11: Routine product monitoring requirements

Parameter	Facilities accepting feedstocks <u>with</u> animal product	Facilities accepting feedstocks <u>without</u> animal products
Nutrients	1 sample per 5,000m^3 digestate produced or 1 sample per 3 months whichever is sooner	
Chemicals Heavy Metals Clopyralid Aminopyralid	1 sample per 5,000m^3 or 1 sample per 3 months whichever is sooner	
Biological (Pathogens)	5 samples per 12 months Samples must not be within 2 months of one another	1 sample per 5,000m^3 or 1 sample per 3 months whichever is soonest
Physical (Contaminants)	1 sample per 5,000m^3 or 1 sample per 3 months whichever is soonest	
Stability	2 samples per 12 months Samples must not be within 3 months of each other	

7. <u>Actions in the event of test failure</u>

Producers must ensure that corrective actions cover:
- Restoring control and preventing recurrence of a loss of control
- Identifying, managing and disposing of affected product
- Managing unforeseen loss of control
- Person(s) to manage incident(s)

If any batch or portion of production fails to meet any of the quality limits, the producer must ensure:
- The batch is disposed of as non-complying digestate and not sold as a biofertiliser; or
- The batch is re-processed
- The reprocessed product is re-tested for the failed parameter/s
- If they choose to re-process or take other corrective actions to a non-conforming liquid product (whole digestate, separated liquor) after implementing corrective actions, an

additional digestate batch or portion of production can be mixed with the re-processed/ corrected batch provided the additional product has been tested and meets the complying criteria.
- The new mixed batch is re-tested for compliance after thorough mixing
- A re-processed/corrected batch or portion of production of separated fibre is re-tested prior to introduction of a new batch or portion of production

8. Storage: Storage of whole digestate, separated liquor and separated fibre

For the safe storage of biofertilisers, producers must ensure the site has:
- Storage capacity for digestate produced outside the growing season
- Storage facilities that minimise odour
- Storage facilities that are gas sealed and vented through emission-destructing equipment

Please note biofertiliser labelling requirements and end user information is located in section 10 overleaf.

10.0 Biofertiliser Labelling & End User Information

For safe labelling of biofertiliser products, producers must ensure:

- They identify and control risks associated with false and misleading labelling
- Products are labelled correctly
- Customers purchasing bulk biofertilisers are given a **Product Information Document** that contains the same information that would appear on the label of a packaged product
- Provide the Product Information Document at the time of collection/delivery
- Ensure transport/storage vessels are adequately marked to minimise the effects of accidents during transportation and storage
- Where appropriate labels should be printed and fixed to containers and remain legible and permanently attached under all climatic, transport and other conditions likely to be experienced
- Complete a **Dispatch Record** for every biofertiliser sale
- Store Dispatch Records in line with the Scheme requirements

The Product Information Document/ label information must include:

- Trade name
- Name and address of producer
- Product Identifier Batch number
- Order number or date of delivery
- Nutrient Content (concentrations of N, P, K) as registered with Fertmark
- Product description (statement of whether whole digestate, separated liquor or separated fibre)
- Particle size range, pH, loss on ignition (volatile solids)
- Information on the product's origins (e.g. if it includes animal products such as ruminant protein)
- Storage and handling information (toxicity, first aid, methods of handling spills)
- As supplied product analysis information
- the 'Precautions for Use' Declaration detailed below

Precautions for Use Declaration

This biofertiliser product may contain a variety of living micro-organisms, some of which on rare occasions can cause illness in humans. Serious infection is rare but can happened for older people and those with reduced immunity. Please take the following precautions:

- *Avoid handling biofertiliser in enclosed areas*
- *Avoid inhaling the emissions to air from the biofertiliser*
- *Always wear gloves and wash hands after use*
- *See your doctor if you develop a high fever, chill, breathlessness or cough*

Notice: Do not feed to sheep, cattle, deer, goats, buffaloes, or other ruminant animals.
This product contains or may contain ruminant protein.

Dispatch Records must include:

- Customer name and contact details
- Delivery address
- Product identifier e.g. batch number
- Date of production
- Quantity dispatched by weight or volume
- Date of dispatch

11.0 The Fertmark Application Process

Fertmark is the auditing body of the New Zealand Fertiliser Quality Council and undertakes audits of digestate to identify compliance to the criteria set out in section 5 for being labelled as a Certified Digestate Biofertiliser.

Producers applying for Fertmark certification must be aware of the Fertmark Code of Practice that covers the rules for the use of the Fertmark Trademark, policies and protocols, code and conduct, product classifications, protocols for mixing plants, auditor protocol and industry agreed agronomic trial protocols. Please note that all products are audited by QCONZ on behalf of the Fertiliser Quality Council.

Detailed information on the process of applying for Fertmark certification is located within the Fertmark Code of Practice, found on the Fertiliser Quality Council website:

www.fertqual.co.nz

Producers must:

- Apply for product certification in writing on the official form accompanied by the application fee
- Follow the certification process specified within the Fertmark Code of Practice, section 6: Certification

Once the application form is complete, the Director of FDQ and accreditors at QCONZ will get in touch to complete the application process. The Fertmark Registration Form can be found on the Fertiliser Quality Council website and an example of a completed Fertmark Application Form can be found on the Bioenergy Association website.

www.fertqual.co.nz/fertmark-registration-form/

https://www.biogas.org.nz/resource/biofertiliser-certification-scheme

The application will be for certification of digestate as a biofertiliser containing the following nutrients:

- Nitrogen
- Phosphorus
- Potassium

Calculated using the 6-month rolling average of sampling data

The tolerance limit for these nutrient concentrations is +/-20% on a dry weight basis once production facility reaches steady state of digestion

As part of the certification process, producers must ensure:

1. Analytical data is provided as requested by the auditor
2. They abide by the Fertmark Code of Conduct
3. Audits are completed as requested
4. Samples are taken as requested
5. Fees are paid to Fertmark and the auditor (if applicable)

11.0 Terms and Definitions

The following terms and definitions apply to this Certification Guide

Anaerobic digestion (AD)	Process of controlled decomposition of biodegradable materials under managed conditions where free oxygen is absent, at temperature suitable for naturally occurring **mesophilic** or **thermophilic** anaerobic and facultative bacteria species, that convert inputs into biogas and whole digestate
Batch/ production portion	Unit of whole digestate, separated liquor or separated fibre produced by a single AD production process, using uniform critical control points and critical limits or a number of such units, when stored together, and that can be identified for the purposes of retreatment or disposal, should monitoring checks or sample tests require such actions. Size of batch or portion of production is set by producer rather than the BCS due to variability between individual AD systems. Please refer to Table 9 of this publication for guidance on batch/production portion quantity requirements
Biodegradable	Capable of undergoing biologically mediated decomposition
Biodegradable Organic Materials	A source separated or single sourced material of food origin which includes all food production and processing residues as well as post-consumer former foodstuffs. It also covers agricultural and horticulture growing and processing residues and supplementary feedstock crops
Biofertiliser	Digestate derived from organic matter which is produced by anaerobic digestion facilities that are designed and operated with this Technical Guidance 8 and have been certified according to the Biofertiliser Certification Scheme. Note in general terms Biofertiliser are a material of biological origin that contains sufficient levels of plant nutrients in forms that are either directly absorbed by plants or are sufficiently quickly decomposed to available forms, to cause an increase in plant growth and/or quality
Biosolid	Sewage or sewage sludge derived from a sewage treatment plant that has been treated and/or stabilised to the extent that it is able to be safely and beneficially applied to land. Biosolids is a Biowaste Product that contains waste material of human origin.
Biowaste	Waste of an animal or plant origin that can be decomposed by microorganisms, other larger soil borne organisms or enzymes. For the purposes of this BCS biowaste much be source-segregated
Catering Waste	All waste food, including waste cooking oil, from restaurants, catering facilities and kitchens including central kitchens and household kitchens
Certification	Third party attestation related to products, processes, systems or persons
Certification body	Independent organisation responsible for assessing and certifying the conformity of production systems, products or other materials to one or more relevant standards
Chemical oxygen demand	Indirect measure of the amount of organic compounds in a substance, in which a sample of the substance is incubated with a strong chemical oxidant under specific temperature conditions and for a particular period of time.
Control	noun**:** State wherein correct procedures are being followed and criteria are being met verb: Take all necessary actions to ensure and maintain compliance with criteria established in the HACCP Plan

Control measure		Action or activity that can be used to prevent or eliminate a digestate safety hazard or reduce it to an acceptable level
Co-operative		Natural or legal persons who forma a group under a written agreement who exercises only agricultural, horticultural or forestry activities who as a group carry out one AD process at one location within the co-operative's holdings.
Corrective action		Action to be taken when the results of monitoring at the critical control point indicate a loss of control
Critical control point		Last step at which control can be applied and is essential to prevent or eliminate a hazard or reduce it to an acceptable level of risk
Critical limit		Criterion which separates acceptability from unacceptability
Deviation		Failure to meet a critical limit
Digestate		Whole digestate resulting from an AD process and any subsequently separated fibre or liquid fractions. NOTE Includes any separated fibre that undergoes a subsequent aerobic **maturation** step, without addition of further materials
Digester		Closed vessel system in which biodegradable materials decompose under anaerobic conditions
Dirty water		Dilute washings from dairy and milking parlours and run-off from yard areas lightly contaminated by slurry, manure or used animal bedding
Feedstock		Import materials/ waste that enter the anaerobic digestion process
Fertmark		The Fertiliser Council's scheme that requires the independent auditing of fertilisers to ensure that their quality meets the claims on its label
Fertiliser		A substance or biological compound or plant material, or a mix of substances or biological compounds or plant material, that is described as, or held out to be suitable for, sustaining or increasing growth, productivity, or quality of plants through the delivery to plants or soil of plant nutrients; and includes any –
	i)	Non-nutrient attributes of the material used in fertiliser; and
	ii)	Animal nutrients used in fertiliser
	iii)	Does not include a substance of biological compound or plant material, or a mix of substance or biological compounds or plant material that is intended for use as a plant growth regulator that modifies the physiological functions of plants.
Fit for Purpose		Material that does not have properties or characteristics that prevent it from being suitable for its intended use. A compound that is Fit for Purpose means it must not - spread harmful organisms; - reduce the efficacy of medications on humans and animals; - result in residues that exceed limits; - be toxic to animals; transmit disease to animals; - transmit pests or unwanted organisms and; - otherwise create of likely create risks.
Flow Diagram		Systematic representation of the sequence of steps or operations used in the process for the production of whole digestate and any subsequently separated liquor or separated fibre.
Forestry		Art and science of controlling the establishment, growth, composition, health and quality of forests used for cultivating trees, timber and woody biomass crops.
Growing medium		Material, other than soil in situ, in which plants are grown.

Harm	Physical injury to, or damage to, the health of people, or damage to property, or to the environment. NOTE In the context of this Scheme, ''harm'' also includes injury or damage to the health of animals and plants. Harm can be caused by one or more unwanted biological, chemical or physical agents in, or by misuse of, whole digestate, separated liquor or separated fibre
Hazard	Potential source of harm
Hazard analysis	Process of collecting and evaluating information on hazards and conditions leading to their presence, to decide which are significant in relation to the production of digestates that can be used without harm. NOTE This should be addressed in the HACCP Plan.
Hazard analysis & critical control point	System used for the identification, evaluation and control of hazards that are significant in relation to the production of digestate in relation es that can be used without harm.
HACCP Plan	Document prepared in accordance with HACCP principles, to ensure control of hazards that are significant in relation to the production, storage, supply and use of digestate that can be used without harm.
Holding	All the land units managed by a farmer/ land manager in New Zealand
Hydraulic retention time	Average time that material stays in the digester vessel, determined by the loading rate and operational digester capacity. NOTE Hydraulic retention time can be calculated by dividing the digester working volume by the rate of flow of input materials into the digester, i.e. HRT (days) = digester volume (m^3) / influent flow rate (m^3 per day).
Input material	Biodegradable material intended for feeding, or fed, into an AD process. In the context of this Technical Guide, Input material is source-segregated organic material, fit for anaerobic digestion.
Manure	Slurries and solid manures, including farmyard manures and dirty water
Maceration	To make biodegradable input materials into a more consistent and readily flowing and pumpable mixture by means of shredding, chopping, crushing or mincing the input materials and/or soaking them in a liquid.
Maturation	Optional period of treatment or storage of separated fibre under predominantly aerobic conditions
Mesophilic	Organisms for which optimum growth temperatures are within the temperature range 30^{o}C to 43 ^{o}C
Method of test	Procedure for testing a sample of digestate. NOTE Where available for any one or more parameters, this Scheme specified recognised international standards
Monitor	Act of conducting a planned sequence of observations or measurements of control **parameters to access whether a CCP is under control**
Most Recent Samples	Samples taken a minimum of 1 week apart but not more than 2 weeks apart
Operating procedures	Carried out and documented procedures for producing digestates
Organic loading rate (OLR)	Weight of organic matter fed to a unit volume of the digester per unit time NOTE OLR = kg COD m-3 day-1 or kg VS m-3 day-1 , where COD is chemical oxygen demand and VS is volatile solids. A similar way to describe OLR is weight of organic dry matter added per day (kg VS d-1) divided by digester volume (m3)

Pasteurisation	Process step during which the numbers of pathogenic bacteria, viruses and other harmful organisms in material undergoing AD are significantly reduced or eliminated by heating the material to a critical temperature for a minimum specified period of time. NOTE 1 Pasteurisation could occur either as part of the AD process or as a separate step. Pasteurisation does not aim to achieve sterilisation, which destroys all life forms. NOTE 2 Pasteurised material might contain beneficial and other, non-harmful, microorganisms.
Personal Protective Equipment (PPE)	Any garments of clothing or equipment that is used to guard you and your employees against hazards in the workplace. For details of required PPE refer to the adequate H&S legislative documentation
Producer	Business enterprise, organisation, community initiative or person(s) responsible for the production of digestates
Product Information Sheet	Documentation that contains producer details, product details and storage and handling requirements that must be provided to biofertiliser hauliers and customers
Putrescible	Material that has the capacity to become putrid. NOTE In this context, those fractions of organic waste or biodegradable material with relatively high proportions of readily biodegradable carbon-based molecules and moisture.
Quality Control	Part of quality management focused on fulfilling quality requirements
Quality Management System (QMS)	Management system to direct and control an organisation with regard to quality. [SOURCE: ISO 9000:2005] NOTE In the context of AD, it is a system for planning, achieving and demonstrating effective control of all operations and associated quality management activities necessary to achieve digestates that are fit for purpose. Where specific controls are applied, they should be monitored and recorded, and their efficacy evaluated both during and after process validation. Corrective actions should be defined.
Quality Protocol (QP)	Set of criteria for the production, placement on the market, storage and use of products derived from suitable types and sources of waste, such that any risks to the environment and to human and animal health are acceptably low when any such product might under certain circumstance, be used without waste regulatory controls, in those countries in which the protocol applies. NOTE A Quality Protocol also sets out how compliance with its criteria should be demonstrated. Products should be used in accordance with good practice, and appropriate guidance is referred to where available and suitable for use of those products in end markets allowed by that specific QP.
Risk	Combination of the probability of occurrence of hard and the severity of that harm [derived from ISO/IEC Guide 51] NOTE It can mean the potential realization of unwanted, adverse consequences to human life and health, property or the environment associated with a hazard.
Senior Management	Individuals or team or individuals, at the highest level of organisational management, who have the day-to-day responsibilities of managing an organisation, and who holds specific executive powers conferred onto him/her/them with, and by authority of, the organisation's board of directors and/or its shareholders
Separated Fibre (SF)	Fraction of material derived by separating the coarse fibres from whole digestate. NOTE At least 15% of its mass should be dry matter in order that the sample is suitable for laboratory tests as a "solid" material. It should contain sufficient dry matter to be capable of being stacked in a heap if it undergoes an aerobic maturation step; a mass fraction of 23% dry matter is a guideline figure.

Separated Liquor (SL)	Liquid fraction of material remaining after separating coarse fibres from whole digestate. NOTE It is normally the fraction remaining following the use of a separator or centrifuge to remove coarse fibres. Less than 15% of its mass should be dry matter in order that the sample is suitable for laboratory tests as a "liquid" material. It should contain sufficient moisture to be pumpable; a suitable mass fraction percentage of dry matter content should be determined in practice and the dry matter result declared for any tested portion of production. If the user desires that no significant solids residue remains on crop leaves after applying separated liquor, it should contain no more than a mass fraction of 4% dry matter.
Sharps	Man-made contaminants that are greater than 2mm in any dimension that might cause physical injury to a person who handles digestate without protective gloves or to a person or animal who comes into contact with these materials
Site Management Plan	Documentation that demonstrates how risks associated with the processing, handling and production of digestate biofertiliser at a facility are controlled to ensure the production of compliant biofertiliser
Specified digestate or biofertiliser	A digestate or biofertiliser where the physical and fertiliser characteristics are known and identified. NOTE Organic components such as twigs and woody fragments can puncture skin but this risk is considered acceptably low and so has been omitted from this "sharps" definition. Omitted also are rock-derived "mineral" particles and aggregated particles of all sizes, including, for example, gravel and stones
Soil improver/ conditioner	Material added to soil in situ primarily to maintain or improve its physical properties, and which many improve its chemical and/or biological properties or activities
Source segregated	Materials or wastes that are stored, collected and not subsequently combined with any non-biodegradable wastes, or any potentially polluting or toxic materials or products, during treatment or storage (whether storage is before or after treatment). NOTE Source-segregated materials can include collection of a mixture of biowaste/biodegradable material types, from more than one source. Such materials do not include sewage sludges and their derivatives. It is acknowledged that low levels of physical contamination might occur, which might trigger rejection of an input material load or physical contaminant removal prior to loading the biowaste/biodegradable material into the working digester.
Stability	Quality of being stable
Stable	Point at which the rate of biological activity has slowed to an acceptably low and consistent level and will not significantly increase under favourable, altered conditions. NOTE Stable digestate should not be attractive to vermin or wild animals and should not be so odorous that its storage or use causes nuisance to humans. In a stable but immature state, it might still contain insufficiently biodegraded natural or man-made substances that exert phytotoxic effects in some applications; this should be taken into account in guidelines for digestate use.
Stabilisation	Biological and chemical processes that, together with conditions in the material being treated, aim to achieve stable, treated material. NOTE after stabilization, biodegradation will continue to occur, albeit at a slower rate.
Step	Point, procedure, operation or in the digestate chain including raw materials, from primary production to final use of digestates and the consumption of food or fodder grown on land that has received such material
Supply agreements	Agreement between an AD facility operator and a supplier of digestible input materials that specifies suitable material types, quality, options and actions to be taken in the event of contamination, and other criteria that facilitate input material control

Thermophilic	Organism for which optimum growth temperatures are within the temperature range 45°C to 80°C
Total Solids (TS)	Those solids in a sample of material that remain after the drying of the sample at 105°C, to the point such that they lose no more moisture. NOTE also referred to as 'dry solids', or 'dry matter (DM)'
User	Individual or organisation that obtains digestates from a producer or third party with the intention of using them
Validation, validate	Obtaining and evaluating evidence that the elements of the HACCP plan are effective. NOTE 1 In the context of this Scheme, this includes obtaining and evaluating evidence that the QMS is effective for producing digestates of the quality to which the producer has committed in the quality policy.
Verification, verify	Application of methods procedures, tests and other evaluations, in addition to monitoring, to determine compliance with the HACCP plan
Volatile fatty acids (VFAs)	Fatty acids, or organic acids with a carbon chain of six carbons or fewer
Volatile solids (VS)	Those solids in a sample of material that are lost on ignition of the dry solids at 550°C. NOTE 1 Volatile solids are also referred to as "loss on ignition (LOI)", which is a measure of organic matter (OM).
Whole digestate (WD)	Material resulting from a digestion process and that has not undergone a post-digestion separation step to derive separated liquor and separated fibre