BIOSOLIDS ASSURANCE SCHEME

Assured Biosolids Limited
Biosolids Assurance Scheme

THE BAS STANDARD

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This BAS Standard will be active from 1st October 2020

THIS ONLINE VERSION OF THE STANDARD EXCLUDES THE SCHEDULES OF PREVIOUS AMENDMENTS

For the latest issue of the BAS Standard, please check the BAS website at: www.assuredbiosolids.co.uk

FOREWORD

The Biosolids Assurance Scheme (BAS) and associated documents have been prepared by Assured Biosolids Limited in consultation with the water industry and other relevant stakeholders.

This document in conjunction with aspects of the Audit Protocols provides the basis of the BAS Standard that will be used to audit BAS Applicants and Members. The Standard Guidance Notes support the BAS Standard by providing further explanation and elaboration where required. BAS Applicants and Members (as the suppliers of biosolids) are not only responsible for meeting the BAS Standard on source materials, treatment, transport and storage of biosolids (sections 1 – 4), but also for soil testing and biosolids application to agricultural land (sections 5 – 7).

For the avoidance of doubt the requirements of the BAS Standard should not become onerous upon farmers, except in circumstances where they may be involved in the land application of biosolids.

Activities within the scope of the BAS (treatment and recycling to agricultural land) conforming to the BAS Standard may be issued with a Certificate of Conformity by the Certification Body and the resulting biosolids in a completed Chain of Conformity may be claimed to be BAS Certified Biosolids by BAS Members.

Conformance with this BAS Standard does not confer immunity from legal obligations.

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INTRODUCTION

The BAS Standard is the term for the collective of all the Requirements specified in this document and any associated documents (e.g. Audit Protocols).

The BAS Standard includes requirements for source material control, sludge treatment, biosolids transport, storage and application to agricultural land. Conformance to the BAS Standard must be audited by the Certification Body appointed by Assured Biosolids Limited before biosolids can be considered to be conforming to the BAS Standard and awarded BAS Certified Biosolids status.

The BAS Standard is largely (but not exclusively) based on the requirements of:

- The Action Programme for Nitrate Vulnerable Zones (Scotland) Regulations 2008; amended 2013
- The Code of Good Agricultural Practice for the Protection of Water, Soil and Air for Wales, 2011
- The Code of Practice for the Agricultural use of Sewage Sludge, 1996
- Council Directive on the Protection of the Environment, and in Particular of the Soil, when Sewage Sludge is used in Agriculture (Sludge Directive) (86/278/EEC)
- The Environmental Permitting (England & Wales) Regulations, 2016 – exemption arrangements
- The Nitrate Pollution Prevention Regulations, 2015 (England) amended 2016
- The Nitrate Pollution Prevention (Wales) Regulations, 2013 amended 2019
- Prevention of Environmental Pollution from Agricultural Activity (PEPFAA) A code of good practice (Scotland), 2005
- Protecting our Water, Soil and Air: A Code of Good Agricultural Practice for Farmers Growers and Land Managers (England), 2018
- The Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018 – Farming Rules for Water (FRfW)
- The Sludge (Use in Agriculture) Regulations, 1989
- The Safe Sludge Matrix, 2001
- The Waste Management Licensing (Scotland) Regulations, 2011 – exemption arrangements
- Waste (England and Wales) Regulations, 2011
- Waste (Scotland) Regulations, 2012
- The Water Environment (Miscellaneous) (Scotland) Regulations, 2017 – general binding rule 18 (GBR 18)
- The Water UK report; *The application of HACCP procedures in the water industry: biosolids treatment and use on agricultural land*

These documents are referenced within the BAS Standard where appropriate as helpful guidance. However, the BAS Standard should not be used as a surrogate for any regulations and it is entirely the responsibility of BAS Applicants and Members to ensure that they meet regulatory requirements.

How to use this document

The BAS Standard document should be read alongside the Audit Protocols document (available to BAS Applicants and Members).

Each section of the BAS Standard document contains detailed technical requirements relevant to the section activity. Every Requirement is itemised and numbered in column one with a description of the Requirement contained in column two.

Column three offers guidance to BAS Applicants and Members to assist conformance to the BAS Standard. Reference to separate Standard Guidance Notes (SGN) and the requirements where a major non-conformance (either system or product) might be raised (indicated by pink shading) are included in the additional information section. Examples of appropriate evidence are also outlined in the guidance column. Additional information on providing evidence to demonstrate conformance to the BAS Standard is contained within the Audit Protocols.

The BAS Standard is underpinned by a separate Hazard Assessment document (based on established potential hazards in source materials and the end product) that identifies Management Control Measures (MCMs), which are also referenced within the BAS Standard. The Hazard Assessment document does not contain any requirements that are part of the BAS Standard.

1. SOURCE MATERIAL RISK ASSESSMENT & CONTROLS - UK		
Sludge processors must be able to demonstrate risk assessments and controls are in place covering the quality and consistency of untreated sludge produced from wastewater treatment processes and any other source materials that enter the process. *Note, these risk assessments focus on input materials, whereas the Hazard Assessment focuses on output materials; the end product.*		
ITEM	**REQUIREMENT**	**GUIDANCE**
1.1 MCM1	If domestic wastewater and industrial wastewater (Category A) or septic tank material and water treatment sludge (Category B) enters or is supplied to the organisation, one risk identification and risk control form must be completed for the entire organisation for each category. The risk identification and risk control forms must be reviewed at least every thirty-six months and amended where necessary. If feedstock material (Category C) is supplied to the organisation, a pre–acceptance assessment must be completed for each separate feedstock stream supplied (one completed assessment is acceptable for the same feedstock material going to multiple Reference Processing Facilities). A risk identification and risk control form must be completed for each Reference Processing Facility that receives one or more feedstock material stream(s). Each pre–acceptance assessment must be reviewed at least every thirty-six months and amended where necessary. The risk identification and risk control form must be reviewed and updated if there is a substantial change to the feedstock material supply into the Reference Processing Facility. Where no substantial change occurs the risk identification and risk control form must be reviewed at least every twelve months and amended where necessary.	ADDITIONAL INFORMATION AND FURTHER REFERENCE – A system major non-conformance may apply where the relevant documents are absent. A system minor non-conformance may apply where any omission or error occurs within the documents. – Refer to Appendix 1 – Source Material Risk Assessment (SMRA) Overview. – For Category C pre–acceptance assessments; where internal systems are in place that monitor the same information requested on the pre–acceptance assessment form it will be acceptable to sign off a single form for the whole organisation with reference to “see internal systems” as appropriate. Otherwise a pre–acceptance assessment form must be completed for each separate feedstock. – Refer to SGN1 – Trade Effluents Prescribed Substances. – Refer to SGN2 – Provision of SMRA. – Refer to SGN3 – Managing Hub & Satellite sites & transfers of sludge in the scope of the BAS audit.

		– Refer to SGN4 – Screening of non-degradable material.
		EXAMPLES OF APPROPRIATE EVIDENCE
		– The domestic wastewater and industrial wastewater (Category A) risk identification and risk control form (BAS mandatory template) – refer to Appendix 1. – The septic tank material and water treatment sludge (Category B) risk identification and risk control form (BAS mandatory template) – refer to Appendix 1. – The feedstock material (Category C) step 1: pre-acceptance assessment form (BAS mandatory template where feedstock materials are used) – refer to Appendix 1. Where internal systems are referred to the auditor will expect to audit this system. – The feedstock material (Category C) step 2: risk identification and risk control form (BAS mandatory template where feedstock materials are used) – refer to Appendix 1. – Examples of appropriate evidence of review: annual management review minutes.

2. SLUDGE TREATMENT; PROCESSES; HACCP & PROCESS VALIDATION PROCEDURES; BIOSOLIDS SAMPLING, ANALYSIS, PARAMETERS & MONITORING - UK

Sludge must be treated to significantly reduce health hazards resulting from its use and so that it does not cause nuisance. *Hazard Analysis and Critical Control Point* (HACCP) plans must be used to establish microbiological parameter process controls. Biosolids must be regularly sampled and tested to ensure it is suitable for recycling to agricultural land and to monitor quality.

ITEM	REQUIREMENT	GUIDANCE
2.1a MCM2	Sludge must be treated by biological, chemical or heat treatment, or any other appropriate process, as described in the Standard Guidance Notes, that significantly reduces its fermentability and potential health hazards resulting from its use in agriculture (*Sludge Directive*, *Code of Practice*).	ADDITIONAL INFORMATION AND FURTHER REFERENCE – Refer to SGN5a – Effective Sludge Treatment Processes. – Refer to SGN5b – Effective Sludge Treatment Processes: lime mixing methods. EXAMPLES OF APPROPRIATE EVIDENCE – HACCP plans.
2.1b MCM4	From 1st October 2020, a Treatment Site Risk Control Form must be completed for each treatment site or Reference Processing Facility within the scope of the audit.	ADDITIONAL INFORMATION AND FURTHER REFERENCE – A system major non-conformance may apply where the relevant documents are absent. A system minor non-conformance may apply where any omission or error occurs within the documents. – Refer to Appendix 2 – Treatment Site Risk Control Form. For mobile treatment sites, a separate form should be completed for each discrete location. – Refer to SGN6 – Treatment Site Risk Control form guidance.

		EXAMPLES OF APPROPRIATE EVIDENCE – From 1st October 2020, completed and valid Treatment Site Risk Control Forms for each treatment site or Reference Processing Facility within the scope of the audit.
2.2a MCM2	Hazard Analysis and Critical Control Point (HACCP) Plan A written *Hazard Analysis and Critical Control Point* (HACCP) Plan on microbiological parameter control must be in place at each Reference Processing Facility. The HACCP plan must include the following information: a) Company name, site name and location including a full postal address for the location. b) The process or processes utilised to treat the sludge. c) For identified portable plant only, the unique identifier (e.g. serial or equipment ID number). d) A detailed site plan as well as a process schematic (see note opposite) both identifying the principle processing plant and the location of numbered HACCP related *Critical Control Points* (CCPs) and *Process Sampling Points* (PSPs) as used in the *Process Validation Procedure* (section 2.3). e) A list of the identified numbered CCPs with a brief description (e.g. digester temperature, pH measurement). f) Numbered *Critical Limits* (CLs) established from the *Process Validation Procedure* (e.g. defined range of temperature, duration, pH) and the frequency of monitoring for each numbered CCP must be added to the numbered CCP list (section 2.3). g) A list of numbered *Process Sampling Points*, material that was sampled from them, records of calculations and results as per the *Process Validation Procedure* (section 2.3). Sample points must be labelled on sites including separate *Process Sampling Points* for *salmonella* spp. testing where relevant.	ADDITIONAL INFORMATION AND FURTHER REFERENCE – A system major non-conformance may apply where the relevant documents or records are absent. A system minor non-conformance may apply where any omission or error occurs within the documents or records. – Refer to SGN7a – HACCP Process Schematic example. – Refer to SGN7b – HACCP Plan Action and Records schematic. – Refer to SGN7c – Lime treatment controls and HACCP Plans. – Refer to SGN8 – Final product sampling point. – Telemetry systems may be used to provide a timeline of the treatment process monitoring records. – For HACCP Plans written prior to 1st January 2015 either a site plan or a process schematic will be acceptable. – Where part of the treatment process occurs at another 'satellite' site (e.g. digested sludge that is transferred to a main site for dewatering), it is recommended that the relevant part of the HACCP

	h) From 1st November 2019 a minimum of two CCPs and their associated CLs must be used to control all lime treatment plants (except where lime is a secondary treatment e.g. after digestion) and at least one CCP must specify and control the minimum lime inclusion rate. i) Process monitoring records must be maintained. j) The location of and length of time HACCP process monitoring records are kept. Where process monitoring testing is undertaken as part of internal process control, such as pH monitoring at lime treatment plants, records must be kept of that routine testing. k) A Corrective Action Plan. The Corrective Action Plan must identify the actions that would be taken to bring the process back within its critical operating limits, and deal with potentially non-conforming product if deviations outside process limits or a process failure occur.	plan(s) for these 'satellite' site(s) is made available in addition to the HACCP plan for the main site producing the end product biosolids. Refer to SGN3 – Managing Hub & Satellite sites & transfers of sludge in the scope of the BAS audit. EXAMPLES OF APPROPRIATE EVIDENCE – HACCP plans, monitoring records or routine testing records. – Where available, a detailed telemetry list of all CCPs monitored and a list of the outstation points and alarm codes.
2.2b MCM2	HACCP Training All operational activity relating to the HACCP Plan must be undertaken by trained operators as determined by the responsible organisation.	ADDITIONAL INFORMATION AND FURTHER REFERENCE EXAMPLES OF APPROPRIATE EVIDENCE The auditor will expect to see an internal procedure or contractual arrangements and records that demonstrate that all operational activity relating to the HACCP Plan will be undertaken by trained operators.
2.3 MCM2	HACCP Process Validation Procedure To ensure a Reference Processing Facility is operating effectively to achieve required log reductions in microbiological parameters, a *Process Validation Procedure* must be undertaken either at start up (but not each time for portable plant) or when the process significantly changes, and must be repeated at least once every ten years. The *Process*	ADDITIONAL INFORMATION AND FURTHER REFERENCE – A system major non-conformance may apply where the relevant documents are absent. A system minor non-conformance may apply where any omission or error occurs within the documents. – Refer to SGN9 – HACCP revalidation.

	Validation Procedure must be undertaken as per the requirements of the sampling and analysis protocols a – l: a) Depending on the process: i. For continuous processes, at least five *sampling events* (see note opposite) must be commenced on different days and completed over a 10 - 60 day test period. ii. For batch processing, at least five *sampling events* (see note opposite) must be taken from more than one batch but with no set test period. iii. For processes that are part continuous and followed by part batch (e.g. continuous digestion followed by cake storage in batch), the overall process can be deemed as batch processing. b) Each *sampling event* must include samples taken from both <u>untreated sludge</u> entering the process (the input) and from <u>treated sludge/biosolids</u> on completion of treatment (the output). The input and output samples may be taken on the same day. For batch processes, input and output samples for an individual sampling event must be from the same batch. c) The sampling method used for inline sampling of cake, liquids (including untreated sludge) or granules must be either; i. A composite sample comprised of five samples taken over a 5 - 10 minute period, which is then sub-sampled to provide 3 triplicate samples for analysis or; ii. Five separate samples taken over a 5 - 10 minute period with each sample being analysed. d) Samples must be kept in the dark and at 1 – 8 ^{0}C and must be analysed within 24 hours (where practicable). e) Analytical results (measured as *E. coli*/gram dry solids) for each *sampling event* will be the mean of the analysis as $\log_{10}$ values of the samples (i.e. a mean of the $\log_{10}$ results, and not a $\log_{10}$ of the mean of the results).	– Refer to SGN10 – Suitable sludge for validation. – For sampling bulk biosolids refer to SGN11 – Sampling Methods for Bulk Biosolids. – Refer to SGN12 – Process Validation Procedure data record example. – For methods of analysis refer to SGN13 – Methods of Analysis. – For process validations completed prior to 1st January 2015 at least three *sampling events* are acceptable. EXAMPLES OF APPROPRIATE EVIDENCE – HACCP plans. – A procedural document outlining the process validation process, a record of the validation procedure and results, date of start-up and validation specific to the Reference Processing Facility. – A procedure for sampling and analysis specific to the Reference Processing Facility. – Evidence records to demonstrate the requirements in 2.3 are being met specific to the Reference Processing Facility. – The auditor will expect to see an internal procedure or contractual arrangements that demonstrate that sludge and biosolids sampling will be undertaken using suitable equipment and trained operators.

	f) The log_{10} reduction (*E. coli*/gram dry solids) will be determined as the untreated sludge mean log_{10} result, less the treated sludge/biosolids mean log_{10} result. g) The mean log_{10} result across the *sampling events* will be used to determine the effectiveness of the sludge treatment process i.e. whether it achieves the Conventionally or Enhanced treatment standard. h) For Conventionally treated biosolids a minimum mean 2 log_{10} reduction (i.e. 99 %) must be achieved. i) For Enhanced treated biosolids a minimum mean 6 log_{10} reduction (i.e. 99.9999 %) must be achieved (subject to note j) below), and *Salmonella* spp. must be absent in all samples (for each *sampling event*). Note samples for *Salmonella* spp. may be taken from a different *Process Sampling Point* to those for *E. coli*. j) Demonstrating adequate *E. coli* reductions in the production of Enhanced treated biosolids can be difficult, nevertheless, the validation procedure must still be followed so that HACCP process parameters can be set. For sites where the untreated sludge contains mean *E. coli* concentrations of < 8.0 log_{10} but can achieve Enhanced treated *E. coli* Maximum Allowable Concentrations (MAC) requirements (section 2.4), these products will still qualify as Enhanced treated products. k) The calculations and results of the *Process Validation Procedure* must be included either within the HACCP plan or in a separate document to demonstrate they are used to identify Critical Limits (CLs) (e.g. minimum/maximum temperature ranges, minimum retention times, etc.) for each Critical Control Point (CCP) identified in the HACCP plan (section 2.2a). l) Sludge and biosolids samples must be undertaken using suitable equipment and trained operators as determined by the responsible organisation.	

2.4

MCM2
MCM3

Product release

Biosolids for use on agricultural land must be treated to either the Conventionally treated or the Enhanced treated standards (*Safe Sludge Matrix*).

To qualify for Conventionally treated biosolids the sludge treatment process must be able to achieve at least a 2 $\log_{10}$ (i.e. 99%) reduction in *E. coli* numbers as per the HACCP *Process Validation Procedure* and, through routine sampling, a Maximum Allowable Concentration (MAC) of 100,000 *E. coli*/gram dry solids in the end product.

To qualify for Enhanced treated biosolids the sludge treatment process must be able to achieve at least a 6 $\log_{10}$ (i.e. 99.9999%) reduction in *E. coli* numbers as per the HACCP *Process Validation Procedure* (subject to 2.3j) and, through routine sampling, a Maximum Allowable Concentration (MAC) of 1,000 *E. coli*/gram dry solids in the end product and be free from *Salmonella* spp. on completion of the treatment process.

Treatment standard	**HACCP *Process Validation Procedure*:** *E. coli* destruction		**End product standard:** Maximum Allowable Concentrations (MAC)
Conventional	99% (2 $\log_{10}$)	and	100,000 *E. coli*/gram dry solids (10^5)
Enhanced	99.9999% (6 $\log_{10}$)	and	1,000 *E. coli*/gram dry solids (10^3) Free from *Salmonella* spp. on completion of the treatment process
		or*	1,000 *E. coli*/gram dry solids (10^3) Free from *Salmonella* spp. on completion of the treatment process

** This is only acceptable where there is a mean < 8.0 $\log_{10}$ E. coli in the untreated sludge* (*Safe Sludge Matrix/Water UK*)

ADDITIONAL INFORMATION AND FURTHER REFERENCE

- Product major non-conformance.
- For methods of analysis refer to SGN13 – Methods of Analysis.
- For more information regarding treatment standards refer to SGN12 – Process Validation Procedure data record example.

EXAMPLES OF APPROPRIATE EVIDENCE

- Sample records and results must be available for assessment.

2.5 MCM3	Maximum Allowable Concentrations (MACs) – on microbiological parameters Monitoring Maximum Allowable Concentrations (MACs) of *E. coli* (and the absence of S*almonella* spp. in Enhanced treated products) must be done to ensure biosolids meet microbiological parameter limits prior to application on agricultural land (*Water UK Biosolids Network*). Monitoring of other parameters; pH, dry matter, organic matter, nitrogen, phosphorus, cadmium, chromium, copper, lead, mercury, nickel and zinc (*Sludge Regulations*); and arsenic, fluoride, molybdenum and selenium must be done prior to application to agricultural land (*Code of Practice*).	ADDITIONAL INFORMATION AND FURTHER REFERENCE EXAMPLES OF APPROPRIATE EVIDENCE
2.6 MCM3	Sampling frequency a) Biosolids for use in agriculture must be sampled for microbiological parameters: i. At the time of output of the final product for *E. coli* (and *Salmonella* spp. on completion of the treatment process to qualify for the Enhanced treated standard) when any HACCP Critical Limits are breached or there is a plant failure either of which are likely to have a negative impact on biosolids conformity (see note in additional information). ii. Monthly when re-engineering an existing Reference Processing Facility which is likely to have a negative impact on biosolids conformity (see note in additional information). iii. Monthly, on commissioning of a new Reference Processing Facility or when a significant change occurs in the quality or source of the biosolids, for a minimum period of 6 months and if necessary for a further period so that it can be demonstrated that the site is consistently producing conforming products. For intermittent processes which operate on an ad-hoc basis, a sample per month must be taken when operating. iv. Monthly (as routine, in the event of a facility failure or a shortfall in processing capacity) for all identified portable plant i.e. at fixed sites (sometimes with site-	ADDITIONAL INFORMATION AND FURTHER REFERENCE – System major non-conformance. – For methods of analysis refer to SGN13 – Methods of Analysis. – HACCP Critical Limits could be breached in a way that might reduce microbiological parameter concentrations e.g. higher digester temperatures or increased residence times and therefore would not require additional product sampling. – It is not mandatory to provide commissioning records for assessment for sites commissioned prior to January 2014. – It is not mandatory to provide records for assessment for arsenic, fluoride, molybdenum and selenium prior to 2014. EXAMPLES OF APPROPRIATE EVIDENCE

based permits) where the plant may be brought to the site when required; and as portable plant that should regularly move to new sites (e.g. under mobile plant permits and associated deployments), particularly where the sludge moves to the plant site for treatment and recycling.

v. At least every 3 months (as routine).

b) Biosolids for use in agriculture must be sampled for pH, dry matter, organic matter, nitrogen, phosphorus, cadmium, chromium, copper, lead, mercury, nickel and zinc:

i. On commissioning of a new Reference Processing Facility or when a significant change occurs in the quality or source of the biosolids.

ii. At least every 6 months (as routine).

c) Biosolids for use in agriculture must be sampled for arsenic, fluoride, molybdenum and selenium:

i. On commissioning of a new Reference Processing Facility or when a significant change occurs in the quality or source of the biosolids. Where concentrations are at levels no greater than the reference concentrations set out below, the frequency of sampling may be reduced to not less than once in every 5 years (*Code of Practice*). Where concentrations are at levels greater than the reference concentrations set out below, the frequency of sampling must be at least every 6 months.

Parameter	**Reference concentration (mg/kg dry solids)**
Arsenic	2
Fluoride	200
Molybdenum	3
Selenium	2

- Sample results (including the date of sampling) to demonstrate; Maximum Allowable Concentration for microbiological parameters monitoring in 2.6 a) is undertaken at least every three months; items listed in 2.6 b) are sampled at least every 6 months; and items listed in 2.6 c) are sampled at least every 6 months or 5 years as required.

2.7 MCM3	Sampling methods Samples must be taken of the biosolids end product at the *Process Sampling Points* (detailed in the HACCP plan for each site) after completion of the treatment process and before delivery to agricultural land (*Sludge Regulations*) and as per the requirements of the sampling and analysis protocols a – d: a) The sampling method used for inline sampling of cake, liquids or granules must be either; i. A composite sample comprised of five samples taken over a 5 - 10 minute period, which is then sub-sampled to provide 3 triplicate samples for analysis for microbiological parameters or; ii. Five separate samples taken over a 5 - 10 minute period with each sample being analysed for microbiological parameters. For analysis of non-microbiological parameters (pH, dry matter, organic matter, nitrogen, phosphorus, cadmium, chromium, copper, lead, mercury, nickel and zinc) a single analysis of a composite sample will be sufficient. Biosolids end product samples can also be taken in e.g. on cake pads or in storage (where resampling is required). See additional information and further reference section for sampling bulk biosolids. b) Samples must be kept in the dark and at 1 – 8 ^{0}C and must be analysed within 24 hours where practicable. c) Analytical results (measured as *E. coli*/gram dry solids) for each *sampling event* must be the mean of the analysis as $\log_{10}$ values of the samples (i.e. a mean of the $\log_{10}$ results, and not a $\log_{10}$ of the mean of the results). The inverse (or antilog) of $\log_{10}$ must be used to convert the mean $\log_{10}$ back to a natural number for MAC assessment. To achieve the Enhanced treated standard, *Salmonella* spp. must be absent in all samples analysed. Note samples for *Salmonella* spp. may be taken from a different *Process Sampling Point* to those for *E. coli*.	ADDITIONAL INFORMATION AND FURTHER REFERENCE – For sampling bulk biosolids refer to SGN11 – Sampling Methods for Bulk Biosolids. – For methods of analysis refer to SGN13 – Methods of Analysis. – For remote locations it may not be possible to arrange analysis within 24 hours. EXAMPLES OF APPROPRIATE EVIDENCE – A procedure for sampling and analysis specific to the Reference Processing Facility. – Evidence records to demonstrate the requirements in 2.7 are being met specific to the Reference Processing Facility. – The auditor will expect to see an internal procedure or contractual arrangements that demonstrate that biosolids sampling will be undertaken using suitable equipment and trained operators.

	d) Biosolids samples must be undertaken using suitable equipment and trained operators as determined by the responsible organisation.	
2.8 MCM2	Biosolids achieving either the Enhanced treated standard, the Conventionally treated standard or failing to achieve either standard must be identified accordingly in sample and result records.	EXAMPLES OF APPROPRIATE EVIDENCE – Evidence of treatment standards achieved must be available for assessment.
2.9 MCM2 MCM3	During MAC sample and test routines biosolids undergoing analysis and any subsequent output may be taken to field storage~~,~~ but must not be applied to agricultural land until the test results prove conformance to the minimum required treatment standard.	ADDITIONAL INFORMATION AND FURTHER REFERENCE – Product major non-conformance. – Refer to SGN14 – MAC sample and hold versus quarantined biosolids. EXAMPLES OF APPROPRIATE EVIDENCE – Records that indicate when the material is tested, transported to field storage and applied to agricultural land must be available alongside sample results. – Evidence of any failure to achieve intended treatment standards and subsequent corrective actions must be available.
2.10 MCM2 MCM3	In the event of a MAC sample failure, the potentially non-conforming material and any material it has been added to and any subsequent biosolids output from the site must be immediately identified as quarantined, where it is destined for recycling to agricultural land.	ADDITIONAL INFORMATION AND FURTHER REFERENCE – Product major non-conformance. – Biosolids outputs are deemed to be conforming until either sampling, HACCP or plant failures indicate they may be non-conforming. – In the event of a MAC sample failure the material may be resampled for further analysis.

		– Where biosolids are accumulated and stored in a single heap before application (either in temporary or field storage), all the cumulatively stored material will adopt the treatment standard (*Safe Sludge Matrix*) of the lowest grade material to join the heap; i.e. where biosolids achieving the Conventionally treated standard is added to biosolids achieving the Enhanced treated standard, the whole heap will be deemed as only achieving the Conventionally treated standard (regardless of any blending activity). Similarly, if non-conforming material is added to a heap then the whole heap will be deemed as non-conforming and must be quarantined. – Refer to SGN14 – MAC sample and hold versus quarantined biosolids. EXAMPLES OF APPROPRIATE EVIDENCE – Sample results (including the date of sampling). – A record of the treatment standard of material in each storage heap.
2.11 MCM2 MCM3	In the event of either a process deviation outside HACCP Critical Limits (as detailed in the site-specific HACCP plan) that is likely to have a negative impact on biosolids conformity or a plant failure that is likely to have a negative impact on biosolids conformity, the potentially non-conforming material must be sampled for microbiological parameters (MAC). This material and any subsequent output may be transferred to agricultural land for field storage~~,~~ but must not be applied to	ADDITIONAL INFORMATION AND FURTHER REFERENCE – Product major non-conformance. – Biosolids outputs are deemed to be conforming until either sampling, HACCP or plant failures indicate they may be non-conforming. – In the event of deviation outside HACCP Critical Limits or plant failure where an Enhanced treated is

	agricultural land until the test results prove conformance to the minimum required treatment standard.	produced the material must be sampled to check for conformance to the Enhanced treatment standard. EXAMPLES OF APPROPRIATE EVIDENCE – Sample results (including the date of sampling). – Evidence of any failure to achieve intended treatment standards and subsequent corrective actions must be available.
2.12 MCM2 MCM3	In the event of material being identified as quarantined; a) It must not be taken from treatment sites to field storage or directly applied to agricultural land. b) Material already in field storage must not be applied to agricultural land~~,~~ but may be resampled. c) Material in field storage that has failed to conform even on multiple retesting (within the time limits for field storage – sections 3.13 & 4.12) to the minimum treatment standard must be removed from the field and may be processed further or utilised elsewhere.	ADDITIONAL INFORMATION AND FURTHER REFERENCE – Product major non-conformance. EXAMPLES OF APPROPRIATE EVIDENCE – A procedure for quarantining material. – Records of material quarantined; the date when material is quarantined, the reason why it is quarantined and where the quarantined material is stored.
2.13 MCM2 MCM3	In the event of material being identified as quarantined, where appropriate, corrective action must be implemented in the HACCP Plan to reduce the likelihood of further biosolids sample MAC failures.	ADDITIONAL INFORMATION AND FURTHER REFERENCE – System major non-conformance. EXAMPLES OF APPROPRIATE EVIDENCE – Corrective actions recorded in HACCP Plans.

3. BIOSOLIDS TRANSPORTATION AND STORAGE - ENGLAND AND WALES		
The supplier of biosolids must ensure they are transported and stored in conformance with relevant regulations and good practice to protect the environment from diffuse pollution and odour nuisance.		
ITEM	**REQUIREMENT**	**GUIDANCE**
	TRANSPORTATION OF BIOSOLIDS	ADDITIONAL INFORMATION AND FURTHER REFERENCE
3.1 MCM4	Biosolids must be transported to permanent storage or to temporary field storage by registered waste carriers in suitable vehicles that adequately contain and cover the biosolids to avoid spillage and minimise odour nuisance (*Waste Regulations, Code of Practice*). Identifiable procedures must be in place to minimise the potential contamination of biosolids from other materials. These requirements do not apply to biosolids being transferred in an agricultural spreader from the temporary field storage to the place of application to land. These requirements do not apply if the treatment (e.g. portable plant) occurs at the place where the biosolids are to be used.	– Refer to SGN15 – Use of permanent stores. – Refer to SGN16 – NVZ identification.
	PERMANENT BIOSOLIDS STORAGE (outwith the curtilage of the treatment site)	EXAMPLES OF APPROPRIATE EVIDENCE
3.2 MCM4	Permanent biosolids storage must have an impermeable base that enables run-off liquid to be collected (*CoGAP*).	– For requirement 3.1 a record of waste carriers and records that demonstrate the requirements in 3.1 are met (i.e. the contract in place with the waste carrier). – For requirement 3.2 – 3.3 the auditor will visually examine any permanent storage on-site or records (including evidence records) for off-site permanent storage sites to demonstrate the requirements in 3.2 – 3.3 are met. – Other electronic or documentary or visual evidence that demonstrates the requirements of 3.1 – 3.16
3.3 MCM4	Permanent biosolids stores must be designed and constructed to ensure that, as far as practicable, biosolids are contained and that members of the public are unable to gain access to it (*Code of Practice*).	
	TEMPORARY BIOSOLIDS FIELD STORAGE	
3.4 MCM4	Biosolids must only be placed in temporary field storage at the place where they are to be used (*Environmental Permitting Regulations, S3 storage exemption*).	
3.5 MCM4	Biosolids (cake) dispatched for temporary field storage: • must be solid enough to be stored in a free-standing heap, and	

	• must not be likely to give rise to free drainage from within the stacked material, to minimise the risk of temporary diffuse pollution during the intended period of storage. (*Nitrate Regulations & Water UK Biosolids Network*).	– are met (i.e. records provided by the contractor), including evidence records – refer to SGN17 – Biosolids Transportation and Storage evidence document template (England and Wales). Where Biosolids Transportation and Storage checklists are used as evidence, they must be signed and dated. – The auditor will expect to see an internal procedure for routine inspection of field stores and evidence (records) that field stores have been inspected where relevant.
3.6 MCM4	Within Nitrate Vulnerable Zones biosolids (cake) temporary field storage heaps must occupy as small a surface area as is practically required to support the mass of the heap and prevent it from collapsing (*Nitrate Regulations, amended*).	
3.7 MCM4	Within Nitrate Vulnerable Zones a minimum 2-year gap must be observed before biosolids can be field stored in the same location as a previous temporary field store (*Nitrate Regulations*).	
3.8 MCM4	Biosolids in temporary field stores must be no greater than 1,250 tonnes fresh weight (*Environmental Permitting Regulations, S3 storage exemption*).	
3.9 MCM4	Biosolids in temporary field stores must be stored further than 10 metres from any watercourse (*Environmental Permitting Regulations, S3 storage exemption/FRfW*).	
3.10 MCM4	Biosolids in temporary field stores must be stored further than 50 metres from any spring or well, or from any borehole not used to supply water for domestic or food production purposes (*Environmental Permitting Regulations, S3 storage exemption*).	
3.11 MCM4	Biosolids in temporary field stores must be stored further than 250 metres from any borehole used to supply water for domestic or food production purposes (*Environmental Permitting Regulations, S3 storage exemption*).	
3.12 MCM4	Within Nitrate Vulnerable Zones, biosolids must not be stored within 10 metres of surface water, or an effective field drain, or within 30 metres of surface water where the land has a slope of >12° (*Nitrate Regulations*).	
3.13 MCM4	Biosolids in temporary field stores must not be stored for longer than 12 months from the commencement of storage (*Environmental Permitting Regulations, S3 storage exemption*), except where the relevant government agency has provided approval.	

3.14 MCM4	Biosolids must not be stored in an Environment Agency Groundwater Source Protection Zone 1 (*EA GW, SPZ1*).	
3.15 MCM4	Biosolids in temporary field stores must be subject to a routine inspection procedure as determined by the responsible organisation.	
3.16 MCM5	Temporary biosolids field storage sites must be located at suitable distances (depending on biosolids condition, prevailing wind direction, etc.) from domestic, public, recreational and industrial properties so as not to cause odour nuisance (*Code of Practice*). The distance between field storage heaps and domestic, public, recreational and industrial properties closest boundaries must be recorded.	

4. BIOSOLIDS TRANSPORTATION AND STORAGE - SCOTLAND		
The supplier of biosolids must ensure they are transported and stored in conformance with relevant regulations and good practice to protect the environment from diffuse pollution and odour nuisance.		
ITEM	**REQUIREMENT**	**GUIDANCE**
	TRANSPORTATION OF BIOSOLIDS	ADDITIONAL INFORMATION AND FURTHER REFERENCE
4.1 MCM4	Biosolids must be transported to permanent storage or to temporary field storage by registered waste carriers in suitable vehicles that adequately contain and cover the biosolids to avoid spillage and minimise odour nuisance (*Waste Regulations, Code of Practice*). Identifiable procedures must be in place to minimise the potential contamination of biosolids from other materials. These requirements do not apply to biosolids being transferred in an agricultural spreader from the temporary field storage to the place of application to land. These requirements do not apply if the treatment (e.g. portable plant) occurs at the place where the biosolids are to be used.	– Refer to SGN15 – Use of permanent stores. – Refer to SGN16 – NVZ identification.
	PERMANENT BIOSOLIDS STORAGE (out with the curtilage of the treatment site)	EXAMPLES OF APPROPRIATE EVIDENCE
4.2 MCM4	Within Nitrate Vulnerable Zones long term biosolids storage areas must have an impermeable surface and must either have a facility to collect, store and recover run-off or the biosolids must be covered with waterproof covering (*Nitrate Regulations*).	– For requirement 4.1 a record of waste carriers and records that demonstrate the requirements in 4.1 are met (i.e. the contract in place with the waste carrier). – For requirements 4.2 – 4.4 the assessor will visually examine any permanent storage on-site or records (including evidence records) for off-site permanent storage sites to demonstrate the requirements in 4.2 – 4.4 are met. – Other electronic or documentary or visual evidence that demonstrates the requirements of 4.1 – 4.14
4.3 MCM4	The volume of biosolids must not exceed ninety per cent of the available capacity of the storage facility (*Waste Management Licensing Regulations, paragraph 8 exemption & PEPFAA Code)*.	
4.4 MCM4	Permanent biosolids stores must be designed and constructed to ensure that, as far as practicable, biosolids are contained and that members of the public are unable to gain access to it (*Code of Practice*).	

	TEMPORARY BIOSOLIDS FIELD STORAGE	are met (i.e. records provided by the contractor), including evidence records – refer to SGN18 – Biosolids Transportation and Storage evidence document template (Scotland). Where Biosolids Transportation and Storage checklists are used as evidence, they must be signed and dated.
4.5 MCM4	Biosolids must only be placed in temporary field storage at the place where they are to be used (*Waste Management Licensing Regulations, paragraph 8 exemption*).	
4.6 MCM4	Biosolids (cake) dispatched for temporary field storage: a) must be solid enough to be stored in a free-standing heap; and b) must not be likely to give rise to free drainage from within the stacked material, to minimise the risk of temporary diffuse pollution during the intended period of storage (*Water UK Biosolids Network*).	
4.7 MCM4	Within Nitrate Vulnerable Zones a minimum 2-year gap must be observed before biosolids can be temporarily field stored in the same location as a previous temporary field store (*Nitrate Regulations*).	
4.8 MCM4	Biosolids must be stored further than 10 metres from any inland or coastal waters. (*Waste Management Licensing Regulations, paragraph 8 exemption* & *PEPFAA Code*).	
4.9 MCM4	Biosolids must be stored at a distance of not less than; 50 metres from any well, borehole or similar work sunk into underground strata for the purpose of any water supply other than a domestic water supply and; 250 metres from any well, borehole or similar work sunk into underground strata for the purpose of a domestic water supply (*Waste Management Licensing Regulations, paragraph 8 exemption* & *PEPFAA Code*).	
4.10 MCM4	Within Nitrate Vulnerable Zones biosolids must not be stored on any area of land that slopes down toward a body of surface water and has a slope of 12 degrees or more or at any location where there is a significant risk of nitrogen from the field stockpile entering a body of surface water (*Nitrate Regulations, amended, SEPA Technical Guidance Note*).	
4.11 MCM4	Within Nitrate Vulnerable Zones biosolids may not be located in any area identified on the risk assessment map (prepared under Regulation 5(4) of the NVZ Scotland	

	Regulations 2008), as being of high risk to the water environment or in any other location where there is a significant risk of nitrogen from the field heap entering a body of surface water (*Nitrate Regulations, amended*).	
4.12 MCM4	Biosolids in temporary field stores must not be stored for longer than 6 months from the commencement of storage (*Waste Management Licensing Regulations, paragraph 8 exemption*), except where the operator has notified the relevant government agency.	
4.13 MCM4	Biosolids in temporary field stores must be subject to a routine inspection procedure and implement mitigation measures, as appropriate, to address risks that are identified during inspections, as determined by the responsible organisation (*SEPA Technical Guidance Note*).	
4.14 MCM5	Temporary biosolids field storage sites must be located at suitable distances (depending on biosolids condition, prevailing wind direction, etc.) from domestic, public, recreational and industrial properties so as not to cause odour nuisance (*Code of Practice*). The distance between field storage heaps and domestic, public, recreational and industrial properties closest boundaries must be recorded.	

5. BIOSOLIDS APPLICATIONS TO AGRICULTURAL LAND; SOIL ANALYSIS, ADDITIONS OF ELEMENTS AND THE SAFE SLUDGE MATRIX - UK

The supplier must analyse soils by prior to the application of biosolids and biosolids additions to land may be limited by metal and nutrient loading rates, taking account of soil pH, heavy metal concentrations and nutrient status. Biosolids applications to agricultural land must be in accordance with the requirements of the Safe Sludge Matrix (ADAS, 2001), which provides controls on the application of biosolids in advance of specific crops.

ITEM	REQUIREMENT	GUIDANCE
5.1 MCM8	Prior to the first application of biosolids to agricultural land and as required before biosolids are subsequently applied, soils must be sampled (to a depth of 25 cm (or to the depth of the soil) on arable land and grassland) and there must be a corresponding analysis dated within 20 years of the date of any application. Soil samples must be analysed for pH, and the elements cadmium, chromium, copper, lead, mercury, nickel and zinc (*Sludge Regulations*). Additionally, from 1st January 2018 prior to the first application of biosolids to agricultural land and as required before biosolids are subsequently applied, soils must be sampled (either to a depth of 25 cm for all land, or a depth of 15 cm for arable (which includes rotational grass) or 7.5 cm for non-rotational grass or in the case of liquid injection to the planned depth of injection) and there must be a corresponding analysis dated within 10 years of the date of any application. Soil samples must be analysed for pH, and the elements cadmium, chromium, copper, lead, mercury, nickel, zinc, arsenic, fluoride, molybdenum and selenium (*Code of Practice*). Additionally, from 1st January 2017 prior to the first application of biosolids to agricultural land and as required before biosolids are subsequently applied, soils must be sampled (to a depth of 15 cm for arable (which includes rotational grass) and 7.5 cm for non-rotational grass or in the case of liquid injection to the planned depth of injection) and there must be a corresponding analysis for soil extractable P dated within 5 years of the date of any application (*Best Practice*).	ADDITIONAL INFORMATION AND FURTHER REFERENCE – For methods of analysis refer to SGN13 – Methods of Analysis. – Refer to SGN19 – Soil sampling overview. – The *Sludge Regulations* samples taken to a depth of 25 cm can be analysed to meet the *Code of Practice* requirements so long as they have been taken within 10 years of any biosolids application. EXAMPLES OF APPROPRIATE EVIDENCE - Records of the sampling method used (including land type and depth), sample dates and sample results must be available. - The auditor may request to see evidence of soil analysis taken at the correct depth and at the minimum frequency required. - The auditor will expect to see an internal procedure or contractual arrangements that demonstrate that soil sampling will be undertaken using suitable equipment and trained operators.

	Sludge Regulations samples must be taken once for every 5 hectares, whilst *Code of Practice* and soil extractable P samples may reflect uniform areas i.e. they do not have to be one for every 5 hectares. From 1st January 2018, soil samples must be undertaken using suitable equipment and trained operators as determined by the responsible organisation.	
5.2 MCM8	Biosolids must not be applied to agricultural land where the soil pH is less than 5.0 (*Sludge Regulations*). Where the soil pH is 5.0 < 5.2, expert advice (i.e. from a FACTS qualified adviser) must be sought before biosolids are applied to that land.	ADDITIONAL INFORMATION AND FURTHER REFERENCE EXAMPLES OF APPROPRIATE EVIDENCE - Records of the sampling method used (including land type and depth), sample dates and sample results must be available and include soil pH. - Where the soil pH is 5.0 < 5.2, evidence of expert advice must be provided.
5.3 MCM8	Biosolids applications to **arable** agricultural land must not cause the element limits of soil specified in the table below to be exceeded (*Sludge Regulations/Code of Practice*).	ADDITIONAL INFORMATION AND FURTHER REFERENCE – It is not mandatory to provide historic records for assessment for chromium, molybdenum, selenium, arsenic and fluoride in soil and biosolids prior to 1st January 2014. – Molybdenum[2] and Arsenic[2]; where soil background levels of molybdenum or arsenic exceed the specified soil limits expert advice (i.e. from a FACTS qualified adviser) must be sought, that takes account of the molybdenum or arsenic levels in biosolids, existing soil concentrations and for molybdenum the current arrangements to provide copper supplements in livestock.

Element	**Limit in mg/kg dry matter according to pH of soil**			
	5.0<5.5	*5.5<6.0*	*6.0-7.0*	*>7.0(1)*
Zinc	200	200	200	300
Copper	80	100	135	200
Nickel	50	60	75	110
	For pH 5.0 and above			
Cadmium	3			
Lead	300			
Mercury	1			

[1] *The increased permissible limits at >pH 7.0 apply only to soils containing more than 5% calcium carbonate.*

Additionally, biosolids applications must not cause the element limits of soil specified in the table below to be exceeded (*Code of Practice*).

Element	**Limit in mg/kg dry matter according to pH of soil** *For pH 5.0 and above*
Chromium	400
Molybdenum[2]	4
Selenium	3
Arsenic[2]	50
Fluoride	500

EXAMPLES OF APPROPRIATE EVIDENCE

- Records of the sampling method used (including land type and depth), sample dates and sample results must be available.
- Records of the calculations to demonstrate that element limits in the soil will not be exceeded by the addition of biosolids or;
- Where electronic systems are used to undertake the calculations required, a demonstration of how the system operates must be provided to ensure that element limits in the soil will not be exceeded by the addition of biosolids.
- Where soil background levels of molybdenum or arsenic exceed the specified soil limits evidence of expert advice must be provided.

5.4
MCM8

Biosolids applications to **grassland** must not cause the element limits of soil specified in the table below to be exceeded (*Sludge Regulations/Code of Practice*).

Element	**Limit in mg/kg dry matter according to pH of soil**			
	5.0<5.5	*5.5<6.0*	*6.0-7.0*	*>7.0*[(1)]
Zinc	200	200	200	300
Copper	130	170	225	330
Nickel	80	100	125	180
	For pH 5.0 and above			
Cadmium	3			
Lead	300			
Mercury	1.5			

[(1)] *The increased permissible limits at >pH 7.0 apply only to soils containing more than 5% calcium carbonate.*

ADDITIONAL INFORMATION AND FURTHER REFERENCE

- It is not mandatory to provide historic records for assessment for chromium, molybdenum, selenium, arsenic and fluoride in soil and biosolids prior to 1st January 2014.
- Molybdenum[2] and Arsenic[2]; where soil background levels of molybdenum or arsenic exceed the specified soil limits expert advice (i.e. from a FACTS qualified adviser) must be sought, that takes account of the molybdenum or arsenic levels in biosolids, existing soil concentrations and for molybdenum the current arrangements to provide copper supplements in livestock.

EXAMPLES OF APPROPRIATE EVIDENCE

- Records of the sampling method used (including land type and depth), sample dates and sample results must be available.
- Records of the calculations to demonstrate that element limits in the soil will not be exceeded by the addition of biosolids or;
- Where electronic systems are used to undertake the calculations required, a demonstration of how the system operates must be provided to ensure that element limits in the soil will not be exceeded by the addition of biosolids.

	Additionally, biosolids applications **to grassland** must not cause the element limits of soil specified in the table below to be exceeded (*Code of Practice*). **Element** — **Limit in mg/kg dry matter according to pH of soil**, *For pH 5.0 and above*: Chromium 600 Molybdenum[2] 4 Selenium 5 Arsenic[2] 50 Fluoride 500	– Where soil background levels of molybdenum or arsenic exceed the specified soil limits evidence of expert advice must be provided.
5.5 MCM9	The rate of addition to soil for each element listed in the table below must not exceed the average annual addition rate specified below calculated over a preceding period of 10 years (*Sludge Regulations/Code of Practice*). **Element** — **Limit of average annual addition rate to soil** kg/hectare/year: Zinc 15 Copper 7.5 Nickel 3 Cadmium 0.15 Lead 15 Mercury 0.1 Chromium 15 Molybdenum 0.2	ADDITIONAL INFORMATION AND FURTHER REFERENCE EXAMPLES OF APPROPRIATE EVIDENCE – Records of calculations to demonstrate that the average annual (10 - year) addition rate to soil limits will not be exceeded by the addition of biosolids must be available.

	Selenium 0.15 Arsenic 0.7 Fluoride 20	
5.6 MCM9	When biosolids are applied to the surface of **grassland** the addition of lead, cadmium and fluoride in any one year must not exceed 3 times the 10-year average annual rates described in 5.5 (*Code of Practice*).	ADDITIONAL INFORMATION AND FURTHER REFERENCE EXAMPLES OF APPROPRIATE EVIDENCE – Records of calculations to demonstrate that the annual addition rates to soil will not be exceeded by the addition of biosolids must be available.
5.7 MCM7	If biosolids lead concentration exceeds 1,200 mg/kg dry solids or biosolids fluoride exceeds 1,000 mg/kg dry solids, biosolids must not be applied to the surface of grassland (*Code of Practice*).	ADDITIONAL INFORMATION AND FURTHER REFERENCE EXAMPLES OF APPROPRIATE EVIDENCE - Evidence that demonstrates biosolids exceeding these limits will not be applied to the surface of grassland must be available.

5.8
MCM6

Planning must demonstrate the intention that Biosolids will be applied to agricultural land in accordance with the Safe Sludge Matrix outlined below (*ADAS, 2001*).

[1] Extended to 2 months no grazing for outdoor pigs.

CROP GROUP	CONVENTIONALLY TREATED SLUDGES		ENHANCED TREATED SLUDGES	
FRUIT	✗		✓	10-month harvest interval applies
SALADS	✗ (30-month harvest interval applies)		✓	
VEGETABLES	✗ (12-month harvest interval applies)		✓	
HORTICULTURE	✗		✓	
COMBINABLE & ANIMAL FEED CROPS	✓		✓	
- GRAZED	✗ (Deep injected or ploughed down only)	3 week[1] no grazing and harvest interval applies	✓	3 week[1] no grazing and harvest interval applies
GRASS & FORAGE				
- HARVESTED	✓ (No grazing in season of application)		✓	

ADDITIONAL INFORMATION AND FURTHER REFERENCE

- A system major non-conformance may apply where the relevant documents are absent. A system minor non-conformance may apply where any omission or error occurs within the documents.
- A Product major non-conformance may apply where it cannot be demonstrated that the intention was to apply biosolids to agricultural land in accordance with the Safe Sludge Matrix.
- Refer to SGN20 – Safe Sludge Matrix cropping categories or the Safe Sludge Matrix publication (ADAS, 2001).
- Harvest interval means the interval of time between a biosolids application to land and the harvest of a crop from the same land.

EXAMPLES OF APPROPRIATE EVIDENCE

- Records must demonstrate intended conformance with the Safe Sludge Matrix.

5.9	Biosolids must not be applied between March and August in advance of stock fodder crops (not including grass or maize) for consumption before winter frosts (*Code of Practice*).	ADDITIONAL INFORMATION AND FURTHER REFERENCE - This is to protect animals from consuming tomato plants, whose seeds can survive sludge treatment. - Refer to SGN21 – Fodder crops clarification. EXAMPLES OF APPROPRIATE EVIDENCE – Records provided by the contractor or evidence records – refer to SGN22 – Field Application Evidence Document template (England and Wales) or SGN23 – Field Application Evidence Document template (Scotland). Records must identify the intended following crop and intended time of biosolids application.

6. BIOSOLIDS APPLICATIONS TO AGRICULTURAL LAND - ENGLAND AND WALES		
The supplier of biosolids must ensure they are applied to agricultural land in conformance with relevant regulations and good practice to protect the environment from diffuse pollution and odour nuisance.		
ITEM	**REQUIREMENT**	**GUIDANCE**
6.1 MCM6	Untreated sludge must not be applied to agricultural land (*Safe Sludge Matrix*).	ADDITIONAL INFORMATION AND FURTHER REFERENCE
6.2 MCM11	Biosolids must not be applied within 10 metres of a surface water course (*CoGAP/FRfW*), or within Nitrate Vulnerable Zones within 6 metres of any surface water course where precision liquid application equipment is used (*Nitrate Regulations/FRfW*).	– Refer to SGN24 – Biosolids Nutrient Management Matrix, 2019. – Refer to SGN25 – Soil P methods in England & Wales and Scotland. – Refer to SGN26 – Low rate/high frequency biosolids applications. – For requirement 6.11 – it is recommended that where an application is made to bare land or stubble, biosolids should be incorporated into the soil as soon as practicable.
6.3 MCM11	Biosolids must not be applied within 50 metres of a spring, well or borehole used for human consumption or for dairies (*CoGAP/FRfW*).	
6.4 MCM11	Biosolids must not be applied to agricultural land that is waterlogged, flooded, frozen hard or snow-covered (*CoGAP/FRfW*).	
6.5 MCM11	Within Nitrate Vulnerable Zones biosolids must not be applied to agricultural land that has slope of >12° where there is a significant risk of nitrogen getting into surface water (*Nitrate Regulations*).	EXAMPLES OF APPROPRIATE EVIDENCE
6.6 MCM10	a) The rate and timing of biosolids applications to agricultural land must take account of the nutrient requirements of crops, as advised in the Fertiliser Manual (RB209) and the Codes of Good Agricultural Practice in England and Wales (*CoGAP*). And must not impair the quality of soil or surface water or ground water (*Sludge Regulations*).	- Electronic or documentary or visual evidence that demonstrates the requirements of 6.1 – 6.13 are met (i.e. records provided by the contractor), including evidence records – refer to SGN22 – Field Application Evidence Document template (England and Wales). Where biosolids application checklists

To help achieve the above requirements, biosolids applications must comply with the Biosolids Nutrient Management Matrix below, including the amendment from the revised matrix, which applies from 1st January 2021 – see note. The Matrix must be used to complement, and not replace, nutrient management planning for both nitrogen and phosphate on farms where biosolids are used.

The ADAS soil P Index, soil type, previous application date (if any) and proposed rate of application must be recorded.

ADAS soil P Index	Maximum potential application of *lime treated* biosolids [a]	Maximum potential application of *all* other biosolids types
0/1/2	250 kg/ha total N in any twelve month period	250 kg/ha total N in any twelve month period
3	250 kg/ha total N in any twelve month period – application 1 year in 4 on sandy soils and 1 year in 2 on all other soils	250 kg/ha total N in any twelve month period – application 1 year in 2 on sandy soils [b]
4	250 kg/ha total N in any twelve month period – application 1 year in 5 on sandy soils and 1 year in 3 on all other soils	250 kg/ha total N in any twelve month period – application 1 year in 4 on sandy soils [c] and 1 year in 2 on all other soils – see note below
5 and above	No application	No application

[a] Lime addition rate >5% w/w on a dry solids basis

[b] Composted biosolids can be applied annually and [c] can be applied 1 year in 2

From 1st January 2021, the maximum potential application of *all* other biosolids types applied to ADAS soil P Index 4 soils will be 250 kg/ha total N in any twelve

are used as evidence, they must be signed and dated.

- Records of the sampling method used (including land type and depth), sample dates and sample results must be available.
- Records to demonstrate that restrictions on nutrient additions to the soil from biosolids have been adhered to or;
- Where electronic systems are used to undertake the calculations required, a demonstration of how the system operates must be provided to ensure that restrictions on nutrient additions to the soil from biosolids will have been adhered to.
- Documentary evidence to show that the person formulating the advice or making the assessment on nutrient applications has been FACTS trained and from 1st June 2021 is FACTS qualified. Refer to SGN27 – FACTS qualification.
- The auditor will expect to see an internal procedure or contractual arrangements that demonstrate that field applications will be undertaken using suitable equipment and trained operators.

<table>
<tr><td></td><td>month period – application 1 year in 4 on sandy soils [c] and 1 year in 3 on all other soils.
b) In special circumstances (e.g. turf production) where biosolids are applied at a low rate of application (e.g. 50 kg N/hectare) and the Biosolids Nutrient Management Matrix would restrict the frequency of applications (e.g. at ADAS soil P Index 3 or 4) then the frequency may be increased where the total application of P would not exceed that which could be applied in one application of up to 250 kg N at the frequency described in the Matrix.
c) Where complex nutrient advice/assessments are made then the person formulating the advice or making the assessment must be FACTS trained. From the 1st June 2021 the person formulating the advice or making the assessment must be FACTS qualified.</td><td></td></tr>
<tr><td>6.7
MCM11</td><td>Within Nitrate Vulnerable Zones biosolids with high readily available nitrogen (usually liquid) i.e. >30% readily available N must not be applied during the following closed periods (Nitrate Regulations):
<table><tr><th>Soil type</th><th>Grassland</th><th>Tillage Land</th></tr><tr><td>Sandy or shallow soil</td><td>1st September to 31st December</td><td>1st August to 31st December</td></tr><tr><td>All other soils</td><td>15th October to 31st January</td><td>1st October to 31st January</td></tr></table>However, on tillage land with sandy or shallow soil biosolids with high readily available nitrogen content may be applied between 1st August and 15th September inclusive if the land is sown on or before 15th September (Nitrate Regulations).</td><td></td></tr>
<tr><td>6.8
MCM11</td><td>Biosolids must not be applied in an Environment Agency Groundwater Source Protection Zone 1 (Environment Agency GW, SPZ1).</td><td></td></tr>
</table>

6.9 MCM11	Biosolids with high readily available nitrogen content must not be applied to land at a rate in excess of 50 m^3 per hectare (*CoGAP*). Within Nitrate Vulnerable Zones biosolids with high readily available nitrogen content must not be applied to land in excess of 30 m^3 per hectare with at least 3 weeks between each spreading during the following periods: • From the day following the last day of the closed period until the end of February (*Nitrate Regulations*).	
6.10 MCM12	Liquid biosolids must either be directly injected into the soil or spread using equipment with a low discharge point to minimise the aerosol effect and spray drift (*Code of Practice & CoGAP*) and within Nitrate Vulnerable Zones liquid biosolids must either be directly injected into the soil or spread using equipment with a trajectory that is below 4 metres from the ground (*Nitrate Regulations*).	
6.11 MCM11 MCM12	Advice must be provided to the farmer that on bare land or stubble, liquid biosolids must be incorporated into the soil within 6 hours of application and sludge cake/granules must be incorporated within 24 hours of application where practicable to minimise the potential for odour nuisance and surface runoff into water courses (*CoGAP*). The date of application must be recorded.	
6.12 MCM12	Biosolids field applications must be located at suitable distances (depending on biosolids condition, prevailing wind direction, etc.) from domestic, public, recreational and industrial properties so as not to cause odour nuisance (*Code of Practice*). The distance between field applications and domestic, public, recreational and industrial properties closest boundaries must be recorded.	
6.13 MCM11	Biosolids field applications must be undertaken using suitable equipment and trained operators as determined by the responsible organisation.	

7. BIOSOLIDS APPLICATIONS TO AGRICULTURAL LAND - SCOTLAND		
The supplier of biosolids must ensure they are applied to agricultural land in conformance with relevant regulations and good practice to protect the environment from diffuse pollution and odour nuisance.		
ITEM	**REQUIREMENT**	**GUIDANCE**
7.1 MCM6	Untreated sludge must not be applied to agricultural land (*Safe Sludge Matrix*).	ADDITIONAL INFORMATION AND FURTHER REFERENCE
7.2 MCM11	Biosolids must not be applied to land that is within 10 metres of any; river, burn, ditch or loch, as measured from the top of the bank; or wetland; or transitional water or coastal water, as measured from the shoreline; or opening into a surface water drainage system (*Water Environment Regulations GBR18, PEPFAA Code*).	– For requirement 7.13 – it is recommended that where an application is made to uncropped land, biosolids should be incorporated into the soil as soon as practicable. – Refer to SGN25 – Soil P methods in England & Wales and Scotland. – Refer to SGN26 – Low rate/high frequency biosolids applications.
7.3 MCM11	Biosolids must not be applied to land that is within 50 metres of any spring that supplies water for human consumption; or well or borehole that is not capped in such a way so as to prevent the ingress of water (*Water Environment Regulations GBR18, PEPFAA Code*).	
7.4 MCM11	Biosolids must not be applied to land that has an average soil depth of less than 40 centimetres and overlies gravel or fissured rock (*Water Environment Regulations GBR18, PEPFAA Code*).	
7.5 MCM11	Biosolids must not be applied to land that is frozen, waterlogged, or covered with snow or during heavy rainfall or where heavy rainfall is forecast within 24 hours (*Water Environment Regulations GBR18, PEPFAA Code*).	
7.6 MCM11	Biosolids must not be applied to land that is sloping (>15^0 for liquid biosolids), unless it is ensured that any run-off of fertiliser is intercepted (by means of a sufficient buffer zone or otherwise) to prevent it from entering any river, burn, ditch, wetland, loch, transitional water or coastal water towards which the land slopes (*Water Environment Regulations GBR18, PEPFAA Code*).	EXAMPLES OF APPROPRIATE EVIDENCE

7.7 MCM11	Within Nitrate Vulnerable Zones, biosolids must not be applied to land if there is a significant risk of pollution particularly where the slope of the land is >12^0 (*Nitrate Regulations*).	– Electronic or documentary or visual evidence that demonstrates the requirements of 7.1 – 7.14 are met (i.e. records provided by the contractor), including evidence records – refer to SGN23 – Field Application Evidence Document template (Scotland). Where biosolids application checklists are used as evidence, they must be signed and dated. – Records of the sampling method used (including land type and depth), sample dates and sample results must be available. – Records to demonstrate that restrictions on nutrient additions to the soil from biosolids have been adhered to or; – Where electronic systems are used to undertake the calculations required, a demonstration of how the system operates must be provided to ensure that restrictions on nutrient additions to the soil from biosolids will have been adhered to. – Documentary evidence to show that the person formulating the advice or making the assessment on nutrient applications has been FACTS trained and from 1st June 2021 is FACTS qualified. Refer to SGN27 – FACTS qualification. – The auditor will expect to see an internal procedure or contractual arrangements that demonstrate that field applications will be undertaken using suitable
7.8 MCM11	a) The rate and timing of biosolids applications to agricultural land must take account of the nutrient requirements of crops as advised in the appropriate SRUC Technical Notes and the Prevention of Environmental Pollution from Agricultural Activity - PEPFAA - A Code of Good Practice in Scotland (Scottish Executive, 2005), and must not impair the quality of soil or surface water or ground water (*Sludge Regulations*). b) From 1st January 2021, no more than 250 kg/ha total nitrogen may be applied in any twelve month period (*SRUC Technical Note 699, Water Environment Regulations GBR 18*). c) Soils must be sampled at least every 5 years and analysed for soil extractable P as advised in the appropriate SRUC Technical Notes. Soil type, previous application date (if any), crop requirements and proposed rate of application must be recorded. d) Phosphate additions must be managed over the crop rotation; at high soil P status (SAC status H & VH), total phosphate inputs must not exceed the amounts removed in crops during the rotation (SRUC Technical Notes 633, 652, 668) (SRUC, 2013). e) Within Nitrate Vulnerable Zones applications of biosolids to individual fields must not exceed 250 kg/ha of total nitrogen in any twelve-month period (*PEPFAA Code*). f) Where nutrient advice or assessments are made then the person formulating the advice or making the assessment must be FACTS trained. From the 1st June 2021 the person formulating the advice or making the assessment must be FACTS qualified.	

7.9 MCM11	Within Nitrate Vulnerable Zones biosolids with high readily available nitrogen (usually liquid with >30% readily available N) must not be applied during the following closed periods: **Soil type** / **Grassland** / **Tillage Land** Sandy or shallow soil / 1st September to 31st December / 1st August to 31st December All other soils / 15th October to 31st January / 1st October to 31st January However, on land which is not grassland and which is situated on sandy or shallow soil, biosolids with high readily available nitrogen content may be applied during the closed period, up to and including 15th September if the land is sown with a cereal crop before that date and up to and including 30th September if the land is sown with oilseed, a catch crop or a cover crop before that date (*Nitrate Regulations*).	equipment that is maintained in a good state of repair and trained operators.
7.10 MCM11	Within Nitrate Vulnerable Zones biosolids with high readily available nitrogen content may only be applied to bare ground and stubble during the months of July, August and September if the land to which it is applied is drilled with a crop within six weeks of the first application. (*Nitrate Regulations*).	
7.11 MCM11	Within Nitrate Vulnerable Zones biosolids with high readily available nitrogen content (usually liquid with >30% readily available N) must not be applied to land in excess of 30 m^3 per hectare during the following periods: • Four weeks prior to the first day on which the closed period commences (refer to table in item 7.7), and • From the day following the last day of the closed period until 14th February, both dates inclusive.	

	(*Nitrate Regulations*). Liquid biosolids must not be applied to the surface of land at a rate in excess of 50 m^3 per hectare (*PEPFAA Code, SRUC Technical Note 650*).	
7.12 MCM12	Biosolids field applications must be located at suitable distances (depending on biosolids condition, prevailing wind direction, etc.) from domestic, public, recreational and industrial properties so as not to cause odour nuisance (*Code of Practice*). The distance between field applications and domestic, public, recreational and industrial properties closest boundaries must be recorded.	
7.13 MCM12	Liquid biosolids must either be directly injected into the soil or spread using equipment with a low discharge point to minimise the aerosol effect and spray drift (*Code of Practice*). During spreading all types of biosolids, the aerosol effect must be kept to a minimum, by using equipment with low discharge points (*Code of Practice, PEPFAA Code*).	
7.14 MCM12	Advice must be provided to the farmer that on uncropped land liquid biosolids must be incorporated into the soil within 6 hours of application and sludge cake/granules must be incorporated within 24 hours of application where practicable to minimise the potential for odour nuisance (*PEPFAA Code*). The date of application must be recorded.	
7.15 MCM11	Biosolids field applications must be undertaken using suitable equipment that is maintained in a good state of repair (*Water Environment Regulations GBR18*) and by trained operators as determined by the responsible organisation.	

8. CALIBRATION, RECORD KEEPING, COMPLAINTS, LABORATORIES AND INTERNAL REVIEW		
Records of instrument calibration, sludge/biosolids and soil analyses, biosolids applications to agricultural land and complaints must be maintained.		
ITEM	**REQUIREMENT**	**GUIDANCE**
8.1	Records must show the planned frequency and actual events of either (re)calibration or cross-checking or other maintenance of all instruments that undertake measurements relating to any HACCP *Critical Control Point* (as identified in the HACCP plan – Section 2.2). These records must be maintained for a minimum period of 3 years.	ADDITIONAL INFORMATION AND FURTHER REFERENCE – The planned frequency of these events must be stipulated by the site operator and will be based on for example; the type of instrument, its operating environment, manufacturer's recommendations and the accuracy of measurement required. EXAMPLES OF APPROPRIATE EVIDENCE – A record of instruments used for CCP measurements. Calibration, cross-checking or other maintenance records must be available for each instrument used for CCP measurements. Clear evidence must be provided that the instruments are providing accurate information.
8.2	All records (paper or electronic) required for audit of this BAS Standard must be maintained and made available for audit for a minimum period of 3 years (unless specified otherwise within the BAS). Records of microbial parameter testing must be maintained for at least 5 years (*Water UK HACCP Procedures*). Records of soil samples must be maintained for a minimum period of 20 years (*Sludge Regulations*) and records of element additions to soil must be maintained for a minimum period of 10 years to enable average annual addition rates to be calculated and reviewed (Section 5).	ADDITIONAL INFORMATION AND FURTHER REFERENCE – It is not mandatory to provide historic records for assessment of certain elements in soil and biosolids as specified in the *Code of Practice* prior to 1st January 2014. EXAMPLES OF APPROPRIATE EVIDENCE – A document control policy and/or staff awareness. – Evidence of records must be available.

	Records of land applications must be maintained for a minimum period of 4 years to demonstrate conformance with the Nutrient Management Matrix (frequency of application) in England and Wales (Section 6), and in Scotland SRUC Technical Note 650 (Optimising the application of bulky organic fertilisers) (Section 7). Note statutory requirements may specify the keeping of some records for longer periods.	
8.3	The biosolids supplier must request from the farmer (if biosolids have been applied by other producers) and maintain a record of any previous biosolids applications to soil intended to be used for further applications (*Sludge Regulations*).	ADDITIONAL INFORMATION AND FURTHER REFERENCE EXAMPLES OF APPROPRIATE EVIDENCE – A record of previous biosolids applications to soil intended to be used for further applications for each land owner, including evidence records – refer to SGN22 – Field Application Evidence Document template (England and Wales) or SGN23 Field Application Evidence Document template (Scotland).
8.4	An up-to-date register of biosolids recycled to agricultural land must be maintained containing the following information (*Sludge Regulations/Code of Practice*): • Address details, field locations and areas of the agricultural units where biosolids have been supplied. • Analyses of the soil in accordance with Section 5. • The type (e.g. advanced anaerobic digestion - cake, anaerobic digestion - cake: anaerobic digestion with lime addition - cake; lime treatment - cake; composting – cake, thermal drying - granules, anaerobic digestion - liquid) and quantities (fresh weight) of biosolids supplied.	ADDITIONAL INFORMATION AND FURTHER REFERENCE EXAMPLES OF APPROPRIATE EVIDENCE – The register must be available for assessment.

	• The microbiological parameter standards and analyses of the biosolids supplied (refer to Section 2). • The quantity of biosolids applied to each specified area of land. • The quantities of nutrients and heavy metals applied per hectare (refer to Section 5).	
8.5	Biosolids analyses must be provided to the farmer as soon as reasonably practicable (*Sludge Regulations*) and within 3 months of biosolids application. The farmer must also be provided with information on soil analyses, biosolids type and quantity applied to each site/field. The farmer must also be advised of: • The intended or actual date of application and; • The requirements for field incorporation (Sections 6.11 & 7.14) and; • Advice on cropping and grazing restrictions (Section 5.8) (*Code of Practice/Safe Sludge Matrix*)	ADDITIONAL INFORMATION AND FURTHER REFERENCE EXAMPLES OF APPROPRIATE EVIDENCE – A record of information supplied to the farmer must be available.
8.6	Any complaint received from a near-by receptor, customer or any other associated party in relation to an activity relevant to the treatment and recycling of biosolids to agricultural land must be recorded. All complaints must be investigated and where valid, appropriate preventative action taken. The outcome of the investigation (even where the complaint is determined to be invalid) and corrective action taken must also be recorded.	ADDITIONAL INFORMATION AND FURTHER REFERENCE EXAMPLES OF APPROPRIATE EVIDENCE – A record of complaints, the outcome of investigating complaints and the preventative action taken (where applicable) must be available.
8.7	Laboratories used for sample analysis must be approved by Assured Biosolids Ltd.	ADDITIONAL INFORMATION AND FURTHER REFERENCE Assured Biosolids Limited will maintain a list of approved laboratories. EXAMPLES OF APPROPRIATE EVIDENCE

		– Identification of laboratories used.
8.8	The organisation must annually review and verify conformance with the requirements of the BAS Standard relating to the operations within their Certificate of Conformity, as determined by the responsible organisation.	ADDITIONAL INFORMATION AND FURTHER REFERENCE
		EXAMPLES OF APPROPRIATE EVIDENCE
		– The auditor will expect to see evidence of an annual management BAS review verifying conformance with the requirements of the BAS Standard relating to the operations within their Certificate of Conformity.

APPENDIX 1 - SOURCE MATERIAL RISK ASSESSMENT

Note

The previous forms issued in November 2015 are still valid for continued use until their routine expiry (i.e. every 36 months for Category A, B and C feedstock materials and every 12 months for the Category C risk identification and risk control form); then please use the new forms, which are available on request from Assured Biosolids Limited. In this interim period, if transferring sludge to another company, please ensure your company name is marked clearly on the form.

SOURCE MATERIAL RISK ASSESSMENT – **OVERVIEW**
The Biosolids Assurance Scheme (BAS) requires BAS Applicants and Members to demonstrate that all source materials that either enter or are supplied to their Reference Processing Facilities are risk assessed and control measures are in place to reduce the presented risks to acceptable levels. Source materials are grouped into categories A, B and C as outlined in Schematic 1 and a definition for each category is provided in Table 1. To demonstrate that you have risk assessed the source materials that enter or are supplied to your organisation, you must complete a risk identification and risk control form for Category A and B source materials. If Category C source material is supplied to your organisation; you must complete a pre-acceptance assessment form; either one for each material stream that is supplied to your organisation or one for the whole organisation where internal systems are in place that monitor the same information requested on the pre–acceptance assessment form; as well as one risk identification and risk control form for each Sludge Treatment Centre that receives one or more streams of Category C material. Refer to Table 1 for definitions and further information about completing and reviewing the forms for each source material category.

Schematic 1: Source material categories: A - C

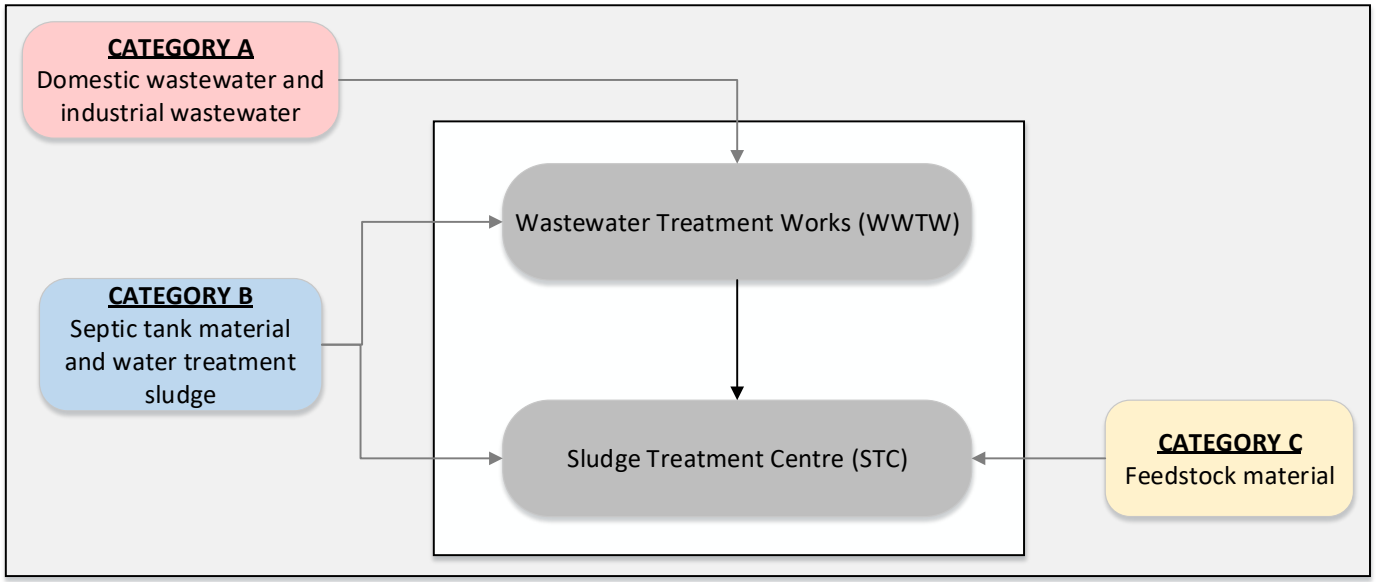


Table 1: Explanatory notes for Source Material Categories A, B and C

	CATEGORY A	**CATEGORY B**	**CATEGORY C**
1. Category title	Domestic wastewater and industrial wastewater.	Septic tank material and water treatment sludge.	Feedstock material.
2. Category definition	Category A materials include: – Materials that have entered the processing/treatment system through Wastewater Treatment Works (WWTW) (*the head of the works*) irrespective of whether the WWTW is operated by your organisation or by another and; – Materials that are defined within the provisions of the Urban Waste Water Treatment Directive (UWWTD). – Example materials include: domestic wastewater, industrial wastewater (including trade effluent discharge), interworks sludge transfers, and wastewaters arriving by tanker to the WWTW inlet.	Category B materials include: – Septic tank material (including cesspit/cesspool and chemical toilet waste) that is supplied into WWTW or STCs or; – Water treatment sludge produced from the treatment of clean water that either enters or is supplied into WWTW or STCs.	Category C materials include: – Materials that are supplied directly into sludge treatment processes at STCs or; – Materials used in the co-treatment of sludge or biosolids or; – Materials not covered by categories A or B. – Example materials: typically, material of non-water industry origin (e.g. organic materials supplied by a third-party into STCs), green waste, woodchip and sawdust. – But exclude genuine process aids (e.g. lime and polyelectrolyte). Any waste material must be accompanied by a completed Category C form, even if it is a process aid (e.g. lime that is a waste).

3. Demonstrating source materials have been risk assessed.	– If domestic wastewater and industrial wastewater enters or is supplied your organisation: **>** complete the domestic wastewater and industrial wastewater (category A) risk identification and risk control form **ONCE** for your entire organisation and review (and amend where necessary) every **thirty-six months** thereafter.	– If septic tank material and water treatment sludge enters or is supplied to your organisation: **>** complete the septic tank material and water treatment sludge (category B) risk identification and risk control form **ONCE** for your entire organisation and review (and amend where necessary) every **thirty-six months** thereafter.	– If feedstock material is supplied to your organisation: **>** complete a feedstock material (category C) pre-acceptance assessment form; either one for each material stream that is supplied to your organisation or one for the whole organisation where internal systems are in place that monitor the same information requested on the pre–acceptance assessment form, update it if there is a substantial change to the feedstock material stream (for example a change in the feedstock composition) or review (and amend where necessary) at least every **thirty-six months** thereafter and; **>** complete a feedstock material (category C) risk identification and risk control form for each STC that receives one or more feedstock material streams, update it if there is a substantial change to the feedstock material supply (for example if a new feedstock stream is proposed to be supplied to a STC) or review (and amend where necessary) at least every **twelve months** thereafter. Refer to schematic two for further information.

Schematic 2: Feedstock material (category C) explanatory schematic

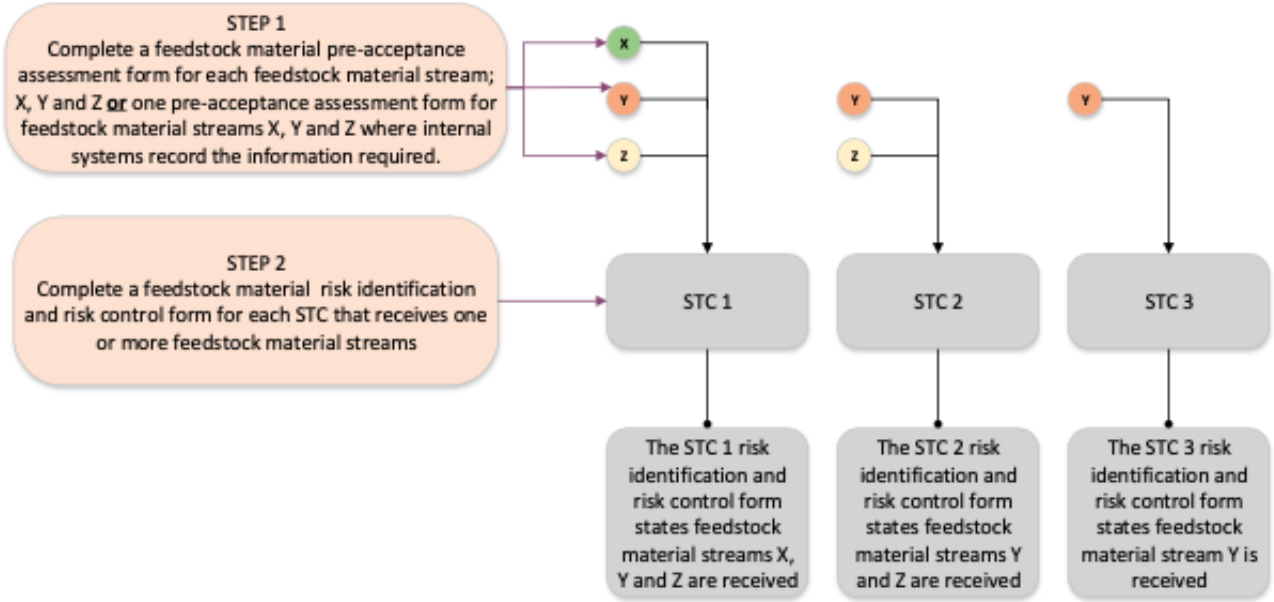
Biosolids Assurance Scheme Applicants and Members must demonstrate that all feedstock materials (category C) that are supplied to their organisation are risk assessed. This is a two-step process:

- Step 1: complete a pre-acceptance assessment form; either one for each material stream that is supplied to your organisation or one for your entire organisation where internal systems in place monitor and capture the same information required in the pre-acceptance assessment form;
- Step 2: complete a risk identification and risk control form for each STC that receives one or more feedstock material stream(s).

Example:

An organisation receives three separate feedstock material streams (X, Y and Z) which are supplied into three different STCs. STC 1 receives streams X, Y and Z; STC 2 receives Y and Z and STC 3 receives Y (as outlined below).

A feedstock material pre-acceptance assessment form must be completed for each feedstock material stream X, Y and Z or one pre-acceptance assessment form can be completed for feedstock material streams X, Y and Z where internal systems record the required information. A feedstock material risk identification and risk control form must be completed for STC 1, 2 and 3 (three risk identification and risk control forms in total for the entire organisation).



CATEGORY A - DOMESTIC WASTEWATER AND INDUSTRIAL WASTEWATER		
Biosolids Assurance Scheme (BAS) Applicants and Members must demonstrate that all Category A source materials that either enter or are supplied to their organisation are risk assessed by completing this form.		
Please read the notes (I – V) below before completing this form:		
I. If the Category A source materials are not sourced from the UK, please contact Assured Biosolids Limited for further guidance. II. This risk identification and risk control form asks you to summarise the process you have undertaken to effectively control the potential hazards and associated risks from domestic wastewater and industrial wastewater that enter your organisation. You must satisfy yourself and declare that the requirements of this risk identification and risk control form are met in full. III. Your answers should be provided in the boxes. Where some questions require detailed answers, a separate sheet may be used (indicated by*). IV. During the BAS audit, the auditor may examine your completed form and may request to see background evidence to support the answers you have provided. V. Once completed, this form must be reviewed (and amended where necessary) at least every **thirty-six months** thereafter or if circumstances change.		
MATERIAL ORIGIN		
1. Company name:		
2. Is there a record of all Wastewater Treatment Works (WWTWs) (operated by your organisation or another organisation) that supply domestic wastewater and industrial wastewater to your organisation? Indicate Yes or No:		
3. Is there a record of all of the industrial wastewater suppliers that your organisation has approved (including Trade Effluent dischargers) that supply industrial wastewater to your organisation? Indicate Yes or No:		
SUPPLIER REQUIREMENTS		
4. Are approved industrial wastewater suppliers issued with a contract or equivalent document? The contract or document may include: – the type of material to be supplied; – the intake rate/volume; – materials that must not be present in the industrial wastewater (i.e. determined by you and listed in the BAS excluded material reference [NOTE 1]); – source location (and description); – physical form and; – absolute limits? Indicate Yes or No:		

SUPPLIER CONFORMANCE	
5. Is there a system to ensure all of the industrial wastewater suppliers that your organisation has approved meet the terms of the contract (or equivalent document)? Indicate Yes or No:	
CONTINGENCY	
6. Is there a contingency arrangement in the event domestic wastewater and industrial wastewater enters your organisation and is later determined not to have conformed to expected requirements? Indicate Yes or No:	
POTENTIAL HAZARD IDENTIFICATION – DOMESTIC WASTEWATER	
7. Are potential hazards in domestic wastewater systematically identified? Indicate Yes or No:	
8. What potential hazards are identified in domestic wastewater that present a risk to the **biosolids treatment/production process? I.e. the process.** * Complete i – iii (only summarised information is required):	
i. Biological:	
ii. Chemical:	
iii. Physical:	
9. What potential hazards are identified in domestic wastewater that present a risk to **Certified Biosolids? I.e. the end product.** * Complete i – iii (only summarised information is required):	
i. Biological:	
ii. Chemical:	
iii. Physical:	
POTENTIAL HAZARD IDENTIFICATION INDUSTRIAL WASTEWATER	
10. Are potential hazards in industrial wastewater systematically identified? Indicate Yes or No:	
11. What potential hazards are identified in industrial wastewater that present a risk to the **biosolids treatment/production process? I.e. the process.** * Complete i – iii (only summarised information is required):	
i. Biological:	
ii. Chemical:	
iii. Physical:	

12. What potential hazards are identified in industrial wastewater that present a risk to **Certified Biosolids? I.e. the end product.** * Complete i – iii (only summarised information is required):	
i. Biological:	
ii. Chemical:	
iii. Physical:	

CONTROL MEASURES	
13. What control measures are in place to control the identified hazards in domestic wastewater and industrial wastewater to reduce the presented risks (to the process or product) to acceptable levels?* Complete i – iii (only summarised information is required):	
i. Control measures for biological hazards:	
ii. Control measures for chemical hazards:	
iii. Control measures for physical hazards:	

DECLARATION AND REVIEW		
14. The control measures[13] control the potential hazards[6-12] in domestic wastewater and industrial wastewater (to the process and product) to an acceptable level of risk. Complete i – iii to confirm the information you have provided in this risk identification and risk control form is true and accurate:	i. Sign:	
	ii. Date:	
	iii. Position held:	
Complete i – v to indicate when this risk identification and risk control form has been reviewed and the changes made (if any) as a result of the review:	i. Date reviewed:	
	ii. Changes (if any)*:	
	iii. Sign:	
	iv. Date:	
	v. Position held:	

Note [1] BAS excluded material reference – refer to substances listed in Schedule 1 of the Trade Effluents (Prescribed Processes and Substances) Regulations 1989, as amended (Standard Guidance Note 1).

CATEGORY B - SEPTIC TANK MATERIAL AND WATER TREATMENT SLUDGE		
Biosolids Assurance Scheme (BAS) Applicants and Members must demonstrate that all Category B source materials that either enter or are supplied to their organisation are risk assessed by completing this form.		
Please read the notes (I – V) below before completing this form:		
I. If the Category B source materials are not sourced from the UK, please contact Assured Biosolids Limited for further guidance. II. This risk identification and risk control form asks you to summarise the process you have undertaken to effectively control the potential hazards and associated risks from septic tank material and water treatment sludge that enters your organisation. You must satisfy yourself and declare that the requirements of this risk identification and risk control form are met in full. III. Your answers should be provided in the boxes. Where some questions require detailed answers, a separate sheet may be used (indicated by*). IV. During the BAS audit, the assessor may examine your completed form and may request to see background evidence to support the answers you have provided. V. Once completed, this form must be reviewed (and amended where necessary) at least every **thirty-six months** thereafter or if circumstances change.		
MATERIAL ORIGIN		
1. Company name:		
2. Is there a record of all septic tank material and water treatment sludge suppliers that supply septic tank material and/or water treatment sludge to your organisation? Indicate Yes or No:		
SUPPLIER APPROVAL		
3. Are all septic tank material and water treatment sludge suppliers approved? Indicate Yes or No:		
4. Are only approved septic tank material and water treatment sludge suppliers able to access your premises? Indicate Yes or No:		
SUPPLIER REQUIREMENTS		
5. Are all septic tank material and water treatment sludge suppliers issued with a contract (or equivalent document)? The contract or document may include: – the type of material to be supplied; – the intake rate/volume; – a description of the material that will be supplied or a description of materials that must not be present in the material supplied (i.e. determined by you and listed in the BAS excluded material reference [NOTE 1]); – source location (and description);		

– physical form; – acceptance and rejection parameters and; – supplier conformance checks. Indicate Yes or No:	
SUPPLIER CONFORMANCE	
6. Is there a system to ensure all septic tank material and water treatment sludge suppliers meet the terms of the contract (or equivalent document)? Indicate Yes or No:	
CONTINGENCY	
7. Is there a contingency arrangement in the event septic tank material or water treatment sludge is supplied to your organisation and is later determined not to have conformed to expected requirements? Indicate Yes or No:	
POTENTIAL HAZARD IDENTIFICATION	
8. Are potential hazards in septic tank material and water treatment sludge systematically identified? Indicate Yes or No:	
9. What potential hazards are identified in septic tank material and water treatment sludge that present a risk to the **biosolids treatment/production process? I.e. the process.** * Complete i – iii (only summarised information is required):	
i. Biological:	
ii. Chemical:	
iii. Physical:	
10. What potential hazards are identified in septic tank material and water treatment sludge that present a risk to **Certified Biosolids? I.e. the end product.** * Complete i – iii (only summarised information is required):	
i. Biological:	
ii. Chemical:	
iii. Physical:	
CONTROL MEASURES	
11. What control measures are in place to control the identified hazards in septic tank material and water treatment sludge to reduce the presented risks (to the process or product) to acceptable levels?* Complete i – iii (only summarised information is required):	
i. Control measures for biological hazards:	
ii. Control measures for chemical hazards:	
iii. Control measures for physical hazards:	

DECLARATION AND REVIEW		
12. The process controls[11] control the potential hazards[8/9/10] in septic tank material and water treatment sludge (to the process and product) to an acceptable level of risk. Complete i – iii to confirm the information you have provided in this risk identification and risk control form is true and accurate:	i. Sign:	
	ii. Date:	
	iii. Position held:	
Complete i – v to indicate when this risk identification and risk control form has been reviewed and the changes made (if any) as a result of the review:	i. Date reviewed:	
	ii. Changes (if any)*:	
	iii. Sign:	
	iv. Date:	
	v. Position held:	
Note [1] BAS excluded material reference – refer to substances listed in Schedule 1 of the Trade Effluents (Prescribed Processes and Substances) Regulations 1989, as amended (Standard Guidance Note 1).		

CATEGORY C - FEEDSTOCK MATERIAL

STEP 1: PRE – ACCEPTANCE ASSESSMENT FORM - for each material type

Biosolids Assurance Scheme (BAS) Applicants and Members must demonstrate that all Category C source materials that enter their Reference Processing Facilities are risk assessed. For feedstock material, this is a two-step process:

- STEP 1: complete a pre-acceptance assessment form; either one for each material stream that is supplied to your organisation or one for the whole organisation where internal systems are in place that monitor the same information requested on the pre–acceptance assessment form;

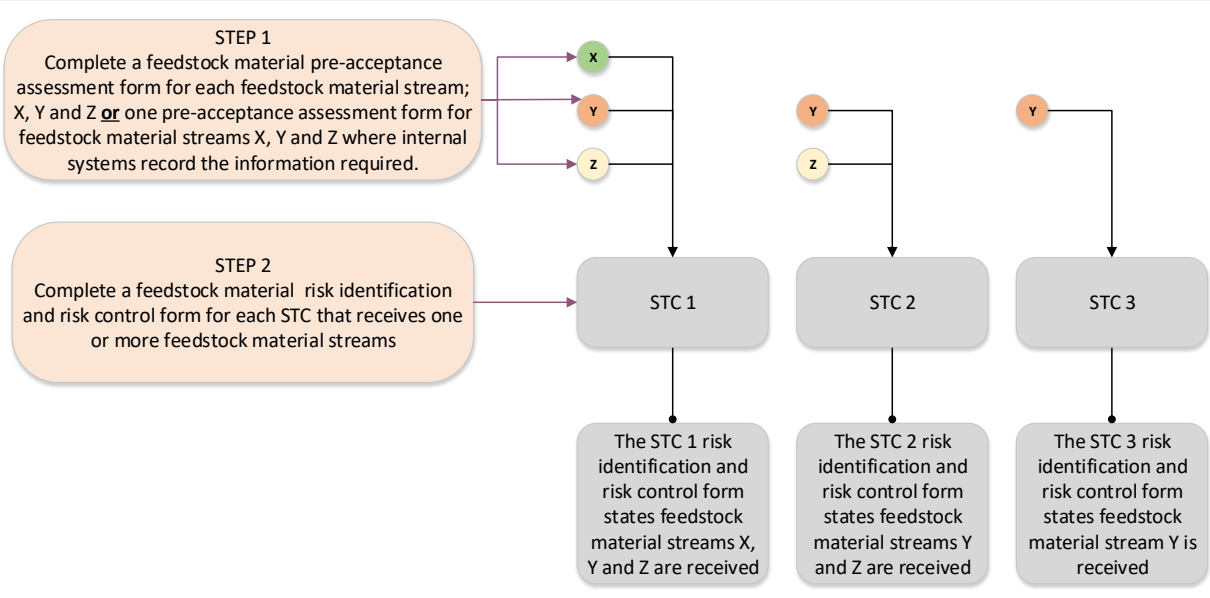
- STEP 2: complete a risk identification and risk control form for each STC that receives one or more feedstock material stream(s).

The example below shows how you should complete the pre-acceptance assessment form (STEP 1) for each separate feedstock material stream that is supplied to your organisation.

Example:

An organisation receives three separate feedstock material streams (X, Y and Z) which are supplied into three different STCs. STC 1 receives streams X, Y and Z; STC 2 receives Y and Z and STC 3 receives Y (as outlined below).

A feedstock material pre-acceptance assessment form must be completed for each feedstock material stream X, Y and Z (three pre-acceptance assessment forms in total for the entire organisation) and a feedstock material risk identification and risk control form must be completed for STC 1, 2 and 3 (three risk identification and risk control forms in total for the entire organisation).



Please read the notes (I – VII) below before completing this form:	
I. If the Category C source materials are not sourced from the UK, please contact Assured Biosolids Limited for further guidance. II. This pre-acceptance assessment form asks you about the pre-requisite controls you have in place for feedstock material. You should complete a pre-acceptance assessment form; either one for each material stream that is supplied to your organisation or one for the whole organisation where internal systems are in place that monitor the same information requested on the pre–acceptance assessment form and you should also complete one feedstock material risk identification and risk control form for each Sludge Treatment Centre that receives one or more feedstock material streams. III. Your answers should be provided in the boxes. Where some questions require detailed answers, a separate sheet may be used (indicated by*). IV. During the BAS audit, the auditor may examine your completed pre-acceptance assessment and may request to see background evidence to support the answers you have provided. V. Where internal systems are in place that monitor the same information requested on the pre–acceptance assessment form it will be acceptable to sign off a single form for the whole organisation with reference to "see internal systems" inserted as an answer as appropriate. Otherwise a pre–acceptance assessment form must be completed for each separate feedstock. VI. BAS Applicants and Members must satisfy themselves and make a declaration that the requirements of this pre-acceptance assessment form are true and accurate. VII. Once completed, this pre-acceptance assessment form must be updated if there is a substantial change to the feedstock material stream (for example a change in the feedstock composition) or reviewed (and amended where necessary) at least every **thirty-six months** thereafter or if circumstances change.	
REFERENCE NUMBER	
1. Company name:	
2. Indicate the reference number for this pre-acceptance assessment form (number the first form '1' and sequentially thereafter:	
FEEDSTOCK MATERIAL STREAM AND SUPPLIER	
3. Name and describe the feedstock material stream (indicate the European Waste Catalogue (EWC) code if the feedstock material is a 'waste')*:	
Name:	
EWC code/description:	
4. Indicate the name of the feedstock material supplier and where the feedstock material originates:	

MATERIALS	
5. Does the feedstock contain **untreated** Animal By-Product (ABP) material? Indicate Yes or No:	If 'yes' go to question 6 If 'no' go to question 7
6. Will the feedstock material be processed according to ABP regulatory controls in a facility approved according to ABP regulatory controls? Indicate Yes or No:	IF 'NO' - DO NOT ACCEPT FEEDSTOCK MATERIAL STREAM
7. Does the feedstock contain **treated** ABP material? Indicate Yes or No:	If 'yes' go to question 8 If 'no' go to question 9
8. Is documentation and traceability in place that meets the requirements of ABP regulatory controls for processing treated ABP material? Indicate Yes or No:	IF 'NO' - DO NOT ACCEPT FEEDSTOCK MATERIAL STREAM

SUPPLIER APPROVAL	
9. Is the feedstock material supplier approved? Indicate Yes or No:	
10. Are only approved feedstock material suppliers able to access your premises? Indicate Yes or No:	
SUPPLIER REQUIREMENTS	
11. Is the feedstock material supplier issued with a contract (or equivalent document) that includes: – the type of material to be supplied; – the intake rate/volume; – a description of the material that will be supplied or a description of materials that must not be present in the material supplied (i.e. determined by you and listed in your environmental site permit [NOTE 1]); – source location (and description); – physical form; – acceptance and rejection parameters and; – supplier conformance checks? Indicate Yes or No:	
SUPPLIER CONFORMANCE	
12. Is there a system to ensure the supplier meets the terms of the contract (or equivalent document) (for example delivery inspection frequency/routine feedstock sampling and analysis/periodic audits)? Indicate Yes or No:	

CONTINGENCY		
13. Is there a contingency arrangement in the event a feedstock material stream is later determined not to have conformed to the requirements of the contract (or equivalent document)? Indicate Yes or No:		
DECLARATION AND REVIEW		
14. Sign, date and indicate your position in the organisation to confirm the information you have provided in 1 – 13 is true and accurate: Complete i – iii	i. Sign:	
	ii. Date:	
	iii. Position held:	
Complete i – v to indicate when this pre-acceptance assessment form has been reviewed and the changes made (if any) as a result of the review:	i. Date reviewed:	
	ii. Changes (if any)*:	
	iii. Sign:	
	iv. Date:	
	v. Position held:	
Note [1] The environmental site permit will identify a List of Permitted Wastes along with European Waste Catalogue (EWC) codes.		

CATEGORY C - FEEDSTOCK MATERIAL

STEP 2: RISK IDENTIFICATION AND RISK CONTROL FORM - for each STC

Biosolids Assurance Scheme (BAS) Applicants and Members must demonstrate that all Category C source materials that enter their Reference Processing Facilities are risk assessed. For feedstock material, this is a two-step process:

- STEP 1: complete a pre-acceptance assessment form; either one for each material stream that is supplied to your organisation or one for the whole organisation where internal systems are in place that monitor the same information requested on the pre–acceptance assessment form;

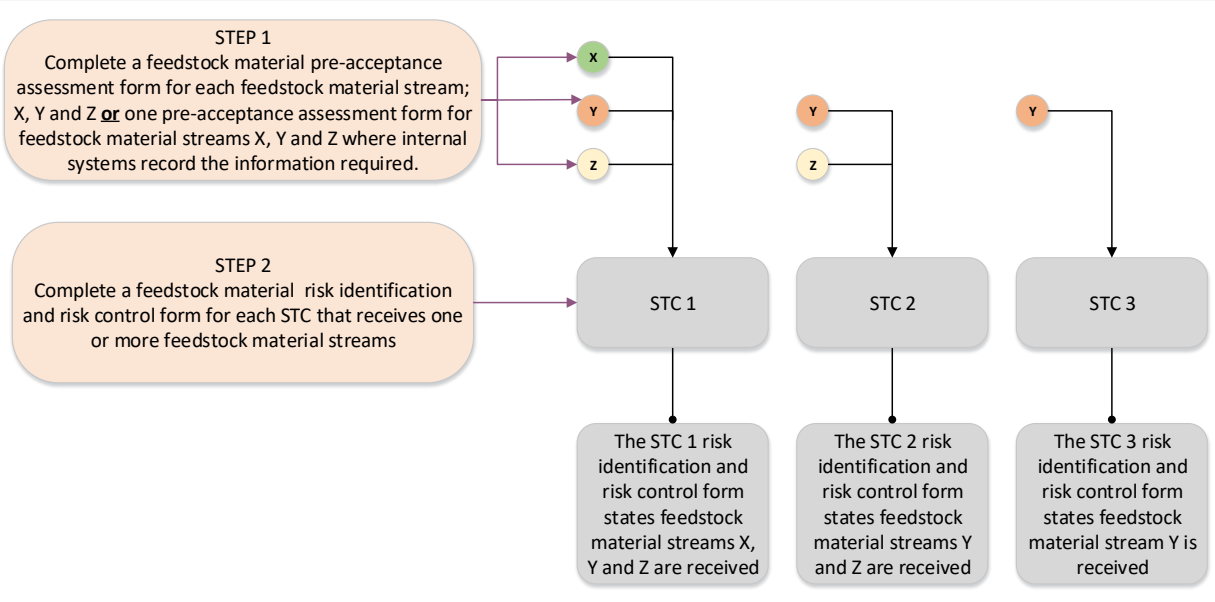
- STEP 2: complete a risk identification and risk control form for each STC that receives one or more feedstock material stream(s).

You should complete this risk identification and risk control form (STEP 2) for each STC that receives one or more feedstock material streams (refer to the example outlined below).

Example:

An organisation receives three separate feedstock material streams (X, Y and Z) which are supplied into three different STCs. STC 1 receives streams X, Y and Z; STC 2 receives Y and Z and STC 3 receives Y (as outlined below).

A feedstock material pre-acceptance assessment form must be completed for each feedstock material stream X, Y and Z (three pre-acceptance assessment forms in total for the entire organisation) and a feedstock material risk identification and risk control form must be completed for STC 1, 2 and 3 (three risk identification and risk control forms in total for the entire organisation).



Please read the notes (I – V) below before completing this form:	
I. This risk identification and risk control form asks you to **summarise** the process you have undertaken to effectively control the potential hazards and associated risks from feedstock material that is supplied to your organisation. You should complete this risk identification and risk control form for each STC that receives one or more feedstock material streams and you must also complete a pre-acceptance assessment form; either one for each material stream that is supplied to your organisation or one for the whole organisation where internal systems are in place that monitor the same information requested on the pre–acceptance assessment form. You must satisfy yourself and declare that the requirements of this risk identification and risk control form are met in full. II. Your answers should be provided in the boxes. Where some questions require detailed answers, a separate sheet may be used (indicated by*). III. During the BAS audit, the auditor may examine your completed risk identification and risk control form(s) (and associated pre-acceptance assessment form(s) – refer to question two) and may request to see background evidence to support the answers you have provided. IV. Where internal systems are in place that monitor the same information requested on the pre–acceptance assessment form it will be acceptable to answer "see internal systems" under Question 2 - Feedstock Material Streams. V. Once completed, this risk identification and risk control form must be updated if there is a substantial change to the feedstock material supply into a STC (for example a new feedstock stream is proposed) or reviewed (and amended where necessary) at least every **twelve months** thereafter.	
SLUDGE TREATMENT CENTRE REFERENCE	
1. Company name:	
2. Indicate the name and reference (if applicable) of the STC that is supplied with one or more feedstock material stream(s):	
PRE – ACCEPTANCE ASSESSMENT FORM	
3. Indicate the pre-acceptance assessment form reference number for each feedstock material stream that is supplied*:	
FEEDSTOCK MATERIAL STREAM 1	
Name:	
Pre-acceptance assessment form reference number:	
FEEDSTOCK MATERIAL STREAM 2	
Name:	
Pre-acceptance assessment form reference number:	
FEEDSTOCK MATERIAL STREAM 3	
Name:	

Pre-acceptance assessment form reference number:	
POTENTIAL HAZARD IDENTIFICATION	
4. How are potential hazards in each feedstock material stream systematically identified? Are there records to demonstrate how this is performed?*	
5. How are potential hazards that might result from the combination of feedstock material streams systematically identified? Are there records to demonstrate how this is performed?*	
6. What potential hazards are identified in each feedstock material stream(s) and as a result of combining the feedstock material streams that present a risk to the **biosolids treatment/production process? I.e. the process**. * Complete i – iii (only summarised information is required):	
i. Biological:	
ii. Chemical:	
iii. Physical:	
7. What potential hazards are identified in the feedstock materials stream(s) and as a result of combining the feedstock material streams that present a risk to **Certified Biosolids? I.e. the end product.** * Complete i – iii (only summarised information is required):	
i. Biological:	
ii. Chemical:	
iii. Physical:	
INTAKE RATE	
8. What is the maximum intake feed/rate/volume for the feedstock material stream(s) [2] and do records demonstrate the supply is within this limit?*	
i. Feedstock material stream 1:	
ii. Feedstock material stream 2:	
iii. Feedstock material stream 3:	
CONTROL MEASURES	
9. What control measures are in place to control the identified hazards in the feedstock material stream(s) to reduce the presented risks (to the process or product) to acceptable levels?*	
i. Control measures for biological hazards:	
ii. Control measures for chemical hazards:	
iii. Control measures for physical hazards:	

DECLARATION, UPDATE AND REVIEW		
9. The process controls[9] control the potential hazards [6/7] in the feedstock material stream(s) to an acceptable level of risk (in terms of the process and product): Complete i – iii to confirm the information you have provided in this risk identification and risk control form is true and accurate:	i. Sign:	
	ii. Date:	
	iii. Position held:	
Complete i – v to indicate when this risk identification and risk control form has been updated or reviewed and the changes made (if any) as a result of the update or the review:	i. Date reviewed:	
	ii. Changes (if any)*:	
	iii. Sign:	
	iv. Date:	
	v. Position held:	

APPENDIX 2 – TREATMENT SITE RISK CONTROL FORM

SLUDGE TREATMENT SITE RISK CONTROL FORM	
Biosolids Assurance Scheme (BAS) Applicants and Members must demonstrate that all sludge treatment locations or Reference Processing Facilities, whether permanent or temporary, are assessed by completing this form. The term 'treatment site' includes any other sludge/biosolids treatment or processing operations (e.g. dewatering) for the purpose of this form.	
Please read the notes (I – IV) below before completing this form:	
I. This treatment site risk control form asks you to summarise the process you have undertaken to reduce the risk of adverse impacts from your sludge treatment operations on nearby sensitive receptors (e.g. the environment, human and animal health). You must satisfy yourself and declare that the requirements of this risk control form are met in full. II. Your answers should be provided in the boxes. Where some questions require detailed answers, a separate sheet may be used (indicated by*). III. During the BAS audit, the auditor may examine your completed form and may request to see background evidence to support the answers you have provided. IV. Once completed, this form must be reviewed (and amended where necessary) at least every **ten years** thereafter or on change to the treatment process.	
SLUDGE TREATMENT SITE NAME & LOCATION	
1. Indicate the name and address of the treatment site:	
WASTE AUTHORISATION	
The answer to questions 3 or 4 must be yes:	
2. Does the sludge treatment activity need to comply with the Industrial Emissions Directive (IED) Indicate Yes or No	
3. If the answer to Question 2 is yes, then is the sludge treatment activity authorised by an appropriate authorisation or are steps being taken to assess, authorise and close the IED compliance gap? Indicate Yes or No	
4. If the answer to Question 2 is no, then does the site where the treatment activity occurs hold a waste authorisation? Indicate Yes or No	
MANAGEMENT CONTROLS	
The answer must be yes to both of the following questions	
5. Does the company/site have written management procedures that identify and minimise risk of pollution, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints? Indicate Yes or No:	
6. Have the potential risks (including but not limited to air emissions, emissions to waters, odour, noise and vibrations) which may affect the environment, or nearby sensitive receptors been identified and mitigated? Indicate Yes or No:	

SUITABLY CAPABLE PERSON		
The answer must be yes to the following question		
7. Is there a suitably capable person who is responsible for the operation of the sludge treatment site? Indicate Yes or No:		
SITE DETAILS		
If the answer is <u>NO</u> to any of the following questions, the risk of harm to the environment, human or animal health must be considered (see question 5)		
8. Is there a plan of the site with the treatment area highlighted? Indicate Yes or No:		
9. Is all untreated sludge stored and treated on an impermeable surface with sealed drainage? Indicate Yes or No:		
10. Is the site managed to prevent unauthorised persons and livestock from accessing the treatment site (e.g. the use of a fence)? Indicate Yes or No:		
SENSITIVE RECEPTORS		
If the answer is <u>YES</u> to any of the following questions, the risk of harm to the environment, human or animal health must be considered (see question 5)		
11. Is the treatment site within a Source Protection Zone 1 (England and Wales) or a Drinking Water Protected Area (Scotland)? Indicate Yes or No:		
12. Is the treatment site within 250m of a spring, well or borehole used to supply water for domestic or food production purposes? Indicate Yes or No:		
13. Is the treatment site within 50m of a spring, well or borehole <u>not</u> used to supply water for domestic or food production purposes? Indicate Yes or No:		
14. Is the treatment site within 50m of domestic, public, recreational or industrial properties or livestock building? Indicate Yes or No:		
15. Is the treatment site within 10m of a watercourse? Indicate Yes or No:		
DECLARATION AND REVIEW		
16. The controls in place at this sludge treatment site, as identified above, minimise the risk of impact on the environment, human or animal health or nearby sensitive receptors Complete i – iii to confirm the information you have provided in this risk control form is true and accurate:	i. Sign:	
	ii. Date:	
	iii. Position held:	

Complete i – v to indicate when this risk control form has been reviewed and the changes made (if any) as a result of the review:	i. Date reviewed:	
	ii. Changes (if any)*:	
	iii. Sign:	
	iv. Date:	
	v. Position held:	

BIOSOLIDS ASSURANCE SCHEME

Assured Biosolids Limited
Biosolids Assurance Scheme

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