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The Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (Wales) Regulations 2010

“the SSAFO Wales Regulations”

Guidance Notes for Farmers
November 2010



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**The Water Resources (Control of Pollution)
(Silage, Slurry and Agricultural Fuel Oil) (Wales)
Regulations 2010**

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GUIDANCE NOTES FOR FARMERS

CONTENTS	PAGE
Introduction	4
General Requirements	8
Specific Requirements	12
• Silage Production and Storage	12
• Slurry Stores	17
• Agricultural Fuel Oil Stores	22
Annex A	
Forms, Factsheets, and Contacts	24
Annex B	
Schedules taken from the SSAFO Wales Regulations	25

Introduction

1. This guidance describes the requirements that persons (who for the most part will be farmers) in Wales must follow in order to comply with the Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (Wales) Regulations 2010, Statutory Instrument 2010/1493 (W. 136)¹; known as “the SSAFO Wales Regulations.” (in the rest of this guidance referred to as “these Regulations” or “the Regulations”.) These Regulations replace Regulations first made in 1991² and apply from 18 June 2010.
2. The Environment Agency Wales (“the Agency”) is responsible for enforcing the Regulations. Advice on general nutrient storage and management can be obtained from the Agency and the Welsh Assembly Government.
3. The requirements of the Regulations are legally binding. This guidance is intended to assist you in meeting the requirements of the Regulations, and the Agency will be able to assist you with any queries.

Why do we need these Regulations?

4. The Regulations set standards for storing silage, slurries and agricultural fuel oil, so as to minimise the risk of water pollution. These substances have all caused significant pollution incidents, often due to farms having inadequate storage capacity, or storage being of poor quality.
5. Silage effluent and livestock manures can also contribute to environmental pollution when they are spread to land outside the growing season, or in inappropriate weather conditions.

Definition of Slurry:

6. ‘Slurry’ is defined in Regulation 2(1) of the SSAFO Wales Regulations as ‘liquid or semi-liquid matter composed of excreta produced by livestock while in a yard or building (including that held in woodchip corrals); or a mixture wholly or mainly consisting of livestock excreta, livestock bedding, rainwater and washings from a building or yard used by livestock, and of a consistency that allows it to be pumped or discharged by gravity at any stage in the handling process.’

¹ www.legislation.gov.uk/wsi/2010/1493/contents/made

² The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991 (S.I. 1991/324),

What do the Regulations apply to?

7. The Regulations apply to the following:
 - **silage making and storage and silage effluent**, including crops being made into silage, silage made in clamps, baled silage (bagged or wrapped) and field silage (field heaps, or non-baled, bagged silage, such as Ag-Bags.)
 - **slurry storage systems**, including stores for dilute effluent such as dirty yard water, excreta, or run-off from solid manure stores in yards, livestock bedding, washings from buildings or yards used by livestock, lagoons, reception pits, towers, woodchip corrals and associated pipes and channels.
 - **agricultural fuel oil stores which are above ground.**
8. It is your responsibility to follow the Regulations if you manage, look after, or control an installation that is described in this guidance. The Agency may serve a notice on you if improvements need to be made. Disputes about who has 'custody, or control' of slurry will need to be resolved ultimately by the courts, but the Welsh Assembly Government considers that the term 'custody, or control' would normally be understood as meaning the person who has the *right and ability* to control the installation.
9. Tenants and landlords in particular should be clear about where this responsibility lies. Normally the tenant will be the person with control of the installation, although in cases where a landlord designs or installs an installation, the landlord may be held responsible.
10. Installations that were in use, or built before March 1991, or where a contract for construction was entered into before March 1991 and completed before September 1991 are "exempt structures"³ for the purposes of these Regulations. See paragraph 26 for further details.

What do I need to do to comply with the Regulations?

11. The Regulations set the minimum legal standards to be met, but they do not, in general, tell you how you should meet these requirements. Provided that minimum standards specified in these Regulations are met, you can exercise discretion in constructing installations as long as you also comply with the duty to avoid causing pollution.
12. This guidance is divided into two sections. The first section sets out the general requirements for complying with the Regulations, and will highlight which paragraphs of the second section you should consult for more detail on the specific requirements.

³ Regulation 6

What are the possible penalties if I fail to comply?

13. Anyone breaching the Regulations will be guilty of a criminal offence. Most offences under the regulations are punishable by a fine of up to the statutory maximum (at the time of publication of this guidance set at £5,000) on conviction in a Magistrates' Court. If the case is heard in the Crown Court the penalty could be an unlimited fine.

What support is available to help me comply with these Regulations?

14. The Agency will provide help and guidance⁴ on complying with the Regulations, and other ways of reducing and preventing pollution. The Agency has also produced a series of forms (see Annex A), which are available from local offices and the Agency website. These forms can help you to provide the information to the Agency that is required to comply with the Regulations. Detailed technical advice on constructing installations, including advice on appropriate materials, may be available from the suppliers and agricultural consultants.
15. If a pollution incident does occur, it is in everyone's interest that the Agency should be contacted immediately: the Agency's **Emergency Hotline** telephone number is **0800 807060**. Quick notification helps reduce the impact of the pollution, and the cost of cleaning it up.

⁴ See ADAS Construction Guidance Notes at www.defra.gov.uk/environment/quality/water/waterquality/diffuse/nitrate/help-for-farmers.htm or CIRIA 126 at products.ihs.com/cis/Doc.aspx?AuthCode=&DocNum=82386

General Requirements

What do I need to do if I am constructing or installing a new store?

16. You must notify your local Agency office **in writing** about a new, or substantially enlarged, or substantially reconstructed installation⁵ at least 14 days before it is used (see Annex B for addresses)⁶. This includes substantial enlargements and substantial reconstructions to exempt installations (see paragraph 26 below). As a minimum you must set out:
 - the type of structure; and
 - where it is situated.
17. For the Agency to be satisfied that the installation complies with the Regulations, you are likely to be asked for additional information about the size, design and construction materials used. The Agency has a form (available on its website and in its local offices) to help you do this (See Annex A).
18. The Agency can serve a Notice to require improvements to be made to an installation if they do not consider it to be suitable. You will be contacted if this is the case. **It is strongly recommended that you minimise the risk of constructing an installation that is not compliant and of receiving a Notice, by involving the Agency early in the planning stage.**

What requirements must my installation meet?

19. Installations must meet the following requirements:

Durability Life

20. The Regulations require all new installations to be constructed with a durability life of at least 20 years⁷. This means that the installation is expected to last – with proper maintenance – for 20 years without causing, or being at risk of causing, pollution, and continuing to comply with the requirements of the relevant schedule to the Regulations. If any part of a silage effluent tank is below-ground, the tank is expected to comply with the requirements of paragraphs 4 and 5 of schedule 1 for 20 years without maintenance⁸. The Agency provides a form to help you provide this information (see Annex A).

⁵ For the purposes of this guidance, “installation” means a silo, slurry storage system or fuel storage area

⁶ Regulation 9

⁷ Schedule 1, para 8 for silage; Schedule 2, para 8 for slurry and; Schedule 3 para 3(b) for fuel oil.

⁸ Schedule 1, para 9

Maintenance

21. When in use, installations must at all times meet the performance standards laid down in the Schedules to the Regulations (see Annex B- Schedules taken from the SSAFO Wales Regulations). For example, a requirement for impermeable bases must be met for all installations subject to the Regulations⁹. Frequent inspections of your installations will help to ensure that potential defects are found and can be corrected before they can cause problems.

Safety Zones

22. Installations should not be constructed, and silage must not be made, and silage, effluent, slurry or fuel oil must not be stored, within **10 metres** of any inland freshwaters or coastal waters which any leakage could enter¹⁰. (This includes rivers, lakes, reservoirs and smaller watercourses such as streams and ditches as well as perforated drainage pipes¹¹). These are **minimum** distances and should be increased in sensitive locations, such as near water supply intakes, which the Agency can advise you on.
23. Different methods of making silage have slightly differing requirements as regards safety zones. (Details are at paragraph 33 below).
24. Impermeable drains and sealed pipes (including sealed pipes transporting slurry) are permitted within 10 metres of inland or coastal waters. Although the use of perforated drainage pipes within 10 metres of any slurry store or reception pit (to move exceptionally high groundwater away) is against the Regulations, this **may** be allowed on a case by case basis, subject to the Agency's permission being granted (see paragraph 60).

Guidance

25. *The Code of Good Agricultural Practice For the Protection of Water, Soil and Air for Wales (CoGAP)*, issued by the Welsh Assembly Government¹² gives further guidance on buildings and structures on farms that could cause pollution of water, air or soil from substances not controlled by SSAFO. It also contains advice on the handling and management of both solids and liquids in and around the farmyard to avoid pollution, and how to deal with effluents that arise. The Construction Industry Research and Information Association (CIRIA)

⁹ Schedule 1, para 4(2) for silage; Schedule 2, para 2 for slurry and; Schedule 3 para 3(a) for fuel oil.

¹⁰ Regulation 3(1)(a) for silage; Schedule 2, para. 7 for slurry and; schedule 3, para 7 for fuel oil.

¹¹ The full definition of "inland or coastal waters" is given in Section 104 of the Water Resources Act 1991.

¹² *The Code of Good Agricultural Practice For the Protection of Water, Soil and Air for Wales* wales.gov.uk/topics/environmentcountryside/farmingandcountryside/farming/codesofgoodagripractise/?lang=en

Report 126 “*Farm Waste Storage: Guidelines for Construction*”¹³ gives technical guidance on how these requirements may be met for different polluting substances.

How do these regulations apply to existing stores, and what are ‘Exempt Structures’?

26. The Regulations apply to all installations used, constructed, substantially reconstructed, or substantially enlarged after September 1991. Installations that were in use or built before March 1991 or where a contract for construction was entered into before March and completed before September 1991 are “exempt structures”¹⁴ for the purposes of these Regulations, and can normally be used subject to two limitations:
- The Agency can require “exempt” structures to be improved to bring them up to the standards within the Regulations by issuing a Notice under Regulation 7 detailing the required improvements and the time period for compliance (see paragraphs 28 and 29 below)
 - When a previously “exempt”, (or any other installation), has been (or is being), substantially enlarged or reconstructed, the Regulations will apply to that structure, and will apply to the **whole** installation and not just the newly extended or reconstructed part. For example, a major refit of an “exempt” store would bring the store and its associated drains and tanks inside the scope of the Regulations, but repairs or minor changes to a reception pit or channels would not necessarily cause a slurry storage tank to lose its exemption, “Substantially reconstructed” will often mean requiring significant structural alterations.
27. Before starting work to enlarge or reconstruct a structure, you are strongly advised to discuss your plans with the Agency. Remember that you have to notify the Agency before bringing new, substantially altered or reconstructed installations into use.

What will happen if the Agency believes that there is a risk of pollution?

28. The Agency has powers to serve a notice on you requiring you to take action to improve existing installations where the Agency considers that there is a significant risk of pollution to ‘controlled waters’¹⁵. (This can include field silage sites and otherwise “exempt” installations). The actions required by the Notice must be appropriate to the task of minimising the risk of pollution (For example, to require sufficient slurry storage to be provided.).

¹³ ISBN 0 86017 352 6, ISSN 0305 408X; published by the Construction Industry Research and Information Association, 6 Storey’s Gate, Westminster, London SW1P 3AU.

¹⁴ Regulation 6

¹⁵ ‘Controlled waters’ are defined in Section 104 of the Water Resources Act 1991.

29. You will have a minimum of 28 days to comply with the Notice. The Agency may extend this minimum period to take into account, for example, of the time needed to obtain planning permission, or to arrange for contractors to do the work, or weather or site conditions.

Can I appeal against a Notice served by the Agency?

30. A farmer may appeal to Welsh Ministers against a Notice served by the Agency. If a farmer wishes to appeal against a Notice served on her/him by the Agency it must be done in writing within 28 days from the day after the date on which the Notice was served. You and the Agency have the right to request an oral hearing by the person appointed to decide your appeal. Appeals in Wales should be addressed to:
- Sustainable Land Management Branch
Farm Development Division
Welsh Assembly Government
Rhodfa Padarn
Llanbadarn Fawr
Aberystwyth
Ceredigion
SY23 3UR

and copied to the Environment Agency at the address given with the Notice. If an appeal is successful the Notice may be withdrawn or modified or the period for compliance be extended. If, following the appeal, the Notice is not withdrawn and the period for compliance is not extended, the period for compliance is deemed to expire on the day of the determination of the appeal, unless the Welsh Ministers decide to extend the period for compliance. The Welsh Ministers could bear in mind, when deciding whether to extend the period for compliance, whether it will be reasonable, feasible, or practicable for the appellant to comply with the determination as soon as it has been issued.¹⁶

31. The appeal must contain a full statement of the grounds of appeal and it should also include the following documents:
- a copy of the Notice served on the farmer;
 - any relevant correspondence;
 - a plan of the farm, showing the installation in question and its relation to watercourses and drains, and;
 - a statement that the appellant is the farmer on whom the Notice was served, or a statement from the farmer authorising someone to act on his/her behalf.

¹⁶ Sections 8(5) and 8(6) of the Regulations.

Specific Requirements

Silage Production and Storage: Regulation 3 and Schedule 1 at Annex B

Silage making and storage of silage affected by the Regulations

32. Silos must be built in accordance with the construction standards set out in Schedule 1 of the regulations (which is set out in full in Annex B and discussed at paragraphs 41-53 below.
33. Silage Safety Zones (See Paragraph 22 above) are as follows:
- **Silage in silos** must not be made or stored within 10 metres of any inland or coastal waters which effluent could enter,
 - **Baled silage**
 - -must be sealed in an impermeable membrane or bagged¹⁷ and not be made, stored¹⁸, opened or unwrapped¹⁹ within 10 metres of any inland or coastal waters which effluent could enter.
 - **Field Silage (silage stored on open land)**
 - -must, in addition to the ten metre restriction for baled silage, not be made or stored within 50 metres of a 'protected water supply source'²⁰.
34. 'Protected water supply sources' are defined in Regulation 3(2)²¹ of the SSAFO Wales Regulations as places where 'water is abstracted for human consumption, or for use in farm dairies, or in the preparation of human food²². If you are in doubt as to whether a nearby water supply is protected by the regulations, you should contact the Agency for advice.
35. Where field silage is being made, the Agency must be given notice of the place where silage is to be stored at least 14 days before that site is first used.²³ If, once silage making has begun, a further relevant abstraction point is identified, there is usually no need to stop or alter silage making on that site for that season, even though this is

¹⁷ Regulation 3(1)(b)(i)

¹⁸ Regulation 3(1)(b)(ii)

¹⁹ Regulation 3(4)

²⁰ Regulation 3(2) states that "For paragraph (1)(c)(ii), a water supply source is a protected water supply source if— (a) any relevant water abstraction from the source is licensed under Part II of the Water Resources Act 1991; or (b) the person making or storing the silage was aware of the source's location— (i) before the making of the silage began; or (ii) if the silage was made elsewhere, before it was stored on the land in question.

²¹ Regulation 3(1)(c)(ii)

²² Also covers abstractions licensed under Part II of the Water Resources Act 1991 and to those unlicensed sources which are known to the silage maker before silage making or storage began.

²³ Regulations 3(1)(c)(i)

technically in breach of the Regulations. However, for the next season the siting of any field silage should take into account the newly identified abstraction point.

36. Silage that is removed from where it was initially ensiled should be stored in the long term in accordance with the relevant Regulations for structures, “Exempt” structures, or field stores.
37. The Regulations do not apply to silage whilst it is being stored temporarily in a container for transporting²⁴. “Temporarily” is not defined in the Regulations, but should be read to mean that any transportation of silage should be done without undue delay. Silage which has been removed from a silo in small amounts for regular feeding of animals is not subject to the storage requirements, and may in any case be kept in the open in unbaled form, (provided that basic pollution prevention measures as laid down in the CoGAP are taken). This provision will **not** act as a defence for any pollution occurring as a result of unprotected silage being left exposed.
38. You do not need to store baled silage (wrapped or bagged) on a specially constructed base, but you **must** ensure that if it is stored directly on the ground it does not leak effluent into water, as this could be an offence under the Regulations
39. Care must be taken to collect and store any silage effluent without causing pollution, as this could be an offence under the Regulations. Silage effluent can be used for feeding to livestock or, following dilution, may be spread onto agricultural land as a fertiliser, within the conditions required under CoGAP, Nitrates Action Plan, or other regulatory scheme.
40. Silage making in field heaps or non-baled bags is allowed, without the need for an impermeable base, provided the site is suitable and subject to notifying the Agency at least 14 days before first using the site (see paragraphs 16 and 49-53).

Silage Stores: See Schedule 1 at Annex B

41. Where silage is stored in silos, the silos must have an impermeable base extending beyond any walls, and impermeable perimeter drains flowing into an effluent tank of adequate capacity. Any associated channels / drains, pipes and tanks must also be impermeable. The base and associated channels / drains, pipes and tanks must be resistant to corrosion by silage and silage effluent.²⁵
42. As well as bases designed in accordance with the code of practice for design of concrete structures for retaining aqueous liquids²⁶, the

²⁴ Regulation 3(3)

²⁵ Schedule 1, para 2, para 4(2) and para 5.

²⁶ (BS 8007:1987)

Regulations²⁷ now allow for bases to be constructed using hot-rolled asphalt, providing this use is in accordance with the code of practice for selection and use of construction materials²⁸.

43. Walls for silos are optional, but where there are walls, they must be placed **inside the perimeter drains** of the base²⁹. Any walls must be capable of withstanding wall loadings as laid down by BS 5502 part 22 2003, not loaded beyond the design specification, and notices displayed on the walls, indicating these loadings.³⁰
44. It is likely that farmers will need to seek professional advice in order to ensure that the required standards are met. These installations will need to meet the durability life requirement of 20 years with maintenance.
45. Effluent collection systems to catch any liquor produced are required. The minimum capacity of effluent tanks must correspond to the silo capacity as shown in table 1 below³¹. In the majority of cases these capacities should provide at least two days storage at peak flow. However, even if the effluent tank provides storage as indicated below, there would still be an offence committed if pollution occurs.

Table 1: Minimum capacity of silage effluent tanks in relation to silo capacity

Silo Capacity	Minimum Effluent Tank Capacity
Less than 1500 ³	20 litres for every 1m ³ silo capacity
1500 ³ or more	30,000 litres plus 6.7 litres for every 1m ³ silo capacity in excess of 1500 ³
500m ³	10,000 litres
1000m ³	20,000 litres
1500m ³	30,000 litres
2000m ³	33350 litres- i.e. 30,000 +3350
2500m ³	36700 litres- i.e. 30,000 + 6700
3000m ³	40050 litres- i.e. 30,000 +10050
4000m ³	46750 litres- i.e. 30,000 +16750

46. In the majority of cases these capacities should provide at least two days storage at peak flow. However, if the effluent tank provides inadequate storage and pollution occurs, this would still be an offence. Effluent tank capacities are unlikely to be sufficient for two days storage for unwilted silage or silage made in an unroofed silo. You should check and empty your tanks as often as is necessary. Within NVZ

²⁷ Schedule 1, para 4(1)

²⁸ BS5502, Part 21 1990

²⁹ Schedule 1, para 2(a) and (b)

³⁰ Schedule 1, para 7

³¹ Schedule 1, para 3

areas, the silage effluent will also be subject to the NVZ rules on storage and spreading of organic manures that have high available Nitrogen.

47. If any part of the effluent tank is below ground level, it must be impermeable and resistant to attack by silage effluent for 20 years **without maintenance**³². The tank can either be prefabricated in one piece or constructed on site. You should discuss your proposals with the Agency at the planning stage, as the Agency will require written confirmation that the requirements of the Schedule have been met. The Agency can provide a form to help you provide this confirmation (see Annex A).
48. In some instances you may wish to store silage effluent and slurry in the same tank. **Mixing or re-circulating slurry can give off dangerous gases that are lethal to both humans and livestock. Never put silage effluent into under-floor slurry stores, as similar problems can occur.** If this method of storage is used then the storage container must be designed to withstand both types of neat effluent and, of course, have sufficient capacity to satisfy the requirements of both Schedules 1 and 2.

Field Silage

49. 'Field silage' means field heaps made on open ground, where there is no form of excavation, nor floors nor walls on the site. Sites may be subject to minor levelling by filling in small depressions. Note that the topsoil **must not** be excavated at all. This is very important as undisturbed soil is needed to help retain any silage effluent that may be produced and reduce the pollution risk. If there are excavations, walls or floors then the full requirements of Schedule 1 must be applied. The making and storage of non-baled silage in 'bulk bags' is field silage.
50. Making and storing field silage in field heaps or in bulk bags (non-baled) without an impermeable base or walls is allowed, provided the site is suitable. You should choose a level site and make a careful assessment of the potential polluting risk to controlled waters. Proposals should be discussed with the Agency well in advance of silage making and, in any event, the Agency must be notified of the proposed site at least 14 days before it is first used. The Agency can provide a standard form for you to use in making this notification (see Annex A).
51. In considering site suitability, the Agency will take into account slope, soil permeability, soil compaction, degree of soil cracking and fissuring, and the risk of causing pollution of groundwater and surface water. Other factors include the proximity of roads and farm tracks (which may increase the risk of run-off reaching surface waters) or the existence of

³² See schedule 1, paragraphs 4 and 5 for details.

protected areas such as 'protected water supply sources' (See paragraph 34 above), or Sites of Special Scientific Interest (SSSIs).

52. Field silage sites have to meet the requirements of the Regulations. You must:
- Notify the Agency of the proposed site at least 14 days before that site is first used. Provided the site is acceptable to the Agency, no further notifications are required unless there is an expansion of that site or new sites need to be considered.
 - Locate the site in accordance with paragraph 22 above.
 - Locate the site at least 50 metres away from water sources in accordance with paragraph 34 above. Water sources may be located on neighbouring property and you should investigate thoroughly such a possibility if your proposed site is within 50 metres of the boundary of neighbouring property.
53. If you make field silage on a site without having notified the Agency or its predecessor the National Rivers Authority ('NRA'), or on a site disallowed by the Agency or the NRA, you will contravene the Regulations, and will be liable to prosecution.

Slurry Stores: Regulation 4 and Schedule 2 at Annex B

Slurry storage systems covered by the Regulations

54. The Regulations apply to all types of slurry storage systems, including those constructed of earth, but not to tankers that are used for transporting slurry on roads or about a farm, and that are used to temporarily store slurry. Slurry stores including earth banked compounds which are newly constructed, substantially enlarged or substantially reconstructed after September 1991 must be built in accordance with the construction standards set out in Schedule 2 at Annex B. Earth-banked compounds should be regarded as slurry storage tanks for the purposes of the current British Standard (BS 5502: part 50 1993).
55. Existing slurry stores constructed before September 1991 can still be used without alteration as long as they qualify as an “exempt structure” (see paragraph 26 above and Regulation 6), unless the Agency specify further works to be undertaken.
56. For the purpose of these Regulations, run-off from solid manure stores, woodchip or straw bedded corrals or stand-off pads³³ counts as slurry. It must be collected and stored either independently, or in the main slurry storage system. Many corrals have no built-in provision to store drainage. As corrals have considerable potential to pollute controlled waters, the Agency will normally require that the corral is modified to ensure that the drainage is collected and contained within the slurry system.

Construction standards for slurry stores and reception pits: Schedule 2

57. There are general requirements for the walls and bases of all slurry tanks, associated tanks, reception pits, pipes and channels to be impermeable. All slurry tanks, associated tanks, reception pits, pipes and channels must also meet standards for protection against corrosion as set out in the current British Standard (BS 5502: part 50

³³ **Woodchip corrals** are usually permanent, unroofed drained systems, bedded with woodchip and used to accommodate livestock. They have no impermeable lining, so have the potential to pollute groundwater and are unacceptable at most sites. **Stand-off pads** are similar to corrals, but either overlay impermeable sub-soil, or have a suitable lining, with pipes delivering the drainage, which is slurry, into a slurry system.

The Agency will normally require a corral overlaying free-draining soil and with no impermeable liner to be modified and ensure any drainage is collected and contained within a slurry system.

There are variations of these systems, including straw-based systems, lined or un-lined, which may be permissible on a case-by case basis. Before construction commences, advice should be sought from the Agency.

1993)³⁴. The base and walls of the slurry tank and any associated reception pit must be capable of withstanding the loadings specified in BS 5502: part 50 1993³⁵. The need to comply with the design requirements in Schedule 2 to the Regulations means that professional advice will almost certainly be needed for the design and construction of all slurry installations including earth-banked compounds. Earthbank stores will need substantial additional work if the in-situ material of the base is found to be permeable. Soil with a clay content of 20-30% is generally ideal for embankments that are stable and resistant to cracking. A higher clay content may be used for the base. In either case, the suitability of the material should be confirmed by analysis in a soils laboratory and preferably verified by a civil engineer. Impermeable soil must be present to a depth of at least one metre below the bottom of the store. Where the material is not suitable, then suitable material can be imported, or an impermeable synthetic liner should be used.

58. In addition, for weeping-wall stores the base must extend beyond its walls and must include perimeter drains to catch any escaped slurry. This effluent must then drain into an effluent tank that complies with these Regulations³⁶. Contingency measures may be built into the store. These could include raising the outer sides of the perimeter drains to collect any 'spurts of slurry', but farmers are advised to speak to Agency staff on a case by case basis, before designs are confirmed.
59. Any outlet drainage pipes on slurry storage tank, effluent tank or reception pit must have two valves in series, each capable of shutting off the flow of slurry and each being kept locked shut when not in use. This does not apply in relation to a slurry storage tank that drains through a pipe into another slurry storage tank if the other tank is of equal or greater capacity, or if the tops of the tanks are at the same level³⁷. The requirement for two valves under schedule 2, para 10 is a safety precaution: the second valve acts as a guard valve against failure of the first. The design and positioning of the valves must take into account the possibility that one piece of debris could obstruct both valves if they are positioned too closely together, so the valves must be separated from each other by a minimum distance of one metre. Each valve should be designed so that sufficient force can be exerted to break through accumulations of bedding material that may regularly pass through the system.
60. Locating stores in areas affected by a high water table may be unavoidable, but might cause the installations to float unless additional measures are undertaken. To reduce the risk of flotation without using excessive amounts of concrete, it may be permissible to install groundwater pressure relief drains. Since these are likely to be sited within 10 metres of the installation and they will be considered to be a

³⁴ Schedule 2, paras 2 and 3

³⁵ Schedule 2, para 4

³⁶ Schedule 2, para 9

³⁷ Schedule 2, para 10

'watercourse', Agency agreement is required to make it legal. You will be asked for confirmation that there is a high water table, and for the scheme to incorporate inspection points.

Sizing of slurry stores and reception pits

61. At premises where slurry is spread on the land, there is normally a requirement for the amount of slurry produced in four months' on the premises³⁸. More storage may be required in some cases, and less may be justified in others. This must take into account the rates and times of utilisation of slurry, the capacity of other slurry storage tanks, the quantities of rainfall likely to contribute to the contents during that period (see paragraph 68 below) and the need to provide at least 750mm or 300mm of freeboard (see paragraph 66-67 below). **In Nitrate Vulnerable Zones (NVZ) different rules apply on storage, and the volume of storage that you should provide is the greater of the two (In most cases this will be the Nitrates Action Programme requirement.)**
62. Farms in some areas, particularly those with above average rainfall and heavy land, will require considerably more than four months' slurry storage capacity. For example, where access to suitable land for land spreading is restricted, farmers are advised to provide this extra capacity to avoid the risk of causing water pollution and of subsequent prosecution.
63. Your local Agency area office will provide general guidance on where more than 4 months storage is advisable. However, farmers may find it useful to take additional professional advice on their storage requirements from their agricultural consultant.
64. Farmers who consider they have sufficient lower risk land to enable them to operate satisfactorily with less than 4 months' storage must consult the Agency to discuss their plans. They will need to demonstrate to the Agency that the system poses a minimal risk to the environment. To justify a smaller storage capacity, you will usually be expected to provide a Manure Management Plan that combines with measures to demonstrate effective use of nutrients in manures, and the management of pollution risks, including diffuse pollution, or soil damage from winter spreading operations.
65. When calculating the minimum size of any slurry installation, you must include provision for the **likely** quantities of rainwater falling directly into the store and onto areas which drain into the store (NB: The definition of "slurry" includes rainwater and yard washings mixed with excreta). *Likely rainfall* is taken as rainfall that may be expected once every five years. In the case of a slurry store the rainfall expected once every five years for the period November to February inclusive is normally used. Roofing your slurry stores and yards, and the use of clean/dirty water

³⁸ Schedule 2, para 6(2)

separation techniques, can reduce the volume of rainwater mixing with slurry, and so reduce the requirement for storage.

66. For earth-banked stores, when calculating capacity you must also allow for an additional capacity to provide a minimum freeboard of 750mm. This freeboard must not be compromised because of the risk of the structure being weakened.³⁹ Check the level of slurry regularly and make arrangements for safe land spreading or export of slurry to maintain the freeboard. Particular care must be taken to ensure that lagoons or stores do not overflow. Overflowing could lead to prosecution for pollution.
67. A minimum freeboard of 300mm is required when calculating the capacity of for stores constructed of materials other than earth. For these stores, the freeboard should only be compromised in **exceptional circumstances** and excess slurry should be removed at the earliest opportunity.
68. For calculating the size of any facilities used for the temporary storage of slurry (such as reception pits and associated channels) the system should be of sufficient size to store a minimum of two days' combined slurry production (including all urine, parlour washings etc) **and likely rainfall**.

In the case of using channels to store such slurry:-

- Where the flow of slurry into the reception pit is from a channel controlled by a sluice, the reception pit must be sufficiently large to contain the maximum amount of slurry that could be released by opening any sluice. Channels leading to the sluice must be adequate to store two days' production of slurry.
- Where there is no sluice and the tops of the channels are the same height as the top of any reception pit, the capacity of the collection channels plus the reception pit must together be sufficient for at least 2 days' production of slurry.
- Where there is no sluice, and the channels are higher than the reception pit, the capacity of the reception pit alone must be sufficient for at least 2 days' production of slurry.
- Where there are no channels leading to the reception pit, the reception pit must have the capacity to contain at least 2 days' production of slurry.
- Where channels discharge directly into a slurry storage tank the channels need not comply with the minimum storage capacity requirement.

³⁹ Schedule 2, para 11

69. 'Two days rainfall' is defined as the figure known as 'M5 48 hour rainfall', which can be obtained from the Meteorological Office, or other commercial sources. A lower rainfall allowance and thence a smaller capacity for the reception pit **may** be agreed in writing with the Agency⁴⁰ for installations where there is a minimal risk of causing pollution and where appropriate safeguards are put into place. Guidance and acceptance must be sought from the Agency who will assess individual cases with regard to design, construction and contingency arrangements in the event of system failure.

⁴⁰ Schedule 2, para 5

Agricultural Fuel Oil Stores: Regulation 5 and Schedule 3 at Annex B

Fuel stores affected by the Regulations

70. The Regulations apply where the total quantity of fuel oil stored on the farm is over 1500 litres⁴¹. Domestic fuel oil which is stored separately is not included in the 1500 litres or is fuel oil stored temporarily in a tanker for transportation on roads or about the farm⁴².
71. Where the Regulations apply, fuel oil must be stored:
- in a fuel storage tank, or
 - in an underground storage tank
 - within a storage area or facility that meets the following requirements or
 - in drums within that storage area.
72. Wherever fuel is stored, either in exempt structures or in accordance with the requirements of the regulations, it remains the farmer's responsibility to take reasonable steps to ensure that it is safely contained, including taking precautions against vandalism where this is an issue, so that risk of pollution is reduced.

Requirements for fuel oil storage areas: Schedule 3 to the Water Resources (Control Of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (Wales) Regulations 2010

73. Fuel stores must be surrounded by impermeable barriers, or bunds to stop oil escaping. The bund and the base of the storage area must be made impermeable to both water and oil and likely to remain so with proper maintenance for at least 20 years⁴³. The bund must not contain any gaps or holes, nor can it have a drain. Every part of the tank must be within the bund.⁴⁴
74. As the bund will contain no outlet or drain it will be necessary to have a method of removing rain water and spilt oil. Ideally, the storage area should be roofed over to prevent rain getting into the bund. If fuel oil, or a mixture of fuel oil and water, collects in a bund the farmer is responsible for removing the liquid and disposing of it safely without causing pollution, and meeting duty of care requirements.
75. Table 2 shows the minimum volume that the bund must be able to contain.⁴⁵

⁴¹ Regulation 5(2)(b)

⁴² Regulation 5(2)

⁴³ Schedule 3, para 3

⁴⁴ Schedule 3, para 4

⁴⁵ Schedule 3, para 2

Table 2: Minimum storage volumes of bunded areas.

Storage Type	Minimum Volume of Bund
One tank per storage area	110% of capacity of the tank
Several tanks in one bund	110% of the capacity of the largest tank; or 25% of the total volume of oil which could be stored at any one time whichever is greater
All other cases; e.g. drums & barrels	At least 25% of the total volume of oil which could be stored at any one time.

76. There are a number of products available, incorporating both a storage tank and a bunding system. Some of these may not fully satisfy the requirements of these Regulations, so it is advisable to obtain written confirmation from the supplier that the requirements are met. Responsibility for compliance with the Regulations rests with the farmer. You are advised to contact the Agency before you decide on your purchase. The Agency can provide guidance, including a Factsheet on the suitability of different designs which is available from the Agency website.
77. When oil is stored in tanks with taps and valves it is important to ensure that any leak or discharge of oil from any part of the tank is retained within the bund. There is a requirement that all taps and valves permanently fixed to the tank through which fuel oil can be discharged into the open must be within the bund, arranged to discharge vertically downwards and must be shut and locked in that position when not in use.⁴⁶
78. Any flexible pipes attached permanently to the tank must be fitted with a tap or valve which automatically shuts off when not in use. This pipe must be locked within the bunded area when not in use. When not in use, all valves and filling devices must be locked shut and remain within the bund.
79. No part of the fuel storage area or the bund enclosing it may be situated within 10 metres of any inland freshwaters or coastal waters that fuel oil could enter, if it were to escape.
80. Although not a requirement of the Regulations, the use of sight glasses on fuel tanks (which would enable operators to see the level of oil in the tank) and the use of alarms (which would alert operators to possible overfilling) are recommended.

Annex A – Forms, Factsheets⁴⁷ and Contacts

⁴⁶ Schedule 3, para 5

⁴⁷ All the forms may be obtained from local EA offices, or downloaded from www.environment-agency.gov.uk/business/sectors/118798.aspx

Form WQE3 Notification by a farmer to the Agency 14 days before an installation is to be used. Regulation 9 (Paragraphs 16,17).

Form WQE3 Construction design for below-ground silage effluent tanks. Schedule 1, (Paragraphs 20, 47)

Form WQE4 Field silage notification by the farmer to the Agency. Regulation 3(1)(c) . (Paragraph 50)

Factsheets

Factsheet 1: Slurry reception pits and in-situ or above-ground slurry stores or tanks

Factsheet 2: Field silage making

Factsheet 3: Silage: Making, storing, and effluent collection systems for silos

Factsheet 4: Low-rate slurry irrigation systems

Factsheet 5: Earth bank slurry stores and tanks

Factsheet 6: Fuel oil storage

Useful contact/further information details

EA Hotline No- 0800 80 70 60 (See Paragraph 15)

EA National Customer Contact Number- 08708 506506- through which contact can then be made with local EA offices.

Annex B –Schedules taken from the SSAFO Wales Regulations

Schedule 1 of the Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil (Wales) Regulations 2010

Requirements for Silos

1. The requirement to be satisfied in relation to a silo is that it complies with the following provisions of this Schedule.

2. The base of the silo must—

- (a) extend beyond any walls of the silo;
- (b) be provided at its perimeter with channels designed and constructed so as to collect any silage effluent that escapes from the silo; and
- (c) have adequate provision for the drainage of that effluent from those channels to an effluent tank through a channel or pipe.

3. The capacity of the effluent tank must not be less than—

- (a) in the case of a silo with a capacity of less than 1,500 cubic metres, 20 litres for each cubic metre of silo capacity; and
- (b) in the case of a silo with a capacity of 1,500 cubic metres or more, 30 cubic metres plus 6.7 litres for each cubic metre of silo capacity in excess of 1,500 cubic metres.

4.—(1) The base of the silo must be —

- (a) designed in accordance with the code of practice for design of concrete structures for retaining aqueous liquids published by the British Standards Institution and numbered BS 8007: 1987⁴⁸; or
- (b) constructed using appropriate hot-rolled asphalt in accordance with the code of practice for selection and use of construction materials published by the British Standards Institution and numbered BS 5502:Part 21: 1990⁴⁹.

(2) The base of the silo, the base and walls of its effluent tank and channels and walls of any pipes must be impermeable.

5. The base and walls of the silo, its effluent tank and channels and the walls of any pipes must, so far as reasonably practicable, be resistant to attack by silage effluent.

6. No part of the silo, its effluent tank or channels or any pipes may be situated within 10 metres of any inland freshwaters or coastal waters into which silage effluent could enter if it were to escape.

7. If the silo has retaining walls—

- (a) the retaining walls must be capable of withstanding minimum wall loadings calculated on the assumptions and in the manner indicated by paragraphs 15.6 of the code of practice on buildings and structures for agriculture

⁴⁸ Publication date: 30th October 1987. ISBN 0-580-16134-X.

⁴⁹ Publication date: 31st December 1990. ISBN 0-580-18348-3

published by the British Standards Institution and numbered BS 5502: Part 22: 2003⁵⁰;

(b) the silo must at no time be loaded to a depth exceeding the maximum depth consistent with the design assumption made in respect of the loadings of the retaining walls; and

(c) Notices must be displayed on the retaining walls in accordance with paragraph 18 of that code of practice.

8. Subject to paragraph 9, the silo, its effluent tank and channels and any pipes must be designed and constructed so that with proper maintenance they are likely to continue to satisfy the requirements of paragraphs 2 to 5 and, if applicable, paragraph 7(a) for at least 20 years.

9. If any part of an effluent tank is below ground level, the tank must be designed and constructed so that it is likely to continue to satisfy the requirements of paragraphs 4 and 5 for at least 20 years without maintenance.

Schedule 2 Requirements for Slurry Storage Systems

1. The requirements to be satisfied in relation to a slurry storage system are as follows.

2. The base of the slurry storage tank, the base and walls of any effluent tank, channels and reception pit, and the walls of any pipes, must be impermeable.

3. The base and walls of the slurry storage tank, any effluent tank, channels and reception pit, and the walls of any pipes, must be protected against corrosion in accordance with paragraph 7 of the code of practice on buildings and structures for agriculture published by the British Standards Institution and numbered BS 5502: Part 50: 1993⁵¹.

4. The base and walls of the slurry storage tank and of any reception pit must be capable of withstanding characteristic loads calculated on the assumptions and in the manner indicated by paragraph 5 of the code of practice on buildings and structures for agriculture published by the British Standards Institution and numbered BS 5502: Part 50: 1993.

5.—(1) Any facilities used for the temporary storage of slurry before it is transferred to a slurry storage tank must have adequate capacity to store—

(a) the maximum quantity of slurry that (disregarding any slurry which will be transferred directly into a slurry storage tank) is likely to be produced on the premises in any two day period; or

(b) a lesser capacity that the Agency agrees in writing is adequate to avoid any significant risk of pollution of controlled waters.

(2) Where slurry flows into a channel before discharging into a reception pit and the flow of slurry out of the channel is controlled by means of a sluice, the capacity of the reception pit must be adequate to hold the maximum quantity of slurry that can be released by opening the sluice.

⁵⁰ Publication date: 10th June 2003. ISBN 0-580-38654-6

⁵¹ Publication date: 15th April 1993. ISBN 0-580-22053-2

6.—(1) Subject to sub-paragraph (2), the slurry storage tank must have adequate storage capacity for the likely quantities of slurry produced from time to time on the premises in question, taking into account—

(a) the proposed method of utilising the slurry, and the likely rates and times of utilisation; and

(b) the matters mentioned in sub-paragraph (3).

(2) If it is proposed to use the slurry on the premises by spreading it on the land, the tank need not have a greater storage capacity than is adequate, taking into account the matters mentioned in sub-paragraph (3), to hold the maximum quantity of slurry likely to be produced in any four month period.

(3) The matters to be taken into account for sub-paragraphs (1) and (2) are—

(a) the storage capacity of any other slurry storage tank on the premises;

(b) the likely quantities of rainfall (including snow, hail or sleet) that may fall or drain into the slurry storage tank during the likely maximum storage period; and

(c) the need to provide at least 750 millimetres of freeboard in the case of a tank with walls made of earth and 300 millimetres of freeboard in all other cases.

7. No part of the slurry storage tank or any effluent tank, channels or reception pit may be situated within 10 metres of any inland freshwaters or coastal waters into which slurry could enter if it were to escape unless precautions are taken that the Agency agrees in writing are adequate to avoid any significant risk of pollution of controlled waters.

8. The slurry storage tank and any effluent tank, channels, pipes and reception pit must be designed and constructed so that with proper maintenance they are likely to continue to satisfy the requirements of paragraphs 2 to 4 for at least 20 years.

9. If the walls of the slurry storage tank are not impermeable, the base of the tank must—

(a) extend beyond the walls;

(b) be provided with channels designed and constructed so as to collect any slurry that escapes from the tank;

(c) have adequate provision for the drainage of the slurry from those channels to an effluent tank through a channel or pipe.

10.—(1) Subject to sub-paragraph (3), if the slurry storage tank or any effluent tank or reception pit is fitted with a drainage pipe there must be two valves in series on the pipe with each valve separated from the other by a minimum distance of 1 metre.

(2) Each valve must be capable of shutting off the flow of slurry through the pipe and must be kept shut and locked in that position when not in use.

(3) Sub-paragraph (1) does not apply in relation to a slurry storage tank that drains through the pipe into another slurry storage tank if the other tank is of equal or greater capacity or if the tops of the tanks are at the same level.

11. In the case of a slurry storage tank with walls made of earth the tank must not be filled to a level that allows less than 750 millimetres of freeboard.

Schedule 3 Requirements for Fuel Oil Storage Areas

1. The requirements to be satisfied in relation to a fuel oil storage area are as follows.

2. The storage area must be surrounded by a bund capable of retaining within the area—

(a) if there is only one fuel storage tank within the area and fuel oil is not otherwise stored there, a volume of fuel oil not less than 110 per cent of the capacity of the tank;

(b) if there is more than one fuel storage tank within the area and fuel oil is not otherwise stored there, a volume of fuel oil not less than the greater of—

(i) 110 per cent of the capacity of the largest tank within the area; or

(ii) 25 per cent of the total volume of such oil which could be stored in the tanks within the area;

(c) if there is no fuel storage tank within the area, a volume of fuel oil not less than 25 per cent of the total of such oil at any time stored within the area;

(d) in any other case, a volume of fuel oil not less than the greater of—

(i) 110 per cent of the capacity of the fuel storage tank or, as the case may be, of the largest tank within the area;

(ii) if there is more than one fuel storage tank within the area, 25 per cent of the total volume of such oil that could be stored in the tanks within the area; or

(iii) 25 per cent of the total volume of such oil at any time stored within the area.

3. The bund and the base of the area must be—

(a) impermeable to water and oil; and

(b) designed and constructed so that they are of sufficient strength and structural integrity so that with proper maintenance they are likely to remain so for at least 20 years.

4. Every part of any fuel storage tank must be within the bund.

5. Any tap or valve permanently fixed to the fuel storage tank through which fuel oil can be discharged to the open must—

(a) also be within the bund;

(b) be so arranged as to discharge vertically downwards; and

(c) be shut and locked in that position when not in use.

6. If fuel from the tank is delivered through a flexible pipe that is permanently attached to the tank, the pipe must be—

(a) fitted with a tap or valve at its end that closes automatically when not in use; and

(b) locked in a way that ensures that it is kept within the bund when not in use.

7. No part of the fuel storage area or the bund enclosing it may be situated within 10 metres of any inland freshwaters or coastal waters that fuel oil could enter if it were to escape.