Jersey

WATER POLLUTION (APPROVAL OF CODE OF PRACTICE) (JERSEY) ORDER 2020

Official Consolidated Version

This is an official version of consolidated legislation compiled and issued under the authority of the Legislation (Jersey) Law 2021.

Showing the law from 4 March 2020 to Current

Jersey

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Article

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THE MINISTER FOR THE ENVIRONMENT makes this Order under Articles 16(1) and 52(1) of the Water Pollution (Jersey) Law 2000, having consulted such other Ministers and other persons as the Minister considers appropriate in accordance with Article 9(2) and having regard to the matters set out in Article 16(2) of that Law –

Commencement [see endnotes]

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1 Code of practice approved

The code of practice set out in the Schedule is approved.

2 Citation and commencement

This Order may be cited as the Water Pollution (Approval of Code of Practice) (Jersey) Order 2020 and comes into force 7 days after the day it was made.

SCHEDULE

(Article 1)

TEXT OF APPROVED CODE OF PRACTICE

THE CODE OF PRACTICE FOR THE PROTECTION OF WATER

An approved code of practice under Article 16 of the Water Pollution (Jersey) Law 2000 ('The Water Code')

1 Foreword

This Code of Good Practice (generally referred to as 'the Water Code') is issued as an Approved Code of Practice for the purposes of Article 16 of the Water Pollution (Jersey) Law 2000 (as Amended). Prior to issuing this Code, officers from Growth, Housing and Environment have consulted with relevant Stakeholders, in accordance with Article 9 of the Law.

The overriding purpose of the Code is to provide practical guidance to those businesses that deal with fertilisers and promote good practices by them, with the aim of preventing or reducing the pollution of controlled waters (which includes in particular ponds, streams and reservoirs as well as all groundwater).

Compliance with the Code will also constitute a defence of 'due diligence' in circumstances that may otherwise amount to an offence under the Law.

Accordingly, I commend this Code to all concerned.

Deputy John Young
Minister for the Environment
31 January 2020

2 Introduction and background to this water code

The purpose of this Code of Practice is to provide practical guidance for those involved in activities that can have an impact on water quality, including their advisors. The Code contains measures to reduce the risk of causing water pollution.

2.1 Statutory responsibilities and where to get advice

Businesses are strongly recommended to comply with this code of practice, especially in view of the provisions of Articles 15(3), 18(4) and 18(5) of the Water Pollution (Jersey) Law 2000 which relates to a 'defence' under the Law of due diligence.

Natural Environment is responsible for administering the majority of the environmental legislation highlighted in this Code and for the Water Management Plan 2017-2021 (WMP).

To find out more about the Water Management Plan for Jersey and about joint working to tackle these challenges please also contact the Natural Environment.

Officers from Natural Environment can also offer advice on practical steps that can be taken to minimize the pollution risks from certain activities and on the requirements for Rural Support payments. You can also seek advice from an independent consultant. Natural Environment recommends that any advice taken is from a suitably qualified advisor, for example FACTS or BASIS.

2.2 Useful Contacts

Natural Environment, Growth Housing and Environment (GHE), General Enquiries	441600	www.gov.je	environmentenquiries@gov.je
Regulation, GHE (water pollution hotline)	709535	www.gov.je	
GHE, Consumer and Environmental Protection, Regulation Directorate	441600	www.gov.je	envprotection@gov.je
Planning and Building Services, Regulation Directorate	445508	www.gov.je	planning@gov.je
Infrastructure, GHE	445509	www.gov.je	dfi@gov.je
'Knacker's yard' service	441643	www.gov.je	
States Veterinary Service, Natural Environment	441600	www.gov.je	rva@gov.je

Jersey Health and Safety Inspectorate	447300	www.gov.je	hsi@gov.je
Jersey Cattle Movement Service (JCMS)	866555		genetics@royaljersey.co.uk
Jersey Water	707300	www.jerseywater.je	
Jersey Water 24 hour emergency	707302	www.jerseywater.je	
Jersey Farmers Union	733581		jerseyfarmersunion@gmail.com

2.3 The Water Pollution (Jersey) Law 2000

This Code of Good Practice for the Protection of Water (The Water Code) is a Statutory Code under Article 16 of the Water Pollution (Jersey) Law 2000.

The Code applies to all landowners and users of land. These include, but not limited to, farmers (arable and pastoral), small holders and liveries and any persons disposing of wastes (such as treated sewage sludge, wastes from water treatment, wood chip, other organic manures etc.) to land.

The Water Pollution (Jersey) Law 2000 contains pollution prevention provisions and allows for the prosecution of people or organisations who cause or knowingly permit the pollution of controlled waters. 'Controlled waters' include all surface waters (such as ponds, streams, brooks, field ditches) and groundwater.

Under Article 17(1) of the Water Pollution (Jersey) Law 2000, it is an offence to cause or knowingly permit pollution of any 'controlled waters' unless it is done under the conditions of a discharge permit.

Anyone wishing to discharge a polluting substance, or energy, into controlled waters can apply to the Minister of the Environment for a discharge permit which, if granted, will set out the conditions under which that discharge can take place.

The maximum penalty for a pollution offence is an unlimited fine and/or two years imprisonment. In addition, a person found guilty of causing pollution may also have to pay for any remedial action and for costs incurred by the Minister of the Environment.

Businesses can also be held liable for water pollution resulting from tampering, vandalism or accidental damage by third parties.

2.4 The Water Management Plan 2017-2021 (WMP)

In 2014, the Natural Environment published the report 'Challenges to the Water Environment in Jersey'. The report sets out the then 'current status' of the water environment.

The Water Management Plan 2017-2021 (WMP) followed on from the first report, setting out the actions that need to be taken as a priority to help ensure healthy water supplies and better improve the status of the water environment.

The key issues and objectives identified for the first five-year WMP were:

- **Nitrate**: Reduce the concentrations in the Island's groundwater and surface water.
- **Phosphates**: Increase understanding of the likely scale of the phosphate issue on the Island and require good practice measures to reduce soil phosphorus (P) indices and losses of P to controlled waters.
- **Pesticides:** Increase understanding of the levels of pesticides in surface and groundwater throughout the Island whilst strengthening the mechanisms that regulate, control and monitor pesticide use and screen for hazardous substances.

By following the advice in this Code you will be making an important contribution to achieving these objectives.

2.5 Water Pollution (Water Management) (Jersey) Order 2020

In 2020, the Minister for the Environment designated eight Water Management Areas (WMA's) in Jersey under the Water Pollution (Water Management) (Jersey) Order 2020 to which this code of practice is appended

The restrictions and requirements imposed by the new Water Pollution (Water Management) (Jersey) Order 2020 apply in respect of any person who imports, sells, purchases, stores or uses any fertiliser[1] in the course of a business activity or operation in any Water Management Area designated by this Order. The 2020 Order provides:

Fertiliser in this context means 'a chemical or natural substance that is added to soil to improve its productivity'. This therefore includes organic materials and manures used as fertilisers or soil conditioners as well as inorganic (manufactured) fertiliser and other chemicals such as lime.

- Article 4 imposes requirements on the storage of fertilisers.
- Article 5 imposes requirements on the planning and management of fertiliser use, including a requirement for producing a 'nutrient management plan' and an 'organic fertiliser management plan'.
- Article 6 requires equipment for the application of fertiliser to be maintained in a good state of repair and in the case of mechanical equipment for it to be calibrated at least once a year.
- Article 7 imposes restrictions on the application of fertilisers.
- Article 8 is concerned with soil cultivation and management.
- Article 9 sets out the requirements for the keeping of plans and records.

The Water Pollution (Water Management) (Jersey) Order 2020

[1] See 13Glossary

There are restrictions and requirements imposed by law that are designed to reduce the pollution of water by some land management activities. See this Order for the current legal requirements for the storage, planning, management and use of fertilisers. This includes inorganic and organic fertiliser. There are also rules in place for soil management and record keeping. Following the rules are a legal requirement and you should ensure you know what they are and whether they apply to you and your business activities and operations.

Note: This applies to all business activities or operations except for any amenity land[2] or any landscape gardener working at domestic premises.

For up to date information please visit www.gov.je and type 'water pollution' into the search.

Land managers wishing to receive States of Jersey financial support under the current Rural Economy Strategy (RES) 2017-2021 must meet certain criteria to qualify for payment. Applicants must demonstrate that they are operating to the standards required by the RES and be able to provide evidence that all activities conform to all relevant legislation and Codes of Good Practice (including this Water Code).

3 About Water Pollution

3.1 Sources of pollution

Water pollution can come from a number of different sources. If the pollution comes from a single source, such as an oil or pesticide spill, it is called 'point-source pollution'. If the pollution comes from many sources, it is called nonpoint-source or 'diffuse pollution'.

3.1.1 Point source pollution

A point source is a single, identifiable source of pollution, such as oil from a fuel tank or slurry overflowing from a storage facility. Point sources of pollution from agriculture may include discharges from animal housing and feeding operations, slurry tanks, silage clamps and handling, mixing and cleaning areas for pesticides, fertilisers and fuel stores.

3.1.2 Diffuse source pollution

Diffuse pollution refers to those inputs and impacts which occur over a wide area and are not easily attributed to a single source or incident. A number of individually minor sources of contamination can be highly significant over an entire water catchment. They are often associated with particular land uses, as opposed to individual point source discharges. If the groundwater in a catchment is contaminated, then any boreholes or wells and also the streams in the catchment are also likely to be affected. Small water courses, with little dilution as in Jersey, are more likely to be adversely affected by diffuse pollution than larger rivers. Abstraction from watercourses can exacerbate this problem by lessening the potential for dilution.

The impact of the agricultural industry, which covers approximately 50% of the land area of the Island is significant. The uncontrolled spreading of slurries and manure, the application of inorganic fertilisers, the ploughing and cultivation of the land and the use of pesticides can

[2] See 13Glossary

increase the risk of diffuse water pollution. Run-off from roads and yards, the surface of fields, manure and feed storage silos and storage buildings are also all potential sources of pollution.

The causes of diffuse pollution can be difficult to remedy, mainly because it is the collective impact of decisions made by many individual land managers in respect of a number of different activities that make the difference. Adhering to the good practice contained in this Code will help to prevent damage to soils and losses of nutrients and promote good soil husbandry.

The activities in a catchment as a whole need to be considered and solutions developed between stakeholders. Don't hesitate to get involved in the partnership initiatives being established in Jersey. By collectively taking action to improve land management there is the potential to really make a positive difference to water quality in Jersey and the environment in general.

3.2 Why is it important to reduce pollutant losses to the environment?

The States of Jersey and many stakeholders have been working together to protect the water environment in Jersey in recent years. Ongoing monitoring shows that the quality of the Island's water is improving but there is still a lot to be done. Currently the majority of Jersey's water bodies are at 'Moderate Status'[3]. This needs improving as it is less than 'Good Status' and is mostly driven by elevated levels of nutrients found in both surface waters and groundwater. The long-term target is to improve the environmental status of as many of our water bodies as possible to 'Good Status'.

Excess nutrients, such as nitrogen and phosphorous, can harm soils, watercourses, reservoirs and coastal waters, by causing algal blooms and by changing the natural balance of plants, insects, and other life. In the wrong place pesticides can kill insects and fish and can contaminate reservoirs making the water unfit to drink. In some cases, there may be human health implications, particularly from the effects of pesticides.

3.3 The responsibilities of businesses

Many common practices pose a risk to water quality in Jersey. This risk is increased where poor standards of management and operation are in place. The inappropriate application of inorganic fertilisers, the storage and inappropriate use of organic manures, the poor storage, use and disposal of pesticides and the storage, leaks and spills of fuel oil can and do cause pollution.

Make sure that you are informed about how to prevent water pollution, that you manage and train your staff and contractors appropriately and you are ready to respond to a pollution incident:

a. Land managers should ensure they have plans in place for the known pollution hazards on their land in order to mitigate against a storage failure or spill and to minimise the effects of an emergency on the water environment.

   Carefully plan all storage, handling and use of livestock slurries and manures, animal feedstuffs, silage effluent, fuel oil, dirty water, fertilisers, veterinary medicines, pesticides and other chemicals and ensure staff and contractors follow procedures. Don't just leave plans on the shelf gathering dust.

[3] A classification used by the EU Water Framework Directive that ranges from excellent, good, moderate to poor

b. Staff and contractors who handle, store, use, spread or dispose of any substance that could pollute water should be aware of their responsibilities and know about the substances they are dealing with and the effects they may have on the environment.

c. Make sure that all workers are suitably trained, qualified and competent to carry out the operation for which they are employed. They should know how to operate and maintain any equipment they use and know what to do in an emergency.

d. Make sure workers are aware of the legal requirements and are prepared to follow the guidance in this Code.

e. Know the position of boreholes, springs, wells, streams and field and yard drainage systems and also which fields are prone to soil issues. Know how to protect them during normal activities and in the event of a pollution incident.

f. Make an assessment of the runoff risk from each field before and during field operations. A field risk assessment map has been compiled and can be accessed via www.gov.je to assist in making these assessments. Also look at the weather forecast if appropriate.

g. Staff and contractors should also know about field drainage systems and which fields are prone to soil erosion as substances, especially phosphates and agrochemicals, can be attached to soil particles and carried into water with the soil. Soil lost from the field is valuable topsoil that cannot be replaced.

h. All areas and buildings should be designed and managed to minimize runoff and pollution and staff should know the whereabouts of pipes, channels and outfalls.

   Inspect all storage facilities regularly for leaks and damage.

i. Emergency contingency plans should be in the form of easy to read documents placed in a conspicuous position and available to all staff in case the land manager is not on the premises at the time of an accident. Those involved should know where the contingency plans are located and be aware of their content. Equipment required, should an emergency occur, must be easily accessible and staff and contractors should receive regular training in its use.

j. Ammonium nitrate fertiliser must be stored securely, where there is no public access (and out of view from roads etc.). Ideally, store fertiliser in a locked building, and carry out regular stock checks. Advice should be sought from the Jersey Health and Safety Inspectorate (see *Useful Contacts, Sect. 2.2*).

k. All facilities and machinery involved in the storage and use of the above substances should be regularly inspected to ensure they meet legal and best practice standards.

Building Control Regulations are in operation to ensure that buildings and storage facilities are built to the correct standard and are fit for purpose. Pre-application advice is available from the Planning and Building Services.

4 Diffuse pollution

4.1 Diffuse pollution: sources and pollutants

There is a wide range of potential diffuse pollution sources which are associated with management practices and which can harm the environment. This pollution tends to arise over a large area and is dependent on what happens on the surface of the land and how it is managed.

Losses of nutrients or agrochemicals to land and water also represent a financial loss to businesses. Businesses and the environment can both benefit from applying these inputs in the right amounts and at the right time.

4.1.1 Nutrients

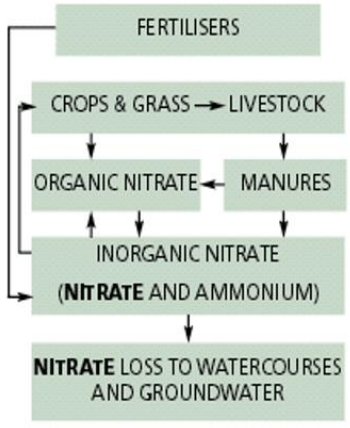
Nutrients such as nitrogen (N) and phosphorus (P) can cause severe problems in streams and coastal waters by, for instance, contributing to the development of algal blooms or sea lettuce overgrowth on our coastline. Nutrients can be lost from manures and slurries as well as from other organic wastes spread on land, and significant losses can also be associated with inorganic fertilisers and soil. Advice on their use must be tailored to the particular circumstances that occur in Jersey in order to prevent losses and reduce the risk of pollution.

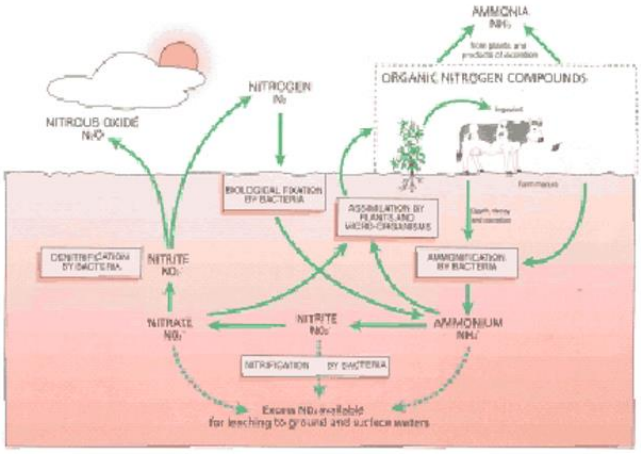
When nutrients are carried out of the crop rooting zone by water draining through the soil, they are said to have 'leached'. This represents a potential loss to the land owner and is a major cause of elevated nitrate levels in our water in Jersey.

4.1.1.1 **Nitrogen**

Nitrogen occurs naturally in soil and water and is an essential plant nutrient. Sources of organic and inorganic nitrogen are used to improve soil fertility and promote crop growth. Chemical fertilisers (containing nitrogen) usually contain nitrogen in the form of ammonium and nitrate. Nitrate is very soluble and is therefore at risk of being washed into watercourses and groundwater by leaching from the soil, especially in late autumn and early winter when soil may be bare or there is little crop uptake. Subsequent rainfall readily washes nitrate from the soil profile.

The main sources and losses of nitrate to water are shown in the diagrams below:





Nitrogen based fertilisers are used in significant amounts in both arable and livestock farming. Nitrate (from inorganic nitrogen fertilisers or organic manures) is leached rapidly especially because it is very soluble. This is particularly important during rainfall if nitrogen fertiliser has been over-applied and the soils themselves are free draining. In areas where there are sandy soils

overlying a shallow water table, as in Jersey, there are particular risks of nitrate leaching into groundwater.

There is also high risk of water pollution from nitrate losses if livestock manures and slurries with a high proportion of their nitrogen content in soluble form (e.g. slurry, pig and poultry manures) are applied when crop uptake is low or non-existent (i.e. in the autumn or winter period).

Agricultural land is the main source of nitrate in many streams and groundwater. This is a cause for concern for two main reasons. Firstly, because of possible risks to human health posed by high levels of nitrate in public and private drinking water sources. Secondly, elevated levels of nitrate and phosphorus are considered to be significant contributors to eutrophication. ('Eutrophication' is the enrichment of water by nitrogen compounds, causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water).

4.1.1.2 **Phosphorus**

Phosphorus is an essential plant nutrient that occurs naturally in soils either as inorganic phosphate or as part of the organic matter. Phosphorus fertilisers, manures and slurries supply phosphate to improve soil fertility and to maintain plant growth. Once added to soils, phosphate is normally strongly bound to soil particles and has a very low solubility. Drainage water percolating through soils therefore normally contains very low concentrations of phosphate, except when soil phosphate levels are excessively high. Phosphate can also be lost from land if soil erosion occurs or due to surface run-off following the application of manures and slurries.

Phosphorus can contribute to eutrophication of freshwater habitats and is a particular threat to still or slow-moving freshwaters. Agricultural and other land can be a significant source of phosphorus input to watercourses.

Phosphorus from land can reach watercourses in various forms and by various routes. Their relative impact will depend on the particular catchment.

The main losses are:

- Surface run-off, particularly of recently spread animal manures.
- Erosion of soil particles.
- Particulate and dissolved phosphorus in water flowing from land drains.
- Phosphorus can also be leached to groundwater.

4.1.2 Soil

Soil is considered a non-renewable resource due to the time it takes to form. It should therefore be protected from damage and loss. In addition, soil and water quality are very closely linked.

The quality of soil and its inherent fertility depends upon:

- The nutrient content and its balanced supply to plants.
- Organic matter content.
- Soil pH.

- Biological activity.
- The physical condition of the soil (soil structure).

Soil structure has a major influence on the rooting potential, drainage, water-holding capacity, strength and consistency of soils. Any degradation of structure will result in limited land use and agricultural potential.

Eroded soil from grazed and cultivated land, muddy run-off from roads, yards or field gateways can cause environmental problems such as silting of gravel beds in watercourses. These areas are essential habitats for many aquatic insects and provide spawning areas for fish and amphibians. Limit livestock access to watercourses. Wherever possible, install water troughs and fence off watercourses to eliminate this problem.

Soil particles are also important because they can carry more serious pollutants. For example, some pesticides (such as pre-emergence herbicides) bind firmly onto soil particles and are therefore liable to contaminate watercourses when soil is lost from fields. Similarly, mud on yards and roads may carry oily residues that can end up in a watercourse.

Phosphorus, attached to soil particles, can be lost from land via run-off entering watercourses and cause pollution. It should also be remembered that erosion very often involves the loss of topsoil, the most fertile soil in a field.

The natural soil biological processes, which are vital for healthy soils, are dependent on soil organisms ranging from bacteria and fungi to earthworms. Soil management and the presence of contaminants affect the activities of these organisms. Heavy metals, excessive fertiliser and organic chemical loadings (including pesticides) can suppress such biological activity. Good soil husbandry, nutrient planning and careful use of pesticides combined with a well-managed crop rotation will maintain good biological activity.

4.1.3 Manures and slurries

Livestock slurries and manures, and other organic materials can help improve soil fertility and can save on manufactured fertiliser costs. However, they are highly polluting if spread at the wrong time or in the wrong place and can cause ‘point source’ pollution incidents and add to problems of diffuse pollution through excess nutrient loadings to land. Apart from the nutrient content and high organic loading, the possibility of microbiological contamination can threaten streams, coastal waters and individual groundwater sources and affect compliance with environmental quality standards.

4.1.4 Treatment systems

Normally, the practices described in this section should be sufficient to prevent or at least minimise the risk of diffuse pollution. In some cases, however, it may be necessary to consider the installation of some form of treatment system near the source of potential pollution. It may be possible, for example, to install a wetland, reedbed or biofilter system to deal with contaminated roof or dirty yard run-off at the farm. Specialist advice should be sought on the selection, design and installation of such systems and the Natural Environment should be consulted beforehand to ensure that the requirements of environmental and waste management legislation will be complied with.

4.1.5 Sewage sludge and water treatment sludge

Sewage sludge or industrial wastes can contain potentially toxic substances such as heavy metals and persistent organic chemicals which may contaminate soil and pollute water.

Certain precautions prior to their use on land must be undertaken. Analysis of the waste before it is used, assessing the lands suitability prior to spreading, calculation of the growing crops nutrient requirements, soil sampling and nutrient budgeting can all reduce the risk of diffuse pollution occurring.

Anyone wishing to apply industrial wastes to land must possess a waste management license unless the activity is exempt under the law (contact GHE). Note that the application of sludge to land should comply with guidelines in 'The Safe Sludge Matrix' and must be included in your nutrient management plan.

4.1.6 Compost

Compost can be made from a wide variety of biodegradable materials, such as domestic garden (botanical) wastes or waste food. Some composting systems also process small amounts of paper, card and untreated wood for example. Composting can be defined as *'the natural breakdown of biodegradable materials through mixing, self-generated heating and aeration to form a stable, soil-like material'.*

There are a number of benefits of using compost as a soil conditioner, as long as the compost is produced to an acceptable standard such as PAS 100 or equivalent, which safeguards the environment and ensures the product being applied is of a suitable quality.

Benefits of compost:

- **Higher yields** - studies show that you can improve maximum yield potential by increasing the amount of organic matter in the soil.
- **Manufactured fertiliser substitution** - compost contains slow release, crop-available nutrients, including phosphate, potash, magnesium and sulphur.
- **Better soil structure and water management** - adding compost improves soil structure, which is good for crops (good water infiltration and retention) and also makes it easier to work, saving fuel and time.
- **Inhibiting pests and diseases** - the organic action of compost can help to inhibit pests and diseases within the soil (for example Rhizoctonia).
- **Fuel savings and traffic tolerance** - compost improves soil structure, making it easier to work whilst using less fuel. Improving soil structure will make it more resistant to compaction from traffic and will extend the conditions in which it can be worked.

4.1.7 Pesticides and other chemicals

A very wide range of chemical compounds are used as pesticides and each of these interacts with soil and water differently. Some will move through soil quite easily and enter groundwater. Groundwater in Jersey is widely extracted for both the public water supply and for private drinking water (wells and boreholes).

Pesticides can have damaging effects on water habitats and water resources, especially the Island's reservoirs and groundwater. When using pesticides, ensure you have sought qualified advice on the options available in order to choose the right product and to safeguard against any adverse effects on the environment.

Once present in groundwater, pesticides can be present for many years and are very costly to remove. It is therefore important that such chemicals are prevented from entering the island's groundwater in the first place.

The storage and use of pesticides is regulated by the Pesticides (Jersey) Law 1991. Pesticides should be used in accordance with the Code of Practice for the Safe Use of Pesticides issued under Article 7 of the Pesticides (Jersey) Law 1991. Please check for updates with the Natural Environment as this legislation is currently being reviewed.

It is essential to avoid spraying pesticides in conditions and circumstances where drift can occur. Buffer strips or unsprayed headlands should be considered prior to spraying fields bordered by watercourses or ditches.

If poorly managed or controlled, pesticides in tank washings, from the cleaning of protective clothing, or from residues in bags or containers, can cause pollution. Due to the particular risks that arise during pesticide handling and wash-down operations, consideration should be given to the installation of purpose-built facilities. Guidance on the design of such areas is available from the Natural Environment or the Crop Protection Association (CPA).

4.2 Effective planning, management and control of potential pollutants

The key to minimising pollution is to ensure effective planning, management and control of potential pollutants. Follow the advice in this code and in the Water Pollution (Water Management) Order 2020 to help reduce the impact of land management activities.

4.3 Rules on fertiliser

Nitrogen and phosphorus are key diffuse water pollutants and are also major plant nutrients. By storing and using fertiliser appropriately you can minimise pollution risks, comply with regulations and ensure that crops get the nutrients that they need in the right amounts.

Applications of inorganic nitrogen to early potatoes are subject to high levels of leaching. It has been estimated that up to 50% of applied N is lost in this way. Put in financial terms this is worth £200,000 - £300,000 across the potato industry per annum.

The Water Pollution (Water Management) (Jersey) Order 2020 makes the following a legal requirement:

4.3.1 Storage of fertilisers

a. Store fertiliser where it can't get into drains and watercourses or leach into groundwater.

b. Don't store fertiliser (inorganic or organic) within 50 metres of a borehole, well or spring unless the storage is in a fit for purpose building or other structure.
c. Don't store fertiliser within 10 metres of any inland water (streams etc.), unless the storage is in a fit for purpose building or other structure.
d. Don't store organic fertiliser in the same location for more than one year or use the same location again for such storage for at least 2 years unless the storage is in a fit for purpose building or other structure.

4.3.2 Make and use a written Nutrient Management Plan that includes:

a. A field by field plan.
b. An assessment of the nutrient requirement of each planting or crop.
c. An assessment of the nutrient supply from any organic fertiliser inputs.
d. A calculation of fertiliser to be applied taking into account all other inputs.
e. A record of actual applications of fertiliser to each field.

4.3.3 Make and use an Organic Fertiliser Management Plan that includes:

a. An assessment of the adequacy of storage based on production figures and of whether there is sufficient land available for spreading.
b. The identification of suitable and unsuitable areas for the application of organic fertilizer. A field risk map has been compiled to assist with this and can be accessed via www.gov.je.
c. A risk assessment procedure for the spreading of organic manures.

4.3.4 Apply fertilisers (inorganic and organic) in the right place, at the right time, in the right amounts and in the right conditions:

a. Calibrate and maintain equipment at least annually.
b. Don't apply more than the RB209 recommended amount of fertiliser to any land.
c. Don't apply more than 210 kg/Ha of Nitrogen to Jersey Royals.
d. Don't apply Phosphate to soils with an index of more than 4, unless evidence is provided that satisfies that, due to the low soil temperature, the application of fertiliser with a P soil index in excess of 4 is necessary to meet reasonable growing conditions;
e. Don't apply fertiliser unless there is a demonstrated need and in accordance with the advice of a properly qualified advisor. The amount of phosphorus lost by erosion, leaching or drain flow will largely depend on the soil phosphorus level. The higher the soil phosphorus levels, the greater the potential loss.
f. Don't apply more than 170kg/Ha of total nitrogen as organic fertiliser as livestock manure to land or more than 250 kg/Ha total nitrogen in all other cases in any 12 months.

4.3.5 Don't apply organic fertiliser to land that is:

a. Within 50 metres of a groundwater source.
b. Within 10 metres of any inland water.
c. Frozen, waterlogged, compacted on the surface or covered with snow.

d. A loafing paddock[4] or other heavily-grazed field[5].

4.3.6 Don't apply manufactured fertiliser to land that is:

a. Within 5 metres of a groundwater source.
b. Within 5 metres of any inland water.
c. Frozen, waterlogged, compacted on the surface or covered with snow.

4.3.7 Keep accurate records:

a. Of fertilisers imported, sold or purchased and of their nature and intended use.
b. Of the nature and composition of fertilisers stored, how long the storage is for and how the storage is managed.
c. Of cropping and nutrient and pesticide applications.

Make the relevant records available to those sharing the land to an extent that enables them to fulfil the requirements of this code.

4.4 Other measures to consider that help reduce losses of nitrate

4.4.1.1 **Avoid ploughing up permanent pasture**

Avoid ploughing up of traditionally permanent pastures, if possible, due to the flush of nitrate which can continue for several years after such action. If the permanent pasture is to be cropped or re-seeded, account should be taken of the nitrate release in calculating the fertiliser applications for the subsequent crop. If permanent pasture is to be re-seeded it is important to ensure that a full crop cover is established as quickly as possible, by early October at the latest.

4.4.1.2 **Maximise green cover**

Winter crops sown in late October/November will have little effect in reducing the amount of nitrate lost in the winter but can help to stop surface runoff. A better strategy for reducing leaching is to grow a spring sown crop (i.e. Jersey Royals) with the land remaining in grass or other catch crop for as long as possible over the winter period.

If possible, a cover or catch crop, such as Italian Ryegrass or mustard etc., should be sown in fields that would otherwise be bare over the autumn and winter period.

Run-off from rutted or compacted ground can be a particular problem for some rotations, including potatoes, maize and vegetables. The use of buffer strips can assist in reducing the impacts of soil erosion and nutrient losses.

4.4.1.3 **Grazing**

Where intensive grazing is practised, a high percentage of the nitrogen is returned to the land as excreta and urine resulting in high soil concentrations of available N. The loss of nitrate from the grassland through leaching may therefore be high, if intensively grazed by livestock throughout the autumn.

[4] See 13Glossary
[5] See 13Glossary

4.4.1.4 **Planning manufactured fertiliser (containing nitrogen) application to grassland and arable crops**

Manufactured fertiliser (containing nitrogen) should not be applied to grassland until the spring, close to the time when the nitrogen is needed for grass growth, and only then if soil and weather conditions are suitable. A useful indicator to when nitrogen should be applied to grassland is the point at which soil temperature is 5ºC or more for five days. For arable crops, manufactured fertiliser (containing nitrogen) should be applied at the start of periods of rapid crop growth and nitrogen uptake.

4.4.1.5 **Organic farming**

Organic farming does still pose potential risks of nitrate leaching due to organic manure use, grazing and ploughing-in of grass and crop residues. Organic farmers should therefore follow Best Practice guidelines described in this Code.

4.4.1.6 **Using buffer zones near sensitive habitats or high risk areas**

Leave, where possible, uncultivated strips of land adjoining sensitive habitats (e.g. wetlands, botanically rich pastures, etc.). This area can act as a buffer between the land under cultivation and the valuable habitat. Take into account natural heritage and conservation issues.

Design of buffer strips will depend on local circumstances. The detailed design of a buffer strip will be closely related to the problem to be addressed, and specialist advice on the best way forward is recommended. A small margin is still going to be better than none; however, if erosion continues then consideration should be given to establishing a permanent grass ley.

5 Soil Management

5.1 Soil Management

Soil is a non-renewable resource (due to the time it takes to form) and it should be protected from damage and loss. Taking the time to look at soil structure is fundamental to achieving better land management, which supports profitable farming and helps protect the environment.

Land should be managed in such a way that the risk of pollution to controlled waters is minimised and managed in accordance with a ‘soil protection plan’. This is to help ensure that the soil is managed, the productivity of the land is optimised and the risk of pollution to controlled waters is minimised.

5.2 Soil and water erosion

Soil erosion is a natural process, caused by the action of both wind and water, though it can be exacerbated by inappropriate management. Certain fields/soils are more susceptible to erosion than others and inappropriate cropping, soil management and cultivations can increase the degree of risk.

Loss of soils through erosion can affect productivity and profitability and result in off-site problems, including in water pollution, flash flooding and road and drain blockage. Soil loss by

water erosion occurs from sloping arable and rotational grassland, particularly on sandy and loamy soils. Water erosion may occur whenever rainfall intensity exceeds the infiltration rate of the soil surface and the surface run-off is heavy and fast enough to move soil particles. Bare soils, fine seedbeds, potato drills and ridges are particularly at risk from water erosion.

Careful management can substantially reduce the risk of soil and water erosion. The following measures may apply, and should be considered for inclusion in the Soil Protection Plan, if required:

- Reduce run-off by increasing surface drainage using sub-soilers to alleviate compaction.
- Encourage topsoil stability by using organic manures.
- Avoid over-cultivation and excessively deep working of the land.
- Soil erosion on susceptible fields can be minimised by using minimum tillage systems, diversion systems and grass buffer strips, and also by adapting field activities according to local risks and previous experience of soil loss.
- Use minimal cultivation techniques with the crop sown at right angles to the direction of rolling where applicable.
- Establish crops across the contours of a sloping field.
- Avoid soil compaction by minimizing the weight on each wheel and by spreading the load over as large an area as possible by using dual and/or flotation tyres.
- The risk of run-off and losses of nitrogen is increased in compacted soil. Physical damage to soils also reduces crop growth and therefore the rate of nitrogen uptake by the crop. This damage can to some extent be avoided by reducing the number of field operations particularly when the soil is vulnerable to damage (e.g. when wet, after frost, etc.). Flotation tyres can be both positive and negative, in that they limit compaction but may encourage field access in conditions which are really not suitable.
- Establish crops as early as possible.
- Cultivated soils which are light textured should not be left without a crop or stubble cover during the autumn and winter period. Changes to crop establishment and field management practices should also be considered in fields with a history of soil erosion. Sow cover crops early enough to establish cover over winter. Use permanent grass buffer strips both within fields and between fields to reduce the potential impact on watercourses.
- Sow permanent grass if repetitive water erosion occurs which cannot be controlled by changes in husbandry or cropping.
- Avoid overgrazing and poaching on banks of watercourses, particularly at watering points and feeding areas.
- Encourage regeneration of trees, shrubs and vegetation which help to stabilize the borders adjacent to flowing water.
- When irrigating, ensure water application is uniform and rates are not too high or droplets too large. This will avoid sealing the soil surface and minimize run-off and soil erosion.

5.3 Soil quality and nutrient status

Soils should be sampled and analysed at least every four years for phosphorus, potassium, magnesium and pH. Soil sampling for SMN should be carried out where appropriate.

Plants require adequate supplies of N, P, K, magnesium, calcium, sulphur and trace elements to grow satisfactorily. These are generally supplied from soil reserves, supplemented particularly for N, P and K by organic manures and inorganic fertilisers.

If soil pH and organic matter are maintained at appropriate levels, N, P, K and sulphur inputs and/or soil reserves can meet most plant nutrient requirements. The appropriate type of lime should be applied to achieve the correct balance between nutrients and target pH for crop or grass growth. Excessive soil nutrient levels (particularly N and P) should be avoided as leaching or erosion of nutrient rich soils to watercourses can cause pollution and promote algal growth (i.e. eutrophication).

5.4 Acidification of soils

The majority of soils in Jersey are naturally acidic and are subject to natural acidification processes from fertiliser and manure use, plant growth and rainfall and to other pollutants from industry. Soil susceptibility depends on soil type and cropping. The result is a reduction in the soil pH level over time unless regular applications of an appropriate type of lime are made.

For most arable crops, the pH of mineral soils should be maintained at pH 6.3. The reduction in lime application in Jersey is resulting in more acid soils. This will reduce crop yield as well as the efficiency of manufactured fertiliser use. Acidic soils will produce acidic drainage and may therefore result in deterioration in water quality on the other hand. It is equally important not to over-lime soils as this will reduce nutrient availability and uptake of some trace elements resulting in reduced plant growth. The target is to achieve the pH levels mentioned above.

5.5 The importance of organic matter

Organic matter in the topsoil influences its physical, chemical and biological behaviour, particularly its structural stability, ease of cultivation, water retention capacity and nutrient availability to plants. Most soils have a reasonable supply but if the organic matter in a soil falls, it can impair its ability to support plant growth.

Where organic matter levels are lower than is desirable, they can usually be increased by sowing a grass ley or by incorporating crop residues or organic manures evenly over several years. The establishment of a cover crop after Jersey Royal potatoes have been harvested can help maintain soil organic matter levels and is also important to reduce soil erosion and reduce diffuse pollution.

5.6 Creating the best physical condition for soil

Over-compaction, due to damage caused by machinery and high stocking densities, is an increasing problem in Jersey. Compaction restricts root growth and limits soil drainage which in turn results in increased run-off, more frequent flooding, increased erosion and the transfer of potential pollutants to surface waters. In compacted soils, aeration is reduced resulting in poor root growth and reduced availability of plant nutrients. To avoid the degradation of soil structure, avoid the use of heavy machinery and livestock poaching when soils are soft or saturated and select appropriate cultivation techniques to mitigate against the creation of a ‘soil pan’ just below cultivation depth.

Preventing compaction is easier than correcting it and regular soil profile inspections should be made, particularly on headlands and tram-lines and/or where Jersey Royals have been grown continuously for several years, to assess soil conditions.

5.7 Restoring disturbed soils

Prior to land being used for storage of building materials and/or used for other development purposes permission must be gained from the Natural Environment. In addition, the developer must provide a detailed inventory of the quality of the land and the condition of both topsoil and subsoil and a detailed specification and method statement for its reinstatement prior to the work commencing. The degradation of agricultural land is an offence under the Protection of Agricultural Land (Jersey) Law 1964.

5.8 Protection against the contamination of soils

To protect the long-term productivity of the soil in Jersey it is necessary to be aware of the many potential sources of contamination, to assess their significance and then take the necessary steps to prevent, limit or remedy their effects.

Soil contamination may affect:

- Soil processes - (physical, chemical and biological) leading to degradation of soil quality.
- Plant growth.
- Human or animal health, by uptake of pesticides or Potentially Toxic Elements (PTEs) into plants resulting in entry of toxins into the food chain.
- Watercourses by run off, leaching or erosion from contaminated land.

Although a wide range of PTEs may contaminate soils, in practice problems usually arise from a relatively small number of elements. The following PTEs may cause problems due to the presence of excessive amounts in soils: zinc, copper, lead, cadmium, arsenic, nickel, chromium, mercury, selenium and molybdenum. While the presence of essential trace elements such as zinc and copper is necessary for plant and animal nutrition, excessive concentrations can affect the health of plants, animals and humans.

The most likely source of such PTEs is from the application of sewage sludge and non-agricultural waste. Industrial organic chemicals, oils and solvents and persistent pesticides can also contaminate soil.

The assessment of the suitability of a waste and the receiving soil for disposal to land should take account of the:

- Waste degradation rates and the release of nutrients and other substances during its breakdown.
- Chemical form of the element and its likely interaction with the soil, given the pH values and the existing ‘background’ concentration of the element in the receiving soil.
- Effect of the element upon soil organisms and processes.
- Timing of application.
- Effects upon plant growth.

- Possibility of uptake of potentially harmful substance to edible parts of plants.
- Effects upon livestock, by consumption of stored and conserved crops, grazing herbage or direct ingestion of contaminated soil.
- Possible effects on the human food chain.

Non-agricultural wastes should not be applied to agricultural land unless they are beneficial to the soil or growing crop and should be applied only when ground and weather conditions are suitable. All proposed applications of non-agricultural wastes to agricultural land must be beneficial to agriculture and meet the terms of the exemption in the Waste Management (Exemptions from Licensing) (Jersey) Order 2006.

For full details see the 'Non- Agricultural Wastes and other Imported Organic Wastes' section of This Code. It is also recommended that the Sludge (Use in Agriculture) Regulations 1989 (as amended) and the Safe Sludge Matrix 2001 is complied with if sewage sludge is to be applied to agricultural land.

6 Storing and handling livestock slurries, manures and other organic materials

6.1 About livestock slurries, farmyard manure and other organic materials

There are important health and safety issues attached to organic manures and slurries and you should include the handling, storage and application of farm manures within the farm's Control of Substances Hazardous to Health ('COSHH') assessments. Further guidance is available in Health and Safety Executive publications.

Livestock slurries, farmyard manure ('FYM') and other organic materials are valuable sources of organic matter and major nutrients such as nitrogen (N), phosphorus (P), potassium (K) and sulphur (S). They also contain magnesium (Mg) and trace elements. Using these nutrients effectively can result in considerable savings in manufactured fertiliser use.

However, these valuable nutrients can be lost from manures and slurries during storage and spreading, posing a water pollution risk. When slurry and other organic material gets into water very rapid and severe oxygen depletion of the water can result, leading to fish and invertebrate deaths for a considerable distance downstream. Manure and slurry can also cause microbiological contamination of inland and coastal waters and groundwater, potentially causing a breach of environmental quality standards.

6.2 Definitions and characteristics

It is important to bear in mind the following definitions as they determine how the defined material can and must be treated and what materials must be collected and contained.

Livestock slurry and manure are classified by the type of stock that produces it and the physical characteristic of the slurry and manure.

6.2.1 Slurry

Slurry is excreta, including any liquid fraction, produced by livestock whilst in a yard or building. It also includes any mixture consisting wholly of or containing such excreta, bedding, feed residues, rainwater and washings from a building or yard used by livestock, manure heap or manure storage area, slatted building and/or weeping wall structures, or any combination of these. Slurry has a consistency that allows it to be pumped or discharged by gravity at any stage in the handling process. Slurry is defined as having a dry matter (DM) content between 2% and 10%.

6.2.2 Solid Manure

Solid Manure is excreta, bedding and feed residues produced by livestock when kept in yards or buildings or manure with a high proportion of straw in it from traditional bedded yards or solids from mechanically separated slurry. Solid Manure is defined as having a dry matter (DM) content above 10%. Manures can be in the form of solids, semi-solids or liquids. Solid manures can be stacked but will produce effluent due to drainage and the leaching effect of rainfall. Leachate from solid manures stored on yards or hard-standing will be defined as slurry and must be collected and contained. Stores specially built for solid manure will reduce the risk of pollution through run off and will make it easier to handle and load.

6.2.3 Dirty water

Dirty Water is any water containing washings from a milking parlour or farm dairy. It also includes yard washings and rainwater runoff from open hard standing areas that have been contaminated by manure, slurry or silage. Dirty water is defined as having a dry matter (DM) content below 2%.

6.2.4 Pig and Poultry manures

These contain high levels of nitrogen that can be readily available and extra care is required to ensure the correct rates of application are used when applying them to agricultural land to meet crop need and reduce the potential impact of these manures and slurries on the environment. These manures are also subject to the closed period (between 1st November and the following 15th January in any year) in respect of applications to land.

6.2.5 Non-agricultural wastes and other organic wastes

Wastes and materials such as sewage sludge, compost, seaweed, waste vegetables (including potatoes) applied to land can be valuable sources of nutrients and organic matter but are also subject to restrictions (see **Non-agricultural wastes**).

6.3 Temporary field storage

- Temporary field heaps of solid manure should be placed close to where they will be spread, and in a position where there is no risk of run off polluting water.
- Only manure that can be stacked and remain in situ should be temporarily stored in field heaps**.**
- Do not place manure heaps within 10m of a watercourse, ditch or field drain or within 50m of a spring, well or borehole.
- Do not store organic fertiliser and other organic material in field heaps in one place for any longer than 12 months. Do not use the same location again for at least two years after that.

- Storing solid manure in a temporary field heap must be in compliance with the Waste Management (Jersey) Law 2005.

6.4 Animal housing and associated Infrastructure, GHE

The type of livestock housing system affects the physical characteristics of the manure or slurry. For instance, solid FYM is produced in systems using straw or other bedding materials. Slurry is produced where housing and feeding systems use little or no additional bedding materials, and where excreta is scraped from solid floors or trodden into slats.

Some systems such as straw courts use a separate scraped feed area to reduce straw use and these produce a combination of both FYM and slurry. **All liquids produced from where livestock are housed must be drained or scraped to a suitable collection system.** These liquids include drainage from passages and aprons used by livestock or where slurry is scraped, contaminated wash water from milking parlours and wash-down (dairy, pig and poultry buildings), and drainage from traditional livestock boxes or straw yards.

6.4.1 Livestock yards

Yards used for livestock, together with feed areas, will become contaminated with slurry, bedding and feed residues. Whether these areas are roofed or unroofed, they must be designed so that all contaminated drainage is collected and contained.

Avoid large unroofed areas. It is also important from an economic view that clean drainage from roofs and aprons is not allowed to enter the slurry collection system in order to reduce the volume of slurry and dirty water to be applied to land.

Drainage from feed areas is likely to be highly polluted and must not be discharged to a watercourse. Although this material does not normally contain manure or slurry, it can add to the volume of manure and slurry collected.

Unroofed areas pose a high risk of pollution during periods of rainfall. Where it is not feasible to direct and collect effluents into existing storage facilities, a separate tank should be provided.

Tanks must always be appropriately sized, constructed and installed with regard to the type of effluent being stored; and they must be properly maintained at all times.

6.4.2 Parlours and dairies

The drainage from milking parlours and the parlour pit must be drained to storage tanks or the mains (if connected to the mains they require a trade effluent consent from GHE Infrastructure). Washings from these areas will be contaminated with milk residues, livestock excreta and cleaning chemicals. If included in the slurry system, the volumes produced must be taken into account in any calculation of the slurry storage capacity and land availability for spreading.

There can be occasions when it becomes necessary to dispose of milk produced on a particular farm to that farm's fields. This can occur when bad weather prevents collection of milk or if milk becomes contaminated (antibiotics, chemicals, blood etc.) or colostrum has to be disposed of from newly calved cows.

Ideally, waste milk may be fed to livestock, but it is advisable to first consult a specialist advisor, especially where the milk is contaminated or where large quantities are involved.

Milk is a highly polluting substance and should never be allowed to enter a watercourse or reservoir. Waste milk should be diluted with water or slurry before disposing to agricultural land. Dairy washings should be collected and stored in suitable stores. As the act of mixing milk and slurry may give rise to lethal or explosive gases, only small quantities of waste milk should be disposed of to the slurry system.

BOD values of milk compared to other on-farm wastes

	Biochemical oxygen demand BOD (mg/litre)
Crude sewage	200 to 300
Dirty Water	1,000-5,000
Slurry	10,000-20,000
Silage effluent	30,000-80,000
Milk	140,000

Precautions should be taken before spreading contaminated milk on grazing land and advice should be sought from Environmental Protection and the States Vet. Milk should not be applied on land/sites with a high run-off risk. The application rate should not exceed $50m^3$/ha (2000 gallons/vergée) of diluted milk.

6.4.3 The design and operation of slurry reception tanks and channels

Where possible, keep the distance between the animal housing and slurry storage to a minimum. Slurry can be transferred from where it is produced to the main storage tank either directly (via slats to storage tank) or via a suitable reception tank or channel from where it can be pumped or flow by gravity into the main tank. The system used will depend on the site, relative levels, type of slurry and storage used.

Slurry tank capacity should include allowance for all excreta produced by housed livestock for a minimum of four months, any washings, dirty water run-off and rainfall and leachate from silage stores and manure heaps.

Good management is essential to prevent overflow. To reduce the risk of overflow and ease operational management, a larger tank may be better. Tanks should be sited to minimise pollution risk in the event of overflow: they must be sited more than 10m from any inland or coastal waters and must be at least 50m from any spring, well or borehole.

A freeboard of at least 300mm must be maintained in all tanks (below and above ground). Slurry should never be allowed to rise to rim levels as this can cause catastrophic failure of the store.

The calculation of the minimum size for any slurry storage facility must include provision for:

- All livestock excreta produced during housed periods or at other times of the year (e.g. for dairy cattle).
- All other effluents directed to the system including dairy wash water, contaminated yard areas and any silage effluent.
- Rainfall and freeboard on the storage tank(s).

6.4.4 The design of slurry tanks

The design and installation must comply with the constructional standards described by BS 5502 on Buildings and Structures for Agriculture (Part 50). The base and walls of the slurry storage tank, any effluent tank, channels and reception pits, and the walls of any pipes must be capable of withstanding characteristic loads, shall be protected against corrosion and, with proper maintenance, must have a working life of at least 20 years.

Where a channel or reception pit connects by pipe to another container of lesser capacity which can overflow, two valves must be fitted in the pipe to minimise the risk of overflow should a blockage occur preventing closure of one valve. These valves must be kept locked when not in use and should be spaced at least 1m apart to minimise the risk of both valves becoming jammed open at the same time. Valves should be checked regularly and maintained in full working order. All channels and reception pits must be covered or fenced. Access openings for pumps and pipes should be guarded to prevent accidents. Covers must be designed to carry the loads to which they will be subjected. Access covers which can be easily opened or lifted should be kept locked.

The design of any livestock storage system must take into account rainfall that enters the system and contributes to the volume to be handled. Both 'long term' and 'short term storm' rainfall events should be taken into account, to ensure adequate storage provision. This is to ensure that land application takes place when field conditions are suitable and the risk of pollution from the operation is minimised. Conditions which will minimise pollution risk also minimise field damage.

6.4.5 The construction of slurry tanks

The contractor must be experienced in the use of concrete and other materials used in the construction process. The relevant design requirements are listed in the relevant sections in BS 5502, BS 8007 and BS 8110. When considering substantially enlarging or reconstructing storage tanks, the resulting structure must satisfy the above standards and receive planning consent. It will therefore be essential to seek professional guidance prior to making a commitment to any work.

6.4.6 The management and operation of slurry systems

The person having custody or control of the management of any facility for the handling and storage of livestock manures and slurries must ensure:

- Good operational standards are adopted (e.g. maintaining required freeboard).
- Maintenance is carried out to retain the minimum performance requirements for at least 20 years (or the operational life of the store).

The following operational actions should be carried out with all systems:

- Check tank storage levels at a frequency appropriate to its capacity, especially those receiving drainage from contaminated yards or uncovered silos where rainfall can fill the tank very quickly.
- Carry out regular spot checks at points where leakage may occur, such as joints in pipework connected to pumps.
- Check that external drains are running freely and are not contaminated.
- Check automatic pumping systems and carry out routine maintenance. Pumping systems which can be removed from a tank for inspection are most convenient and essential in situations where poisonous gasses may be present.
- Check freeboard in tanks particularly after periods of heavy rain.
- Check parts of systems which may freeze during cold spells.
- Check tanks for the separation of contents which may lead to the build-up of solids and loss of storage capacity. Above ground tanks require regular attention where surface drying can cause crust formation.
- Check all safety hatches after handling operations. Empty and inspect all tanks (taking appropriate safety measures) prior to animal housing.
- Persons having custody or control of slurry are responsible for informing those individuals who act on their behalf of the precautions to be taken to avoid overflow or spillage and the consequences of causing pollution.

The Department of the Environment must be contacted in the event of a pollution incident on its pollution report line tel: 709535. All staff must be aware of the action to take in any emergency.

Appropriate training in the proper use of facilities and associated equipment is essential. The dangers likely to be encountered from moving parts on equipment and the presence of poisonous gases particularly from tanks within buildings during mixing of slurry must be emphasised.

In slatted courts, livestock housed over the slats should be removed and the building well ventilated prior to and during slurry agitation. If possible, within buildings avoid the storage of silage effluent and slurry in the same tank at the same time as this can increase the risk of poisonous gases.

Harmful gases are generated at slurry stores and these have been responsible for both human and animal deaths.

It is essential that controls for pumps be situated so that they can be started and stopped without the operator entering buildings which may contain harmful gases.

Stock or humans must not access buildings until appropriate actions have been taken to prevent risk of harmful effects. Such buildings should be well ventilated before entering.

If it is absolutely essential to enter an area which may be contaminated by gas, operators should wear either an approved self-contained or airline breathing apparatus. Full training must be given in the use of this equipment before it is used. A notice should be erected at slurry stores warning of the danger of poisonous gas and that stores should not be entered without taking the recommended precautions.

6.4.7 The maintenance of slurry tanks

Practical and safe methods must be employed to allow all facilities to be inspected regularly for any signs of failure e.g. damage to surface coatings on steel and concrete structures, damage and failure of store walls and floor, leakage in pipes, connections and fittings.

The following is a suggested procedure which should be carried out at least at annual intervals:

- Inspect walls and floors for cracking and surface erosion. Only the exposed external surfaces of slurry tanks should be inspected (see above).
- Inspect all drains and channels for damage or deterioration.
- Check that all channels and pipes are free flowing.
- Check all safety arrangements.
- List all repairs required and prepare a timetable to execute the work. This may involve diverting slurry to other storage or providing temporary arrangements.

Planning permission must be obtained with regard to any proposed substantial enlargement or reconstruction.

6.4.8 Limiting pathogenic micro-organisms in slurry and manures

Manures can contain pathogenic micro-organisms (e.g. *E. coli* O157, *Salmonella, Listeria, Campylobacter, Cryptosporidium and Giardia*) which may cause food-borne illness. Factors such as the age, diet and management of animals, as well as seasonal influences, affect the number of micro-organisms in manures.

The management and handling of farm manures, particularly the length of time they are stored, are important factors in the survival of micro-organisms. The method and timing of manure applications to land can affect the length of time that pathogens survive in the soil, and the likelihood of them getting onto food crops. In order to reduce any risks of food-borne illness resulting from the use of farm manures, there is a need for due diligence.

To reduce the risk of transferring disease to healthy stock, pasture should not be grazed for at least one month after spreading slurry or manure or until all visible signs of the solids have disappeared.

Pathogenic micro-organisms usually die out over time. The rate at which this happens depends on environmental conditions. In some conditions, they can survive for several months following the spreading of farm manures or deposition during grazing. They may also be present in dirty water, yard runoff and leachates from stored manures.

Pathogens can be killed either in the manure itself or after application to land. The main factors that will lead to a reduction in numbers are:

- Temperature.

- Sunlight.
- Soil pH.
- Drying.
- Time.
- Soil microbes.

7 Organic fertiliser management planning and application to land

7.1 Farm manure and organic waste management planning

It is important to ensure that anyone who uses or plans to use fertiliser on any land in Jersey as part of their business activities or operations follows a written organic fertiliser management plan and nutrient management plan unless they are exempted. This can be checked by reference to the Water Pollution (Water Management) (Jersey) Order 2020. Nutrient inputs to land from organic materials need to be balanced with the inputs from inorganic fertilisers and plant requirements.

7.1.1 The resource value of organic materials

Livestock slurries and manures are a valuable resource. If correctly applied, they can save money spent on inorganic fertilisers as well as protecting the environment and adding organic matter to the soil. However, because of this nutrient content they can also be polluting if not applied correctly or accounted for in the nutrient management plan.

The nutrient value of manure or slurry should be estimated from published data (RB209) or supported by representative sampling and analysis of the manures and slurries from time to time. Dilution from rainfall, washings and bedding materials must be taken into account.

Before agreeing to accept non-agriculturally derived organic wastes, a farmer must carefully assess whether these additional nutrient inputs can be utilised effectively to give a 'benefit to agriculture or ecological improvement' without causing a pollution risk. Advice should be obtained in writing from a FACTS qualified advisor or equivalent.

The DEFRA publication RB209 provides detailed information on the nutrient requirements of crops and grass, as well as the nutrient value of different types of manures and slurries and chemical fertilisers. Soil analysis for pH, P, K and Mg must be carried out at least every 4 years to assess the nutrient needs of the crops in the fields you are planning to apply organic material or fertiliser to.

Livestock manures and slurries should be applied in amounts such that the nutrient content, particularly of N and P, can be used by growing crops. Excessive application rates can result in high N and P concentrations in the soil and an increased risk of water pollution.

All applications of waste materials to soils should be in quantities and at frequencies which convey positive benefits without causing pollution. Advice, from a FACTS qualified advisor (or

equivalent), should be sought on what application rate is appropriate for each waste material, each soil and each site.

7.2 Maximum application rates of organic manures and slurries

Livestock manures and slurries are a valuable asset and should be applied to agricultural land in accordance with the recommendations set out in this section.

- The maximum application of livestock manure to land must not exceed 170 Kg per hectare of total nitrogen in any 12-month period.
- The maximum application of organic manures including *non –agricultural wastes and/or compost*, to agricultural land must not exceed a total nitrogen content of more than *250 Kg per hectare of total nitrogen in any 12-month period*.
- However, if the only organic fertiliser to be applied is *compost* then the compost may be applied in levels of up to 500kg of nitrogen per hectare over any 24-month period as long as it –
    a. Does not contain livestock manure;
    b. Is applied as mulch or worked into the ground
    c. Is produced to the British Standards Institute specification for composted materials PAS100 or equivalent standard; and
    d. The Minister has given written permission for the application.
- High readily available nitrogen manures and slurries must not be applied to agricultural land during the closed period (between 1st November and the following 15th of January in any year) except with the written permission of the Minister.
- The amount and frequency of applications should not be more than the nutrient requirements of the growing crop and take account of the time of application and the residual value in the soil from the previous application.
- The organic manures and slurry application should be timed to minimise leaching.
- Any application of organic waste to agricultural land must be included in an Organic Fertiliser Management Plan and Nutrient Management Plan.

You must ensure the application of organic manures does not exceed 250 Kg per hectare of total nitrogen in any 12-month period of which only 170 Kg per hectare of total nitrogen may be from livestock manure (unless material being applied to the land is compost only as specified above).

The table below, **Surface application rates in optimum conditions*** shows the maximum surface application rates which can be applied when soil and weather conditions are suitable to avoid run-off and minimise the risk of pollution. The normal rate of slurry application is generally between 25-30m^3/ha (1000 – 1200 gallons/vergée).

7.2.1.1 **Surface application rates in optimum conditions***

Material	Maximum application rate†	Normal application rates
Slurry	50 m^3/ha (2000 gallon/vergée)	25-30 m^3/ha (1000 – 1200 gallon/vergée)
Manure (FYM)	50 tonne/ha (9 tonne/vergée)	30-50 tonne/ha (5.4 – 9 tonne/vergée)
Poultry Manure	15 tonne/ha (2.7 tonne/vergée)	5 to 15 tonne/ha (0.9 – 2.7 tonne/vergée)

Dirty Water	50 m 3/ha (2000 gallon/vergée)	25-30m^3/ha (1000 – 1200 gallon/vergée)
*Lower rates should be used in the event of sub-optimum or difficult conditions and may also be required to ensure that crop nutrient requirements are not exceeded. † Organic manure applications in any 12-month period to any field must not result in the total nitrogen applied exceeding 30 Kg (60 units) total nitrogen per vergée or 170 kg total nitrogen per hectare.		

Repeat applications should not be made for a period of at least 3 weeks. This is a necessary requirement to allow the crop to utilise the available nutrients. Soil microbes breakdown and assist in the incorporation of slurry and manure. More frequent applications would smother herbage and saturate the soil, increasing the chances of leaching and run-off.

Where there is insufficient suitable land for application on the farm, alternative options, such as waste treatment or the use of other suitable land close by, will have to be considered. A record of the type of organic manure, application rate, total volume and date of application must be supplied to all other users of the field to ensure the nutrients they contain are taken into account when applying fertiliser to the next crop.

7.2.1.2 **Typical leaching losses of available nitrogen from a slurry application are:**

Time of application	Typical losses of available nitrogen (%)
Autumn	90%
Early Winter	60%
Late Winter	30%
Spring and Summer	0%

Nitrate leaching from application of farmyard manure is far lower, as most of its nitrogen is not readily available rather than an immediately soluble form. This makes the timing of the spreading operation less critical.

7.3 Spreading organic manures and slurries

Farmers and contractors should be aware of legal requirements and willing to follow the guidance in this Code. Persons carrying out spreading activities on farm should be suitably trained, qualified and competent to carry out the operation involved. Best practise is to GPS to calibrate and monitor applications. It is also important to carry out a risk assessment before spreading organic manures and slurries to assess the risk of causing water pollution and to continue to assess the risk during spreading.

7.3.1 Spreading organic manures and slurries near watercourses

Don’t apply organic fertiliser to land that is:

- Within 50 metres of a borehole, well or spring.
- Within 10 metres of any inland water.
- Frozen
- Waterlogged.

- Compacted on the surface.
- Covered with snow.
- Used as a loafing paddock[6] or is a heavily grazed field[7].

You must undertake a risk assessment to avoid run off and pollution from any spreading activity. Keep accurate records of all organic wastes applied to agricultural land.

The above distances may have to be increased on certain sites to reduce risk e.g. from wind blow or field slope. An untreated strip at least 10m wide should be left beside all watercourses, to reduce the risk of direct contamination by run-off.

Field dirty water irrigation systems should be operated so that there is no possibility of the spread pattern reaching within 10m of a watercourse.

7.3.2 Spreading near springs, wells and boreholes

There are serious public health risks if harmful chemicals and micro-organisms (such as *E. coli* O157, *Cryptosporidium*) enter into water supplies. This is the reason why livestock manures, slurries and other organic manures must not be applied within 50m of a spring, well or borehole. Springs, wells and boreholes for drinking should be adequately fenced off to prevent faecal contamination from grazing livestock. If a stream is particularly vulnerable to poaching or pollution, consider fencing it off and providing livestock with alternative crossings or drinking water.

7.3.3 Spreading near domestic dwellings and public buildings

Air pollution from livestock manures and slurries must be considered whenever there is a risk of public nuisance caused by odours or a potential risk to public health from harmful organisms. This applies to fixed installations such as slurry stores and manure stores, as well as to land spreading operations. When spreading, use low trajectory equipment.

Be a 'good neighbour'. Spreading of livestock slurry and manures should be done sensitively and avoided where possible:

- Close to domestic or public buildings.
- At weekends or public holidays.
- When the wind direction is towards public/residential areas.
- In areas designated for their conservation value.
- During the hours of darkness, unless this is not otherwise practicable.
- Close to public access areas, footpaths, picnic areas.
- On windy days.

[6] See 13Glossary
[7] See 13Glossary

7.3.4 The correct soil conditions

The quantity of liquid slurry that can be applied to an area without causing surface run-off is dependent on soil type and conditions including structure, moisture content, infiltration rate and surface gradient. As the permeability and infiltration rate of a soil decrease as the surface gradient increases, the risk of surface run off is increased. To minimise this risk, liquid slurry should not be applied at rates greater than the infiltration capacity of the soil and at no time during periods when a soil is waterlogged. This applies to both surface application and soil injection methods. The use of heavy, fully laden tankers in wet conditions increases the risk of soil compaction and damage, which will reduce the infiltration capacity of the soil and increase the potential for run-off.

Spreading slurries and manures at a time when conditions are not ideal also costs money later, in terms of remedial works to overcome compaction/tracking and the associated crop yield reduction or reseeding requirement.

7.3.5 Spreading on sloping ground

The application of slurry and manure on sloping ground should be carried out with care to prevent the risk of run off entering a watercourse. Also safe-working practices associated with vehicle operation on slopes must be followed at all times. Factors to consider include:

- Any watercourse at the bottom of slope.
- Soil type and condition.
- Gradient.
- Weather conditions (before, during and after application).
- Application rates.
- Presence of buffer area.
- Avoiding contamination of growing crops in neighbouring fields.

7.3.6 Use of buffer strips

Where livestock has ready access to a watercourse, water can become polluted with animal waste. The banks of a watercourse can also become eroded or ‘poached’ leaving them open to erosion by the watercourse. Fencing a watercourse from livestock access and allowing vegetated buffer strip to establish will protect both water quality and the water margin. An alternative to allowing livestock to drink from a stream or pond can be provided by a suitable sized water trough or siphoning system connected to a drinking bowl.

In addition, buffer strips can filter pollutants running from the field. In an intensively farmed situation a buffer strip will also act as a place of refuge for wildlife and provide connections to other habitats. Applications for fencing to exclude livestock from a watercourse and provide them with an alternative water source will be considered for financial support under the Rural Support Scheme (RSS).

7.3.7 Matching slurry and manure production pattern to land availability

A land availability schedule should be matched to a slurry and manure production schedule to ensure storage facilities on the farm are adequate and that organic manures can be utilised

efficiently. An account of slurry (and/or manure) being collected should then be compared to the amount which can be viably spread taking account of all crop, stock and field constraints.

7.3.8 Making use of meteorological data

Check the forecast before spreading slurry or organic materials. A field that is normally suitable for slurry application and is a low pollution risk could become unsuitable and a high pollution risk following heavy rainfall. Check local weather forecasting information prior to proposed application.

7.3.9 Wind direction and force

Wind direction and force will dictate days when spreading should be avoided to prevent air pollution from drift and odour affecting residential and other sensitive areas.

Full account should be taken of the weather (particularly prolonged wet weather) prior to any intended application being made and to the consequent field conditions. Effect on the risk assessment should be considered.

7.3.10 Spreading during flooding

Flooding of low-lying fields adjacent to watercourses can occur at certain times of the year. Application to these areas should be avoided when there is a risk of flooding; consideration should be given to previous flood patterns.

7.3.11 Spreading during periods of snow

Liquid and semi-liquid livestock slurries should not be applied to ground with snow cover, as there is a high risk of run-off during the subsequent thaw.

7.4 Types of application methods for organic fertilisers

7.4.1 Tanker application systems

Tanker systems must never be over-filled to avoid risk of spillage during filling, transit and unloading. Closure of valves should be checked after filling and emptying to prevent leakage during travel. The operator must determine and set the application rate taking full account of all the factors identified above.

The discharge system should produce a low trajectory-spreading pattern which will improve application accuracy, minimise the risk of odour nuisance and losses of ammonia to the environment[8]. Excessive soil compaction by the tanker will be reduced by reducing the load on each wheel and by fitting larger tyres to spread the load. Avoid spreading when the soil is wet and at risk of being compacted or rutted.

7.4.2 Irrigation

[8] See the UK Code of Good Agricultural Practice for reducing ammonia emissions. https://www.gov.uk/government/publications/code-of-good-agricultural-practice-for-reducing-ammonia-emissions

Irrigation systems (including low rate irrigation systems) require regular checking to ensure automatic movement and speed of mobile irrigators is correct to avoid over-application. Application rate must be selected taking account of field conditions and crop cover. It is difficult and/or often impractical to achieve low enough application rates with static irrigators.

The responsibility for operation of the system must be given to a competent person who must check the field for signs of over-application, e.g. ponding, run-off, etc. Mobile irrigators must shut off automatically at the end of each run. Any water used for flushing should be treated in the same manner as the slurry and manure. Operators must be aware of potential odour nuisance and take any necessary action to minimise this.

7.4.3 Soil injection

Injectors can be supplied by tanker or umbilical systems. Soil type and structure, stones, slope and stage of crop growth will often limit the circumstances when and where injection can be successfully carried out. Applications of injected slurry should take account of the soil conditions and N required. In areas where there is a risk, work the injector across the slope, rather than up and down.

7.4.4 Use of contractors

You should only employ agricultural contractors to spread slurry and manure to land that are competent and appropriately trained, aware of legal requirements and are prepared to follow the guidance in this Code. Always agree beforehand what responsibilities and measures the contractor will need to take to avoid pollution and odour nuisance and provide them with all essential information specific to your land. They also need to keep and provide you with a record of what has been applied and where.

7.5 Treatment of waste slurry

Normally following the practices described earlier in this Section should be sufficient to prevent or at least minimise environmental pollution and waste treatment systems will not be required. On some farms however, slurry handling and storage problems may be eased by separation of the solid and liquid fractions of slurries by using mechanical separators such as screen or belt presses, vibrating screens or centrifuges.

The cost of providing and operating treatment systems can be high. Before deciding if these technologies are cost effective and are a practical solution for your farm, professional and specialist technical advice should be sought and the Natural Environment consulted for advice on issues such as waste licencing and discharge permitting.

8 Clamps and Silage Effluent

8.1 About silage effluent

Silage effluent is produced from any forage crop which is being made, or has been made, into silage. It is also defined as a mixture consisting wholly of or containing such effluent, rain or groundwater emanating from a clamp, silage effluent collection system or drain.

It is an offence under the Water Pollution (Jersey) Law 2000 to allow silage effluent to pollute the island's controlled waters. Silage should be stored in containment facilities or clamps/silos which have been constructed to meet minimum standards for installations used for the storage of such substances and their associated effluents. New or substantial alterations to silage containment facilities will require planning permission to ensure they are constructed to the correct standard.

Silage effluent is highly acidic and corrodes steel and concrete surfaces, causing deterioration of cracks and joints in silo floors, collection channels and tanks, making it very difficult to contain and collect all the effluent.

8.2 Silage making

The volume of effluent produced depends on the moisture content of the crop being ensiled. This in turn depends on factors such as the maturity of the crop, the degree of wilting, the weather conditions, the use of additives and absorbents (e.g. dried sugar beet pulp) and whether the silo is roofed or unroofed. The peak flow of effluent normally occurs within two to three days of ensiling the crop. Up to 50% of the total volume of effluent is produced in the first ten days. The table below demonstrates that the typical volume of effluent likely to be produced varies significantly with the dry matter of the crop ensiled.

8.2.1.1 **Dry matter content of grass ensiled and quantity of effluent produced**

Dry matter content of grass ensiled (%)	Effluent production (litre/tonne of grass ensiled)
10-15	450-360
16-20	300-50
21-25	90-0

Wilting is therefore very desirable but is highly dependent on weather conditions at the time of silage making. The ensiling of crops with a relatively high dry matter content, such as whole crop cereals, results in less effluent production. Farmers should always be prepared to contain, collect, store and dispose of any effluent and should be aware that the use of some silage additives tends to increase the amount of effluent produced. In a wet year, very high volumes of effluent have to be dealt with and even greater care is required.

The objective should be to reduce the volume of effluent to a minimum. Rainwater falling directly on the silo cover should be diverted and drained separately from the silage effluent if practicable.

When the silo is being used, rainwater falling on the floor will become polluted and must be collected. A roof over the silo with an independent rainwater drainage system will minimise the quantities of effluent which require to be handled. Care should be taken by directing rainwater through a sealed system to a suitable outfall to ensure roof drainage does not become contaminated.

The regular monitoring of collection tank levels should be undertaken at all times but with greater frequency during the first ten days following ensiling to contend with peak flow rates of effluent,

and during periods of wet weather. Many factors influence effluent flow, such as depth of silage, efficiency of drainage within the silo and the use of certain additives. Tank levels must be checked throughout the year especially in the autumn/winter and not just during silage making. All contaminated water must be collected and by-pass systems must never be used.

8.3 Construction, management and maintenance of silage facilities

The Water Pollution (Jersey) Law 2000 provides for the control of pollution in Jersey waters including coastal waters, inland waters and groundwater. New and substantial alterations to silos are subject to planning and building control permission to ensure they meet required construction standards. Officers from the Natural Environment have powers to enter premises where water pollution is suspected and inspect existing structures to ensure they do not pose a significant risk of pollution.

All silos, effluent tanks and any associated pipes and channels must be designed in such a way that with proper maintenance, they will prevent silage effluent from causing a risk of water pollution. All parts of the silo must be sited at least 10m from a watercourse, including permeable drains (e.g. field drains) and open ditches, to which any escaping effluent could enter.

Silage stored in freestanding field heaps should have an impermeable base and an effluent containment system. They should be sited at least 10m from a watercourse, including permeable drains (e.g. field drains) and open ditches, to which any escaping effluent could enter.

All new or substantially amended silage containment systems must comply with BS5502 standards.

Farmers should check and empty their effluent collection systems as often as is necessary in the light of their own circumstances and experience. Additionally, farmers should take advantage of other appropriate storage facilities elsewhere on the farm e.g. slurry store, for the storage of silage effluent as part of an Organic Fertiliser Management Plan and/or Pollution Contingency Plan.

If possible, a farmer should try to have an effluent tank which has a capacity in excess of the minimum requirement. An effective alarm system, ideally with audible and visible alarm (i.e. warning lights), will provide an early indication that tanks are almost full, thus avoiding overflow. For unroofed silos, it is important to take account of the volume of surface water run-off and plan accordingly.

It is important to remember that effluent can also be produced from other livestock feeds such as maize silage and whole crop cereals, thus making it essential that such effluent is collected and not allowed to escape and cause pollution.

Best practice dictates that two aspects of the effective management of a silage making operation (in addition to health and safety) must be undertaken namely:

- Maintenance of silos to retain minimum performance standards.
- Management of a silo at all times but particularly during periods of maximum effluent generation to confirm that there are no leakages, that the drainage system is working effectively and that the tank is not allowed to overfill.

8.3.1 Maintenance

The silo drainage system and effluent tank must be carefully inspected for any signs of surface corrosion, cracking of concrete or fractured pipes.

The following procedure should be carried out each year immediately after the silo is emptied:

- Empty and, when safe to do so, visually check the effluent tank.
- Do not enter the tank, as poisonous gasses may be present.
- If it is necessary to enter for repair purposes, seek specialist advice on safety requirements.
- Clean any areas which cannot be clearly seen.
- Inspect walls, floors and wall floor joints for cracking or surface corrosion.
- Reseal all sealed joints where the jointing material has been damaged.
- Inspect all drains and channels for damage.
- Check that all channels and pipework are free flowing.
- Check all safety arrangements.
- List all repairs required and prepare a timetable to execute the work.

There are often only a few weeks between silos being emptied and refilled. As many materials require time to cure before being exposed to effluent, plan ahead to ensure the silo is emptied completely and that there is sufficient time before silage making begins to properly complete any works as soon as practicable.

8.3.2 Management

It is essential that frequent checks be made to ensure that the drainage system is free running and that the effluent tank does not overflow.

The design criteria of BS5502 require that there are internal drains along the bottom of the walls to reduce pressure. Where the silage is made as a wedge or grass ramps are used, care must be taken that the ramp does not extend beyond the silo's drainage system, to ensure that the effluent is contained.

The filling of unroofed silos requires planning if the maximum quantity of rainwater is to be diverted from the effluent tank. The aim is to dome or shape the top of the silo so that water falling on the cover is directed away from the working end of the pit. To achieve this in solid walled silos, the covering sheet should extend over and out from the end or one side of the silo. It is important that silo covers are properly secured in place by the use of weights and are regularly inspected to ensure they remain intact.

While any silage remains in the pit, all effluent and contaminated rainwater (floor, cover and silage) must be collected and disposed of. When empty, the silo may be washed down but on no account should wash waters be discharged to a watercourse.

All adjacent ditches, streams or watercourses should be checked regularly (preferably daily) for signs of pollution, particularly when silage effluent is being produced just below the point of discharge of the surface water drainage system from the farm. If any pollution is found, immediate action should be taken to remedy the situation. The Natural Environment should also be notified using the emergency phone number.

8.4 Disposal of silage effluent

Silage effluent has a Biochemical Oxygen Demand (BOD) of up to 200 times that of raw sewage. Although aeration treatment can significantly reduce the BOD strength of silage effluent, it cannot be treated to a safe level for discharge to a watercourse.

BOD is a measure of how much a substance reduces oxygen in the watercourse whilst breaking down. If silage effluent is allowed to enter a watercourse it rapidly strips oxygen from the water, killing fish, plants and other aquatic life.

Silage effluent should be diluted by a minimum of 1:1 with water and spread safely on land. The application rate should be determined by the land suitability and crop cover and should never exceed a maximum rate of $9m^3$ or 1980 gallons per vergée ($50m^3$/ha or 4500 gallons/acre) in any 12-month period. It is advised to apply at a lower rate to avoid scorching and in that case any repeat application should not be made within 3 weeks. The maximum rate of application should also be reduced if the soil has been compacted.

Silage effluent is also a significant source of nutrients, with a high proportion of these nutrients readily available to the growing crop. An analysis of the nutrient content should be carried out and this should be accounted for in your Farm Manure and Crop Nutrition Plans and in determining crop requirements.

Soakaways are not an acceptable method of effluent disposal and must not be used. Fresh silage effluent can be a valuable feedstuff on which livestock thrive. Increasingly farmers are appreciating this and a growing number are collecting and storing silage effluent to feed back to their livestock.

9 Non-agricultural wastes and other imported organic wastes

9.1 About non-agricultural wastes and other imported organic wastes

The main non-agricultural organic wastes applied to agricultural land arise from sewage treatment, water treatment and compost producers. Although many of these wastes potentially have valuable fertilizing and soil conditioning properties, their storage and application under unsuitable conditions or at inappropriate rates can give rise to pollution and contamination of soil, water or air.

This section recommends appropriate management practices for waste producers, contractors and farmers so as to avoid or minimise the risk of pollution, while enabling sustainable agricultural practices to continue.

Application to agricultural land should be carried out as a method of beneficially recycling nutrients to the soil and not as a method of waste disposal.

Persons carrying out spreading activities on farm should be suitably trained, qualified and competent to carry out the operation involved. Farmers and contractors should be aware of legal requirements and willing to follow the guidance in this Code.

All applications of organic wastes brought in to be spread on farmland should be included in the calculations within your Organic Fertiliser Management Plan and your Nutrient Management Plan.

The spreading of non-agricultural waste and other imported organic wastes on land has to be carried out in compliance with the Waste Management (Jersey) Law 2005. The waste can only be spread if it is beneficial to agriculture. Any resulting contamination of controlled waters could be an offence under the Water Pollution (Jersey) Law 2000.

The Waste Management (Exemptions from Licensing) (Jersey) Order 2006 allows certain non-agricultural wastes and other imported organic wastes to be applied to agricultural land. The operations do not need a waste management licence but are controlled under exemptions detailed in the above Order.

If you are unclear about any of the requirements, contact the Natural Environment.

Spreading waste without being able to demonstrate that it is beneficial to agriculture may be an offence under the Waste Management (Jersey) Law 2005.

Farmers receiving non-agricultural wastes and other imported organic wastes should establish and agree what responsibilities and measures the waste provider or contractor will need to take to avoid pollution. Best practice guidelines dictate that producers, carriers and disposers of waste must ensure that:

- Waste is not kept, treated or disposed of illegally.
- An adequate written description of waste accompanies the transfer of waste.
- The waste is held securely and does not escape.
- The waste is only passed to persons authorised to receive it.

9.2 Maximum application rates of non-agricultural wastes and other imported organic wastes

Any application of organic waste to agricultural land must be included in an Organic Fertiliser Management Plan and Nutrient Management Plan. You must ensure the total nitrogen applied from all organic manures does not exceed 250 kg per hectare of total nitrogen in any 12-month period of which only 170 kg per hectare of total nitrogen may be from livestock manure (including slurries).

However, if the only organic fertiliser to be applied is compost then the compost may be applied in levels of up to 500 kg of nitrogen per hectare over any 24-month period as long as –

a. It does not contain livestock manure;
b. It is applied as mulch or worked into the ground
c. It is produced to the British Standards Institute specification for composted materials PAS100 or equivalent standard; and
d. The Minister has given written permission for the application.

You must keep accurate records of all organic wastes applied to agricultural land, undertake a risk assessment to avoid run off and pollution from any spreading activity using the guidelines in this code.

9.3 Storage of non-agricultural waste and other imported organic wastes

Wastes should be removed from premises in a timely manner for appropriate disposal or recycling and not left indefinitely to accumulate.

Storage sites for organic wastes should be fenced to exclude livestock and should be located a suitable distance away from residential areas. Wastes stored while waiting to be applied to land (and waste being applied to land) can cause a nuisance such as obnoxious smells. It is therefore essential to act as a good neighbour taking into account wind direction, slope, and soil type and field conditions before siting a waste store or applying waste to land.

To minimise the risk of causing water pollution when storing in temporary locations, you must:

- Store material close to where it will be spread and in a position where there is no risk of run off polluting water.
- Only store organic material that can be stacked and remain in situ.
- Locate heaps over 10m away from a watercourse, ditch or field drain and 50m away from a spring, well or borehole.
- Avoid storing organic material in field heaps in one place for any longer than 12 months and then avoid using the same location again for at least two years.
- Organic wastes, other than sewage sludge, intended to be spread on land for agricultural benefit must be on the land intended to be used for spreading.

9.4 More about other organic materials and waste

9.4.1 Vegetable wastes

These are commonly spread to land. However, there is a risk of introducing pests and diseases, such as potato brown rot, potato ring rot and potato cyst nematode, through the spreading of waste derived from ‘imported’ agricultural or horticultural produce to arable land. Guidance on methods to minimise plant health risks by the management of waste from the commercial handling of certain types of plant produce is provided in the Code of Practice for the Management of Agricultural and Horticultural Waste.

9.4.2 Animal processing wastes

Animal processing wastes are tightly regulated and are not suitable for spreading to land. The land-spreading of unprocessed abattoir waste, including blood is also prohibited.

9.4.3 Sewage sludge

The use of sewage sludge on farmland in Jersey must be in compliance with best practice as set out in the UK Sludge (Use in Agriculture) Regulations 1989 (as amended) and the associated Sewage sludge on farmland: code of practice for England, Wales and Northern Ireland (Updated June 2017). These are also known as 'The Sludge Regulations', which are designed to control the build-up of Potentially Toxic Elements (PTEs) in soil and restrict the planting, grazing and harvesting of certain crops following the application of sludge.

Further guidance on the application of sewage sludge to farmland is provided in 'The Safe Sludge Matrix 2001' (an agreement between the UK water industry and the British Retail Consortium on sludge use). Responsibility rests with the producer of the sludge for compliance with The Sludge Regulations in regard to the analytical testing of the sludge. Farmers should not allow spreading without this having been done.

The only sewage sludge provider in Jersey is the Infrastructure, GHE who will analyse the sewage sludge and the soil in each field prior to application whilst maintaining detailed records of applications of all sludge to farmland.

9.4.4 Composting

The composting of biodegradable controlled waste on agricultural land is exempted under Article 3, The Waste Management (Exemptions from Licensing) (Jersey) Order 2006. The maximum quantity being composted at any time under the exemption must not exceed 1000 cubic metres, unless agreed by the Waste Regulator, GHE. The above exemption applies only if composting takes place where the waste is produced or the compost is to be used or at any other place that is occupied by the person producing the waste or using the compost.

Composting operations must be carried out in a way that does not endanger human health or harm the environment or present a risk of pollution of controlled waters.

9.5 Determining the suitability of wastes for land application

9.5.1 Wastes with high nutrient content

Wastes which contain significant quantities of nutrients may have valuable fertilizing properties. The rate and timing of application of waste must be matched to the nutrient requirements of the crop. If this is exceeded, then the operation will be classed as waste disposal rather than fertilisation. To be of fertiliser value, at least part of the nutrient content should be available or become available for plant uptake within 12 months of application.

Some non-agricultural wastes contain other important nutrients (e.g. sulphur and magnesium) or a range of trace elements. If, however, a trace element deficiency has been diagnosed, it is important to apply a specific treatment because the trace element content of most non-agricultural wastes is generally insufficient to correct a deficiency.

The Fertiliser Manual RB209 provides detailed information on the nutrient requirements of crops and grass, as well as the fertilizing value of different types of manures, slurries and other inorganic fertilisers.

Chemical analyses of the waste usually measure the total quantities of nutrients they contain. However, the effectiveness or availability of these nutrients for crop uptake must be assessed before the fertiliser value of the imported waste can be calculated. Certain wastes with a high C: N ratio may not initially release any of its nitrogen for plant uptake as a result of a temporary locking-up of plant available N (immobilisation).

9.5.2 Liming value, pH and salinity

Wastes such as lime sludge can have a high liming (neutralising) value which makes the waste a useful liming material for acid soils. Care must be taken however to avoid raising the soil pH too high through excessive applications as this may lock-up some trace elements. The best practice guidelines advise against the spreading of sewage sludge on soils with a pH less than 5.0.

The application of wastes which have a high level of salinity or acidity can result in damage to soils and crops as well as causing the risk of water pollution.

9.5.3 Soil conditioning

Certain non-agricultural wastes can act as a soil conditioner and may also add useful amounts of organic matter to the soil which may improve soil structure and increase the water holding capacity. However, such improvements to soil conditions will only be significant if regular and well managed dressings of bulky and highly organic wastes are made to a low organic matter soil. Best practice guidelines should be followed so that soil organic matter levels are maintained through appropriate practices, including optimising the use of organic manures by basing rates of application on soil and crop needs.

9.5.4 Wastes with a high biochemical oxygen demand (BOD) and chemical oxygen demand (COD)

Wastes with a high BOD or COD will be highly polluting if allowed to enter a watercourse by seepage or run-off. Application of such wastes can also result in a temporary soil oxygen depletion leading to poor plant growth. You must take reasonable steps to manage such wastes.

9.5.5 Consideration of contaminants and pathogens

The amount of PTEs (see below), organic contaminants and pathogens, and environmental risks of any particular waste type can vary greatly from one waste producer to another. There can also be great variability in the analysis on a monthly basis for any particular waste producer. Farmers should seek up-to-date and representative analysis from the waste producer (or waste contractor) and seek agronomic and environmental advice. It is important that accurate records of the type of waste and rate of application are kept for each field.

Check the ‘The Safe Sludge Matrix’, Red Tractor, LEAF or any other quality assurance schemes your farm adheres to together with your produce buyer before using non-agricultural wastes, as there may be commercial consequences.

9.5.6 Potentially toxic elements (PTEs)

Certain wastes such as those from sewage works, distilleries etc. can have high levels of metals and must be used with caution. It is strongly recommended that application of non-agricultural wastes should be made at a rate which does not exceed the levels specified for heavy metal loadings as given in The Sludge Regulations.

9.5.7 Organic contaminants

Wastes from some industrial processes may contain significant quantities of other potentially toxic organic substances, antibiotics or residual pesticides and must not be applied to agricultural land. It is, therefore, essential that full details of the waste is assessed and a comprehensive analysis is carried out to determine if application to land is safe[9].

10 Preventing pollution from pesticides

Reducing the pollution of water by pesticides is a key aim in Jersey. This section of the code has been included to provide guidance to ensure the safe use of pesticides. For more detailed information and guidance please contact the Natural Environment and refer to the Pesticides (Jersey) Law 1991 and associated Code. There are also a number of additional voluntary measures being taken by farmers and growers through the Action for Cleaner Water Group initiatives. For more information contact the Natural Environment or the Jersey Farmers Union. *See 2.2 Useful* Contacts, *Sect. 2.2.*

10.1 About pesticides

For the purposes of this Code, pesticides include crop protection chemicals such as herbicides, fungicides, growth regulators and insecticides. They also include substances, preparations or organisms prepared or used as pesticides to protect plants or products from harmful organisms or pests. In legislation some of these chemicals may be defined as 'biocides'.

The use of pesticides is controlled in Jersey under the Pesticides (Jersey) Law 1991 (as amended). The Law and the associated Jersey Code of Practice are currently being reviewed (January 2020). To ensure you have the most up to date information and guidance please contact the Natural Environment. See Useful Contacts, Sect. 2.2.

Pesticides have the potential to damage the environment and harm wildlife if poorly or inappropriately used. In arable farming areas in particular, pesticides can contribute to diffuse pollution via field run-off, spray drift and accidental spillages. Users of pesticides, and their advisers, must therefore ensure that pesticides are used correctly.

If a pesticide is to be applied, the label recommendations must be followed. If the application is to be made under an EAMU (extension of authorisation for minor use), that label must be in the possession of the user. The adoption of a Crop Protection Management Plan (CPMP) can assist in optimising inputs and minimising risks.

[9] contact the Waste Regulator, GHE if in doubt (tel: 709535)

10.2 Pesticide pollution incidents

The Water Pollution (Jersey) Law 2000 contains pollution prevention provisions and provides for offenders to be prosecuted if they pollute 'controlled waters'. Controlled waters includes coastal waters, streams, reservoirs, ponds (even if they are dry) and groundwater. This Water Code is a statutory Code of Practice under Article 16 of the Water Pollution (Jersey) Law 2000. This means that the approved Code will be relevant to a defence in Law of due diligence under Articles 15 (3), 18(4) and 18(5) of that Law.

Pesticide pollution may occur accidentally or through inappropriate handling at any stage of use - during storage, mixing, application, or from subsequent disposal of the dilute pesticide washings or the used containers.

If any spillage occurs, immediate action should be taken to limit the effects and to warn others who may be affected (particularly downstream water users) and the Water Pollution Hotline tel: 709535.

Pesticide users should be equipped for a spillage and have a contingency plan to deal with such incidents. The two key aspects to this plan are to have a list of all emergency contact numbers and sufficient absorbent materials to cope with any spillage. You may also need to carry out a 'Control of Substances Hazardous to Health' (COSHH) assessment. If in doubt, seek professional advice.

The disposal of solid waste arising from the clean-up of spillages, including pesticides, contaminated equipment, protective clothing and absorbents should be arranged with a licensed waste disposal operator.

10.3 Training in pesticide use

Anyone involved in the use of pesticides on a farm or holding must have adequate training in the safe, efficient use and disposal of pesticides - including emergency action in the event of spillages.

Holding a Certificate of Competence in the safe use of pesticides such as the NPTC 'Certificate of Competence in the Safe use of Pesticides' is a statutory requirement. Training in Jersey is undertaken by several local providers. Please phone the Agricultural Inspectorate at the Natural Environment for more details.

Farmers and growers are not allowed to retain products that are no longer approved for use. Also, they have to carry out spray operations on approved crops only, and whilst the Jersey Code is being developed, follow the UK Green Code[10] using the pesticide at the correct dosage levels and leaving sufficient 'buffer zones' so that the spray does not enter watercourses. Records including product, application rate, crop, field and date of use must be maintained.

[10] UK Code of practice for using plant protection products.
https://www.hse.gov.uk/pesticides/resources/C/Code_of_Practice_for_using_Plant_Protection_Products_-_Contents_and_Official_Status.pdf

10.4 Sustainable use of pesticides

There are increasing demands on farmers and growers to apply pesticides only where they are justified. Furthermore, to minimise their use, pesticides should comprise part of an integrated control programme using alternative control methods wherever possible. An integrated approach reduces pesticide use and associated environmental risks. A note of the reason or justification for pesticide use forms part of many quality assurance schemes (e.g. through being asked to prepare a Crop Protection Management Plan) and is good practice for every farmer and grower.

The UK Sustainable Use Regulations requires operators to ensure pesticide use is as low (both in volume applied and frequency) as reasonably practicable in certain areas such as infrastructure close to surface and groundwater, areas used by the general public and vulnerable groups, near healthcare facilities, in conservation areas and areas used or accessed by agricultural workers. Guidance on the Sustainable Use of Pesticides is available from the HSE website.

In order to make sound decisions on pesticide use, crops need to be inspected regularly for disease, weed and pest infestation.

In line with the UK Regulations on Sustainable use, preference should be given to products that represent a lower risk to the aquatic environment and/or drinking water supplies and those that do not contain priority hazardous substances. If you are unsure, seek advice from your qualified BASIS adviser.

The label should always be read before using a pesticide. Pesticides should only be used for the purpose for which they are approved. Even if a pesticide is used regularly, the label should be consulted as revisions do occur including changes to the legal requirements. If in doubt about pesticide use, a BASIS qualified adviser should be consulted.

10.5 Storage of pesticides

Guidance on the storage of approved pesticides is given in HSE Agricultural Information Sheet No 16 'Guidance on Storing Pesticides for Farmers and Other Professional Users'.

- A chemical store should be properly maintained and be large enough for its intended use and be constructed of fire-resistant materials.
- The store should be designed to contain any leaks or spillages to the capacity of 110% of the maximum store contents. In areas where there are particular environmental concerns this may require to be increased to 180%.
- Don't store more pesticide than is intended for use.
- Stores should not be sited in areas where there is a risk of pollution to watercourses or groundwater, and your emergency contingency plan should include a map of your farm’s pesticide store in relation to streams, wells and boreholes.
- Planning requirements may impose restrictions on storing pesticides in certain catchments to protect drinking water supplies. Before erecting a new pesticide store or substantially altering existing storage arrangements, specialist advice should be sought.

10.6 Mixing pesticides and filling sprayers

Pesticides can easily pollute the environment. Even during the careful opening of a pesticide container and pouring into a sprayer tank, small drops can create potential 'point' sources of pollution. These small amounts can cause pollution if they are allowed to run off into watercourses/ groundwater.

The careful selection of the location of pesticide handling and wash down areas is important. At the farm, these operations should be carried out on areas specifically designed and constructed for this purpose. In the field, these operations must be carried out at least 10m from watercourses and at least 50m from springs, wells and boreholes. Additionally, every precaution should be taken to prevent spillage from entering field drains.

Where possible, full use should be made of equipment that reduces the risk of pollution when filling sprayers (e.g. induction hoppers, closed transfer systems, direct injection). Where possible, techniques such as closed-handling and pre-mixing of pesticides should be used.

Water for filling the sprayer should be drawn from an intermediate tank and never directly from the mains or a watercourse, as there is a danger of back-siphoning occurring.

Guidance on the design of pesticide handling and wash-down areas is available from the CPA (Crop Protection Association) under the Voluntary initiative (VI) tool at http://www.voluntaryinitiative.org.uk/water/advice/

10.7 Application of pesticides

Pesticides should only be used where there is justification and where conditions are suitable for application. Take the following actions prior to applying pesticides:

- Carry out a COSHH assessment.
- Read the pesticide product label, paying particular attention to the Statutory Information.
- Ensure the applicator is serviced and calibrated.
- Check that the correct nozzles are attached.
- Check the correct forward speed and boom height for spraying.
- Ensure the correct water volume and application dose of pesticide.

In addition to the information on the product label, help with selection of nozzle type is available on a Home Grown Cereals Authority (HGCA) chart, in CPA leaflets and British Crop Protection Council (BCPC) Handbooks. When spraying near to a watercourse, low drift nozzles are advised to prevent contamination, LERAPS must be followed and mandatory buffer zones near streams must be adhered to.

There are some circumstances when the approved use of a pesticide may present a particular risk to groundwater. Groundwater in Jersey is vulnerable because of the shallow water table and light sandy soils: pesticides may therefore move rapidly through the ground and enter groundwater. This may be of particular concern where the groundwater is feeding a drinking water supply. In general, persistent pesticides must not be applied within 50m of a spring, well or borehole and

you should consider the use of all pesticides carefully, as pollution of these waterbodies may result in prosecution.

10.8 Storage of pesticide spraying equipment

During use, sprayers and tractors will become coated with pesticide residues. This is particularly the case for the rear of tractors/sprayers where negative pressure can produce a fine coating of residues.

It is therefore important to keep all spraying equipment, including tractors and booms etc. out of the rain and under cover when not in use.

Take care on your speed when driving sprayers on the road. A small spill near a watercourse can have a large detrimental impact.

Special consideration must be given when washing down spray equipment, as the waste water and loose soil generated can be heavily contaminated with pesticide residues. Some modern machinery is equipped to complete this process in the field, however if you plan to wash down application equipment on your farm you must ensure the process does not cause pollution.

10.9 Correct record keeping

Records of the justification, application rates, dates and location of applications of pesticides, together with the type used, should be kept in accordance with the UK 'Green Code' (whilst the Jersey Code is being developed).

10.10 Sensitive habitats

There are certain areas of farmland which are particularly sensitive. For example, arable field margins, the strips of land lying between potato crops and field boundaries managed specifically for the benefit of wildlife. Field boundaries are another sensitive habitat as pesticide drift into hedges or ditches will reduce their value for wildlife. Wetter habitats such as marshy grassland and permanent pasture are also very sensitive to pesticide and herbicide drift. Information about sensitive species and habitats in Jersey are available from the Natural Environment. *See 2.2 Useful* Contacts, *Sect. 2.2.*

10.11 Crop protection management plan

In the UK the pesticides industry's Voluntary Initiative (VI) is a package of measures aimed at reducing the adverse environmental impact of pesticides use and improving farmland biodiversity. To further this aim, the Crop Protection Association (CPA) and supporting organisations have developed the concept of Crop Protection Management Plans (CPMP), a measure that encourages farmers and growers to produce a CPMP for their businesses. A CPMP will set clear management objectives and identify specific issues that need to be addressed as well as the actions needed including alternatives to using pesticides. Guidance on preparing CPMPs is available from the Department of the Environment, the CPA, agricultural advisers and online.

Two further voluntary initiative measures are the National Sprayer Testing Scheme (NSTS) and the National Register of Sprayer Operators (NRoSO). Farmers and Growers are advised to ensure

that any contracted sprayers used are registered with the NRoSO and that equipment is tested in accordance with the NSTS. Local advisers should be consulted for advice on these measures.

10.12 Local environmental risk assessment for pesticides (LERAP)

The use of LERAPs is now permitted in Jersey. Certain plant protection products have an aquatic buffer zone requirement when applied by horizontal boom or broadcast air assisted sprayers. If you want to reduce this a LERAP needs to be carried out. However, if you just want to apply the buffer zone on the label you don't have to carry out a LERAP but you should still record this in your spray records. If a product has the use of drift reduction technology (DRT) as a condition of horizontal boom spraying, then this should also be recorded. A record of where a buffer zone has been applied should be recorded in your pesticide application records.

10.13 Controlling pesticide drift

In order to minimise the impact of pesticide drift onto non-target crops, vegetation, wildlife habitats or watercourses, it is important to take account of droplet quality and weather conditions.

Conditions are unsuitable for spraying where the wind speed is greater than Force 3 on the Beaufort Scale (4.0 to 6.0 mph or 6.5 to 9.6 km/h). Even at Force 3 there is an increased risk of spray drift and special care needs to be taken. Detailed guidance on these points is set out in the UK 'Green Code'.

10.14 Disposal of pesticides and containers

10.14.1 Waste pesticide and pesticide washings

It is not only a false economy to continue storing unused pesticides as an alternative to disposal, it is illegal if the approval for storage and use has been withdrawn. On no account may waste concentrates be diluted for disposal. Good stock control in store prevents waste. In some instances, it may be possible to return unwanted, unused pesticides to the supplier. Alternatively, holders of such materials will need to use the licensed waste disposal operator.

10.14.2 Waste pesticide and pesticide washings

Whenever possible sprayers should be washed and rinsed out in the field where the pesticide has been used, using the minimum amount of water necessary and ensuring that the maximum dose is not exceeded.

If the sprayer is washed out elsewhere and the resulting washings cannot be used on the treated crop, these washings should be collected for disposal by the licensed waste disposal operator.

The washing facilities provided must be designed to ensure that back siphoning of pesticides into the water supply cannot occur. Non-return valves should be fitted to any taps connected to spray equipment. Such activities will produce a relatively large volume of water contaminated at low concentration with pesticide. If suitable, the contaminated water may be used later for making a further batch of the same dilute pesticide. On completion of wash-down, protective clothing involved in the operation should be cleaned, washed and rinsed within the area used for cleaning the sprayer. Single use coveralls should be stored in a separate locker prior to disposal.

Other acceptable options for dealing with waste pesticides and pesticide washings are:

- Application to previously untreated crop areas, within the permitted use of the pesticide (as per product label) and absence of water bodies.
- Treat waste using bio-filters/beds. Please contact Natural Environment to obtain advice.
- Do not discharge water used for hydroponics unless you have a discharge permit (issued by Consumer and Environmental Protection, Regulation, GHE).
- Storage of the waste in a suitable container pending delivery or collection by a licenced waste disposal operator.

10.14.3 Disposal of pesticide containers

Unless the product label clearly states otherwise, cleaned containers and surplus concentrate must be disposed of through the licensed waste disposal operator. Empty pesticide containers and measuring vessels must be thoroughly rinsed out and the rinse water should be returned to the sprayer.

The cleaned containers should never be reused or left lying about, as they can be a source of pollution and a potential safety hazard due to the presence of residues. The burning or burial of empty, even rinsed, pesticide containers is not allowed.

Farmers and growers should check whether manufacturers and suppliers of pesticides offer a recovery service for used containers. Empty pesticide containers should never be re-used for any purpose except where the manufacturer offers a refilling service. Containers of liquids, except those liable to produce hazardous gases, should always be thoroughly rinsed into the spray tank before disposal or return. Label instructions for cleaning should be followed or, in the absence of any instructions, the container should be thoroughly rinsed and the rinsing liquid added to form part of the spray dilution. Different conditions apply to the containers of solid or granular pesticides. Ensure you follow the label recommendations and dispose of these appropriately.

Once the container has been cleaned, all foils and seals should be placed within the container and the cap re-attached. If practicable, the labels should not be disfigured. Containers should be stored in a secure compound pending their disposal. Such waste will generally be accepted by the licensed waste disposal operator.

11 Fuel and Oil

Fuels and oils are used in a wide range of machinery and for heating. Accidental spillages of oil into watercourses and onto land can have serious impacts for plant and animal life in Jersey and cause long lasting pollution of water.

If a loss of oil to land occurs, specialist advice and assistance may be necessary. The Department of the Environment should be notified immediately of any oil loss that might cause pollution tel: 709535.

The Building Bye-Laws set standards for building work. Their aim is to ensure the health and safety of people in and around buildings by setting requirements for building design and construction.

Liquid fuel storage systems (and the pipes connecting them to combustion appliances) with a capacity of 3500 litres or less must comply with the Building Bye-laws (Jersey) 2007 (as amended). There are technical guidance documents available on the gov.je website or from the Department of the Environment, Planning and Building Services that give more detailed guidance on the standards required to meet the Bye-Laws. *See 2.2 Useful* Contacts *Sect. 2.2.*

Fuel oil installations with a capacity of more than 3500 litres must comply with BS 799-5:1987 Oil Burning Equipment.

The Building Bye-Laws are not retrospective so tanks which were installed prior to 2007 may not meet current standards. However, it is an offense under the Water Pollution (Jersey) Law 2000 to pollute any controlled waters (e.g. surface water, groundwater, coastal waters) with oil. In any event you should consider replacing tanks that are older than 20 years old or that are no longer fit for purpose.

11.1 Design and construction of fuel stores and tanks

All liquid fuel storage systems should meet the requirements of BS5410. It is recommended that fuel tanks are located above ground as this makes them easier to check and maintain. In cases where they have to be sited underground the tank must be contained in a specially constructed waterproof chamber with access that allows a complete walk around inspection, plus a bund sensor with an alarm. Pipework and off-set fill pipes are common causes of leaks and should be installed to be compliant with Building Bye-Laws.

Storage tanks should be labelled to describe tank capacity and fuel type. All oil storage installations should also carry a label in a prominent position giving the water pollution hotline number and advice on what to do if a spill occurs. *See 2.2 Useful* Contacts, *Sect. 2.2.*

11.2 Secondary containment of fuel storage tanks (bunds)

Bunds, whether part of a prefabricated tank system or constructed on site must have a capacity of at least 110% of the largest fuel tank they have been designed to contain. Bunds constructed of masonry or concrete must be in accordance with the guidance contained in the technical guidance documents available on the gov.je website or from Planning and Building Services Regulation that give more detailed guidance on the standards required to meet the Bye-Laws. Oil tanks with integral bunds must also comply with the relevant standards. *See 2.2 Useful* Contacts, *Sect. 2.2.*

Every part of the container must be within the bund including all taps, valves, pipes and these must discharge downwards into the bund. Permanently attached flexible pipes must be fitted with automatic cut off taps and valves which must be locked shut when not in use to mitigate against tampering by third parties. No outlet should be provided in the bund as this could allow escape of fuel oil and cause a major pollution incident.

Where applicable a system for the removal of rainwater and spillages must be provided for example a small sump for removal by a hand pump. Providing a roof will reduce the volume of waste material collected in the sump where practicable.

11.3 Location of fuel storage

Considerations for siting include the location of other buildings as well as the location of the nearest drains, watercourses and water supplies. No part of the fuel oil storage facility should be within 50m of a borehole, well, or spring or within 10m of any inland water. Avoid locations where a spillage could contaminate other storage materials such as animal feeds.

Fire and the possibility of spillage should be considered. Further advice on fire protection can be found in the Technical Guidance Documents available on the gov.je website or from the Department of the Environment, Planning and Building Services. *See 2.2 Useful* Contacts*, Sect. 2.2.*

11.4 Access to fuel stores

This should satisfy the needs of delivery and business vehicles. Good artificial lighting should be considered for the area to provide safe working conditions and for security reasons in some situations.

Areas around the store on which vehicles park to load and unload should ideally be concreted. If possible, the drainage gradients should be inwards to the storage area. Drains leading to controlled waters should be fitted with a suitable oil trap and/or some means of sealing the drain in an emergency.

11.5 Operational management of fuel stores

Where feasible, the delivery of fuel should be supervised and only when unavoidable should ladders or steps be used. In such cases it is essential that *Health and Safety* regulations are followed.

When used, tanks with top openings should be provided with a suitable system to hold the filler pipe in position. Where the filler pipe connection is below the maximum fuel level in the tank, a tap or non-return valve must be fitted to prevent spillage when the filler pipe is disconnected.

A method to indicate the level of the fuel oil in the tank should be provided. Gravity is frequently the method adopted for transferring the contents from the storage tank and this necessitates the tank being raised above the level of the vehicle's fuel tank. Good working access and a trigger valve should be provided to prevent the operator overfilling the vehicle's tank.

11.6 Maintenance of fuel stores

- The storage area and bund should be regularly checked for the presence of water and fuel oil to ascertain that there have been no failures of the structure. The bund should be frequently emptied of accumulated rainwater.
- The storage tank(s) and associated pipes and valves should be regularly checked for leakage.
- The tank, if made of steel, will require regular maintenance of the exterior surface.

11.7 Temporary storage of fuel in mobile tanks

The same care and attention should be given to the installation and use of mobile fuel tanks as those for permanent storage. Installation should be to the same basic specification and be fitted with equivalent safety devices as necessary to minimise spillage of oil.

The fuel systems of engines used to drive pumps (e.g. irrigation pumps) should be regularly checked to ensure they are in good working order. Any leakage of fuel would pose a significant risk of pollution.

Avoid temporary storage of fuels and oils in places from which a leak or spill could enter a watercourse or groundwater. Great care must be taken in transferring fuel oil from cans or drums to the fuel tank of an engine.

11.8 Safety Precautions for fuel stores

A Contingency Plan should be prepared to cope with any possible potential spillage and proprietary spill kits should be available to deal with any clean up. Any contaminated spill kits (after use in a spillage) should be disposed of to a suitable licensed site.

A supply of sawdust, or proprietary oil absorbent, should be provided close to the fuel oil store. This can be used to soak up relatively minor spillage and/or contain a more serious spillage.

All relevant personnel should be aware of the pollution risks associated with fuel oil and the details of the contingency plan and actions necessary to deal with any emergency.

Never use detergents to clean up an oil spill. This will cause an increased and unacceptable risk of environmental harm. In the event of an emergency telephone the Water pollution hotline number tel: 709535.

12 Waste management and minimisation

12.1 The Waste Management (Jersey) Law 2005

The Waste Management (Jersey) Law 2005 regulates waste disposal activities including wastes generation. Sites for the disposing, treating or recovering of waste need a licence from the Department of the Environment unless they are exempt under the Waste Management (Exemptions from Licencing) (Jersey) Order 2006.

12.2 Responsibilities

If you handle, treat, recover or dispose of wastes on land it is your responsibility to ensure that your arrangements for waste are compliant. The Department of the Environment can offer help and guidance. *See 2.2 Useful* Contacts, *Sect. 2.2.*

Do not dispose of (or store indefinitely) scrap metal, plastic or other rubbish on land or land tips and do not burn wastes (other than natural plant matter, wood and vegetation) as a means of disposal. Wastes are substances or materials which the holder discards, intends to discard, or is required to discard.

Some wastes have hazardous properties (e.g. waste oil, lead acid batteries and asbestos cement sheeting) - these are called hazardous wastes. Hazardous wastes are subject to additional controls to reflect the higher risk associated with them. The waste producer must correctly identify the hazardous nature of the waste to any person storing, carrying or otherwise dealing with the waste.

Anyone who imports, produces, carries, keeps, treats or disposes of controlled waste (hazardous waste, health care waste or municipal waste) or, as a broker, has control of such waste, has a duty of care to ensure that:

- They do not cause pollution of the environment or harm to human health.
- They prevent the escape of waste from their control or that of any other.
- Wastes are only passed onto persons who are authorised to accept them.
- A written description of the waste (e.g. on a transfer note) is provided at the handover of the waste to any third party to enable them to comply with their duty of care and take any such precautions in handling the waste and ensure it is taken to a licenced or exempt site which is authorised to deal with that category of waste.

Prior to importing, carrying, keeping, treating or disposing of waste, it is important to ensure that a person is authorised to do so. Persons who accept wastes for storage, treatment or disposal will either require an appropriate licence or the activity may in certain circumstances be exempt from licensing. Transporters of hazardous and/or health care wastes, (which includes waste from veterinary treatment), must not carry them in a motor vehicle on a public road unless they are registered to do so with the Department of the Environment.

12.3 Fly-tipping

Fly-tipping is a criminal offence under the Waste Management (Jersey) Law 2005 and any such activity should be reported to the Department of the Environment, Parish and/or the States Police. These bodies will investigate incidences where fly tipping has occurred and can instigate proceedings against perpetrators where they can be identified. A convicted fly tipper can receive an unlimited fine and/or up to two years imprisonment.

12.4 Bonfires on land

The open burning of any wastes (other than exempt activities described below), should not take place. The open burning of waste as a means of disposal is not accepted practice and can cause pollution. Burning plastics, packaging, tyres or waste oil in the open can produce large amounts of polluting smoke and is illegal. Residues from plastics and tyres in particular will contaminate the ground and can cause pollution of groundwater and watercourses. Burning them at low temperatures, typical of a bonfire or open drum, will allow toxic compounds to escape into the atmosphere.

There is an exemption from this prohibition for the burning on open land of controlled waste consisting of wood, bark or other plant matter, if:

- The waste is produced in or on a woodland, park, garden, verge, landscaped area, sports ground, recreation ground, churchyard or cemetery, or it is produced on other land as a result of demolition work.
- The burning is carried out on the land where the waste was produced.
- The total quantity of all such wastes that are burned in any period of 24 hours does not exceed 10 tonnes.

However, open burning should only be undertaken with great consideration for your neighbours and the environment. Smoke emissions from burning wastes can cause an offence under the Statutory Nuisances (Jersey) Law 1999.

12.5 Land spreading of beneficial wastes

The use of controlled waste that is beneficial to the environment is exempt from licensing and this is outlined below. This can be applicable to both livestock slurries and manures generated on the farm as well as non-agricultural waste and other 'imported' organic wastes which can provide nutrients and other benefits to agricultural land.

You should maintain a record of evidence that the land spreading of such wastes is beneficial to your agricultural land and include them in your Farm Manure and Crop Nutrition Plans (including waste nutrient analysis, crop nutrient requirement, volumes and date applied and advice received from your FACTS qualified advisor).

The use of controlled waste is considered to be beneficial to the environment, if;

- It is put to use without further treatment.
- The use does not amount to disposal.
- The quantity that is being stored for beneficial use does not exceed 100 tonnes.

Producing and following an 'Organic Fertilizer Management Plan' will help maximise the value of manures and slurries produced on farms and will reduce the loss of nutrients from land and the runoff of dirty water from yards used by livestock.

13 Glossary

13.1.1 Amenity Land

Under the Water Pollution (Water Management) (Jersey) Order 2020 amenity land means any land (not covered by a building) used as a park, garden, playground, golf course, sports field or for any other recreational purpose.

13.1.2 Fertiliser

Under the Water Pollution (Jersey) Law 2000 and for the purposes of the Water Pollution (Water Management) (Jersey) Order 2020 the definition of fertiliser means a chemical or natural substance that is added to soil to improve its productivity. This includes bagged fertiliser, lime, slurry, Farmyard Manure and other manures, compost, sewage sludge and other similar 'natural' and man-made materials applied to land for beneficial use.

13.1.3 Heavily grazed field

A heavily grazed field is a field or parcel of land that is grazed or occupied by livestock intensively. As a guideline it is considered heavily grazed if there is more than 340 kg/N/Ha (which is 60 kg/N/verge) of urine and dung deposited by livestock on the field in any 12-month period.

These loafing paddocks and heavily grazed fields should not receive any additional organic matter from the spreading of slurry, farm yard manure, compost, sewage sludge or other material which will further enrich their fertility leading to leaching and runoff of nutrients.

Example; Dairy Herd of 200 Jersey milking cows restricted to a grazing block around the farm amounting to 80 vergées over a grazing/outdoor loafing period 1st March – 30th September each year.

Assumptions

1. One cow deposits 45kg of 10% DM muck and urine containing 0.36% N in any 24-hour period.
2. Dairy herd grazing or loafing on the 80 vergée grazing block for 20 hours (83% of 24-hour period) for 214 days period.
3. Heavily grazed Nitrogen disposition limit 340kg/ha per annum (60Kg/N per vergée per annum).

Calculation

- 200 cows x 214 days x 45kg x 83% = 1,598,580kg (1,598.6 tonnes) 10% DM muck per annum.
- 1,598,580kg x 0.36 %N /80 vergées = 71.9 Kg N deposited per vergée per annum.

Conclusion

71.9 Kg N per vergée per annum is above the threshold for N inputs from dung and urine from grazing animals of 60Kg N per vergée per annum. Therefore no further slurry or FYM should be spread on the farm's 80 vergée grazing block.

13.1.4 Poor drainage

Drainage means the process of removing water from the soil that is in excess of the needs of crop plants.

The causes of poor drainage of agricultural land in Jersey is either related to low lying fields or to soils that have been cultivated or ploughed at the same depth on an annual basis leading to the formation of a hard soil pan just below cultivation depth and/or harvesting and cultivating in wet soil conditions leading to restricted water movement through the soil strata resulting in soil erosion problems.

13.1.5 Livestock poaching of agricultural land

Poaching is the damage caused to turf or sward by the feet of livestock. Hooves cause compaction of the soil surface, leaving depressions which can be 10cm to 12cm deep. This can form an almost continuous layer of grey anaerobic soil, where natural activity, carried out by soil micro-organisms, is low. Widespread poaching lowers sward productivity, with knock-on consequences for meat or milk yield. It can also lead to welfare issues such as lameness, while mastitis and somatic cell counts can rise. Poaching will also lead to an increased risk of run-off as water is unable to permeate soil, and can give farming a poor image.

Regularly used tracks and highly-stocked fields in wet conditions or cattle having access to wet areas, particularly around inappropriately-placed or overflowing water troughs, will cause poaching. Feeding rings left in the same position also cause problems.

Frequent movement of livestock along the same routes, such as cows to milking parlour, also puts pressure on fields closest to farm buildings.

Poorly-drained soils, badly-maintained ditches and blocked drains create a sward prone to poaching. Grazing new leys too early in the season or when excessively wet should be avoided.

Surface compaction, caused by cattle or machines/ vehicles, can lead to poaching of the top surface while the substrata remain dry. Water becomes trapped as it cannot drain away quickly because it cannot permeate soil.

13.1.6 Loafing paddock

Field (or parcel of land) occupied by livestock on a regular basis to enable them to exercise but which provides minimal grazing or forage intake for those livestock from the grass or other crop growing in that field.

Note: The above fields can become enriched by the continuous deposit of manure and urine from regular use by livestock leading to leaching and runoff problems.

13.1.7 Rotation

A rotation is the practice of growing a number of different crops in the same field over successive seasons. This is good agricultural practice as it can be used to provide a barrier to crop pest and diseases and allows land managers to ensure soil characteristics such as organic matter are sustainably managed. The sowing of a cover crop outside of the main growing season is considered a catch crop and is not a rotation.

13.1.8 Soil compaction

Heavily compacted soils contain few large pores and have a reduced rate of both water infiltration and drainage from the compacted layer. This occurs because large pores are the most effective in moving water through the soil when it is saturated. In addition, the exchange of gases slows down in compacted soils, causing an increase in the likelihood of aeration-related problems (such as poor root growth). Finally, while soil compaction increases soil strengthening (the ability of soil to resist being moved by an applied force-a compacted soil also means that roots must exert greater force to penetrate the compacted layer).

With farm tractors and field equipment becoming larger and heavier, there is growing concern around soil compaction. Soil compaction can be associated with the majority of field operations that are often performed when soils are wet and more susceptible to compaction. Soil structure is important because it determines the ability of a soil to hold and conduct water, nutrients, and air that are necessary for plant root activity. Although much research has been conducted on soil compaction and its effects on yield, it is difficult to estimate an economic impact because fields vary in soil types, crop rotations, and weather conditions.

13.1.9 Soil erosion

Soil erosion is the significant displacement of the upper layer of soil on land. The agents of soil erosion are water and wind, each contributing a significant amount of soil loss each year. Soil erosion may be a slow process that continues relatively unnoticed, or it may occur at an alarming rate causing a serious loss of topsoil. The loss of soil from farmland may be reflected in reduced crop production potential, lower surface water quality and damaged drainage networks.

Excessive (or accelerated) erosion causes both 'on-site' and 'off-site' problems. On-site impacts include decreases in agricultural productivity and a loss of soil fertility due to the loss of the nutrient-rich upper soil layers. Off-site effects include sedimentation of watercourses and eutrophication of water bodies, as well as sediment-related damage to roads and houses. Soil carried off in rain or irrigation water can lead to sedimentation of streams, ponds and coastal areas. The problem is exacerbated if there is no vegetation left along the banks of ponds and watercourses to hold the soil.

14 Other Useful Links and Documents:

Code of Good Agricultural Practice **for Reducing Ammonia Emissions**

This information explains the practical steps farmers, growers, land managers, advisors and contractors in England can take to minimise ammonia emissions from farms. Recommended measures include ways of storing and applying organic manures, ways of applying fertilisers, and modifications to livestock diet and housing.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/729646/code-good-agricultural-practice-ammonia.pdf

Code of Practice for Using **Plant Protection Products (The UK 'Green Code')**

Produced by DEFRA and the Health & Safety Commission (HSC), this is the latest version of the UK code of practice for the safe use of plant protection products. Whilst Jersey has a separate Pesticides Code of Practice, the guidance in this document is more recent and following it will be considered good practice.

http://www.hse.gov.uk/pesticides/resources/C/Code_of_Practice_for_using_Plant_Protection_Products_-_Complete20Code.pdf

Health and Safety Executive Pesticide Approvals

An online search tool that allows you to search for current product approvals by MAPP number or product name. This search tool should be used when conducting your regular pesticide store inventories to ensure you are aware of upcoming revocations. Other information such as details on EAMUs are also available through this page.

https://secure.pesticides.gov.uk/pestreg/ProdSearch.asp

Jersey Farm Risk Map

An online search tool that allows you to look up the current risk rating for local fields. This tool is designed to supplement your current risk ratings and should be used as a baseline tool, field conditions and your knowledge of ground conditions should be used to determine the true actual risk before any field operations commence. https://statesofjersey.maps.arcgis.com/apps/webappviewer/index.html?id=08c3015f8e8e4a3c961701390d3c2d29

Protecting our water, soil and air

A Code of Good Agricultural Practice for farmers, growers and land managers which offers practical interpretation and provides good advice on best practice. Good agricultural practice means a practice that minimises the risk of causing pollution while protecting natural resources and allowing economic agriculture to continue. It has been written by technical specialists from Defra and Natural England.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/268691/pb13558-cogap-131223.pdf

The Nutrient Management Guide (RB209)

Published by the AHDB, the Nutrient Management Guide (RB209) helps you make the most of organic materials and balance the benefits of fertiliser use against the costs – both economic and environmental. The guide explains the value of nutrients, soil and why good nutrient management is about more than just the fertilisers you buy; it can save you money as well as help protect the environment.

https://ahdb.org.uk/nutrient-management-guide-rb209

ENDNOTES

Table of Legislation History

Legislation	Year and No	Commencement	◦Projet No (where applicable)
Water Pollution (Approval of Code of Practice) (Jersey) Order 2020	R&O.15/2020	4 March 2020	

◦Projets available at statesassembly.gov.je

Table of Endnote References

There are currently no endnote references