Environment Protection Authority

Code of practice for the environmental management of the South Australian oyster farming industry

Draft for public consultation

EPA South Australia

Code of Practice for the Environmental Management of the SA Oyster Farming Industry – Draft for public consultation

For further information please contact:

Information Officer
Environment Protection Authority
GPO Box 2607
Adelaide SA 5001

Telephone: (08) 8204 2004
Facsimile: (08) 8124 4670
Free call (country): 1800 623 445

Website: <www.epa.sa.gov.au>

Email: <epainfo@epa.sa.gov.au>

ISBN 978-1-921125-00-3

April 2017

Disclaimer

This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice.

Contents

List of figures

Summary

The commercial culture of Pacific oysters in South Australia began in the late 1960s. Today, the industry is sustainable and contributes significantly to the economic prosperity of regional South Australia.

The majority of farmers in South Australia focus on the culture of Pacific oysters, *Crassostrea gigas* with some farmers also culturing commercial quantities of native flat oysters, *Ostrea angasi.* Key farming areas in South Australia include Ceduna, Coffin Bay, Cowell, Kangaroo Island, Smoky Bay, Streaky Bay and Yorke Peninsula.

Oyster culture methods vary from farm to farm, with farmers using either the rack and rail method, longlines, or a combination of the two to grow oysters. Oysters are grown in subtidal or intertidal areas of the marine environment, with other activities associated with oyster farming taking place predominantly at land-based facilities.

Although aspects of oyster farming may differ between farms, there are a number of environmental issues that are relevant to the sector as a whole. If the farm is not appropriately designed or managed, there is potential for environmental harm.

Every oyster farmer has a general environmental duty, as described in section 25 of the *Environment Protection Act 1993* to avoid causing environmental harm. The code of practice provides a set of guidelines containing specific requirements, advice and information that describe how oyster farmers can comply with their general environmental duty and minimise the potential for environmental harm.

1 About this code

1.1 Purpose and application

The aim of this Code of Practice is to assist oyster farmers in complying with EPA legislation and, in doing so, ensure that oyster farming activities do not cause environmental harm. This is achieved by identifying potential environmental issues associated with the farming of oysters and providing management actions to address these issues (Section 2).

Figure 1 illustrates the links between codes of practice, the Act and the EPPs.

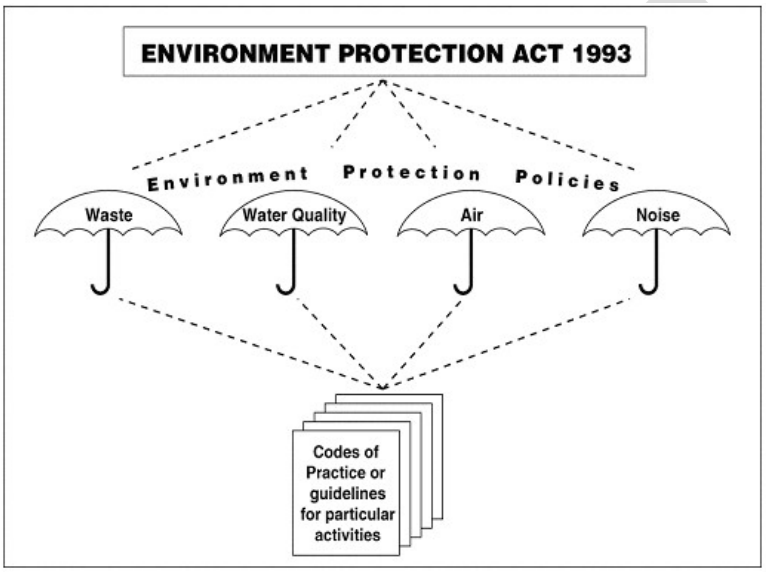

Figure 1 Links between the codes of practice, the EP Act and the environmental protection policies

The Code applies to all operational aspects of oyster farming including land-based hatcheries, intertidal and subtidal marine farming sites, vessels and land-based oyster depots

1.2 EPA's role in the regulation of the oyster Industry

Primary Industries and Regions South Australia (PIRSA) is the agency responsible for the sustainable development and ongoing management of the South Australian aquaculture industry which incorporates leasing and licensing, policy development, environmental assessment and monitoring, aquatic animal health and compliance. This is administered under the *Aquaculture Act 2001, Aquaculture Regulations 2016* and relevant aquaculture policies.

The Environment Protection Authority (EPA) is a mandatory referral agency for PIRSA licence applications under the Aquaculture Act 2001 and also works closely with PIRSA to ensure the management of the oyster industry is in alignment with the objectives of the *Environment Protection Act 1993* (EP Act) and environment protection policies (EPPs).

With respect to oyster farming, the scope of PIRSA legislation only applies to licensed marine farming sites and hatcheries, and not land-based oyster depots. Aquaculture licence-holders must ensure that all aspects of their operations, including both licensed sites and land-based depots, comply with EPA legislation.

The key issues of particular legislative interest[1] to the EPA include:

- protection of water quality
- management of noise and air quality (principally dust and odour)

[1] Either through objects of the Act or relevant EPPs

- solid waste management and disposal
- storage, use and disposal of hazardous substances[2]
- ecological impacts.

Section 3 of this Code provides further information on these environmental issues that may potentially be associated with oyster farming activities and is referenced to the applicable EPA legislation.

1.3 Other relevant and important legislation

Besides PIRSA and the EPA, oyster farmers also need to be aware of other legislation relevant to their farming activities. This legislation is administered by other agencies including but not limited to:

- Department of Environment, Water and Natural Resources (DEWNR)
- Department of Planning Transport and Infrastructure (DPTI)
- local councils.

It is important for oyster farmers to recognise this Code only reflects EPA requirements and does not include environmental legislation administered by these agencies which may apply to their activities. It remains the oyster farmers' responsibility to comply with all legislation[3], whether or not that legislation is referred to in this document.

1.4 Benefits of using this Code

Besides assisting farmers with meeting EPA requirements, there are other potential benefits to farmers in applying this Code. These include:

- Demonstrating compliance with the general obligations of the EP Act and associated environment protection policies.
- Providing a positive image to the community and other interested stakeholders by demonstrating the environmental responsibility of the industry.
- Improving marketing capacity with the production of an environmentally sustainable product.
- Identifying environmental requirements that can assist with obtaining relevant approvals should a farmer wish to expand or diversify.
- Assisting with the production of environmental management accreditation systems (EMS) for individual businesses.
- Helping to provide a cleaner environment for everyone.

[2] The *Dangerous Substances Act 1979* and the *Controlled Substances Act 1984* also regulate the keeping, handling, conveyance and use of dangerous and controlled substances, and provide directives on how the substances must be stored and disposed of.

[3] Relevant legislation may include but is not limited to the *Aquaculture Act 2001, Aquaculture Regulations 2016, Agricultural and Veterinary Products (Control of Use) Act 2002, Coast Protection Act 1972, Controlled Substances Act 1984, Dangerous Substances Act 1979, Development Act 1993, Fisheries Management Act 2007, Local Nuisance & Litter Control Act 2016, Marine Parks Act 2007, Natural Resources Management Act 2004, National Parks and Wildlife Act 1972*, and *Native Vegetation Act 1991.*

2 Achieving best practice environmental management

All aquaculture licence-holders must ensure that their operations comply with the EP Act and associated environment protection policies. The operational requirements and advice presented in this section aim to assist oyster farmers with compliance, and ultimately achieve best practice environmental management.

The two key words used throughout this section are 'MUST' and 'SHOULD'. These requirements aim to be outcome based and not prescriptive and therefore should enable farmers to continue their own individual methods of farming oysters while meeting the overall environmental objectives of the Code. Operators are encouraged to use their experience, knowledge and ingenuity within their own industry to develop tools to avoid pollution.

MUST ⇒ indicates a requirement[4] which if ignored, is likely to lead to a breach of the EP Act or relevant EPPs, or may expose the environment to a risk of harm.

SHOULD ⇒ represents a recommended practice that oyster farmers need to have regard to in order to meet their general environmental duty.

Failure to comply with a 'MUST' may result in enforcement action such as the issuing of an environment protection order (EPO). An EPO typically requires a farmer to take specified action within a certain period of time. Failure to comply with an EPO can lead to prosecution.

Farmers should also ensure that all staff members employed on the farm are aware of their obligation to comply with the requirements specified in this Code.

It should be noted that environmental issues addressed within particular activities could also be applicable to other activities associated with oyster farming even though they may not be highlighted within that segment of the Code.

2.1 General obligations

The Code is structured in a manner that enables an oyster farmer to identify what their EPA requirements are for different activities associated with oyster farming. However there are some requirements that are applicable across all operational practices which are detailed in this section.

Farmers must:

1 Take reasonable and practical measures to ensure that the discharge or deposit of any pollutant from oyster farming does not cause environmental harm.

2 Not discharge or deposit a listed pollutant[5] into any waters including stormwater. Listed pollutants of relevance to oyster farms include, but not limited to, fuels and lubricants, high pressure water blasting waste, putrescible waste, and washdown water from cleaning and detergents.

3 Apply the Waste management hierarchy (Figure 2) when managing and disposing of waste and wastewater that is produced as part of oyster farming activities. The application of this hierarchy aims to minimise the potential for environmental harm as well as to improve resource recovery and minimise waste going to landfill.

[4] Mandatory practice in accordance with requirements of the EP Act and associated environment protection policies. Other legislation, such as that administered by PIRSA and DEWNR, also contain mandatory practices that will not be specified in this document.

[5] As specified in Schedules 2 and 3 of the *Environment Protection (Water Quality) Policy 2015*.

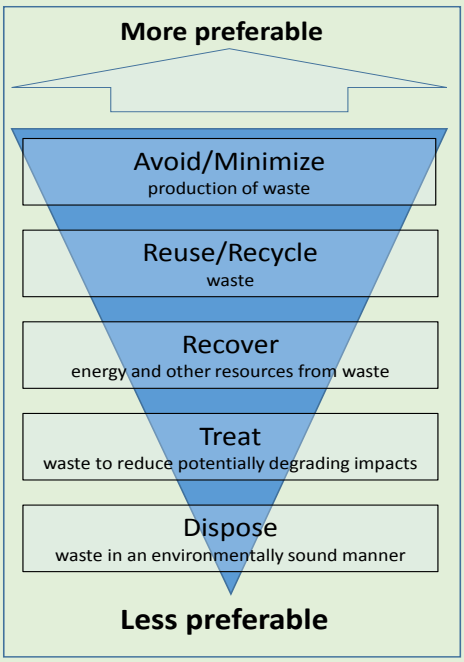

Figure 2 Waste management hierarchy

4 Ensure that all waste and hazardous substances (eg fuels, oils, veterinary chemicals) on site are stored and disposed of in a lawful manner and does not result in contamination of land or any waters. The preferred option for disposal is via kerbside waste collection or at licensed waste facilities if this service is not available at the farm or is not suitable for general collection (eg hazardous waste).

5 Not exceed the noise limits as specified in Tables 1 and 2 of Clause 5(9) of the *Environment Protection (Noise) Policy 2007* (refer to EPA Information Sheet – General environmental noise). Permitted noise levels will depend on the land-use category specified in the relevant Development Plan.

6 Take all reasonable and practical measures to minimise offsite noise and odour impacts to neighbouring properties.

2.2 Design and construction of oyster farms, hatcheries and support facilities

When planning a facility, it is important to ensure the location is suitable for its intended use, and development approval is obtained from the relevant planning authority before any construction work commences.

Potential environmental issues that need to be considered when designing and constructing oyster facilities include machinery noise, waste from excess or broken equipment and impacts on vegetation (both aquatic and terrestrial) and water quality. Consideration also needs to be given to the management of stormwater runoff for land-based facilities and treatment of wastewater prior to discharge.

Oyster growers will need to contact their relevant planning authority to identify if development approval is required prior to commencement of any construction work.

Water quality

Farmers must

1 Ensure that any soil or sand that is disturbed for the construction of the farm or any support facilities is managed to avoid contamination of any waters or smothering of aquatic vegetation such as seagrass.

2 Seek EPA authorisation or use a licenced contractor for dredging if any construction within the marine environment requires the removal of solid matter such as sand and/or rock.

3 Design any land-based depot or hatchery system to prevent leakage/seepage of salt water from pipes, tanks, ponds and other infrastructure into groundwater or result in surrounding soils becoming contaminated by salt.

4 Incorporate treatment mechanisms into a pump-ashore system design to ensure that discharged water meets the requirements of the *Environment Protection (Water Quality) Policy 2015* at the receiving waters, in particular for nutrient and sediment levels.

5 Meet the requirements of the *EPA Guideline: Wastewater lagoon construction* when designing and constructing wastewater storage lagoons (eg settlement ponds). This includes constructing lagoons so they are:

   a appropriately sized to retain nutrients, sediments and chemicals

   b do not intersect or leak into any underlying seasonal water table

   c prevent overflow of wastewater unless the overflow has been contemplated in the approved design and normal operation.

6 Ensure that septic systems are constructed so that waste is not discharged into any waters or onto land where it may enter any waters unless it meets the requirements of clause 16(2) of the Water Quality Policy.

7 Construct land-based facilities in accordance with the EPA Stormwater Pollution Prevention: *Code of Practice for the building and construction industry*.

Farmers should

8 Construct and position infrastructure so as not to inhibit dispersal of bio-deposits through natural tidal flow or predominant water current, eg by ensuring sufficient distances between rack and rail or longlines.

Noise

Farmers must

9 Not undertake construction work that impacts the amenity of an area (including demolition, site preparation works, building maintenance and/or repair work) on a Sunday or other public holiday, and on any other day except between 7 am and 7 pm. Construction may be permitted during other times to avoid unreasonable interruption of vehicle or pedestrian traffic or if other grounds exist that is deemed sufficient by the Authority or other administering agency (See *EPA Information Sheet – Construction noise* or contact the EPA for further information)[6].

Farmers should

10 Minimise construction activities that involves particularly loud noise (eg jack hammering) to after 9 am from Monday to Saturday.

11 Ensure that any potentially noisy equipment is housed or sited appropriately if there is potential for impact on neighbouring properties. Noisy equipment may include graders, basket washers, pumps, generators, refrigeration, air-conditioners, etc. NB: The level of acceptable noise levels will depend on the land-use category that is prescribed in the relevant council development plan.

[6] This provision only applies for construction undertaken under development authorisation from the planning authority. Indicative noise provisions apply as per clause 5 of the Noise Policy for all other noise.

Air quality

Farmers must

12 Ensure that dust produced from construction on land-based sites is minimised so that it does not affect neighbouring properties.

13 Design and locate basket-washing areas and waste bins in an area to minimise potential odour impacts on neighbouring properties.

Solid waste

Farmers must

14 Not allow construction waste to be blown, washed or swept off site and recover any construction waste that that has been blown, washed or swept off site as soon as possible.

Farmers should

15 Ensure that drainage systems in oyster sheds incorporate mechanisms (eg sumps) to capture putrescible waste such as barnacles and shell grit during cleaning.

16 Use durable, long-life materials for the construction of the farm that will not readily deteriorate and result in waste or loss from the site.

17 Ensure that equipment is appropriately designed to withstand local conditions to minimise the potential for equipment loss in the event of storms, wave action, currents, wind, etc.

Hazardous substances

Farmers must

18 Consider the EPA guideline: *Copper-chromated arsenate (CCA) timber waste – storage and management when using CCA treated timber*.

19 Store CCA treated timber posts in a manner that minimises potential for seepage of chemical compounds into soils (eg off the ground or on a hard stand area).

20 Ensure that materials (including treated timber) used for building and construction purposes are stockpiled in a manner that prevents leachates from contaminating the stormwater system or other waters, eg by wind or rain erosion.

21 Ensure generators, fuel tanks and other similar equipment are located/housed in a manner that contains any fuel spills and/or leakages to prevents the contamination of land, stormwater and the aquatic environment (see *EPA Guideline: Bunding and spill management*.

22 Avoid disturbing acid sulfate soils if they are found to occur on the site, and remediate if disturbed.

Farmers should

23 Only use treated timber that is approved for use in the marine environment

24 Avoid the use of timbers treated with CCA, creosote or pentachlorophenol in water structures[7]

[7] The use of H6 CCA treated timber in marine waters is approved by the APVMA. Australian research indicates that there is insufficient evidence to suggest that CCA-treated timber leachates pose an unreasonable risk to the marine environment. Studies have also demonstrated that CCA residues have not been found in oysters. However, the disposal of treated timber to landfill and its inappropriate storage can have impacts on soil and waters. The EPA does not encourage the use of treated timber for sea-based infrastructure, though it does not oppose its use.

25 Aim to use materials such as recycled plastics OR choose naturally marine resistant renewable timbers, such as turpentine timber (*Syncarpia glomulifera*) OR endeavour to purchase pre-immersed treated timbers for use in aquatic construction (harmful volumes of leachate can be removed this way).

Ecological effects

Farmers should

26 Minimise disturbance to aquatic vegetation, sand dunes, foreshore areas and vegetation during the placement of pipes and other associated hatchery infrastructure

27 Position and construct culture equipment to minimise the potential for sand accretion, and scour and shading of seagrass

2.3 Stock management

2.3.1 General husbandry

Stock management incorporates husbandry practices such as stocking, grading and harvesting of oysters. Optimal stock management will reduce the potential for disease outbreaks, mortalities and the establishment of wild populations.

Overstocking of sites may lead to excess biodeposition on the seafloor which may result in affecting the benthic environment including aquatic vegetation or other marine organisms living in the sediment. Biodepositions may also lead to elevated nutrient levels and result in excessive algal and epiphyte growth.

The use of rack and rail and placement of baskets across longlines may also impact on seagrass through shading. This has been evident in some areas using this method of culture.

Noise

Farmers must

1 Take all reasonable and practicable measures to minimise the adverse effect that off site noise from graders and other noisy equipment may have on neighbouring properties.

Farmers should

2 Minimise the use of noisy equipment after 7 pm during weekends and public holidays.

3 Be aware of the land-use category applicable to the location where the noise is occurring, eg lower noise levels apply to depots operating in residential areas than to those operating in light industrial areas.

Solid waste

Farmers should

4 Undertake harvesting and grading under suitable conditions to minimise stock losses.

Ecological effects

Farmers must

5 Not stock oysters at a rate such that the accumulation of faecal matter (biodeposits) exceeds the capacity of the site to disperse and/or assimilate it.

6 Avoid practices that disturb or impact seagrass and other sensitive habitats.

Farmers should

7 Rotate seed trays, baskets and racks located over seagrass on a regular basis to minimise impacts to seagrass that may result from shading.

8 Regularly monitor/record seagrass presence on sites (eg photos, video) to quantify changes over time.

2.3.2 Management of mortalities

Stock mortalities are inevitable on oyster farms and can result from disease, poor health, mishandling, sub-optimum water quality and a variety of other causes. The extent of mortalities may range from day-to-day mortalities of a few oysters to large-scale mortalities resulting from disease or an environmental event (eg algal bloom)[8]. Oyster mortalities predominantly comprise of empty shells. Inappropriate disposal of dead oysters may result in contamination of land or water, odour or attraction of vermin.

Water quality

Farmers must

1 Not dispose of dead oysters at sea.

2 Store and dispose of dead oysters in a manner that does not pollute nearby surface waters, groundwater or stormwater.

Air quality

Farmers must

3 Store and dispose of any dead oysters in a manner that does not result in any offsite odours or attraction of vermin (eg flies) that is likely to impact neighbouring properties.

Solid waste

Farmers must

4 Contact the EPA for advice in the event of burying or composting large volumes of organic waste on site.

Farmers should

5 Regularly remove dead oysters from the site and dispose of them appropriately. Potential methods may include waste depot facilities licensed to receive specified wastes, and crushing and compositing shells.

6 Avoid burying dead oysters on site.

7 Develop a contingency plan that deals with unexpected large volumes of dead oysters that may occur in the event of a fish kill due to water quality, disease, etc.

8 Investigate the potential for composting organic waste on site or using methods to recycle or reuse oyster shells.

9 Dispose of oyster mortalities in accordance with *EPA Guideline: Management of aquaculture stock mortalities*.

2.3.3 Veterinary chemical use (hatcheries)

Chemicals may be used in oyster hatcheries to treat (therapeutants) or prevent (prophylactants) disease or promote spawning. Inappropriate chemical use may contaminate the surrounding environment or affect other fauna or flora.

Many chemicals are listed pollutants as specified in the EP Act and the Water Quality Policy and must not be discharged into any waters unless they are used in accordance with the Aquaculture Regulations 2016 administered by PIRSA or approved by the Australian Pesticide and Veterinary Management Authority (APVMA).

[8] PIRSA is the regulatory authority for the management of fish health and the Aquaculture Regulations require farmers to contact PIRSA when unusually high numbers of mortalities are experienced.

Water quality

Farmers must

1 Ensure that chemicals (listed pollutant) used to treat disease or for spawning do not result in environmental harm to the aquatic ecosystem.

2 Store and use chemicals in a manner that prevent spillage/runoff into stormwater and other waters.

3 Seek EPA authorisation if discharged water contains antibiotic or chemical water treatments, and the total volume of the discharges exceeds 50 kL per day.

Hazardous substances

Farmers must

4 Only use chemicals that are permitted by the APVMA via registration or a minor use permit, or approved by PIRSA in accordance with Aquaculture Regulations 2016.

5 Use veterinary chemicals in accordance with label directions and/or as prescribed by a veterinarian.

6 Dispose of any waste chemicals appropriately[9].

Farmers should

7 Ensure that staff are trained in correct storage, application and emergency procedures for chemicals.

8 Provide appropriate clean-up materials, spill kits and instructions for staff on how to use them.

9 Seek advice from a licensed disposal contractor, manufacturer or veterinarian for information about appropriate disposal of unwanted veterinary chemicals.

2.4 Cleaning and maintenance of culture equipment

Cleaning of marine culture equipment and oyster sheds will produce waste predominantly in the form of biofouling, sludge and shell grit. Waste material produced from cleaning activities must be managed to ensure it does not impact water quality, cause site contamination, odour or vermin such as flies. Food grade chemicals such as chlorine and hydrogen peroxide based products are also used to clean and disinfect grading equipment.

Equipment maintenance is required to minimise the potential for equipment loss and breakdown. Waste will be generated from disused, broken or replaced equipment.

Water quality

Farmers must

1 Ensure that wastewater and waste from cleaning baskets, and other infrastructure do not flow into stormwater or the aquatic environment.

2 Only dispose of wastewater from washing sheds and baskets via a sewer or septic system if it has the capacity to accept the wastewater.

[9] Green Industries SA operates a hazardous household waste depot which accepts numerous controlled substances from primary producers and householders <www.greenindustries.sa.gov.au/hazardous-waste-depot>. Additionally, ChemClear, an industry based chemical waste disposal program, provides a collection and disposal service for chemical users in Australia. Contact ChemClear on 1800 008 182, or visit the website <www.chemclear.com.au> for further information.

Farmers should

3 Locate stockpiles of infrastructure and waste (eg baskets, timber, waste shell and barnacles) on site away from drainage lines, and protect them from being washed or blown to the stormwater system or the aquatic environment.

4 Sweep shed floors and dispose of waste appropriately prior to hosing down.

5 Remove solid material such as shell grit and biofouling from wastewater prior to discharge into the sewer or septic system.

Air quality

Farmers must

6 Ensure that the storage and cleaning of baskets, grading equipment and vessels, and any waste produced from cleaning (eg biofouling, shell grit, sludge) do not result in offsite odour and vermin impacts.

7 Obtain local council consent prior to burning rubbish or other material on site if it is to be undertaken within a local township. NB: disposal of agricultural waste outside of townships does not require a permit, however where relevant, burning is to be conducted in accordance with the *SA Country Fire Service Code of Practice: Broad Acre Burning 2015*.

Farmers should

8 Contain biofouling wastes in enclosed receptacles to minimise odours and vermin.

9 Regularly remove and dispose of putrescible waste such as biofouling and dead shells off site regularly to minimise the potential for odour.

10 Clean baskets in an area which allows for the collection of biofouling.

11 Remove biofouling from baskets prior to stacking and storing on the site.

12 Ensure that sedimentation traps and/or sumps located in the shed's drainage system are regularly emptied of putrescible waste.

13 Only burn waste (including office refuse) if other mechanisms for disposal are not an option.

14 Contact the local Fire Prevention Officer or Environmental Health Officer at your council to identify if a permit is required for burning or for further information on burning requirements.

Noise

Farmers should

15 Avoid using high pressure water guns against structures such as corrugated iron fences which is likely to exacerbate noise when cleaning the equipment.

Solid waste

Farmers must

16 Ensure that removal of biofouling during cleaning of marine structures does not result in sedimentation of the benthic environment or damage to seagrass or other aquatic vegetation.

17 Recover any infrastructure that that has been blown, washed or swept off site as soon as possible.

Farmers should

18 Regularly inspect the region surrounding the farm to recover and lawfully dispose of any marine debris (equipment, rubbish, etc) that has originated from the farming site.

19 Routinely take ashore any hard waste equipment removed from the culture system for maintenance purposes (eg longlines, bands, etc) and lawfully dispose.

20 Regularly inspect the site to ensure that equipment is maintained and secured to minimise the potential for marine debris.

21 Clean and separate materials on waste oyster baskets to optimise potential for recycling (refer to *Feasibility study to recycle plastic oyster baskets*).

22 Dismantle or shred discarded plastic oyster baskets to reduce the space they occupy in licensed waste depots.

23 Store waste in a manner that minimises the potential for rubbish to leave the site.

24 Ensure there are appropriate rubbish containers located on site to receive office waste and other general rubbish (eg food wrappers, drink containers, etc).

25 Promote the collection of recyclable and reusable wastes.

26 Avoid burying waste on site.

Hazardous substances

Farmers must

27 Not burn treated timber waste, plastics or tyres under any circumstances.

28 Have regard to the EPA guideline: *Copper chromated arsenate (CCA) timber waste – storage and management when storing and disposing CCA treated timber posts*.

29 Not allow cleaning chemicals to enter the stormwater or other waters.

Ecological effects

Farmers should

30 Maintain pipes and drains to prevent erosion of foreshore or subtidal areas.

2.5 Water use, treatment and disposal (hatcheries only)

The majority of land-based oyster hatcheries use flow through culture systems where water is pumped from the marine environment and then discharged back out to sea after it circulates through the farm. Discharged water may contain low levels of oyster faeces and excess feed algae. This may result in sedimentation or excessive algal growth (in particular *Ulva sp*.) at the point of discharge and receiving environment, epiphyte growth or other impacts on aquatic vegetation and algal blooms.

Water quality

Farmers must

1 Ensure that discharged wastewater from the hatchery meets the requirements of the Water Quality Policy for the environmental values at the receiving waters, and does not exceed the trigger levels as specified in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (in particular for nutrient, chemicals and sediment levels). NB: An information sheet is currently being drafted to assist with this.

2 Maintain equipment (eg tanks, pipes, drains) to prevent the leakage of seawater onto land.

3 Ensure that sediment/settlement ponds are adequately maintained to minimise the potential for seepage, uncontrolled overflow and odour.

Farmers should

4 Monitor aquatic vegetation and sedimentation at the point of discharge and adjacent marine environment.

5 Amend management practices such as water treatment if sedimentation, excessive algal/epiphyte growth or other adverse ecological effects are noted at the discharge point.

2.6 Maintenance and use of vessels and vehicles

Vessels (i.e. boats or punts) are primarily used to service oyster farming sites. Some hatcheries use vessels to conduct water quality sampling and maintenance on inlet and outlet pipes. Vehicles on farms include cars, trucks, forklifts and tractors which are used for a variety of tasks including towing boats, and transporting stock and equipment.

Vehicles and vessels should be maintained to minimise the potential for fuel/oil leakages and fumes. Farmers should also minimise noise when operating vehicles and vessels in populated areas particularly during early morning starts. Other associated environmental issues include site and water contamination from spills and leaks, disposal of general rubbish, inappropriate use of antifoulants on vessels, ecological impacts from beach launches and propeller/hull scour in seagrass areas.

Water quality

Farmers must

1 Ensure that vehicle and vessel refuelling practices prevent fuel and cleaning water from fuel dispensing being discharged directly or indirectly into stormwater or other waters.

2 Conduct vessel and vehicle maintenance (including cleaning) in appropriate areas as not to cause contamination of any waters by fuel, oils or other pollutants.

3 Clean vessels and vehicles in an area that will prevent wastewater from entering any waters including stormwater.

4 Ensure that tractors do not leak oil and fuel on the beach.

Air quality

Farmers must

5 Manage dust emissions on the site from the operation of machinery (eg vehicles) so not to affect neighbouring properties.

Farmers should

6 Undertake regular vessel and vehicle maintenance to minimise air pollution from fumes and noisy engines.

Noise

Farmers must

7 Take all reasonable and practical measures to minimise noise impacts on neighbouring properties from transporting oyster punts within the depot or when entering or leaving the depot, particularly between 10 pm and 7 am.

Farmers should

8 Select an appropriate route from the depot to the boat ramp to avoid passing residential properties particularly during early morning starts.

9 Be mindful of noise impacts to neighbouring properties while transporting oyster punts to and from the depot on public roads, particularly during early morning starts.

Solid waste

Farmers should

10 Include waste disposal containers (ie bins) on board vessels for general waste (eg food wrappers, drink containers, etc).

Hazardous substances

Farmers must

11 Clean the hull of a vessel or the surface of any structure treated with an antifoulant or any equipment contaminated by an antifoulant within a dry dock, or above the high-water mark of any waters, or below the high-water mark of any waters while the tide is out so there is no tidal water coming into contact with the vessel, structure or equipment.

12 Ensure that antifoulant residues do not enter any waters or come in contact with any land that is below the high water mark of any waters.

13 Collect and dispose of antifoulants at a waste depot that is authorised by the EPA to receive such waste.

14 Apply antifoulants on vessels and clean vessels treated with antifoulants according to the *Anti-fouling and In-water Cleaning Guidelines*.

15 Only use antifoulants that are registered by the APVMA.

16 Store and use fuels, oils, lubricants and other substances used in vessel and vehicle maintenance in an manner which prevents site contamination or potential spillage/runoff into stormwater or other waters.

17 Dispose used oil, fuel, batteries or other hazardous waste via a licensed contractor or within approved depots licensed by the EPA to receive that waste.

18 Not bury waste oil.

Farmers should

19 Establish a response plan for spills that may occur, and induct new and existing staff to these plans.

20 Ensure spillage kits are available to clean up any spills. Kits should contain appropriate equipment, information for notification of authorities, and a training plan for staff.

21 Ensure that areas where fuels and lubricants are stored are bunded and enclosed (if appropriate). For large quantities, the bunded area must be impervious and able to contain 120% of the volume of the largest container within the bund.

Ecological effects

Farmers should

22 Launch vessels at established boat launching areas and consider sensitive coastal areas when launching boats.

23 Avoid the operation of vessels in shallow water which may result in propeller scour.

Other recommendations

Farmers must

24 Where appropriate, abide by the *EPA Code of Practice for material handling on wharves* which addresses activities such as:

- a equipment cleaning
- b vehicles, equipment and machinery handling
- c transport of livestock, fisheries catch and feed
- d dry bulk and liquid bulk handling.

25 Where appropriate abide by the *EPA Code of Practice for vessel and facility management: marine and inland waters* which addresses activities such as:

a vessel cleaning and maintenance

b refuelling practices

c management and disposal of grey and black water

d engine maintenance and repair works.

3 Background to relevant environmental issues

This section aims to provide farmers with explanations on each of the environmental themes discussed in Section 2 of this Code of Practice.

3.1 Water quality

Objective: To take all reasonable and practicable measures to prevent the discharge or deposit of pollutants into the State's marine, estuarine and inland waters and minimise the potential for environmental harm

Key EPA documents

Environment Protection Act 1993 (EP Act)

Environment Protection (Water Quality) Policy 2015

Stormwater pollution prevention codes of practice for the building and construction industry, 1999

Guideline: Bunding and spill management, 2012

Guideline: Copper chromated arsenate (CCA) timber waste – storage and management, 2004

Guideline: Pressure water-blasting activities, 2003

Guideline: Wastewater lagoon construction, 2014

Code of practice for vessel and facility management: marine and inland waters, 2008

Code of practice for material handling on wharves, 2006

ANZECC Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2000

The protection of water quality is relevant to both land-based and sea-based oyster operations. Issues for land-based facilities include inappropriate disposal of waste and wastewater from cleaning infrastructure and vessels, wastewater discharge from hatcheries and contamination of stormwater. Sea-based issues include the deposition of pollutants such as antifoulants, treated timber leachates, biofouling, oyster faecal material (biodeposits), oils and fuels.

All oyster farmers must ensure their operation and activities do not cause environmental harm. For the purposes of section 5(1)(b) of the Act, clause 5 of the Water Quality Policy defines environmental harm in relation to waters to be:

a loss of seagrass or other native aquatic vegetation from the waters

b a reduction in numbers of any native species of aquatic animal or insect in or in the vicinity of the waters

c an increase in numbers of any non-native species of aquatic animal or insect in or in the vicinity of the waters

d a reduction in numbers of aquatic organisms necessary to maintain the health of the ecosystem of the waters

e an increase in algal or aquatic plant growth in the waters

f the waters becoming toxic to vegetation on land

g the waters becoming harmful or offensive to humans, livestock or native animals

h an increase in turbidity or sediment levels of the waters.

The ANZECC Water Quality Guidelines provide a set of indicators according to the environmental value of a particular water body. If wastewater is discharged from the site, farmers must take all reasonable and practicable measures to avoid activating trigger values for these indicators as specified in clauses 7 and 9 of the Water Quality Policy. It is not an offence if trigger values are exceeded but it does indicate the potential for environmental harm. Exceeding trigger values may therefore require further investigation of the ecological condition of the receiving environment, and/or review of the application of the waste management hierarchy.

3.2 Noise

Objective: To minimise the impact of noise on surrounding property owners and other resource users

Key EPA documents

Environment Protection Act 1993

Environment Protection (Noise) Policy 2007

Local Nuisance and Litter Control Act 2016

Guideline: Pressure water-blasting activities, 2003

Information Sheet: Construction noise, 2017

Information Sheet: General environmental noise, 2013

Guideline: Evaluation distances for effective air quality and noise management, 2016

Excessive noise is considered to be environmental harm or nuisance under the Act. Noise from oyster farming activities may result from using:

- heavy machinery and vehicles (eg tractors)
- high-pressure cleaning guns
- sorting and grading equipment
- pumps and generators.

Land use category	Noise levels not to exceed in dB(A)*	
	7 am – 10 pm	10 pm – 7 am
Rural Living	47	40
Residential	52	45
Rural Industry	57	50
Light Industry	57	50
Commercial	62	55
General Industrial	65	55
Special Industry	70	60

* Measured according to the Noise Policy at any place, other than the premises from which the noise emanates, where a person lives or works.

Noise from oyster facilities must not exceed the limits specified in the Noise Policy. Noise limits are classified into day (7 am to 10 pm) and night (10 pm to 7 am). Noise factors are site specific and vary depending on local council development plan provisions. Oyster farmers should seek advice from their local council or the EPA to ensure compliance with the Noise Policy.

Regardless of where land-based oyster facilities are situated, oyster farmers must take common sense measures to minimise noise being a nuisance to others. The interests of those whose legitimate activities cause noise must be balanced against those who are exposed to and affected by the noise.

3.3 Air quality

Objective: To protect and enhance air quality by minimising odours, dust and burning-related outputs

Key EPA documents

Environment Protection Act 1993

Environment Protection (Air Quality) Policy 2016

National Environment Protection (Ambient Air Quality) Measure, 2016

Guideline: Ambient air quality assessment 2016

Guideline: Evaluation distances for effective air quality and noise management, 2016

Air pollution is defined as the emission of particles and gases, including dust, offensive odours, attraction of vermin such as flies, and burning related odour and smoke.

Oyster farming has the potential to cause poor air quality by the inappropriate disposal of wastes such as biofouling and dead oyster shells, inappropriate storage of oyster baskets that are covered in biofouling, and the incineration of wastes.

3.4 Solid waste

Objective: To minimise the impact that solid wastes may have on the environment

Key EPA documents

Environment Protection Act 1993

Environment Protection (Waste to Resources) Policy 2010

Environment Protection (Water Quality) Policy 2015

Environment Protection (Air Quality) Policy 2016

Local Nuisance and Litter Control Act 2016

Guideline: Management of aquaculture stock mortalities 2007

Information Sheet: Feasibility study into oyster basket recycling 2014

Stormwater pollution prevention code of practice for the building and construction industry, 1999

Guideline: Pressure water-blasting activities. 2003

Guideline: Copper chromated arsenate (CCA) timber waste – storage and management, 2004

The three main solid waste products produced by oyster farms are:

- Putrescible material (eg biofouling and oyster shells)
- Office refuse (eg food wrappers, cigarette butts)
- Building and construction materials (eg oyster baskets and treated timber waste).

The improper disposal of solid wastes can cause pollution, particularly contamination of stormwater, surface water, groundwater and land. Inappropriate management and disposal of putrescible waste can also lead to odour and vermin issues.

Best practice solid waste disposal includes reuse, recycling and the appropriate storage and management of solid wastes.

3.5 Hazardous substances

Objective: To minimise the impact that hazardous (controlled) substances may have on the environment during their use, storage and disposal

Key EPA documents

Environment Protection Act 1993

Environment Protection (Water Quality) Policy 2015

Stormwater pollution prevention code of practice for the building and construction industry, 1999

Guideline: Bunding and spill management, 2012

Information Sheet: Engine maintenance and repair works, 2010

Guideline: Copper chromated arsenate (CCA) timber waste—storage and management, 2004

Code of Practice for vessel and facility management: marine and inland waters, 2008

Code of Practice for material handling on wharves, 2006

Anti-fouling and In-water Cleaning Guidelines, 2015 (Commonwealth of Australia)

EPA Guideline: Acid sulfate soil material, 2007

EPA Report: CCA Treated Timber in SA, 2008

Most hazardous substances used in oyster farming are used on land, at either service depots or oyster hatcheries, and include:

- Fuel (vehicles and vessels)
- oil and grease
- cleaning chemicals, such as chlorine, hydrogen peroxide and veterinary chemicals
- antifoulants
- CCA treated timber.

The environmental concern in the use of hazardous substances[10] is the potential for stormwater, groundwater, surface water and land contamination. Other legislation[11] governs appropriate use and storage of hazardous (controlled) substances to avoid adverse human health and general environmental impacts.

3.6 Ecological effects

Objective: To protect South Australia's aquatic ecology through appropriate oyster farming techniques and procedures

Key EPA documents

Environment Protection Act 1993

Environment Protection (Water Quality) Policy 2015

[10] Controlled substances include 'Listed wastes' as defined by the Act.

[11] The *Dangerous Substances Act 1979* and the *Controlled Substances Act 1984* regulate the keeping, handling, conveyance and use of dangerous and controlled substances and provide directives on how the substances must be stored and disposed of.

Environmental issues relevant to sea-based oyster farms are:

- aquatic pests, including:
  - wild oysters
  - introduced aquatic pests.
- ecological health, including:
  - carrying capacity
  - seagrass impacts
  - sand accretion/scour.
- marine wildlife interactions.

Some of these are addressed by legislation other than the EP Act and therefore are not addressed in section 2. Nonetheless, farmers must comply with all relevant statutes[12].

[12] For example, the *Aquaculture Act 2001*, *Fisheries Management Act 2007*, *National Parks and Wildlife Act 1972*, *Coast and Protection Act 1972* , *Native Vegetation Act 1991*, *Natural Resources Management Act 2004*, and *Marine Parks Act 2007.*

Glossary and abbreviations

APVMA	Australian Pesticides and Veterinary Medicines Authority
biofouling	the unwanted settlement of aquatic organisms, such as molluscs (eg barnacles) and bryozoans, on structures that are immersed in water; it can occur in both marine and freshwater environments but is considered a major problem in various marine industries
bund	a wall, moat or other device which is graded or contains grated drains, or combines the two, which is designed to prevent the escape of spilt materials and to exclude stormwater runoff
copper-chrome-arsenic (CCA)	timber treatment or preservative
controlled (hazardous) substances	includes any substances defined within the *Controlled Substances Act 1984*, and also includes any hazardous substances or wastes listed in the EP Act or relevant EPPs
effluent	wastewater originating from land-based oyster support facilities and/or hatcheries
environment	means land, air, water, organisms and ecosystems and includes (i) human made or modified structures or area; and (ii) the amenity values of an area
environmental authorisation	an EPA works approval, licence or exemption
environmental harm	'any harm, or potential harm, to the environment (of whatever degree or duration), and includes an environmental nuisance' (EP Act); each EPP defines relevant environmental harm differently. See section 3.1 for definition of environmental harm in relation to waters.
environmental management system (EMS)	a systematic approach to dealing with the environmental aspects of an organisation's operation. It is a 'tool' that enables an organisation of any size or type to monitor and manage the impact of its activities, products or services on the natural environment
environment protection policy (EPP)	a legislative tool provided for by the Act to address environment protection matters; it can be made for any purpose directed towards securing objects of the Act
EP Act	*Environment Protection Act 1993*
EPA	South Australian Environment Protection Authority
general environmental duty	'A person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm' (section 25 of the EP Act)
licensed waste depot	waste depot licensed under Part 6 of the EP Act
listed pollutants	pollutants outlined in Schedule 2 and Schedule 3 of the *Environment Protection (Water Quality) Policy 2015*
listed wastes	defined by the Act, Schedule 1 Part B:
Noise Policy	Environment Protection (Noise) Policy 2015
PIRSA	Department of Primary Industries and Regions South Australia

pollutant	(a) any solid, liquid or gas (or combination thereof) including waste, smoke, dust, fumes and odour; or (b) noise; or (c) heat; or (d) anything declared by regulation to be a pollutant; and includes waste (as defined by the Act)
putrescible	component of the waste stream liable to become putrid
stormwater	includes rain that runs from roof-tops and buildings down gutters, into drains under the road and then into natural waterways.
trigger values	a set of values for indicators as specified in the Water Quality Guidelines
underground waters	water occurring naturally, or stored, below ground level
waters	includes all surface (marine and inland) and underground waters, stormwater and irrigation drainage channels
ANZECC Water Quality Guidelines	Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 prepared by ANZECC and ARMCANZ
Water Quality Policy	Environment Protection (Water Quality) Policy 2015