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Biosecurity control measures for abalone viral ganglioneuritis

Code of Practice



Government
of South Australia
Department of Primary
Industries and Regions

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Website [Abalone viral ganglioneuritis - PIRSA](#)

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Introduction

This Code of Practice has been developed to set out the standard procedures to be implemented in South Australian waters to allow for fishing activities following the detection of abalone viral ganglioneuritis (AVG) in the Southern Zone Abalone Fishery in February 2024. The procedures described in this document cover the commercial Southern Zone Abalone, Central Zone Abalone, Western Zone Abalone, Southern Zone Rock Lobster and Northern Zone Rock Lobster fisheries including fish processors, as well as recreational fishing and vessel movement related to these activities.

This document provides good biosecurity practices to support fishers to reduce the risk of the spread and impact of AVG within the abalone fishing zones of South Australia while allowing for responsible fishing activities to continue where possible.

The procedures described apply across all South Australian waters (unless specific areas are described).

This Code of Practice is based on the Victorian Fisheries Authority (VFA) Code of Practice that was developed in consultation with their commercial catch, processing and aquaculture sectors and informed by a series of “Rapid Risk Assessments” undertaken with the above-named sectors. The South Australian Government acknowledges the significant work of the VFA and the Victorian abalone industry in developing the Code. Similarly, the Department of Primary Industries and Regions (PIRSA) has worked closely with the South Australian industry in developing this Code of Practice, which along with the Victorian one provides a basis for a national approach to AVG management.

The protocols and procedures presented in this document are fundamentally consistent with those prescribed in the latest (2023) VFA Code of Practice but provide biosecurity control measures for the South Australian fisheries.

The requirement for a Code of Practice was informed by a series of risk assessments undertaken by PIRSA to facilitate industry-led management of AVG for the long-term. As such, this document provides a tool for minimising the risk of spread of AVG both within and outside the Southern Zone Abalone Fishery whilst supporting market access for South Australian abalone and associated products (whether from wild-caught or farmed). The Code of Practice has been endorsed by the relevant fisheries sectors.

The Code of Practice is not a regulatory tool. It outlines good biosecurity practices to minimise the risk of outbreaks and spread of AVG through implementing standard operating procedures (SOPs) in the following industry sectors:

- commercial harvesting operations,
- recreational divers and fishers,
- aquaculture farms, and
- processors.

Abalone viral ganglioneuritis

Background

AVG is caused by the haliotid herpesvirus-1 (HaHV-1) and is a notifiable disease nationally under the *Livestock Act 1997*. It was first identified in southern Victoria in late 2005, prior to which it had never been recorded in Australia. The disease can have a devastating impact on both wild and farmed abalone populations, and it is therefore important that effective biosecurity control measures are in place to minimise the impact of the disease.

In February 2024, sick and dying abalone were reported near Port MacDonnell in the South East region of South Australia, within the Southern Zone Abalone Fishery (SZAF) management area. Samples were collected to rule out infectious and notifiable diseases. HaHV-1 was detected in abalone by PCR testing and AVG was confirmed. Presently (April 2024), there is no evidence of AVG in farmed or wild abalone stocks in either the Central Zone Abalone Fishery (CZAF) or Western Zone Abalone Fishery (WZAF).

Origin of the virus: Internationally, it is believed that the abalone herpesvirus has caused significant mortalities in cultured abalone since the late 1990s. The cause of the losses was not known at the time. The first official report of mortalities due to the virus was made in Taiwan in 2003.

Clinical signs of disease: The clinical signs of disease differ between Australian populations. In Victoria, in both farmed and wild abalone, the clinical disease presented as rapid mortality, an inability to adhere to a substrate, curling of the foot and swelling of the mouthparts. The mortality rates in both farmed and wild environments varied between 10% and 90%. In Tasmania, the virus was seen in processing plants as a more chronic condition with increased mortalities and “hard foot” where the large muscular foot of the abalone became very rigid. In South Australia’s initial outbreak there were high mortalities in discrete areas and other areas that did not show other clinical signs of AVG.

General epidemiology: AVG is known to occur in Australia (Victoria, Tasmania and recently South Australia), Taiwan and mainland China. All age classes of abalone appear to be susceptible. Under laboratory conditions, the disease was found to be transmissible in water. It is likely that the virus can be spread by contaminated mucous, direct contact with infected abalone, short range movements in the water column or attached to fomites (i.e., inanimate objects such as fishing gear).

The point of entry of the virus is unknown but it is presumed to be the mouth or gills. The incubation period for the disease was found to be 60 hours under laboratory conditions.

A well-known attribute of herpesviruses is the ability to occur in clinically healthy hosts. Across all animal species, herpesviruses are known to be activated to a clinical disease when the host is under some form of stress.

Diagnostic tests: Historically, the virus was detected by visualisation of tissue changes through histopathology until more modern molecular tests were developed. Currently, all tests involve destruction of the abalone and are performed on an individual animal (i.e., there is no pooling of samples). Through laboratory challenge studies it has been determined that the time from viral challenge to diagnosis is 36 hours with the PCR test, 48 hours with in situ hybridisation and 60 hours with histopathology. More recently, a “LAMP” test has been developed to enable detection of small amounts of virus rapidly and accurately. The need for rapid tests will no doubt result in the development of accurate, validated “tank side” tests for this virus. Analysing water samples and marine microorganisms for environmental DNA is another area of development.

Carrier status and susceptibility: A well-known attribute of herpesviruses is the ability to occur in clinically healthy hosts. It is highly likely that this pattern of disease manifestation is applicable to abalone.

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The potential for genetic resistance to the virus in abalone has been investigated. A transmission trial across 49 family lines of Greenlip Abalone concluded that some families had a delay to mortality rather than survival to disease. Resistance in areas previously impacted by the virus in western Victoria did not find a difference between the mature survivors and juvenile recruits. It is possible that the survivors selected were not exposed to the virus originally. The robustness of this study has been questioned based on the sample size used and lack of DNA sequencing performed. Work is currently underway to further explore this issue. A study examining the pathogenicity of the five known variants of HaHV-1 was undertaken and it was established that all five variants caused disease and mortality in all abalone stocks tested. The New Zealand paua (*H. iris*) is known to be highly resistant to disease as is *H. discus hannai* (from work undertaken in China). The mechanism for this resistance is still under investigation.

Deactivation: HaHV-1 belongs to a group of viruses that have a lipid envelope and are of intermediate to large size. This type of virus is not difficult to destroy as the lipid envelope is sensitive to many compounds including soaps, detergents and disinfectants.

Test definitions

- **PCR** – polymerase chain reaction is a test that can detect the DNA of the virus in frozen or fresh abalone.
- **In situ hybridisation** – similar to the above PCR, this test detects the DNA of the virus but also shows where it is located in the tissues.
- **LAMP** – Loop mediated isothermal amplification (LAMP) is another test looking for the DNA of the virus but has some advantages over the PCR in terms of ease of operation, portability and efficiency.
- **Histopathology** – is the traditional method of looking at fixed tissues down a microscope. This method is less sensitive at detecting AVG than the molecular methods.

Code of practice for the Commercial Fishery Sector

Background

Commercial abalone fishing operations in South Australia are managed under the *Fisheries Management Act 2007* and associated regulations in line with the *Management Plan for the South Australian Commercial Abalone Fisheries (2021)*. The commercial Abalone Fishery comprises three management zones – Western Zone, Central Zone and Southern Zone – and targets Greenlip Abalone (*Haliotis laevis*) and Blacklip Abalone (*H. rubra*). Roe's Abalone (*H. roei*) is also taken in areas of the Western Zone.

Abalone (Blacklip and Greenlip) are economically important species in South Australia for both the commercial wild-catch fishery and the aquaculture sector. During 2021/22, the South Australian commercial Abalone Fishery contributed \$45 million to Gross State Product (GSP) and employed 300 Full Time Equivalent (FTE) positions. During the same financial period, the abalone aquaculture sector contributed \$16.2 million to GSP and 137 FTEs. Abalone are also important species for the recreational fishing sector and are key species in healthy and complex reef ecosystems.

The main output control used to manage the South Australian commercial Abalone Fishery is the implementation of annual total allowable commercial catches (TACCs) for target species in each management zone. Annual TACCs for each species of abalone is determined based on the most recent stock assessment, harvest strategy and industry consultation in each of the three management zones.

Commercial abalone divers mostly operate from large, trailered vessels. Divers use surface supplied air from the vessel and may use motorised cages to mitigate physical interactions with White Sharks (*Carcharodon carcharias*). Some divers circulate warm water through their wetsuits to help them operate in cold water for extended periods of time. Divers harvest legal-sized abalone from the substrate by hand using an abalone iron. All abalone must be measured immediately after being detached from the seabed.

Catches of abalone are raised to the surface in air-lifted mesh bags. Another person operates the vessel and usually actively follows the diver and cage, recovers the bags, and for the Western Zone and Central Zone Abalone fisheries may remove the abalone meat from the shell (shucking). Where the market is live or whole, animals are not shucked from the shell. After landing, the catch is transported to the consigned processors and prepared for markets. Abalone products are usually sold as live, frozen, dried, parboiled, retort pouched and canned products.

Divers must lodge catch records through a Catch and Disposal Record (CDR) reporting system which allows consignments of abalone to be tracked through the supply chain to fish processors authorised to receive consignments.

Further information on the Abalone Fishery management in South Australia is available on the PIRSA website (Commercial fisheries - PIRSA).

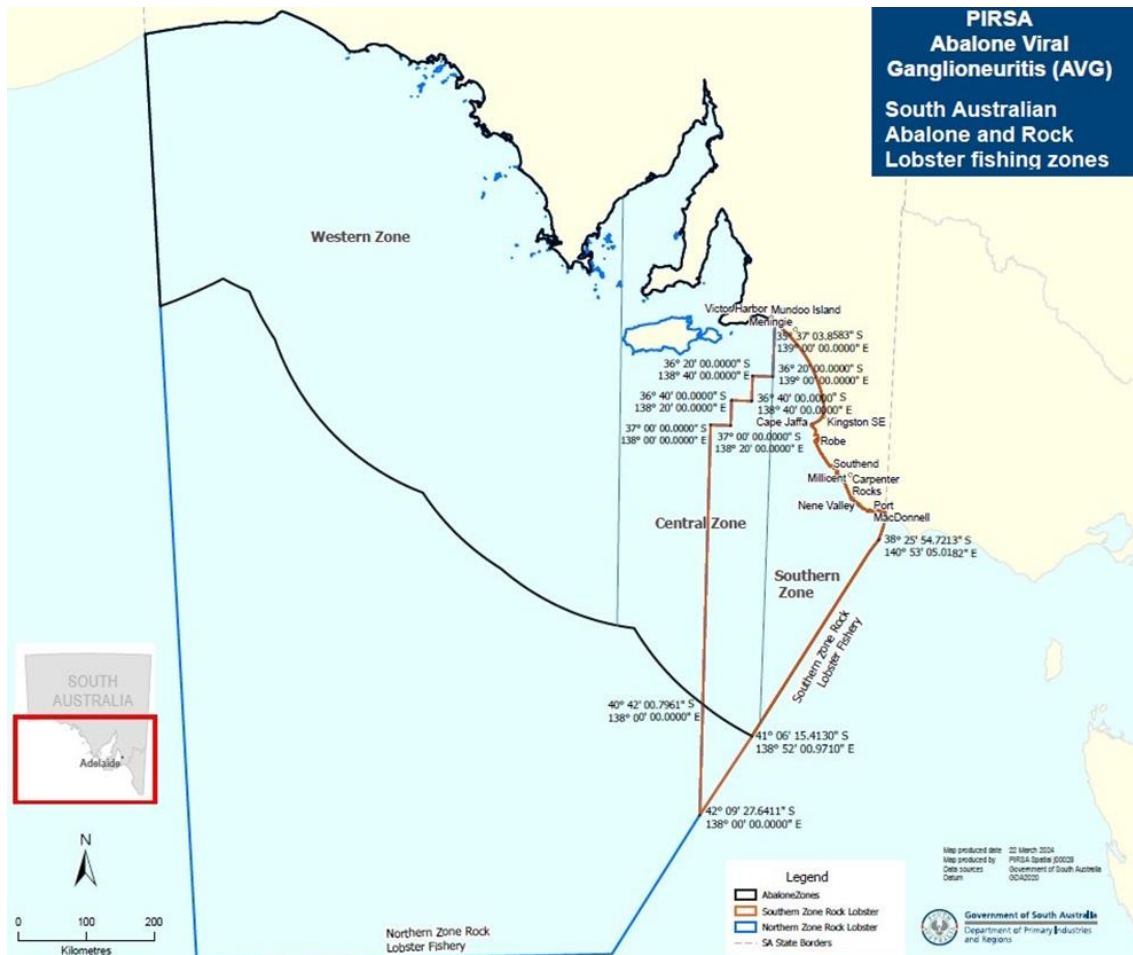


Figure 1: Management zones for the commercial abalone and rock lobster fisheries in South Australia (PIRSA, 2024).

Zone/area classifications

References to areas in this document relate to the following descriptions.

No Evidence of AVG Zone – Area where there has been no evidence of AVG or HaHV-1 (i.e., currently, Western Zone and Central Zone Abalone fisheries). Note decontamination protocols in these areas are consistent with those required under ‘Non-Active’ areas defined below.

Known AVG Zone – Zone where AVG has occurred or HaHV-1 has been detected by PCR (i.e., currently, Southern Zone Abalone Fishery).

Non-Active Area – Area within a Known AVG Zone where abalone showing no clinical signs of AVG.

Active Area – Area where abalone showing clinical signs of AVG and collected abalone have provided positive HaHV-1 PCR results.

Suspect Area – An area in any Zone where unusual dead, dying or suspect abalone (other than occasional isolated dead abalone a diver would consider a normal occurrence) have been identified and samples have been taken for testing. The area will include the area where samples were taken and surrounding areas, noting specific geographic and management variances between the Southern, Central and Western Abalone Fishery Zones.

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Decontamination protocols only apply when activities that interact with the sea floor are undertaken within that defined area. Travelling through an area does not require the level of decontamination from that area.

Surveillance in an area including diagnostic testing may change the classification of an area.

Risks and control measures for commercial fisheries

Risk assessments were conducted by PIRSA as part of the AVG response activities. The risk assessments were developed by technical experts familiar with the risks associated with translocating disease (including by other industries).

The key disease transmission pathways identified for the Abalone Fishery (commercial and recreational) included:

- Movement of contaminated abalone
- Movement of contaminated equipment
- Movement of contaminated personnel
- Movement of contaminated water.

Standard Operating Procedures for the Commercial Abalone Fishery

Identifying and reporting AVG

Similar to Victoria, it was acknowledged that divers have an ability to recognise abalone showing clinical signs of AVG. As such diver observations are an excellent form of passive surveillance.

This protocol provides information for commercial fishers and divers on how to identify and report signs of AVG in abalone.

Identification of infected abalone

Infected abalone are lethargic, do not adhere well to the reef substrate, may have enlarged mouthparts and a curled foot. The presence of enlarged mouthparts alone is not sufficient to diagnose AVG. When clinically affected by the virus, the abalone are weak and easily removed from the substrate. The presence of a large quantity of mortalities or empty shells may indicate previous or active infection.

Reporting and preserving samples for diagnosis

It is essential that all divers and crew are diligent in following appropriate biosecurity protocols upon discovery of dead and suspected diseased abalone.

Discovery of abalone suspected of being affected by disease (AVG or other) by abalone divers (all fishery zones)

The following protocols describe steps commercial divers should take in the event they discover ANY unusual dead, dying or suspect abalone (other than occasional isolated dead abalone a diver would consider a normal occurrence). Whilst the protocols are consistent across all abalone zones of South Australia, it is recognised that there are specific geographic and management variances between the Southern, Central and Western Abalone Fishery Zones.

The process below should be followed by commercial fishery divers when:

- Unusually high mortalities are observed, including dead/dying abalone with no obvious clinical signs of AVG (i.e., no protruding mouthparts, curling of the foot or unusual clusters of ten or more clean, empty shells); or
- Detection of dead or dying abalone and at least one abalone is observed with clinical signs of AVG (i.e., protruding mouthparts and 'curling of the foot') or weak attachment.

Upon discovery, commercial divers must:

1. Collect samples of at least five (preferably up to 15) abalone (including healthy looking abalone, if possible).
2. Take two water samples, one from the seabed near the abalone collection point and one from a metre below the water surface (using the bottles provided from SARDI with the AVG sample collection kit). Place water samples in an insulated container. It is important to not chill or freeze water samples.
3. Take underwater pictures or videos of the affected reef area (if possible).
4. Place abalone samples into sealed plastic bags and label, complete the sample report form (provided in the sampling kit) ensuring the GPS coordinates of the site are listed on the form.

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Place individual sample bags of abalone into a larger sealed bag together with the completed sample report form.

5. Wrap all sealed bags of sampled abalone in newspaper and place on ice (if possible). It is important that the abalone samples do not have direct contact with ice.
6. Report the activity to FISHWATCH on 1800 065 522 as soon as possible (this is a legal requirement under the Livestock Act and will provide appropriate notification to PIRSA). When making the report, divers will need to provide the following information:
 - Diver contact details
 - Date, time and location
 - Expected point of landing
 - Map Code and area description of where dead and/or dying abalone were located
 - GPS coordinates (and datum)
 - Depth of water
 - Basis for suspecting incidence of disease (e.g., external signs of disease, number of dead abalone, etc.)
 - Environmental conditions (e.g., water temperature, visibility).
7. Place all catch into bins without drainage (if sealed bins are unavailable, place catch into sealed plastic bags before placing into bins).
8. Place all portable diving gear (e.g., wetsuits, gloves, shucking tool, catch bags) used in operation that day in a sealed and separate container at sea, for decontamination on land.
9. Ensure bins containing suspect abalone are clearly identifiable (e.g., marked with brightly coloured tape). All abalone collected during the fishing trip including suspect areas must be isolated (including holding tanks at Fish Processor facilities).
10. Relay observations to:
 - a. other commercial abalone fishers operating at sea, if possible
 - b. your relevant industry representative
 - i. Industry representative to then advise other industry representatives including those in the Southern Zone Abalone, Central Zone Abalone, Western Zone Abalone, Southern Zone Rock Lobster and Northern Zone Rock Lobster fisheries
 - ii. other licence holders in their own fishing zone
 - c. fish processor/s receiving the catch.
11. Prior to leaving the site divers will undertake decontamination at sea including returning all organic matter (i.e., seaweed, marine algae) to the water at the location of operations. If the vessel has a self-draining deck, wash-down the deck. Contain all wet diving equipment and catch bags in a bin, tub or dive bag.
12. Retain all water on deck (i.e., close scuppers) before leaving the area. Any remaining water must be emptied on land where it cannot return to the marine environment. Cleaning can then take place on land as prescribed in this document.

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13. Upon leaving an area where suspect abalone were collected, return immediately to shore and decontaminate the boat, equipment, and personnel with additional requirements including using an approved disinfectant as described below in “Immediate Post-Sampling Management”.
14. Other fishers operating in the ‘**Suspect Area**’ are also required to discontinue fishing and return to shore immediately on being informed of suspect abalone being identified in the area and decontaminating gear and vessels as described below in “Immediate Post-Sampling Management”.
15. Provide the water and abalone samples collected to SARDI, PIRSA Fisheries and Aquaculture or Biosecurity as soon as possible (within the same day).

IMMEDIATE POST-SAMPLING MANAGEMENT

1. Until diagnostic testing is completed and results are available:
 - i. A ‘**Suspect Area**’ will be identified (to include the hotspot area and surrounding areas) with industry consultation and considering the following:
 1. A minimum distance of 5 nm (i.e., 10 km radius) from the site of observed suspect abalone; OR
 2. An area appropriate to geographic area or practical operations including Map Code of observed suspect abalone and adjacent Map Codes on either side, bays, inlets tides, and vessel movements (i.e., launch facilities) as appropriate on a case-by-case basis.
 - ii. All vessels operating in the Suspect Area on the day suspect abalone are observed (when the samples were taken) will be fully decontaminated on land noting:
 1. Vessels will be quarantined for a minimum of 24 hours with air drying in the sun.
 2. Operators can then return to work (outside of the Suspect Area) 24 hours after vessels have been decontaminated and ‘quarantined’, with a complete change of dive gear.
 - iii. All abalone harvested from the Suspect Area must be clearly marked by fishers to be identifiable and subsequently held by the processor and not be moved through the supply chain.
 - iv. In the case of the Central Zone and Western Zone Abalone fisheries, shucking at sea will cease, unless all waste is retained in sealed bags or bins on the vessel and disposed of appropriately on land.
 - v. An industry-wide standstill (i.e., no fishing) in the Suspect Area will remain in place until a negative result is confirmed through diagnostic testing, or if the results of these tests are positive an appropriate response actioned.

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Please note, individual industries may wish to implement additional measures (e.g., longer quarantine periods for vessel drying).

PIRSA will communicate results of testing carried out to industry as soon as possible.

In addition to the decontamination of fishing/diving gear used, divers should have multiple (i.e., at least two) sets of gear which can be swapped out if diving in an impacted area, or suspect abalone are discovered during normal diving activities. Multiple gear sets will allow additional drying time and the flexibility to leave gear within a fishing zone.

Decontamination procedures

This protocol describes the decontamination process for equipment and other resources used in the commercial harvesting of abalone. This protocol applies not only to commercial divers but to individuals or organisations undertaking research or surveillance studies of wild abalone. Items that should be decontaminated under this protocol, include the following:

- Vessels, including hulls and decks, anchors, anchor lines and mooring lines.
- Divers, diving equipment including wetsuits, fins, gloves, masks, weight vest, hookah gear and other abalone harvesting equipment (especially fish bins, hessian bags, nets, knives, etc.).
- Transport vehicles and fish bins.
- Personnel (other than divers).

Details of the decontamination protocols to be undertaken for divers operating in No Evidence of AVG Zones, Non-active Areas in Known AVG Zones and Active Areas are described in the sections on protocols for decontamination on Pages 15 and 17.

The highest risk items are those that have been in contact with infected abalone or associated environments and could retain organic material harbouring virus.

The class of virus that causes AVG is susceptible to soaps, detergents and disinfectants.

Both detergents and disinfectants can be used in the decontamination process.

Detergents

Detergents are normally a complex mixture of compounds that help to remove and disperse dirt. Detergents should be used for the removal of gross fouling and organic matter. The removal of organic matter by scrubbing and other mechanical means is the most important first step in the decontamination process.

At a minimum, all equipment should be washed with detergent as per the instructions below:

- Vessels: low toxicity detergents used for washing trucks or specifically designed for cleaning vessels are available from a number of suppliers.
- “Truckwash” may be used for general cleaning on land after which another suitable product should be applied to areas where produce comes in direct contact with equipment including shelling table, containers holding abalone, shelling irons and abalone bags.
- These compounds are not classified as hazardous and are normally biodegradable.
- Wetsuits and other diving equipment: specialised wetsuit wash preparations are available, but a mild liquid soap or shampoo may also be used.

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- Bins and fishing gear: low toxicity detergent should be suitable for cleaning equipment and equipment should be scrubbed to assist in the removal of organic matter.
- People: soaps should be used to wash hands and laundry detergents to wash clothes.

Disinfectants

To ensure the virus is killed or inactivated, disinfectants approved for use by the Australian Pesticides and Veterinary Medicines Authority (APVMA) should be used. A limited number of agents have been assessed for efficacy against the virus (HaHV-1).

Suitable disinfectants include:

- Iodine-based disinfectants (e.g., “Buffodine” at 50 ppm).
- Chlorine-based disinfectants (e.g., hypochlorite at a concentration of 15 ppm active chlorine at the site of application).
- Benzalkonium chloride (e.g., “Impress” at 1% concentration).
- At sea, vessels should be cleaned with products which are non-rinse air dry sanitisers (e.g., “Proof” or “Bacban”).

The efficacy of the disinfection process is affected by various factors including temperature, pH and most importantly the presence of organic matter. Many disinfectants are inactivated (i.e., less effective) in the presence of large quantities of organic material, such as seagrass or marine algae. Although the effectiveness of all specific disinfectants against AVG has not yet been evaluated, disinfection is likely to be highly effective against the virus given its fragility.

The manufacturer’s instructions for the safe use of chemicals will be specified in the Material Safety Data Sheets for the chemicals; these should be requested and read when the product is purchased.

Protocol for decontamination in No evidence of AVG Zones and Non-Active areas in Known AVG Zones

This section of the decontamination protocol applies to fishing activities within No Evidence of AVG Zones and Non-Active areas in Known AVG Zones where abalone are not showing clinical signs of AVG.

Decontamination of vessels

All commercial abalone dive vessels currently operating in South Australia are removed from the water at the end of each day. However, vessels in other jurisdictions or used for other purposes (research or surveillance) may remain in the water. The decontamination protocol for vessels that are removed from the water will be different from those that remain in the water.

Commercial vessels will not be routinely entering areas where AVG is active, but research or surveillance vessels may deliberately enter these areas. It is possible that commercial vessels could encounter diseased abalone during their routine operations.

This protocol applies under normal operating conditions and no abalone suspected to have AVG are encountered.

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Prior to leaving the launching site all gross fouling and organic matter should be removed from the hull of the vessel. The hull of the vessel should be cleaned after each trip with freshwater and kept free of organic matter and marine organisms. All surfaces (i.e., decks), diving equipment and other equipment should be hosed down with freshwater, washed with a suitable detergent rinsed with freshwater and left to air dry after each trip, for 24 hours if possible.

Operators should ensure that organic matter accumulated under carpets or in other difficult to reach places is removed and the area rinsed with freshwater.

Bungs (if present) should be removed to allow any water to drain out of the vessel onto land and any bilge areas should be rinsed thoroughly with freshwater and drained.

General protocol for vessels remaining in the water

All surfaces (i.e., decks), equipment and superstructures should be cleaned through scrubbing or with high pressure sprayers, including the use of detergent. All external areas should be rinsed with freshwater and low toxicity detergent or disinfectant. Air drying parts of the vessel not submerged in the sun for over 24 hours can effectively kill many pathogens.

General protocol for divers, wetsuits and equipment

Applies to divers operating in areas where there is no recent history of infection and where no abalone suspected of AVG have been observed. The appropriate level of decontamination for diving equipment will depend on the level of risk associated with the activities undertaken by the diver. This will result in more frequent decontamination rather than different procedures.

The categories of decontamination for divers have been identified as follows.

- Remove gross contamination of organic material by rinsing divers, equipment and vessel surfaces (i.e., decks) throughout diving operation.
- Between dives and at the end of diving rinse all equipment in freshwater to remove salt, including rinsing the inside of a weight vest if used.
- All equipment should be washed or sprayed with a wetsuit cleaning solution or mild soap or shampoo to remove traces of organic matter. Dive suits should be washed inside and out (note that Virkon is not suitable for cleaning dive suits) and other equipment can be immersed in large plastic bins with disinfectant.
- Gloves and catch bags need to be scrubbed clean prior to air drying, for 24 hours if possible.
- Thoroughly rinse all dive equipment in freshwater and dry in a well-ventilated area, preferably outside in the sun for 24 hours if possible.

General protocol for transport vehicles and bins

All solid debris and organic matter should be removed from transport vehicles, trailers and harvest bins, before cleaning with soapy water and rinsed with freshwater. All residual mucous, faecal and waste material must also be removed and disposed of through appropriate waste disposal facilities. Ensure bins are dried in a well-ventilated area, preferably outside in the sun.

Protocol for decontamination in an Active Area

Protocol for vessels potentially exposed to AVG

This protocol applies when vessels are deliberately taken into an Active Area where AVG is known to occur including where abalone are displaying expression of clinical disease, observations of significant mortalities or when suspected diseased animals are encountered during routine harvesting, surveillance or research operations (i.e., see above section “Discovery of abalone suspected of being affected by disease (AVG or other) by abalone divers (all fishery zones)”).

Prior to returning to shore, return all organic matter (i.e., seaweed, marine algae) to the water at the location of operations. If the vessel has a self-draining deck, wash-down the deck. Contain all wet diving equipment and catch bags in a bin, tub or dive bag.

Prior to leaving the launching site, all gross fouling and organic matter should be removed from the vessel hull. All material removed should be disposed of in appropriate waste disposal facilities away from the water.

After the abalone catch has been offloaded the vessel should be removed from the water to allow for thorough cleaning. Cleaning should take place in an area (e.g., a car wash) where none of the wash-down water can re-enter the marine environment.

- All vessel surfaces (i.e., decks), equipment and superstructures must be rinsed with freshwater through scrubbing or with high pressure sprayers.
- Detergent or disinfectant must be sprayed on all surfaces on the inside of the hull, gunwales and topsides (outside of the hull) and rinsed off with a hose or similar appliance.
- The external hull of the vessel must be sprayed with detergent or disinfectant and rinsed with freshwater.
- All pipework and pumps, particularly deck hoses must be rinsed with an effective detergent or disinfectant.
- Scrub and clean all equipment (i.e., anchors, mooring lines, net bags, fenders, etc.) in detergent or a foaming disinfectant to ensure all organic matter is removed then allow to air dry for at least 24 hours.
- Water contained in bilges and scuppers must be emptied while in the area of infection/clinical disease. Any remaining water must be emptied on land where it cannot return to the marine environment. Cleaning can then take place as prescribed above.
- All internal areas should be thoroughly cleaned. All catch bags should be scrubbed clean with detergents/disinfectants and air dried in the sun for at least 24 hours.

High risk decontamination protocol for divers

Applies to divers involved in the observation or removal of dead or moribund abalone (i.e., either AVG suspected or confirmed) or operating within areas known to be infected, but with no direct contact with infected abalone.

As for “General” above but using effective disinfectants. Dive operations must cease immediately following detection.

Protocol for vehicles and bins that have carried infectious abalone

Remove and clean bins using detergent followed by an effective disinfectant then air dry outside. Clean the entire cargo area of the transport vehicle using a detergent, and areas that have been in contact with fish bins need to be scrubbed down with an effective disinfectant. Wastewater from this process must not be allowed to re-enter the marine environment. The vehicle should be left to air dry outside for at least 24 hours.

Decontamination protocol for personnel

Personnel other than divers must also undergo decontamination to ensure that the virus is not transmitted. Heaviest contamination of personnel will occur when infected animals or equipment are handled on-board the vessel, where mortalities are collected and where there is exposure to biological material from infected abalone. The following steps are to be taken to decontaminate personnel:

- Protective clothing must be cleaned. Rubber boots must be scrubbed.
- Personnel should regularly wash their hands in soapy water or detergent.

Decontamination protocol for movement of gear to another zone

If travelling from the Southern Zone Abalone Fishery to another zone or jurisdiction for diving activities, fishers must fully decontaminate dive equipment including:

- At sea, remove biological material from equipment, including anchors and other equipment at the dive location and wash with fresh or sea water.
- On land, thoroughly clean equipment with freshwater and remove material. Wash-down cannot re-enter the marine environment.
- Dive suits should be washed inside and out and other equipment can be immersed in large plastic bins with disinfectant.
- Gloves and catch bags need to be scrubbed clean prior to air drying.
- Wash equipment thoroughly with detergent or detergent.
- Rinse with freshwater.
- Air dry in the sun preferably for at least 72 hours.

A notice under the *Livestock Act 1997* is in place restricting the movement of fishing equipment outside of the Southern Abalone Fishing Zone without decontamination. See Appendix 2: *Livestock Act notice: Movement of fishing gear between SA abalone zones.*

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Table 1: Example chemicals for decontamination

Chemical class	Chemical name	Dosage (details on registered label/ permit)	Research information	Comment
Oxidising agents	Potassium monopersulphate "Virkon aquatic"	0.5% (Cleaning and disinfecting equipment, boats, vehicles and other non-porous surfaces) to 1% (porous surfaces/footwear)	Not assessed	Very expensive, strips boats/harsh on skin, not often used, toxic, oxidising agent
Oxidising agents	Hypochlorite solutions e.g. "EEZI pool", "Barracuda" etc.	Range of doses in current permit	Assessed: effective at 15ppm active chlorine at site of application	Not used by dive industry – damages wetsuits, discolours boats. Used extensively in processing/ farm sectors for treating tubs, footbaths, surfaces etc.
Oxidising agents	Iodophors e.g. "Agridyne" (Iodine 16g/l)	0.1% iodine in solution (= 1000 ppm Buffodine)	Assessed - "Buffodine" assessed as effective at 50ppm	Safe. Not used by industry – obscurity and price. Stains brown. Highly effective
Quaternary ammonium	Didecyldimethyl-ammonium chloride "Virukill"	No dose information	Not assessed	Expensive, used by some Victorian industry for hard surfaces e.g. boats, fins, irons etc.
Ionic surfactants	Sodium dodecylbenzene sulfonate e.g. "Truck wash"	Dosage as recommended by manufacturer	Not assessed	Commonly used for boats in Victoria, some use on wetsuits and other gear Disposal issues
Non-ionic surfactants	General detergent, laundry detergent and dishwasher powder	Dosage as recommended by manufacturer	Not assessed	Very commonly used and presumed effective for general biosecurity. Includes specific wetsuit washing products
Non-ionic surfactants	Impress	1% solution (50g/L Benzalkonium chloride)	Assessed: effective at 1% "Impress"	Not commonly used

Standard Operating Procedures for Commercial Rock Lobster Fisheries

The operation of rock lobster pots in the Southern Zone Rock Lobster Fishery was considered as part of the risk assessment undertaken by PIRSA.

When fishing in areas of the Southern Zone Rock Lobster Fishery:

- Wash areas of the vessel (i.e., deck), as well as fishing pots and equipment, at the location of fishing to remove all biological material, sand and sediment collected during fishing operations.
- Avoid fishing in areas where clinical disease has been observed or confirmed, by relocating to another area.

If moving rock lobster pots to the Northern Zone Rock Lobster Fishery or other jurisdiction:

- Pots are to be removed from the water and transported to land.
- Once on land, thoroughly clean all equipment with freshwater, removing any remaining biological material, sand and sediment during fishing operations. When cleaning ensure wash-down water cannot enter the marine environment.
- Pots should be air dried, in the sun preferably for at least 72 hours before reuse.

A notice under the *Livestock Act 1997* is in place restricting the movement of rock lobster pots outside of the Southern Zone Rock Lobster Fishery without decontamination. See Appendix 2: *Livestock Act notice: Movement of fishing gear between SA abalone zones*.

Code of Practice for the Recreational Fishing Sector

Background

The activities of recreational divers and fishers pose a risk of spreading the virus in the marine environment. The number of fishers that take part in recreational diving and fishing is significant. This sector needs protocols to raise awareness of biosecurity issues and to minimise the risk of groups or individuals inadvertently transferring the virus. The recreational fishing sector was considered in the risk assessment process for the Code of Practice and supports a framework for improving biosecurity in this sector.

The purpose of the Code of Practice is to provide standard practices which seek to minimise the risk of the virus being spread between abalone zones within South Australia and inter-state by human related activities.

Standard Operating Procedures

Recreational diving

This protocol provides basic information on how recreational divers can identify and report abalone that have been affected by the disease. It also provides guidance on decontaminating vessels, equipment and personnel.

Before diving, fishers should visit the PIRSA website to check any current disease outbreaks, and if so determine locations and what restrictions may apply. PIRSA strongly advises divers and fishers to fish well away from confirmed disease outbreaks.

During normal fishing activities, recreational fishers and divers should remove biological material from equipment, including anchors at the location of activity and wash with fresh or sea water before moving to a new dive site.

If sick or dying abalone are encountered recreational fishers and divers should return to land and thoroughly clean equipment following the decontamination procedures described below with freshwater and detergent, removing any remaining biological material before returning to fishing/diving. Wash-down water must not re-enter the marine environment.

If travelling from the Southern Zone Abalone Fishery to another zone or jurisdiction for diving activities, fishers must fully decontaminate dive equipment including:

- Avoid fishing in areas where clinical disease has been observed or confirmed, by relocating to another area at a suitable distance.
- At sea, remove biological material from equipment, including anchors and other equipment at the dive location and wash with fresh or sea water.
- On land, thoroughly clean equipment with freshwater and remove material. Wash-down water cannot re-enter the marine environment.
- Wash equipment thoroughly with detergent.
- Rinse with freshwater.

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- Air dry in the sun preferably for at least 72 hours before reuse.

A notice under the *Livestock Act 1997* is in place restricting the movement of fishing equipment outside of the Southern Abalone Fishing Zone without decontamination. See Appendix 2: *Livestock Act notice: Movement of fishing gear between SA abalone zones*.

Identifying and reporting AVG

It is vital that recreational divers and fishers can identify abalone that could have AVG and report that information to FISHWATCH on 1800 065 522. This information will be used to respond quickly to an outbreak of AVG in areas where it may otherwise have gone undetected.

Identification of infected abalone

Infected abalone are lethargic, do not adhere well to the reef and may have enlarged mouthparts and a curled foot. The presence of enlarged mouthparts alone is not sufficient to diagnose AVG as it is not always present in infected abalone. A more reliable sign is the presence of numerous empty shells and weak/easily removed abalone.

If recreational divers and fishers encounter abalone that they suspect may have the virus they need report their findings to Fish Watch and decontaminate appropriate as described below.

Reporting the virus

Report the observations immediately through the 24-hour FISHWATCH hotline (1800 065 522).

Call FISHWATCH (1800 065 522) and provide the operator with as much detail as possible including:

- GPS co-ordinates of the reef and full description of the area where the abalone was found (including depth of water).
- Contact details of diver or fisher.
- Photos of infected abalone, if possible.
- Basis for suspecting disease.
- Recreational divers are also encouraged to make contact with regional PIRSA staff.

Decontamination procedures

This procedure is principally aimed at recreational divers who have inadvertently been in areas or zones that have disease or who encounter disease when diving. However, it is also applicable to all recreational divers and fishers.

Key areas that need to be addressed to minimise the risk of disease transfer through recreational diving and fishing activities are detailed below.

Decontamination of vessels

Prior to returning to shore, return all organic matter (i.e., seaweed, sand) to the water at the location of fishing/diving activity. If your vessel has a self-draining deck, wash-down the deck. Contain all wet diving equipment and catch bags in a fish bin, tub or dive bag.

When you return to shore, the vessel should be removed from the water and transported away from the boat ramp. Once away from the marine environment, remove any bungs and hose the vessel down, preferably with freshwater and detergent to remove organic matter from inside and outside of the vessel. Allow the vessel to dry, preferably in the sun for 24 hours.

If you live or have accommodation in the area, decontamination can be done when returning home.

Decontamination of wetsuits and other dive equipment

Wetsuits should be washed inside and out in fresh soapy water, rinsed and allowed to dry in a well-ventilated place, preferably in the sun.

Tanks, buoyancy/weight vests, regulators, mask and snorkel, dive floats, hookah hose and fins should be scrubbed clean with fresh soapy water, rinsed clean then allowed to dry, preferably in the sun.

Equipment that has touched abalone (i.e., catch bags, gloves, knives, measuring devices, etc.) should be carefully scrubbed with fresh soapy water to remove any grit, seaweed, etc., rinsed then air dried for at least 24 hours – preferably in the sun. This cleaning should be done away from the marine environment.

All equipment should be allowed to dry for at least 24 hours outside before re-use.

Decontamination of people

After diving for abalone, ensure that all people who have come in contact with abalone wash their hands with soap and water.

All waterproof clothing (i.e., lifejackets, etc.) should be sprayed with soapy freshwater, rinsed and left to dry in the sun. Normal clothes can be washed with laundry detergent.

Appropriate disposal of abalone shells and gut

Abalone may only be shucked in an area where waste cannot return to the marine environment with all waste disposed of in domestic waste facilities.

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Under no circumstances can abalone shells or gut be returned to the sea or used as bait/berley (see Appendix 4). This is an illegal activity.

Under the *Fisheries Management Act 2007*, it is unlawful to return abalone product to the water if it has been kept apart from its natural habitat.

Recreational rock lobster pots

When operating in areas of the Southern Zone Rock Lobster Fishery:

- Avoid fishing in areas where AVG has been confirmed by relocating to another area.
- Wash areas of the vessel (i.e., deck), as well as fishing pots and equipment, at the location of fishing to remove all biological material, sand and sediment collected during fishing operations.
- When you return to shore, the vessel should be removed from the water away from the boat ramp. Remove bungs and hose the vessel down, preferably with freshwater and detergent to remove organic matter from inside and outside of the vessel. Allow the vessel to dry, preferably in the sun.
- If you live or have accommodation in the area, decontamination can be done when returning home.

If moving rock lobster fishing gear or vessel to another fishing zone or jurisdiction:

- Gear is to be removed from the water and transported to land.
- Once on land, thoroughly clean all equipment with freshwater, removing any remaining biological material, sand and sediment during fishing operations. When cleaning ensure wash-down water cannot enter the marine environment.
- Pots must be air dried, in the sun for at least 72 hours before reuse.

A notice under the *Livestock Act 1997* is in place restricting the movement of rock lobster pots outside of the Southern Zone Rock Lobster Fishery without decontamination. See Appendix 2: *Livestock Act notice: Movement of fishing gear between SA abalone zones.*

Other fishing gear

When fishing in areas of the Southern Zone Rock Lobster Fishery, particularly when using fishing or boating equipment which interacts with the sea floor:

- Avoid fishing in areas where clinical disease of abalone has been observed or confirmed, by relocating to another area at a suitable distance.
- Wash areas of the vessel (i.e., deck), as well as fishing pots and equipment, at the location of fishing to remove all biological material, sand and sediment collected during fishing operations.
- When you return to shore, the vessel should be removed from the water so that waste water cannot return to the marine environment.
- Remove bungs and hose the vessel and equipment down, preferably with freshwater and detergent to remove organic matter from inside and outside of the vessel.
- Allow the vessel and equipment to dry, preferably in the sun.
- If you live or have accommodation in the area, decontamination can be done when returning home.

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If moving fishing gear or vessel to another fishing zone or jurisdiction:

- Gear is to be removed from the water and transported to land.
- Once on land, thoroughly clean all equipment with freshwater, removing any remaining biological material, sand and sediment during fishing operations. When cleaning ensure waste water must not enter the marine environment.
- Gear must be air dried, in the sun for at least 72 hours before reuse.

A notice under the *Livestock Act 1997* is in place restricting the movement of fishing equipment outside of the Southern Abalone Fishing Zone without decontamination. See Appendix 2: *Livestock Act notice: Movement of fishing gear between SA abalone zones.*

Other fishing gear which may interact with the sea floor includes, but not limited to:

- Anchors
- Sinkers
- Berley baskets
- Hoop or drop nets.

Code of Practice for the Aquaculture Sector

Background

There are currently 11 land-based aquaculture farms licensed under the *Aquaculture Act 2001* authorised to farm abalone. Of these, only five actively farm abalone. Activities under each licence are regulated through specific licence conditions, the *Aquaculture Regulations 2016* and the *Aquaculture (Standard Lease and Licence Conditions) Policy 2022*.

Land-based aquaculture systems

Land-based abalone aquaculture systems need access to large quantities of good quality seawater and require substantial coastal infrastructure. Larger farms pump ocean water at rates up to 1000 litres/second. There are two types of land-based abalone farms: hatchery-based and grow-out only. Hatchery-based farms are vertically integrated comprising hatchery, nursery and grow-out components. Grow-out farms buy juvenile abalone (usually 20–25 mm, 1 year old) from hatcheries aiming to grow out to market size in 2.5 years. Grow-out systems culture abalone in tanks of various designs and materials and require a regular exchange of seawater.

Marine abalone farming

Thirteen marine licences have been issued for farming abalone in South Australia, however at this time, none are actively farming. Typically, farming structures comprise concrete bases placed directly on the seafloor. Currently, as there is no commercial production from these systems, they are considered outside the scope of this Code of Practice.

Abalone Health Accreditation Program for the land-based abalone aquaculture sector

Nationally, the Abalone Health Accreditation Program (AHAP) was endorsed by the Animal Health Committee in April 2015. This program provides technical guidelines for the land-based abalone aquaculture sector to maintain a farm “compartment” free of AVG. The AHAP incorporates initial surveillance testing and ongoing sentinel testing for the virus that causes AVG (HaHV-1). The program requires annually audited biosecurity plans including a component that addresses surveillance outside the farm for the virus in wild populations. The AHAP is overseen by the competent authority (relevant government body) in each state and incorporates a SOP outlining steps required to achieve accreditation. The elements of the AHAP will not be repeated in this Code.

All active land-based aquaculture sites farming abalone were members of the AHAP prior to the detection of AVG in South Australia. As AVG has now been detected in South Australia, further surveillance is required to meet the requirements of the AHAP.

Standard Operating Procedures for Land-Based Abalone Farms

Identifying and reporting AVG

The Figure below shows a decision support process to assist farmers in determining if the virus is a likely cause where dead or dying abalone are observed in culture units.

Where high and unusual mortalities occur that are suspected to be caused by a disease, the farm must report this event to PIRSA, under the *Aquaculture Regulations 2016*. If required, samples will be submitted for diagnostic testing at a laboratory to confirm the presence or absence of AVG and other pathogenic organisms. AVG is a notifiable disease under South Australian legislation and is also nationally notifiable to the Australian Chief Veterinary Officer.

If AVG is confirmed on the farm, discussions will take place with the South Australian Chief Veterinary Officer regarding management of the farm. The aim is to limit the spread of disease to other farms and the wild (assuming endemic infection does not already exist in local wild stock). Means to achieving this end may include restricting movements of stock and water off the farm; harvesting or culling and processing of stock; and drainage, drying and disinfection of culture units housing infected abalone.

All South Australian farms are required under regulation 13 of the *Aquaculture Regulations 2016* to report unexpected mortalities. There are a range of potential causes of mortalities on abalone farms. It is good biosecurity practice to remove any mortalities from tanks as soon as possible.

Stock management

Stock management is a critical component of animal husbandry, and the following factors should be considered to reduce animal stress and the potential spread of disease. These elements are all incorporated into the farm biosecurity plan which is auditable under the AHAP.

- Separation and/or physical isolation of areas on the farm. Individual sheds or groups of sheds should be kept physically separate and be managed separately, by different staff members to prevent the spread of disease.
- Manage stocking densities to minimize stress and maintain optimal water quality.
- Feed commercial pelleted diets specifically formulated for abalone at an appropriate rate to sate stock. Diets should be sourced from a known and reliable manufacturer.
- Housing different age classes of abalone separately to reduce the potential for disease to spread.

Quarantine procedures

Quarantine facilities are required for stock movements approved under the AHAP, or any other legal translocations. These facilities should be completely isolated from the rest of the farm (i.e., separate room or building) until the health status of new stock can be determined. Key features of a quarantine facility include the following:

- Water used in the facility must not be allowed to mix with the water of other culture systems within the farm.

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- Equipment used in the quarantine area should not be used in other areas of the farm and appropriate sanitation procedures should be employed.
- The health status of the stock should be certified through an approved program (e.g., AHAP).

Disinfection of influent and effluent water

Given the current design and system of operating land-based abalone farms, it is likely that disinfection of influent and/or effluent water could only be practically applied on a small scale to discrete parts of the farm (i.e., hatcheries and broodstock holding facilities by filtration, chlorination and/or UV treatment).

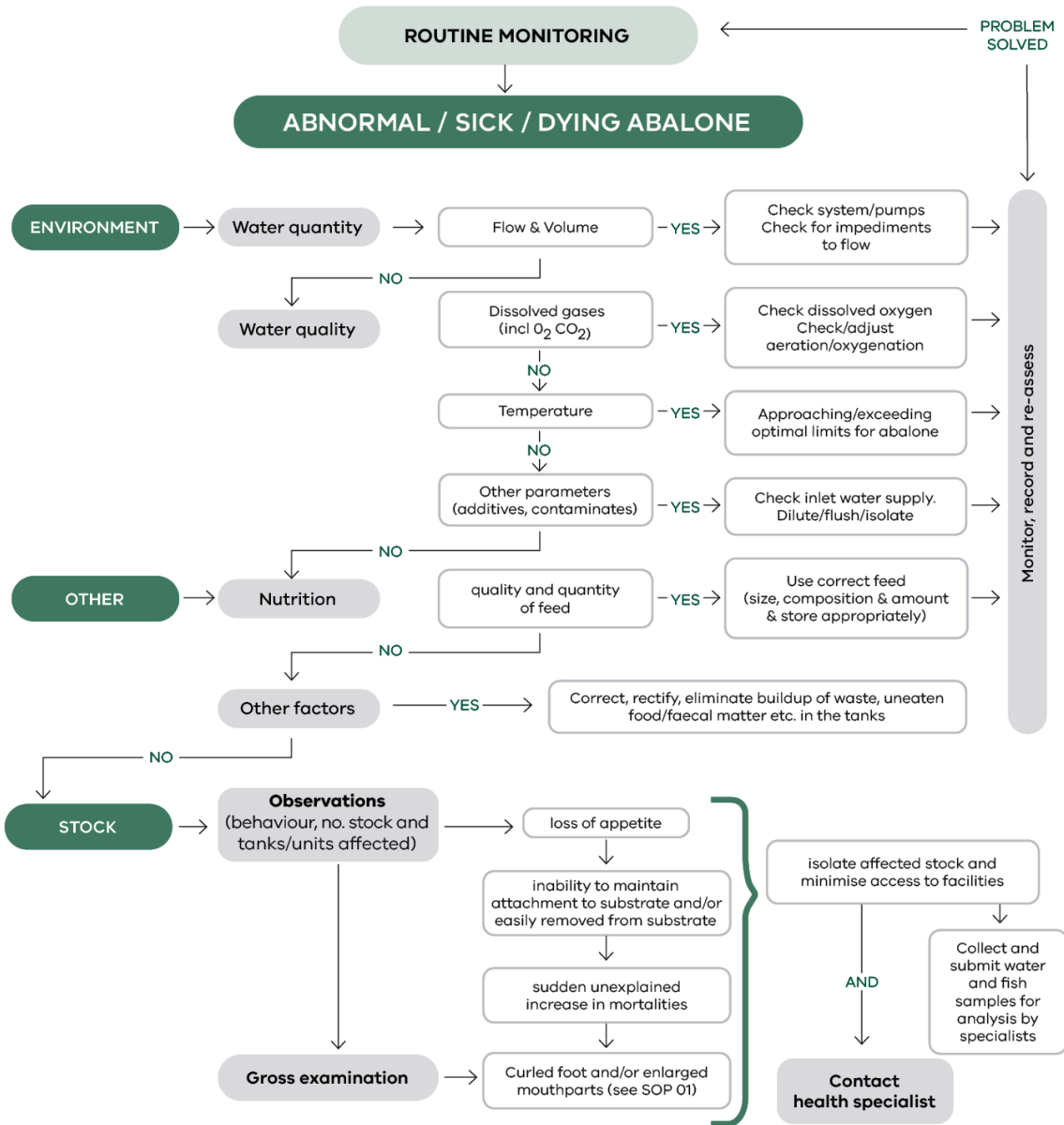


Table 2: Decision support pathway for abalone disease status

Code of Practice for Abalone Processors

Background

Fish processors must hold a registration to receive abalone in South Australia. There are currently 18 fish processors approved for the receipt of abalone in South Australia. Processors may receive abalone from within the zone they are located in, other zones, other states and aquaculture farms.

The South Australian abalone industry is a highly export oriented industry.

To export abalone, processors must be registered with the Australian Department of Agriculture, Fisheries and Forestry (DAFF). Abalone are prescribed goods, and their export is regulated under Commonwealth legislation. It is a condition of registration that the processor facility has an approved food safety management system known as an Approved Arrangement (AA). The AA must contain a Hazard Analysis and Critical Control Point (HACCP) plan that is an internationally recognised system used to manage food safety, staff training, knowledge and skills, product traceability, protection from contamination and other aspects of food safety. Prior to exporting each consignment, the processor must sign a declaration of compliance. The AA and HACCP plan may not cover additional risks presented by AVG.

Registration of fish processors is managed through PIRSA. Registration conditions require biosecurity measures to ensure the protection of the marine environment and domestic and international markets. These conditions include:

- Live abalone sourced from the Southern Zone must be:
 - Transported directly to the fish processor in sealed containers that are either new containers or have been decontaminated following the procedures described below.
 - Kept in separate holding systems (i.e., water, tanks or aquaria, equipment) from other management zones of South Australia.
 - All water, tanks, containers and other equipment that have come into contact with the unprocessed abalone are decontaminated before disposal or removal from the fish processor's premises or the point of sale, as applicable; following the procedures described below.
 - The unprocessed abalone must not enter an aquaculture lease or aquaculture licence.
 - The unprocessed abalone must not be allowed to enter South Australian waters.
- Abalone imported from outside of South Australia must be received and held in accordance with the Livestock Act notice dated 27 May 2021, refer *Appendix 3: Livestock Act notice: Movement of abalone from interstate to South Australia*.
- Other marine benthic species (e.g., rock lobster or crabs) originating from the Southern Zone Rock Lobster Fishery must be kept separate from abalone.
- Live abalone must only be held for human consumption.
- All water that has come into contact with live abalone must be disposed of on land.
- Abalone or their products must not be sold or disposed of for the purpose of use as bait or berley.

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Fish processors are encouraged to develop an auditable biosecurity plan. This plan should detail the standard operating procedures (SOPs) specific to their operation to ensure the major risks associated with live holding of abalone are mitigated.

The purpose of this Code of Practice is to address issues concerning the potential entry of AVG into the marine environment; entry and spread through processors and through the domestic and international export of abalone. The virus is not a concern for human health.

Risks and control measures for abalone processors

Livestock Act 1997 notices relating to the holding of abalone in processing facilities sourced from South Australia and other jurisdictions prescribe processing and holding requirements. These notices can be found at Appendix 2 and 3.

A risk assessment process was conducted by PIRSA and highlighted the key risks associated with the transmission of AVG to processors, the marine environment and the supply chain.

Key risks in processing facilities related to AVG:

Marine environment

- Untreated waste exiting a live holding receiver without treatment discharging directly into the marine environment.
- Live holding floor waste reaching the marine environment (e.g., biofouling and water spillage entering the marine environment through inappropriate waste disposal practices).
- Live holding mortalities entering the marine environment through inappropriate disposal or sale.
- Inappropriate disposal of solid waste including shell and viscera through poor waste disposal practices or sale.

Entry into live holding

- Abalone displaying clinical symptoms of AVG entering a live holding receiver that were not identified during wild harvesting operations.
- Infected abalone not displaying clinical symptoms of the disease, entering a live holding system (silent infection).
- Transfer of abalone between processors which were sourced from currently impacted areas.

Transfer within live holding

- Live holding systems with recirculation system combining multiple tanks.
- Mixing of consignments from known AVG areas with abalone from areas where AVG is not known to occur.
- Transfer of live holding containers between tanks.

Export (Domestic and International)

- Failure to identify clinical disease during pack outs.
- Abalone without clinical signs of AVG being packed out.

Procedures for Abalone Processors

These procedures relate to conditions for specified fish processors who receive abalone.

Processors may receive abalone from areas where AVG suspected or has been confirmed. Staff need to be familiar with the key signs of disease and how to recognise and diagnose it. There are a range of resources to assist with training.

If a batch of abalone received has been sampled for disease and awaiting testing, they must be retained in isolated tanks or stored separately in sealed containers and not moved from the facility until results from diagnostic testing are completed. Any other abalone received from other fishers operating in the area (i.e., a “Suspect Area” as described above in Area Classifications) around where those samples were taken should also be held separately.

If a diver suspects AVG presence in a batch of abalone, the bin will be clearly marked.

Pursuant to a Livestock Act notice, issued 27 March 2024, the following activities are prohibited in South Australia:

- Keeping of abalone originating from the Southern Zone in the same holding system (water, tanks or aquaria, equipment) as any other abalone.
- Keeping of non-abalone marine benthic species (including but not limited to rock lobsters and crabs) originating from the Southern Zone in the same holding system (water, tanks or aquaria, equipment) as abalone.

Abalone imported from outside of South Australia must be received and held in accordance with the Livestock Act notice dated 27 May 2021, refer *Appendix 3: Livestock Act notice: Movement of abalone from interstate to South Australia*.

Recording mortalities

There are legal requirements for the identification and notification of suspicion of AVG. The most obvious sign of virus infecting abalone in a tank is high mortality rates, (greater than 10% of unexplained stock mortality in 24 hours within a single tank).

Any unusual signs of abalone health or mortality should be closely monitored.

The registration holder must keep full and accurate daily written records of all mortalities and make the records available on request by an authorised officer.

Abalone received from impacted areas may exhibit clinical signs when they arrive for live holding. It is vital that employees in live holding facilities and processing plants can identify the clinical signs of disease so that they can prevent further spread of the virus and the origin of the consignment can be traced. These abalone must be kept isolated from other consignments.

Identifying the disease in live abalone

- The most prominent sign that an abalone has AVG is that it is weak or dead.
- Potential signs in live abalone:
 - poor suction and can be easily removed from holding tanks

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- inability to right itself if inverted
- swollen and protruding mouth parts
- edges of the foot curling inwards, exposing clean shiny shell
- excessive mucus.

Reporting suspicion of AVG in abalone

AVG is a notifiable disease. Processors must report any abalone on the premises that they suspect have the virus to FISHWATCH on 1800 065 522.

If suspect abalone are observed, abalone must remain in the holding tanks until results from diagnostic testing have been received.

Information that may be required

- Name and full contact details for the processing facility.
- The catch disposal record (CDR) number, the diver and receipt date.
- The location where the abalone were collected (i.e., reef codes, GPS, etc.).
- Total number of abalone in the tank and the total number of tanks on the premises and current stock holding.
- Details of the signs and symptoms the animals have including photographs.
- History of the abalone (e.g., transportation to the premises or movement within tanks).
- Export history, both domestic and international of suspect consignment or abalone held in the same recirculation system.

Where there is suspicion of disease, PIRSA staff will be available to assist with queries around sample submission, quarantine of tanks to reduce risk of spread and decontamination processes.

Sampling suspect abalone

PIRSA can provide guidance on sample selection based on individual circumstances, but in the absence of such guidance, at least five (preferably up to 15) abalone (including healthy looking abalone, if any present) is appropriate.

Sample storage

- Place samples of sick, dying and dead abalone in a labelled, sealed plastic bag and refrigerate as soon as possible.
- Previously shucked and frozen abalone suspected of having AVG are suitable for testing.
- Transport of samples will be arranged in consultation with PIRSA staff. If there is a delay with the transportation of over 24 hours, samples can be frozen.

If you have come in contact with infected abalone

- Wash your hands with fresh, soapy water.

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- Spray waterproof clothing with fresh, soapy water, rinse and allow to air dry.
- Wash clothes in laundry detergent.
- The virus causing AVG is not a human health risk.

Reducing the risk of AVG entering a fish processor

Receival of new stock

- If a batch of abalone received has been sampled for disease and awaiting testing or abalone are received from other fishers operating in the area around where those samples (i.e., Suspect Area” as described above) were taken they must be:
 - Retained in isolated tanks and not moved until results from diagnostic testing are completed; or
 - If abalone are to be processed:
 - the processed product is treated in a manner which is effective at inactivating AVG and the product is preserved in a can or other sealed package for human consumption, or
 - untreated abalone product is stored in a sealed container and held onsite until test results have been received.

All abalone product if held as processed or unprocessed product, including abalone waste and abalone mortalities, must be disposed of appropriately as described in the section above “Reducing the risk of the spread of AVG within a fish processor and out into the marine environment”.

- Where possible tanks should be left for 48 hours before tanking new stock.
- Abalone imported from outside of South Australia must be received and held in accordance with the Livestock Act notice dated 27 May 2021, refer *Appendix 3: Livestock Act notice: Movement of abalone from interstate to South Australia*.
- Where abalone have been received from a Known AVG area, they should be subjected to thorough visual inspection for any sign of clinical signs of AVG.
- All abalone in live holding should be held in bins and labelled with the date, licence number, zone and state.
- Each live holding tank must have complete and accurate written records of all abalone in that tank including mortalities (expressed as a percentage per tank), water tests, incomings, outgoings, visual observations and cleaning.
- Abalone must only be received from appropriately licensed fishers or businesses.

Reducing the risk of the spread of AVG within a fish processor and out into the marine environment

Live holding water and waste discharge

Under the *Environment Protection Act 1993* fish processors are not permitted to discharge waste or wastewater into any waters. They can discharge into a sewer but they may need to apply for a trade waste agreement from SA Water. It also may depend on the system they use and whether seawater upsets the balance or not. Note the Water Quality Policy includes:

- (4) Fish Processing:
 - the conduct of works for scaling, gilling, gutting, filleting or otherwise processing fish for sale, but excluding—
 - (a) works with a processing output of less than 100 tonnes per year where wastewater is disposed of to a sewer or Community Waste Management System (CWMS); or
 - (b) works with a processing output of less than 2 tonnes per year where wastewater is disposed of otherwise than to a sewer or CWMS; or
 - (c) processing of fish only in the course of a business of selling fish by retail.
 - In this subclause—
 - fish** has the same meaning as in the *Fisheries Management Act 2007*;
 - processing fish** does not include freezing, chilling or packing the fish.

Live holding floor waste

- Live holding floor waste is to be retained in drainage pits, cleaned out regularly with waste disposed to general waste or landfill. The remaining wastewater is to be discharged to trade waste or sewer subject to approval.

Disposal of live holding mortalities

- Mortalities should be appropriately processed or disposed of in general waste or landfill.
- Abalone mortalities or products must not be given away or sold as bait or berley. It is unlawful for a person to use abalone product as bait or berley under the *Livestock Act 1997* (Appendix 4).
- All shells intended for export or commercial use must be free of viscera prior to drying.
- Processors located near marine waters should ensure that any area designated for that purpose is scavenger proof.
- Shell not intended for commercial use must be disposed of in general waste or landfill.

Disposal of solid waste (viscera)

- Viscera not intended for commercial use (i.e., food stuffs, fertiliser, stock feeds) must be disposed of in general waste or land fill.

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- Abalone viscera must not be given away or sold unprocessed to fishers to use as bait in marine waters.

Movement of abalone within a live holding processor:

- Abalone from known AVG regions must not be tanked with abalone from non AVG regions.
- Abalone imported from outside of South Australia must be received and held in accordance with the Livestock Act notice dated 27 May 2021, refer *Appendix 3: Livestock Act notice: Movement of Abalone from interstate to South Australia*.
- Processors are to avoid moving abalone from one tank to another.
- Processors are to avoid moving small quantities of abalone into other tanks and mixing stock in the same tanks.
- All live holding bins should be cleaned of any organic matter and a suitable disinfectant used (see Table 1), rinsed with freshwater and dried outside prior to reusing. All equipment (i.e., brushes, nets, sponges, cloths, vacuum) including Personal Protective Equipment should be washed between cleaning tanks.

Export of abalone from live holding processor

- All abalone leaving a live holding facility should have tank logs examined for unexpected mortality increases – expressed as a percentage.
- All abalone leaving the live holding facility must be inspected during pack out for clinical symptoms of disease.
- All abalone consigned from the processor must be accompanied by the appropriate documentation.

Decontamination of equipment, vehicles and personnel

Containers and fish bins

- Containers and fish bins that are used to transport abalone between commercial divers, processors and aquaculture farms were identified as a key risk area for potential cross-contamination. Processors should make sure that any bins are clean before they leave the premises by undertaking the following measures:
 - A dedicated wash area should be set up.
 - Containers and bins should be scrubbed clean of any organic matter (i.e., grit, dirt, etc.) and cleaned with water and a suitable disinfectant used.
 - Containers and bins should be fully air dried before return to commercial divers or farmers, preferably in direct sunlight.

Vehicles

- All solid debris should be removed from trailers and vehicles and the area wiped with disinfectant. All residual biological material must also be removed.

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- Where the vehicle has carried abalone that are known or suspected to have AVG, all bins and contact areas should be scrubbed clean with a dilute detergent or suitable disinfectant and allowed to dry in the sun for at least 24 hours.
- Any fixtures and fittings (i.e., aeration equipment, pipework, etc.) coming in contact with potentially infected abalone must be dismantled and rinsed with freshwater to ensure that infected material is removed.

Personnel

- It is important that appropriate protective clothing is worn at work.
- Protective clothing should be cleaned with a sponge or low-pressure pump while being worn to remove gross organics. The clothing can then be rinsed and hung up to dry. Rubber boots should be scrubbed.
- Personnel should regularly wash their hands in soapy water.

Frequently Asked Questions (FAQs)

Help stop the spread of abalone disease

Abalone viral ganglioneuritis (AVG) is a viral disease affecting the nervous system of abalone. This often results in the curling of the foot and swelling of the mouth and can lead to weakness and death of abalone.

What does an abalone with AVG look like?

While abalone with AVG usually show one or more of these signs, the virus can also be present without any visible signs.

The most common sign that an abalone has AVG is that it is weak or dead. The presence of a large number of empty shells in the wild may be an indication of infection with AVG.

In some abalone you may see:

- Swollen and protruding mouth parts
- The mouth coming out from under the foot
- Edges of the foot curling inwards, exposing clean shiny shells
- Abalone with poor suction that can be easily removed from substrate whether that is the rock they are attached to in the wild or a tank on a farm or processing plant
- An inability for the abalone to right itself when turned over
- Excessive mucus.

What do I do if I suspect abalone have AVG?

- Report AVG to FISHWATCH on 1800 065 522.
- If you are an aquaculture farm or processor it is important that you report any suspicion of disease immediately to increase the chance of effectively controlling the disease.
- If you are a commercial fisher, it is also important that you report suspicion of disease to ensure protection of the resource. Providing the GPS location will greatly assist with further investigations.
- Recreational fishers can assist with providing reports where there are multiple dead abalone or obvious clinical signs. One or 2 deaths is unlikely to be caused by the virus.

Processor and farm actions where there is a suspicion of disease

If you see an unusual number of sick or dead abalone:

- Contact FISHWATCH on 1800 065 522.
- Quarantine the tanks immediately.
- Use a commercial grade disinfectant to clean shucking tables, tools, rumblers and any other equipment used to handle abalone whilst waiting for advice on next steps.

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- Await detailed instructions on next steps if AVG is confirmed on your site. This may involve stopping water discharge and emergency harvest followed by a complete disinfection of affected parts of the site.

What happens when I make the report?

You can call FISHWATCH 24 hours a day, every day of the year, to report any significant animal disease. The operator will take some details from you and arrange for PIRSA to contact you and provide you with guidance on further action you need to take.

What information do I need to provide?

- Name and full contact details.
- Location of your farm/processing plant or the GPS location of where abalone were seen if in the wild.
- Total number of abalone seen dead/dying. If you are from a farm or processing plant, how many tanks are affected and the number of dead abalone observed in each tank.
- Details of the signs and symptoms, as well as photographs of affected abalone.

Which abalone do I select as samples for testing?

If possible, please select at least five (preferably up to 15) abalone (including healthy looking abalone, if any present) for testing.

Abalone shell cannot be tested for the virus and most of the meat in the shell needs to be intact for sampling.

How do I store abalone samples?

- Live, sick abalone: place your sample in a sealed plastic bag with a label and refrigerate as soon as possible for transport within 24 hours. Keep the sample moist, out of direct sunlight and allow some air (or oxygen if available) to remain in the bag.
- Freshly dead abalone: place in a separate sealed plastic bag with a label and transport with ice bricks.
- If there is a delay in transporting to the laboratory (more than 24 hours), the samples can be frozen.
- Transport of samples to the laboratory will be discussed after the report has been made.

What measures do I need to follow to help stop the spread of AVG?

- For recreational and commercial fishers, follow the basic biosecurity protocols provided in this Code.
- For processors, do not place abalone sourced from different zones or state in the same tank as abalone sourced from elsewhere in SA and do not share equipment between tanks.
- For farms, follow the biosecurity practices in your farm biosecurity plan.
- For all people working with, or fishing for abalone, we rely on your vigilance to report suspicions of AVG. Please report suspicions in line with these FAQs.

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What if I think I have come in contact with infected abalone?

- Wash your hands with fresh, soapy water.
- Spray waterproof clothing with fresh, soapy water, rinse and allow to air dry.
- Wash clothes in laundry detergent.

How do I correctly dispose of abalone waste?

- Ensure shells can dry for several months in an area designed to keep out any scavenger animals or birds, away from the marine environment.
- Ensure abalone gut is disposed of in commercial waste, landfill or to an approved food waste recycler.

Appendix 1: Contact information

Department of Primary Industries and Regions

Dr Annabel Jones

General Manager, Fisheries Management

Email: annabel.jones@sa.gov.au

Phone: (08) 8429 0165

Mobile: 0417 612 737

Hamish Telfer

Fisheries Manager

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Dr Matthew Bansemer

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Dr Ben Stobart

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Andrew Hogg

Research officer, SARDI Aquatic and Livestock Sciences

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Phone: (08) 8735 1329

Mobile: 0428 104 160

Industry representatives

Mr Arthur Martel

Secretary, Southern Zone Abalone Management Inc.

Email: tilanby6@bigpond.com

Phone: (08) 8725 9995

Mobile: 0409 094 689

Dr Nicole Hancox

Executive Officer, Abalone Industry Association of SA Inc.

Email: eo@abalonesa.com.au

Mobile: 0428 630 211

Mr Michael Tokley

Executive Officer, Central Zone Abalone Fishery

Email: michael@strategicmc.com.au

Phone: 8294 1402

Mobile: 0418 841 114

Mr Nathan Kimber

Executive Officer, South Australian Rock Lobster Advisory Council

Email: nathan@kimberconsulting.com.au

Phone: (08) 8132 0161

Mobile: 0417 838 459

Appendix 2: Livestock Act notice: Movement of fishing gear between SA abalone zones

LIVESTOCK ACT 1997

SECTION 37

Requirements for the control of Abalone Herpes Virus-1 (AbHV-1)

Pursuant to Section 37 of the *Livestock Act 1997* and for the purposes of controlling Abalone Herpes Virus-1 (AbHV-1), I Elise Katherine Spark, Chief Inspector of Stock, delegate of the Minister for Primary Industries and Regional Development, hereby require that:

- activities listed in Schedule 1 are prohibited within South Australia, and
- activities listed in Schedule 2 Column A are prohibited unless they are undertaken in accordance with requirements in Schedule 2 Column B.

DEFINITIONS

In this Notice:

biological material does not include fish that are lawfully able to be taken under the *Fisheries Management Act 2007*.

diving equipment includes wetsuits, fins, masks, weight vests and belts, hookah gear and diving accessories, including but not limited to knives, bags and nets.

fishing equipment includes but is not limited to rods, reels, lines, hooks, sinkers, lures, jigs, bins, baskets, buckets, nets, pots, bags, spearguns and knives.

marine benthic species includes but is not limited to southern rock lobster, gastropods and macroalgae, but does not include pipis collected in the intertidal zone.

rock lobster pot has the same meaning as the *Fisheries Management (Rock Lobster Fisheries) Regulations 2017*.

Southern Zone means waters adjacent to South Australia east of the meridian of longitude 139° East and shallower than 30 metres.

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SCHEDULE 1 - Activities prohibited within South Australia

Keeping of abalone originating from the Southern Zone in the same holding system (water, tanks or aquaria, equipment) as any other abalone.

Keeping of non-abalone marine benthic species (including but not limited to rock lobsters and crabs) originating from the Southern Zone in the same holding system (water, tanks or aquaria, equipment) as abalone.

SCHEDULE 2 – Activities subject to requirements

Column A Activity	Column B Requirements
Any activity that requires the use of diving equipment, fishing equipment, and anchors that have come into contact with the marine benthic environment	All equipment used within the waters of the Southern Zone must be decontaminated in accordance with the “PIRSA Guideline Decontamination requirements for Abalone Viral Ganglioneuritis” as published on the Department of Primary Industries and Regions website (https://www.pir.sa.gov.au) before entering State waters other than the waters of the Southern Zone. Within the aforementioned Guideline, <i>biological material</i> and <i>rock lobster pot</i> have the meaning defined in this Notice.

This Notice will be in effect from 23:59 on 27 March 2024 and remain in force until 23:59 on 26 March 2025 unless amended or revoked by a subsequent Notice.

Dated: 27 March 2024



Elise Katherine Spark
Chief Inspector of Stock
Delegate of the Minister for Primary Industries and Regional Development

Appendix 3: Livestock Act notice: Movement of abalone from interstate to South Australia

LIVESTOCK ACT 1997

SECTION 33

Prohibition of Entry into South Australia of Unprocessed Abalone (Haliotis spp.)

Pursuant to Section 87 of the *Livestock Act 1997*, I, Mary Ruth Carr, Chief Inspector of Stock, delegate of the Minister for Primary Industries and Regional Development, revoke the notice made by the Minister for Agriculture, Food and Fisheries pursuant to section 33 of the *Livestock Act 1997* on 6 May 2021, published in the *Gazette* on 7 May 2021 at pp. 1360-1361.

Pursuant to Section 33 of the *Livestock Act 1997*, and for the purposes of controlling or eradicating disease or contamination, I prohibit the entry into, and subsequent movement within, *South Australia* (including *South Australian waters*) of *unprocessed abalone*, except to the extent, and subject to the conditions, set out in Parts A to E below. Except as expressly provided, the exceptions in Parts A to E are independent of one another.

Part A. unprocessed abalone supplied by a designated aquaculture supplier

The entry into, and movement within, *South Australia* of *unprocessed abalone* originating from another State or Territory of the Commonwealth is permitted if:

- a. the *unprocessed abalone* were cultivated by a *designated aquaculture supplier* of that State or Territory (or, if the *unprocessed abalone* is fresh *abalone* product, it was derived exclusively from *abalone* so cultivated), the *designated aquaculture supplier* has been *accredited* by a *competent authority* of that State or Territory within the previous 12 months and the *accreditation* has not been revoked or withdrawn, and the *unprocessed abalone* are accompanied:
 - i. if they are to be processed in *South Australia*, to the *fish processor* to which they are transported for *processing*; or
 - ii. otherwise, to the *point of sale* where they are to be sold by retail in *South Australia* by a copy of the *designated aquaculture supplier's* current certificate of *accreditation*; and
- b. in the case of *unprocessed abalone* originating from a State or Territory that has reported the occurrence of *AVG*, and which is not declared free of *AVG* in accordance with the standards set by the World Animal Health Organisation (OIE), the *unprocessed abalone* are accompanied:
 - i. if they are to be processed in *South Australia*, to the *fish processor* to which they are transported for *processing*; or
 - ii. otherwise, to the *point of sale* where they are to be sold by retail in *South Australia* by a completed *Abalone Health Statement* in respect of the *unprocessed abalone*; and
- c. the *unprocessed abalone* are transported from the *designated aquaculture supplier* which cultivated them (or, if the *unprocessed abalone* is fresh *abalone* product, from the *designated aquaculture supplier* which cultivated the *abalone* from which the fresh *abalone* product was derived):
 - i. directly into *South Australia*; or
 - ii. directly to a *certified biosecure area* of a *fish processor* in the State or Territory where the *abalone* were cultivated and, from there, directly into *South Australia*, and if they enter *South Australia* from a *certified biosecure area*, the *unprocessed abalone* are accompanied;
 - iii. if they are to be processed in *South Australia*, to the *fish processor* to which they are transported for *processing*; or
 - iv. otherwise, to the *point of sale* where they are to be sold by retail in *South Australia* by a copy of the current certificate as to the biosecure status of the *certified biosecure area*; and
- d. upon entering *South Australia*, the *unprocessed abalone* are transported directly to a *fish processor* or *point of sale* in *South Australia*; and
- e. the *unprocessed abalone* are moved into *South Australia* and transported to the *fish processor* or *point of sale* in sealed containers that are either new or have been *decontaminated* before receiving the *unprocessed abalone*; and
- f. so long as they remain *unprocessed*, *unprocessed abalone* that leave the place where they were received upon entering *South Australia* are transported (including to the *point of sale* where they are to be sold by retail) in sealed containers which (unless the *unprocessed abalone* remain in the same sealed containers in which they entered *South Australia*) have been *decontaminated* before receiving the *unprocessed abalone*; and
- g. all water, tanks, containers and other equipment that have come into contact with *unprocessed abalone* are *decontaminated* before disposal or removal from the *fish processor's* premises or the *point of sale*, as applicable; and
- h. the requirements set out in Part D are complied with.

Part B. wild-caught unprocessed abalone entering by road or air from a jurisdiction not affected by AVG

The entry into, and subsequent movement within, *South Australia* of *unprocessed abalone* comprising wild-caught live *abalone* originating from a State or Territory of the Commonwealth other than a State or Territory referred to in Part C, or fresh *abalone* product derived from wild-caught *abalone* originating from such a State or Territory, is permitted if:

- a. the *unprocessed abalone* are transported from the place where, as wild-caught *abalone*, they were landed:
 - i. directly into *South Australia* by road or air; or
 - ii. directly to a *certified biosecure area* of a *fish processor* in the State or Territory where the *abalone* were landed and from there, directly into *South Australia* by road or air, and if they enter *South Australia* from a *certified biosecure area*, the *unprocessed abalone* are accompanied;
 - iii. if they are to be processed in *South Australia*, to the *fish processor* to which they are transported for *processing*; or
 - iv. otherwise, to the *point of sale* where they are to be sold by retail in *South Australia* by a copy of the current certificate as to the biosecure status of the *certified biosecure area*; and
- b. upon entering *South Australia* (or if arriving by air, upon being landed in *South Australia*), the *unprocessed abalone* are transported directly to a *fish processor* or *point of sale* in *South Australia*; and
- c. the *unprocessed abalone* are moved into *South Australia* and transported to the *fish processor* or *point of sale* in sealed containers that are either new or have been *decontaminated* before receiving the *abalone*; and
- d. so long as they remain *unprocessed*, *unprocessed abalone* that leave the place where they were received upon entering *South Australia* are transported (including to the *point of sale* where they are to be sold by retail) in sealed containers which (unless the *unprocessed abalone* remain in the same sealed containers in which they entered *South Australia*) have been *decontaminated* before receiving the *unprocessed abalone*; and
- e. all water, tanks, containers and other equipment that have come into contact with *unprocessed abalone* are *decontaminated* before disposal or removal from the *fish processor's* premises or the *point of sale*, as applicable; and
- f. the requirements set out in Part D are complied with.

Part C. wild-caught unprocessed abalone entering by road or air from an AVG-affected jurisdiction

The entry into, and subsequent movement within, *South Australia* of unprocessed abalone comprising wild-caught abalone originating from a State or Territory of the Commonwealth that has reported the occurrence of AVG, and which is not declared free of AVG in accordance with the standards set by the World Animal Health Organisation (OIE), or fresh abalone product derived from wild-caught abalone originating from such a State or Territory, is permitted if:

- a. the unprocessed abalone enter *South Australia* by road or air; and
- b. upon entering *South Australia* (or if arriving by air, upon being landed in *South Australia*), the unprocessed abalone are transported directly to a fish processor for processing; and
- c. the unprocessed abalone are moved into *South Australia* and transported to the fish processor in sealed containers that are either new or have been decontaminated before receiving the unprocessed abalone; and
- d. from the time of entering *South Australia* until being processed, the unprocessed abalone are not at any time kept in water; and
- e. the unprocessed abalone are processed by the fish processor on the fish processor's premises; and
- f. all water, tanks, containers and other equipment that have come into contact with unprocessed abalone are decontaminated before disposal or removal from the fish processor's premises; and
- g. the requirements set out in Part D are complied with.

Part D. requirements

The requirements that apply for the purposes of Part A. paragraph h., Part B. paragraph f. and Part C. paragraph g. are that:

- a. water that has come into contact with unprocessed abalone is disposed of (after it has been decontaminated) to the public sewer; and
- b. all unused unprocessed abalone are transported directly to a waste depot in sealed containers where they are disposed of in landfill; and
- c. no unprocessed abalone enter an area that is subject to an aquaculture lease or aquaculture licence; and
- d. no unprocessed abalone enter *South Australian waters*; and
- e. the unprocessed abalone are accompanied:
 - i. if they are to be processed in *South Australia*, to the fish processor to which they are transported for processing; or
 - ii. otherwise, to the point of sale where they are to be sold by retail in *South Australia*

by a copy of a consignment note, or similar document, relating to the carriage of the unprocessed abalone into *South Australia*, which, among other things, identifies the consignor of the unprocessed abalone in the State or Territory where the unprocessed abalone originated, the location where the carrier took delivery of the unprocessed abalone, and the destination in *South Australia* where the unprocessed abalone are to be delivered (including the identity of the person to whom the unprocessed abalone are to be delivered).

Part E. with Chief Inspector's approval

The entry into, and subsequent movement within, *South Australia* of unprocessed abalone is permitted if the Chief Inspector of Stock has (in his or her discretion) approved in writing the entry of the unprocessed abalone into *South Australia* and its subsequent movement within *South Australia* and all conditions (if any) attached to the approval are satisfied.

Definitions

In this Notice:

abalone means abalone (*Halotis* spp.) of all species;

Abalone Health Statement means the *Abalone Health Statement for Entry of Abalone for Purposes Other Than Aquaculture from a State or Territory Not Declared Free of Abalone Viral Ganglioneuritis*, available at www.pir.sa.gov.au or from the Chief Inspector of Stock, 33 Flemington Street, Glenside SA 5065, or GPO Box 1671, Adelaide SA 5001 or by telephone (08) 8207 7900, or any other document determined by the Chief Inspector of Stock to be an "Abalone Health Statement" for the purposes of this Notice and made available at www.pir.sa.gov.au;

abalone product means carcasses or parts of carcasses of abalone or any products consisting of parts of or derived from abalone;

accredited, in relation to a designated aquaculture supplier of a State or Territory, means that a competent authority of that State or Territory has certified in writing in respect of the designated aquaculture supplier that:

- a. it implements biosecurity measures to prevent AVG, monitor mortality rates, and report mortality and disease to the competent authority; and
- b. AVG has not been detected at its aquaculture facilities in the past 12 months;

and **accreditation** has a corresponding meaning;

aquaculture lease means an aquaculture lease granted under the *Aquaculture Act 2001* (as described on the public register kept under that Act);

aquaculture licence means an aquaculture licence granted under the *Aquaculture Act 2001* (as described on the public register kept under that Act);

AVG means abalone viral ganglioneuritis;

certified biosecure area means an area where measures are applied to mitigate the risks of introduction and spread of disease that has been annually inspected and certified as being biosecure by a competent authority of the State or Territory where the area is located;

competent authority, of a State or Territory of the Commonwealth, means a veterinary authority or government authority having the responsibility in that State or Territory for ensuring the implementation of animal health measures or veterinary health certification;

decontaminated means inactivation of the virus that causes AVG by a disinfection process using granular 650g/kg available chlorine as calcium hypochlorite or sodium hypochlorite to prepare a 200ppm effective chlorine solution (Australian Pesticides and Veterinary Medicines Authority (APVMA) PER86206) or another process approved by APVMA and the Chief Inspector of Stock and notified at www.pir.sa.gov.au or otherwise approved in writing by the Chief Inspector of Stock, 33 Flemington Street, Glenside SA 5065, or GPO Box 1671, Adelaide SA 5001;

designated aquaculture supplier, of a State or Territory of the Commonwealth, means any person who holds a current authority to engage in aquaculture issued under the law of that State or Territory;

fish processor means a fish processor registered under the *Fisheries Management Act 2007* or corresponding legislation of another State or a Territory of the Commonwealth;

fresh abalone product means *abalone product* that is not *processed abalone product*;

point of sale means a place at which *unprocessed abalone* is processed and/or sold, whether by wholesale or retail, on a commercial basis;

processed abalone product means *abalone product* that has been treated in a manner that is generally recognized as being effective to inactivate the virus commonly known as “*abalone herpesvirus*” and is preserved in a can or other sealed packaging for human consumption;

processing means any process in which *unprocessed abalone* are converted to *processed abalone product*, and *processed* and *unprocessed* have corresponding meanings;

public sewer means a sewer operated by a council or any other authority established under the *Local Government Act 1999*, a water supply authority (within the meaning of the *Water Industry Act 2012*), a State owned corporation (*South Australian Water Corporation Act 1994* or a subsidiary of such a corporation) or any other public or local authority;

South Australia means the State of *South Australia*;

South Australian waters means waters that are within the limits of *South Australia*;

unprocessed abalone means live *abalone* or *fresh abalone product*;

waste depot means a place at which waste may be treated or stored in accordance with an approval under the *Local Government Act 1999* or a place approved as a *waste depot* or waste facility under any other Act.

This Notice will remain in force (as it may be varied from time to time by subsequent Notice) until revoked by subsequent Notice.

Dated: 25 May 2021

MARY RUTH CARR
Chief Inspector of Stock
Delegate of the Minister for Primary Industries and Regional Development

Appendix 4: Livestock Act notice: Prohibition on the use of abalone products for bait or berley

LIVESTOCK ACT 1997

SECTION 37(1)(A)

Prohibition on the Use of Abalone as Bait or Berley

Pursuant to Section 37(1)(a) of the *Livestock Act 1997* and for the purpose of control or eradication of abalone viral ganglioneuritis (AVG), an exotic disease of abalone (*Haliotis* spp.) caused by abalone herpesvirus (Haliotid herpesvirus-1), I, Mary Ruth Carr, Chief Inspector of Stock, delegate of the Minister for Primary Industries and Regional Development require that:

- (1) In all *South Australian waters*, abalone (*Haliotis* spp.) or abalone product must not be used as bait or berley for any fishing activity unless the prior written approval of the Chief Inspector of Stock has been obtained, and all conditions of the approval are complied with.

In this Notice:

South Australian waters means Waters that are within the limits of *South Australia*.

This Notice will remain in force until 31 December 2025 unless amended or revoked by a subsequent Notice.

Dated: 10 July 2023

MARY RUTH CARR
Chief Inspector of Stock
Delegate of the Minister for Primary Industries and Regional Development