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Aquaculture Management Standard

Guidelines for Auditors
- Indicators of Conformity -
Version 2.0

Marine Eco-Label Japan Council

Introduction

This document, Aquaculture Management Standard, Guidelines for Auditors - Indicators for Conformity - (hereinafter referred to as Guidelines), refer to the indicators of each standard and those meanings that assist the auditors to evaluate whether the unit of certification is conformity or non-conformity with standards. This Guidelines aims to equalize the quality of assessment results concluded by the different auditors.

This guideline has been revised in conjunction with the adoption of the MEL Aquaculture Management Standard Ver. 2.0. The main objectives are to respond to the changes in the environment of the aquaculture industry in Japan and overseas, and comply with the GSSI (Global Sustainable Seafood Initiative) Benchmark Tool Ver. 2.0. Besides, the descriptions of criteria, standards and indicators and explanatory texts, which might be unclear at some points, were modified as clear as possible. It is hoped that the judgment and basis of assessment will be further clarified and contribute to the improvement of the quality and uniformity of assessment and auditing.

MEL AMS is applicable to all aquaculture species and production systems. The unit of certifications are four production systems, 1) marine cage aquaculture (yellowtail, greater amberjack, red sea bream, Pacific bluefin tuna, Coho salmon, Japanese flounder and Japanese pufferfish, etc.), 2) inland aquaculture (rainbow trout, Ayu, Japanese flounder and Japanese pufferfish, Atlantic salmon, Coho salmon etc.), 3) shellfish aquaculture (scallops and oyster, etc.), and 4) seaweed aquaculture (wakame seaweed, laver and nemacystus decipiens, etc.) under the same management procedures.

The unit of certification is basically the one that an aquaculture farmer carries out under the same management rule in one aquaculture area. However, it can be subject to certification even if multiple producers are organized, and three types of certification are established: Multi-Site Certification, Partial Certification, and Group Certification. Since the details are set out in “Appendix 1 Guidelines for MEL Aquaculture of Units of Certification" at the end of this document, the assessment shall be conducted based on these guidelines.

Principle 1. Social Responsibility in Aquaculture Operations (To surely fulfil social responsibilities)

All aquaculture activities must be conducted legally in accordance with all the relevant laws and regulations to fulfill social responsibility. Many laws and regulations are related to the aquaculture standard of Marine Eco-Label Japan, and each criterion of the standard may be stricter than laws and regulations. Each criterion of Principle 1 can be achieved by satisfying criteria in other principles. Social responsibility further requires providing employees with appropriate working conditions and environments as well as not making use of illegal labor.

Criterion 1.1

The aquaculture operations shall be conducted in compliance with all the relevant laws, regulations and ordinances of national and local governments where the aquaculture site is located.

1.1.1	Aquaculture farmers shall carry out production in compliance with all the relevant national and local laws and regulations.	
Indicators	A	Applicants have prepared and maintained documents listing required procedures in accordance with relevant laws and regulations.
	B	Specific actions are properly conducted to meet Indicator 1.1.1A.
1.1.2	Aquaculture farmers shall obtain the requisite licenses and permissions, and the aquaculture site and target species shall be in accordance with the licenses and permissions.	
Indicators	A	Requisite fishery licenses and other relevant permits are obtained. The actual aquaculture production matches the requirements in the permit.
	B	Where regulations of fishery rights are set by the local government or fisheries cooperative, farmers understand the contents of the regulations correctly, and aquaculture production is carried out in accordance with the regulations.
1.1.3	Workers shall be treated fairly, with appropriate wages, welfare, and working conditions in accordance with the relevant laws and regulations. Proper health management and working environment shall be secured for them.	
Indicators	A	Workers are provided with appropriate wages, welfare, and working conditions in accordance with the relevant laws and regulations.
	B	Proper health management of employees (e.g., regular health checks) is carried out and recorded.
1.1.4	The use of child labor or other illegal labor is strictly prohibited.	

Indicator	**A**	Illegal labor practices, such as child labor or employment of illegal foreign workers, are not conducted.

Standard 1.1.1

Indicator 1.1.1 A:

The auditor shall confirm that the applicants maintain a list of documents issued or notified by the relevant authorities, including but not limited to:

- Fishery Act (Act No.267 of 1949)
- Act on the Protection of Fishery Resources (Act No. 313 of 1951)
- Sustainable Aquaculture Production Assurance Act (Act No.51 of 1999)
- Act on Promotion of Inland Waters Fishery (Act No.103 of 2014)
- Act on Securing Quality, Efficacy and Safety of Pharmaceuticals, Medical Devices, Regenerative and Cellular Therapy Products, Gene Therapy Products, and Cosmetics (Act No. 145 of 1960)
- Act on Safety Assurance and Quality Improvement of Feeds (Act No.35 of 1953)
- Food Sanitation Act (Act No.233 of 1947) and Food Safety Basic Act (Act No.2003)
- Basic Act on Biodiversity, and/or
- The laws and regulations of local governments where the aquaculture site is located

Laws and regulations other than those directly related to aquaculture (e.g., the Water Pollution Prevention Act) can be applied to confirming compliance with this criterion. Required procedures for aquaculture farmers based on relevant laws and regulations are explained for each Standard and Indicator in this guideline; thus, the auditor can confirm Standard 1.1.1 when the all of Standards were conformed. In the case of surveillance assessment (or annual audit), whether newly issued documents are published or not needs to be confirmed and evaluated in the conformity with each indicator.

Standard 1.1.2

Indicator 1.1.2 A:

Standard 1.1.2 applies to mariculture and in-land aquaculture. The auditor confirm that the applicant has obtained the demarcated or specific demarcated fishing right for the aquaculture operation.

Indicator 1.1.2 B:

The applicant should have Rules on Exercising Fishing Rights. In addition, the applicant understands the aim of Marine Eco-Label Japan and is willing to carry out aquaculture in keeping with that aim.

Standards 1.1.3 and 1.1.4

Indicator 1.1.3 A, 1.1.3 B and 1.1.4 A

The standards apply to the employers of aquaculture operations. These standards include the ILO conventions as well as the national laws and regulations of Japan that have been revised in accordance with the international conventions. The auditor confirms the work contracts and other documents. Records from the Labor Standards Supervision Office and other competent authorities are observed to confirm the existence and details of instructions and advice. The auditor also interviews the employers. Note that these standards do not apply if the applicant is a farmer belonging to a fisheries cooperative without employment relationships.

Principle 2. Consideration for the Health and Welfare of Aquatic Animals (To ensure the health and welfare of aquatic animals)

Animal welfare for aquatic animals for aquaculture is subject to international laws and regulations. Aquaculture management with consideration for the health and welfare of aquatic animals is therefore an essential requirement for exporting the cultured animals. The Farmed Fish Health Code of the OIE (International Epizootic Office) provides general principles of animal welfare, since the applicable animals and production methods vary. Although the animal welfare of livestock is different from that of aquatic animals, the standards aim to properly apply ideas and methods to aquatic animals similar to those for livestock.

Criterion 2.1

The aquatic animals shall be managed in a suitable environment to minimize stress on them, and precautionary measures against diseases shall be planned and executed.

2.1.1	Aquaculture farmers shall use proper water in accordance with Water Quality Standards for Fisheries based on the type of target species and their life stage.	
Indicators	A	The dissolved oxygen level, necessary for the healthy growth of aquaculture animals, meets the water quality standards for fisheries (see Appendix 3: Water Quality Standards for Fisheries).
	B	Contamination indicators, such as COD (Chemical Oxygen Demand), and total nitrogen level, as well as levels of COD and TS (Total Sulfide) on the bottom, meet the water quality standards for fisheries (see Appendix 3).
	C	Procedures for dealing with adverse impacts on aquaculture, such as red tide and pollution, include information collection, record of conditions, and countermeasures are provided.
2.1.2	Aquaculture farmers shall provide sufficient cage space and a suitable rearing density to maintain satisfactory environmental conditions at the growing site.	
Indicators	A	Cages in mariculture farms are located at intervals for maintaining sufficient circulation of seawater.
	B	The numbers of aquaculture animals for each rearing unit are recorded.
	C	Aquaculture animals are reared with proper density.
2.1.3	Aquaculture farmers shall monitor the environmental conditions of the farming site by using proper indicators. Appropriate procedures shall be established for dealing with deteriorating conditions.	
Indicators	A	Monitoring of the environment suitable for aquaculture animals is planned and

		implemented accordingly.
	B	The monitoring results meet the standards in these Guidelines.
	C	Necessary improvement measures are taken in case the results are not met.
	D	Improvement of water quality is ensured as a result of taking measures.
2.1.4	Aquaculture farmers shall use suitable feed matched to the nutritional requirements of aquatic animals, with proper quantities for maintaining their healthy condition.	
Indicators	A	Feed used at the aquaculture farm is properly stored to avoid quality deterioration.
	B	Proper feed is used at the aquaculture farm.
	C	When there is a concern about the health of the aquatic animals, vitamins and other feed additives are properly used in accordance with the relevant laws and regulations as necessary.
	D	The amount of feed given to the aquatic animals is recorded for each rearing unit.
	E	In line with the stipulated procedures, observing bite condition, proper amount of feed is adjusted and given to the aquatic animals.

Standard 2.1.1

This standard conforms with the water quality suitable for aquaculture animals in response to animal health and welfare. The standards of natural condition for enhanced fishery and aquaculture are set in the Basic Policy for Development and Rational Use of Marine Resources (Act No. 06 of 1971). Based on those standards, the Water Quality for Aquaculture Animals (Japan Fishery Resources Conservation Association) was corresponded; thus, those standards of water quality and sediments shall be used.

Indicator 2.1.1 A

The quality of water suitable for the healthy growth of aquatic animals is determined by the level of dissolved oxygen (DO). The standard value for these indicators complies with the quality standards of fishery water (6 mg/L or higher). However, it should be noted that DO levels vary depending on the water temperature. The upper limit of dissolved oxygen for many aquatic animals is around 50% of oxygen saturation; however, this level may affect the immune system.

As the indicators for water quality show diurnal and seasonal fluctuations, measurements need to be taken several times from September to November, when the harvest, feeding, and growth of aquatic animals reach their peak, to set the average. Measures need to be taken to ensure that the average oxygen saturation ratio is not below 60%, or that the lowest allowable level of dissolved oxygen level of 4.3 mg/L is maintained on the inner bay fishing ground and on the bottom layer of lakes and marshes

during the summer.

Indicator 2.1.1 B

Regarding the chemical oxygen demand (COD) of water, the Water Standards for Fisheries, 2018 edition shown in Appendix 3, states that "the criteria of value of desirable COD-OH (alkaline method) in general sea areas, Nori seaweed cultured farms and coastal areas of closed inner bays are temporarily suspended." However, the conventional method will be applied until a formal conclusion is reached.

The chemical oxygen demand (COD) of seawater for aquaculture of clams (*Anadara broughtonii, Meretrix lusoria Saxidomus purpurata* and *Ruditapes philippinarum*), sea cucumber, oyster, Japanese tiger prawn and seaweed should be 3 ppm or lower. COD of seawater for aquaculture of other species should be 2 ppm or lower. The COD of the bottom materials for aquaculture of tilefish, grouper, halibut, flatfish, shellfish (*Babylonia japonica*), clams (*Anadara broughtonii, Atrina pectinata, Mizuhopecten yessoensis, Saxidomus purpurata, Ruditapes philippinarum, Mactra chinensis, Pseudocardium sachalinense* and *Sinonovacula constricta*), Japanese blue crab, sea cucumber and Japanese tiger prawn should be 20 mg/1 g dry dirt or lower, and sulfide should be 0.2 mg/1 g dry dirt or lower.

Indicator 2.1.1 C

In the seawater area, red tide and contamination accidents may affect the survival of aquatic animals. The preparation of a risk manual may help to minimize the impacts on aquatic animals. Occurrences of harmful events must be recorded. Where harmful events continue, necessary measures, such as relocation of the farm, must be taken.

The monitoring of all the contamination indicators, such as COD, BOD, and total nitrogen, is not required. However, the selection and monitoring of appropriate indicators for the specific cultured species are required and the applicant should explain the reasons for the selection.

Standard 2.1.2

This standard requires the rearing density must be kept at an appropriate level. Since the rearing densities for avoiding stress on the aquatic animals depend on environmental factors, there is no uniform rearing density. The determination for standard 2.1.2 must be made in relation to the determination for standard 2.1.1. For instance, even when the density seems to be low, if the dissolved oxygen level described in standard 2.1.1 is not maintained, the rearing should be conducted at a lower density.

Indicators 2.1.2 A, 2.1.2 B and 2.1.2 C

The intervals to be provided between cages is influenced by the aquaculture environment. The auditor should evaluate whether the ratio of cage area to the whole farming ground, DO and rearing density of aquatic animals in each cage match to the criteria indicated in Sustainable Aquaculture Production Assurance Act (Act No. 51 of May 21, 1999). If farmers are rearing beyond the above criteria, they are required to show that various kinds of data (years of rearing results (efficiency of the feed, occurrences of disease, average survival rate, etc.), water quality data, regulations of local government, etc.) are good in comparison with other average farming sites. The density of aquaculture animals shall be confirmed based on 2.1.2 B.

Standard 2.1.3

Indicators 2.1.3 A, 2.1.3 B and 2.1.3 C

Compliance with the standards from **2.1.1 to 2.1.3** can be considered confirmed when the aquaculture farm improvement plan has been properly formulated in accordance with Concerning the Application of the Sustainable Aquaculture Production Assurance Act (1999) based on the Sustainable Aquaculture Production Assurance Act, and the plan has been certified by the local authorities. The auditor should also observe the implementation of the plan.

Standard 2.1.4

This standard requires that the auditor shall confirm the proper method of feed storage to maintain and improve the health of aquaculture animals.

Indicator 2.1.4 A

The proper method of feed storage includes the feeds shall be used up within a couple of days to prevent the feeds from storing for long term, be kept dry storage to prevent the feeds from getting moldy and not be kept outside to prevent the decomposition of fats and vitamins in the feeds. Thus, the auditor shall confirm the procurement method of feeds and conditions of storage.

Indicator 2.1.4 B and C

Feed manufacturers produce compound feeds considering nutritional requirement for each fish species. The auditor shall confirm the feed targeting to the farmed fish is used as appropriate feed. When the feed for other fish species is used, it can be in conformity if it is confirmed that the nutritional requirements is met from the information on nutrients, etc. obtained from feed manufactures, and that there are no growth and health problems for the farmed fish from a rearing management log.

Feed additives such as vitamins, etc. are effective to maintain and improve the health condition of aquatic animals. It must be confirmed that the feed additives used for the purpose of maintenance and

improvement of the health of aquatic animals are either naturally derived or made with substances allowed in the former Pharmaceutical Affairs Act or the Act on Safety Assurance and Quality Improvement of Feeds.

Indicator 2.1.4 D

The auditor shall confirm the records of feed amount given to aquatic animals to evaluate proper quantity of feeds. Thus, the amounts and kinds of feed given to the aquatic animals shall be recorded for each rearing unit.

Indicator 2.1.4 E

The auditor shall observe the aquaculture log and/or interview with the applicant whether the amounts of feed supplied to each aquatic animal are properly recorded for each cage, whether the amounts are adjusted (observation method of feeding status, adjustment method of feed amount, etc.) depending on their condition of feed intake as well as whether the feeding rate is not exceeded the recommended feeding rate.

Remaining feed may have negative impact on environment. The auditor shall confirm feeding methods to reduce remaining feeds if an aquaculture farmer prepares operating procedures for feed. It is recommendable to confirm the record of amount of remaining feed, etc. Also, the procedure and implementation for re-feeding (feeds are kept in cold storage and used next day) and disposal of feed, in case that feeds are remained, shall be confirmed.

Criterion 2.2

Aquatic animals shall be maintained under appropriate management to prevent disease outbreaks and spread.

2.2.1	Aquaculture farmers shall monitor the health condition of aquatic animals regularly with appropriate indicators.	
Indicators	A	Procedures for regular monitoring of the health condition of aquatic animals are provided.
	B	Monitoring is conducted by following the procedures and the results are recorded.
	C	The records are regularly reported to the officer of the Fisheries Experimental Station for their review and counselling.
2.2.2	Aquaculture farmers shall establish a procedure for the collection and treatment of dead and moribund aquatic animals, and shall treat them properly in accordance with	

	the decision procedure.	
Indicators	A	When dead and moribund aquatic animals are found, the animals are immediately removed into special containers and the number of such animals is recorded.
	B	Procedures for the proper treatment of moribund aquatic animals are established and implemented.
2.2.3	Aquaculture farmers shall manage their facilities to prevent escape, and shall not release diseased aquatic animals intentionally.	
Indicators	A	Diseased aquatic animals are not released intentionally.
	B	Aquaculture farmers remove organisms attached to facilities when the organisms may serve as a breeding ground for pathogens, and regularly repair the nets to avoid spreading diseases through the escape of diseased organisms.
2.2.4	Seeds shall be certified free from specific or material pathogens before introduction to aquaculture sites.	
Indicators	A	The rearing history of the aquaculture seeds before introducing them into the site is confirmed and recorded.
	B	Seeds are inspected as necessary and properly kept in a separate site until the test results are obtained.
	C	If disease was discovered in the testing, disposal or treatment is conducted by following the instructions of experts.
	D	In case seeds were imported from other countries or were purchased from an area where a specific disease occurred in the past, the certificate of non-disease infection has been obtained.
2.2.5	Aquaculture farmers shall manage the aquatic animals properly by effective preventive measures and vaccination throughout all the rearing stages.	
Indicators	A	When a fisheries vaccination is certified, such vaccine is actively used to prevent diseases. The vaccine is properly used in accordance with the relevant laws and regulations.
	B	Disinfection and other measures to prevent spreading of the disease specified in the Guideline for the Countermeasures against Specific Diseases are conducted as needed. Preparations have been made for such activities.

Standard 2.2.1

This standard requires aquaculture farmers to monitor animal health and prevent disease outbreak from the view point of animal health and welfare.

Indicator 2.2.1 A

The methods using various indicators have been proposed for evaluating the health condition of aquatic animals. Examination for diseases should ideally be carried out on a regular basis. When costs, stress on aquatic animals, and other factors are considered, visual observation by farmers may be advisable. The condition of animals while feeding and swimming, as well as changes in body color, are especially important indicators. The auditor shall confirm the procedures of daily monitoring of animal condition and implementation of monitoring based on procedures.

Indicator 2.2.1 B

The auditor shall confirm the records of monitoring and diagnosis of animal condition based on procedures confirmed with indicator 2.2.1 A.

Indicator 2.2.1 C

It is desirable that these procedures and the results of monitoring are regularly checked by the officer of the Fisheries Experimental Station, etc. for improvement of aquatic animal health management. Also, the aquaculture farmers can prevent disease based on their knowledge and experiences.

Standard 2.2.2

This standard requires that aquaculture farmers shall collect and treat the dead and moribund aquatic animals, and shall treat them properly to prevent disease outbreak.

Indicator 2.2.2 A and 2.2.2 B

This requires that special containers that can be sterilized and hermetically sealed should be provided and the dead and moribund animals transferred to a proper place to be buried or burnt. Compliance with this standard can be confirmed when these procedures are in place and implemented. Also, the number of dead aquatic animals shall be recorded since it is the important indicator to suspect the disease outbreak.

Standard 2.2.3

This standard requires to prevent disease outbreak in other facility of aquaculture farms and wild animals when disease is detected one facility of aquaculture farm.

Indicator 2.2.3 A

If dead or diseased aquatic animals released intentionally, it may cause disease outbreak inside and outside of aquaculture farms and wild animals. Also, diseased fish escaped from broken nets or the

sessile organisms on the nets can be causations to disease outbreak. Aquaculture farmers shall manage their facilities to prevent escape, and shall not release diseased aquatic animals intentionally. This indicator can be confirmed with Standard 2.2.2.

Indicator 2.2.3 B

The auditor shall confirm that aquaculture farmers regularly maintain their facilities (methods and frequency of net cleaning etc.) to prevent disease outbreak caused by the periphyton on the nets and the escape of diseased organisms.

Standard 2.2.4

This standard requires proper hygiene management of seed since the transport of seeds and adult fish can be a major route of disease transmission. The proper hygiene management shall be required to confirm Indicators 2.2.4 A and 2.2.4 B.

Indicator 2.2.4 A

The aquaculture farmers shall identify and record the history and other data (origin of production, history of disease occurrences, medication record, supplier, purchaser, etc.) of the seed.

Indicator 2.2.4 B and 2.2.4 C

Seeds introduced to the aquaculture facility may be inspected if necessary. This does not mean seed inspection is required regardless of whether there are visually identifiable abnormalities. Inspection is required only when the applicant so decides based on visibly recognized abnormality in the seeds. In this case, seeds under the inspection and other seeds shall not be mixed until the result of inspection is obtained. The auditor shall confirm the procedures to decide starting inspection, keep seeds under inspection and handle diseased seeds (dispose, treat in accordance with Standard 2.3 etc.).

Indicator 2.2.4 D

The auditor shall confirm a non-disease certificate and/or results of inspection in case the relevant laws and regulations require the submission of those documents.

Standard 2.2.5

This standard requires aquaculture farmers shall manage the aquatic animals properly by effective preventive measures throughout all the rearing stages to minimize disease and outbreak.

Indicator 2.2.5 A

Vaccination is one of the effective preventive measures. Although vaccination is not obligation, the

aquaculture farmers should make active efforts including vaccination to prevent the spread of diseases. If the applicant declares that vaccination is not conducted because there have been no disease records at any time, the occurrence of the disease should be confirmed by the rearing management record, etc. And, if the content of the declaration is judged to be appropriate, it should be complied with requirement. Fish species for which there is no approved vaccine are considered as not applicable.

Indicator 2.2.5 B

The measures against spread of diseases described in the Guideline for the Countermeasures against Specific Diseases as well as disinfection and other measures are effective for preventing the outbreak and spread of diseases derived from pathogens already existing in the aquaculture farm. When standards 2.2.3 and 2.2.4 are complied with, compliance with standard 2.2.5 may be considered as confirmed.

Criterion 2.3

In the case of disease outbreaks, the aquatic animals shall be treated in accordance with the applicable laws and regulations.

2.3.1	Aquaculture farmers shall establish and implement procedures for responding to disease.	
Indicators	A	Procedures for diagnosis and cure of diseases in case of disease outbreak are provided.
	B	The procedures include measures to prevent the spread of diseases.
	C	Treatment is implemented in line with the procedures above mentioned.
2.3.2	Aquaculture farmers shall treat diseases in accordance with the diagnosis and decision on treatment under the supervision of Fish Epidemic Prevention Officers.	
Indicators	A	Diagnosis and decision on treatment of diseases are implemented based on the results of examinations conducted by Fish Epidemic Prevention Officers, etc.
	B	When antimicrobial agents are used, procedures (e.g., instructions for the use of fisheries antibacterial agents) are followed and documented.
	C	As special cases where the farm starts disease treatment to avoid disease spreading without the results of the examinations conducted by Fish Epidemic Prevention Officers, etc., the procedures are followed on instructions.
2.3.3	Aquaculture drugs shall be used in accordance with the Act on Securing Quality, Efficacy and Safety of Pharmaceuticals, Medical Devices, Regenerative and Cellular Therapy Products, Gene Therapy Products, and Cosmetics (Act No. 145 of	

	1960) and other relevant regulations. Aquaculture farmers shall establish procedures for drug usage to minimize any impacts on the environment.	
Indicators	A	In case medicines are used, proper measures are taken to prevent the contamination of other aquaculture animals and the spilling of medicines into the environment.
	B	When medicines are used, the cage where the medicines are used, the name and dose of medicines, the date of medication, and the period of cessation are recorded.
	C	Information is recorded on aquaculture drugs such as records of purchase, manufacturer and retailer, serial numbers, date of production, purchase, and use, and administrated dosage in stock, etc. Aquaculture drugs are stored properly to prevent deterioration in their quality.
	D	Aquaculture drugs are disposed of after the expiration date.
2.3.4	Antimicrobial agents shall be used in accordance with the Principles for Responsible and Prudent Use of Antimicrobial Agents in Aquatic Animals of the OIE Aquatic Animal Health Code.	
Indicator	A	This indicator can be confirmed as standards 2.3.1 to 2.3.3 are confirmed.
2.3.5	Aquaculture workers shall be trained, educated, and competent to handle aquatic animal and equipment in hygienic, safe and proper manner. Workers shall have high awareness of these matters and shall act responsibly.	
Indicator	A	The aquaculture workers regularly participate in training sessions on fish diseases provided by the local government and others.

Standards 2.3.1, 2.3.2 and 2.3.3 require in the case of disease outbreak, the aquatic animals shall be treated in accordance with the applicable laws and regulations from the viewpoint of animal welfare.

Standard 2.3.1

Indicator 2.3.1 A

The procedures for diagnosis and treatment in the case of disease outbreak are established and implemented accordingly. The procedures must include sampling diseased fish, submitting samples to the competent authority, adding medicines to a compound feed and controlling compound feed.

Indicator 2.3.1 B

The procedures should include methods for isolating the cage where disease is detected, if such treatment is possible. The cage which contain diseased fish is isolated from other cages and treatment

can be conducted. In this case, the auditor shall confirm the space where the cage can be located. On the other hand, it is difficult for many aquaculture farms to secure the space. In this case, aquaculture farmers can give medication to cages all at once. Also, this indicator can be confirmed with the conformity of Standards 2.2.2 and 2.2.3.

Standard 2.3.2

Indicator 2.3.2 A

Aquaculture farmers must request diagnosis by experts (Fish Epidemic Prevention Officer or a veterinarian authorized by the prefectural governor) and receive instruction for treatment based on drug sensitivity examination. The auditor shall confirm the records of medication and diagnosis by experts (medical records etc.).

Indicator 2.3.2 B

It is vitally essential for dealing with the National Action Plan on Antimicrobial Resistance. It must be confirmed that the application for Instruction for the Use of Fisheries Antimicrobial Agents, the instructions, and other documents are properly prepared, and that rules for storage of issued documents are established.

Indicator 2.3.2 C

Where the aquaculture farm is located in a remote area (it takes more than 4 days to obtain result of examination), it may be necessary to start the treatment to prevent disease spreading before the examination results are obtained. In this case, the auditor shall confirm the procedures before starting the treatment as follows;

1) the aquaculture farmers shall inform the symptoms of dead fish and situation of disease outbreak to the relevant experts via telephones, emails and other communication tools,
2) the samples shall be submitted to the competent authority,
3) after the communication with the experts, aquaculture farmer can start the treatment by following the instructions from the experts.

The auditor shall confirm the records of communication such as contact notes and/or emails between aquaculture operators and experts. The records must include name of expert, date and instructions from experts. In case those records are not observed by the auditor, this standard will be resulted as non-conformity.

Standard 2.3.3

Indicator 2.3.3 A

Aquaculture drugs are uniformly added to the feed and procedures to prevent cross-contamination are established as follows;

1) the measures to distinguish the drug added feeds and normal feeds shall be prepared to separate diseased fish and healthy fish,
2) less amount of feeds (80% of normal amount feed) shall be used to be consumed all the feeds by aquatic animals,
3) healthy fish shall be fed before the diseased fish to avoid mixing medicated feed and normal feed in the feeding machine.

Indicator 2.3.3 B

The auditor shall confirm the records listed in the Indicator 2.3.3 B.

Indicator 2.3.3 C

The auditor shall confirm the purchase slips that show farmers purchase aquaculture drugs only listed in Instruction for the Use of Fisheries Antimicrobial Agents. The information on date of purchase, date of use, amount of use and stock should be recorded. This indicator can be confirmed by verifying compliance with Indicator 2.3.3 B.

Indicator 2.3.3 D

In case aquaculture drugs are stored, the auditor shall confirm the proper condition of storage (proper temperature and humidity, sealed drugs etc.) and the valid date of drugs. In case the expired date of drug is found, the auditor shall confirm its disposal method and by when to be disposed.

Standard 2.3.4

This standard can be confirmed by verifying compliance with standards 2.3.1 to 2.3.3 since those standards in accordance with Section 6. Antimicrobial Use of Aquatic Animals of OIE Aquatic Animal Health Code

Standard 2.3.5

This standard requires that aquaculture workers are required to be aware of their obligation to take responsible measures for prevention and treatment of diseases.

Indicator 2.3.5 A

Aquaculture workers are required to attend training sessions organized by the Fisheries Experimental Station, etc. to the extent possible. A record of training such as dates, names, venues, and attendees

should be kept. In case those records are not kept, the auditor shall observe the training certificates issued by the organizer, notices for training sessions, and other documents to prove their attendance. As no aquaculture drag is approved for the bivalve disease, the standards 2.3.1 – 2.3.5 are not applied to the bivalve aquaculture.

Although the agent of seaweed exists, no drug is used for its treatment. The diseased seaweeds are removed during seed production and culture and only healthy seaweeds are cultured since diseased seaweed seriously decrease the quality of products. Thus, standards 2.2 and 2.3 are not applied to seaweed aquaculture. In case diseased outbreak of nori seaweed, the acid treatments by using organic acid etc. are conducted. Since the chemicals used for acid treatment may have environmental impacts, standard 4.1 is applied to this treatment.

Principle 3 Assurance of Food Security
(To carry out aquaculture activities properly for food safety)

The aquaculture products should contribute to the promotion of the health of consumers. Aquaculture animals must be reared in a manner to ensure the safety of the products for human consumption. The following criteria are established to ensure the trust of consumers in the aquaculture products through the efforts of aquaculture farmers to minimize unexpected health risk to consumers.

Criterion 3.1

Aquaculture activities, environment, materials, and equipment shall be managed properly to minimize the risks to human health.

The location of aquaculture sites is particularly associated with the accumulation of chemical substances such as environmental pesticides, heavy metals, etc. It is necessary to conduct risk management at seed production facilities as well. Therefore, this criterion is also subject to assessment in the case of certifying seed production facilities.

3.1.1	The aquaculture site shall be selected in consideration of proper risk assessment of pollution at the site and the surrounding environment.	
Indicators	A	The location of the aquaculture farm and the number and arrangement of cages are documented.
	B	The location of agricultural farms and factories and the inflow of rivers around the aquaculture farm are documented. The potential sources of contamination of the aquaculture farm are evaluated.
3.1.2	Aquaculture farmers shall conduct hazardous substance monitoring at the aquaculture site to prevent hazards to human health.	
Indicator	A	Monitoring plans are established for existing risks, and the level of contamination is not harmful.

Standard 3.1.1

This standard requires that aquaculture farmers shall consider the risk of food safety caused by environmental contamination of aquaculture sites.

Indicator 3.1.1 A

Maps of aquaculture sites and cage location shall be prepared to recognize the risks caused by surrounding environment. The auditor shall confirm the maps and/or other documents.

Indicator 3.1.1 B

Agricultural farms and factories as well as inflow of wastewater from households may cause risk to an aquaculture site. Thus, the location of agricultural farms and factories and the inflow of rivers around the aquaculture farm are documented. The potential sources of contamination of the aquaculture farm are evaluated.

Standard 3.1.2

Indicator 3.1.2 A

When heavy metals such as mercury, arsenic, lead, and cadmium or agricultural chemicals are detected, the level must be confirmed to be below the standard levels given in the Food Safety Act. Even when the level of pollution is lower than the limit in environmental water, it is desirable to conduct monitoring of the aquaculture products at least once a year. The auditor should evaluate the relevant documents submitted by the applicant to confirm compliance with this standard.

In case that no pollution has been detected last three years or neither agriculture site nor factory exists, this indicator is not applied.

Criterion 3.2

Aquaculture medicines shall be managed properly in accordance with procedures for preventing drug residues.

3.2.1	Aquaculture medicines shall be used based on the expertise and accurate diagnosis of Fish Epidemic Prevention Officers to optimize its medical efficiency, and records of drug usage shall be kept.	
Indicator	A	Compliance with this indicator is confirmed by compliance with Criterion 2.3.

The requirements for this criterion are common with each standard and indicator of criterion 2.3. Thus, if the criterion 2.3 is complied, this criterion automatically is complied. This criterion is subject to assessment since the disclosure and provision of rearing history are necessary in the case of certifying seed production facilities.

Criterion 3.3

Feed shall be properly managed to minimize any risks of contamination.

This criterion is also subject to assessment since the disclosure and provision of rearing history are

necessary in the case of certifying seed production facilities.

3.3.1	Feed, feed additives, and feed ingredients shall be used responsibly to prevent chemical contamination. Traceable records on feed used for each aquaculture unit shall be kept.	
Indicators	A	Information on feed is recorded, such as the place of origin (whether the identification of the fishing site is traceable), provider, fish species, quantity, and date of purchase; and records of purchase are kept.
	B	Information on manufactured feed and feed additives is recorded, such as the manufacturer, provider, name of the product, serial number, quantity, date of purchase, composition, etc.; and records are stored.
	C	For manufactured feed and feed additives, documentation is obtained and kept showing conformity with the Act on Safety Assurance and Quality Improvement of Feeds and the origin of manufactured feed ingredients (for fish meal, oil, etc., the species of the raw fish material, and whether the identification of the fishing water is traceable).
	D	The types and amounts of feed given to the fish are recorded for each cage.
	E	Feeding equipment and other tools are regularly cleaned and disinfected and managed hygienically.
	F	Feeding-related works, such as preparation of feed, feeding, and changing of nets, are properly conducted to prevent contamination with harmful chemical substances, such as machine oil or paint.
	G	Feed is properly stored to prevent contamination with harmful chemical substances or other contaminants.

Standard 3.3.1

This standard requires measures to identify the risks of aquaculture products being contaminated with harmful substances through feed given to the aquatic animals.

Indicators 3.3.1 A, 3.3.1 B and 3.3.1 C

The origin of the feed serves as important information for determining the risk of contamination (even when the origin cannot be identified, a traceability system must be established). To understand the origin is therefore especially important. The auditor shall confirm that procedures for cleaning of feeding equipment and on-board operations are established and implemented. For manufactured feed and feed additives shall satisfy the standard of Act on Safety Assurance and Quality Improvement of Feeds. The aquaculture farmers shall obtain the information about the origin of feed from supplier or

from warranty document.

Indicators 3.3.1 D

The types and amounts of feed shall be recorded for each cage. Also, the auditor shall confirm the record that shows the transfer of aquatic animals from one cage to other cages to trace back the feeding records.

Indicators 3.3.1 E

The procedures for the cleaning of feeding equipment and tools shall be prepared. The auditor shall observe the feeding equipment and tools to check its cleanliness.

Indicators 3.3.1 F

The chemical substances such as machine oil and/or paint shall not be left and spitted in the location of feeding-related works such as blending, scaling, feeing, etc. to prevent contamination of feed with chemicals.

Indicators 3.3.1 G

The auditor shall confirm the storage method of feed and storage condition to prevent contamination of feed with chemical substrates and/or harmful animals.

Criterion 3.4

The landing of bivalves shall be performed in hygienic conditions and traceability shall be assured at all the rearing stages of the mollusks.

3.4.1	The growing areas of bivalves shall be monitored and managed to prevent microbiological contamination, hazardous chemicals, and shellfish poison.	
Indicator	A	The nursery areas are monitored for shellfish poison. When shellfish poisoning occurs, the closing and opening of the ocean area is notified and shipping is controlled accordingly. It must be confirmed that products cultured outside the areas designated for aquaculture of products to be eaten raw are not shipped as products to be eaten raw.
3.4.2	Bivalves shall be purified if necessary and the purification equipment shall be properly maintained.	
Indicator	A	The methods and frequency of maintenance of the purification facility are established and implemented.
3.4.3	At the time of shipment, detailed information about the products such as the growing	

	area, landing site, species, quantity, transportation method, the name of the farmer, etc. shall be confirmed and recorded. Identification marks shall be explained to the shipping destination to enable product identification.	
Indicator	A	A method is established for providing the necessary information on the products to the consignee.
3.4.4	Equipment, machinery, and packing materials for shipment shall be maintained in hygienic conditions.	
Indicator	A	The same as above.
3.4.5	The shipping process shall be decided and carried out in hygienic conditions to prevent deterioration of the products.	
Indicator	A	The same as above.

Criterion 3.5

The landing of aquaculture products shall be performed in hygienic conditions and traceability shall be assured at all the rearing stages of the products.

3.5.1	Cultured fish shall be managed per cage, and daily aquaculture activities shall be recorded.	
Indicators	A	When seeds are introduced, the date of landing and the total weight (or number of individuals) are confirmed and recorded for each rearing unit.
	B	When seeds with different origins are reared in one rearing unit, the conditions of mixed rearing are clearly recorded.
	C	When seeds are separated into another rearing unit with growth, the transfer history for the aquatic animals, as well as the total weight (or number of individuals) after separated rearing, are confirmed and recorded for each rearing unit.
3.5.2	Detailed information about the cultured fish such as landing date, the number of fish landed, weight, shipping destination, etc. shall be recorded. Identification marks shall be explained to the shipping destination to enable product identification.	
Indicators	A	A product identification method is established for identifying one rearing unit as one lot.
	B	Procedures are established for submitting information on the production history at the request of buyers.
3.5.3	Equipment, machinery, and packing materials for the shipment shall be maintained in hygienic conditions.	
Indicators	A	Screening tables, tying equipment, fish tanks, containers, and equipment, etc.

		used for shipping are cleansed and kept in hygienic condition.
	B	Water used in the fish holds and containers is sanitary, and the ice used for storage is made from potable water.
	C	Measures to prevent contamination are taken for the fish holds and containers (e.g., using containers with a cover).
	D	Equipment, machinery, and packing materials used for shipping are properly stored to prevent contamination with vermin.
3.5.4	Procedures for shipping shall be established and implemented.	
Indicator	A	Procedures are established for carrying out shipment work hygienically.

Standard 3.5.1

This standard requires confirmation of traceability at the aquaculture production stage.

Indicators 3.5.1 A, 3.5.1 B and 3.5.1 C

It must be verified that the rearing records at all rearing stages include the necessary information. The auditor uses random sampling to observe whether the records can be traced back to the seeds.

In case the seaweed aquaculture, the operation includes seed production, cultivation and landing. The production unit can be set when seaweed nets are placed in aquaculture facility. The auditor uses random sampling to observe whether the records can be traced back to the seeds.

Standard 3.5.2

This standard requires precise identification of certified aquaculture products at the shipping stage. Compliance with this indicator is essential for CoC certification.

Indicator 3.5.2 A

One lot is the one production unit and date of landing can be the information to specify the lot. The auditor shall confirm the product identification method to identify one rearing unit as one lot.

Indicator 3.5.2 B

When aquaculture products are shipped, the procedures are established for submitting information on the production history at the request of buyers. The auditor shall confirm the format of production history and methods to submit the information.

Standards 3.5.3 and 3.5.4

These standards aim to minimize the risks of pathogen contamination to humans, by following proper procedures for hygienic management at the shipping stage. The key procedures are cleansing of the

equipment, use of clean water and clean ice, and prevention of contamination from vermin. The working procedures are confirmed for each of these elements.

Principle 4 Consideration for Environmental Conservation (To carry out aquaculture activities properly for the environment)

For aquaculture to be widely accepted and for its sustainable production, the influences of aquaculture operations on the surrounding environment and wild organisms must be considered, and efforts must be made to minimize such influences. Implementation of such measures is verified, and the following criteria are established to improve the situation as needed.

Criterion 4.1

Aquaculture activities shall be carried out in accordance with suitable operating procedures established to minimize environmental impacts caused by aquaculture equipment and materials, excretions of aquatic animals, and feed residues.

4.1.1	The aquaculture equipment, cages, and vessels shall be maintained regularly and coated with materials not containing heavy metals and hazardous chemicals, to prevent contamination of aquaculture facilities and surrounding areas.	
Indicator	A	Lists are kept of lubricating oil, paint, and detergent used for the maintenance of cages, boats, feeding equipment, etc.
	B	Lubricating oil, paint, and detergent used for equipment in seawater are used properly to avoid adverse effects on the environment.
	C	The lubricating oil, paint, and detergent are properly stored to prevent deliberate or accidental inflow into the environment.
	D	Antifoulant for nets and substances in the paint used for boats do not contain any organic tin compound.
	E	When antifoulant for nets or paint for boats is used, each use is recorded and managed.
	F	Unneeded equipment (broken fishing nets, containers of chemical, etc.) is disposed of by appropriate methods and not left in the aquaculture farm.
4.1.2	Water used for aquaculture shall be utilized in compliance with relevant laws and regulations. Salinization of freshwater and wastewater treatment shall be controlled to maintain water quality at the aquaculture sites and surrounding environment.	
Indicator	A	For mariculture, the rules regarding fishing rights, farm improvement plans, etc. are complied with and aquaculture operations are conducted within the permitted area.
	B	Observance of the farm improvement plan is monitored.
	C	Environmental indicators are maintained within the standards.

	D	In-land aquaculture facilities obtain the rights of water usage from local government and use the amount of water within the permitted range.
	E	The quality of the wastewater satisfies the wastewater standards at in-land aquaculture facilities.
	F	In case seawater fish aquaculture is conducted at in-land aquaculture facilities and wastewater is drained into freshwater areas, the concentration of chloride ion in the vicinity of drainage outlet shall be less than 200mg/l.
4.1.3	The density of fish shall be controlled adequately, and organic matter shall be monitored to prevent increased sedimentation of organic matter and occurrence of de-oxygenated water.	
Indicator	A	The amount of production is properly controlled to meet the environmental capacity.
	B	The environment of the aquaculture farm is regularly monitored to confirm that the farm is in a healthy state.
	C	Procedures for treating residual feed are properly established and implemented.
4.1.4	Waste disposal from aquaculture operated in closed water shall be managed properly to prevent negative impacts on the benthic environment.	
Indicator	A	All waste that may affect the benthic environment is properly disposed of on land.

Standard 4.1.1

This standard requires the proper management of all chemicals such as oil, paint and detergent, etc. used for the maintenance of nets, boats, feeding machines and other equipment. In case seaweed aquaculture, as antifouling agent cannot be used to seaweed nets, this standard is applied to the substances in the paint used for boats. In case the disease outbreak of nori seaweeds, the acid treatments by using organic acid etc. are conducted. Since the chemicals used for acid treatment may have environmental impacts, standard 4.1 is applied to this treatment.

Indicator 4.1.1 A

Lists of oil and paint detergent and other chemicals shall be prepared to identify those usage. It is better to obtain Safety Data Sheet (SDS) for each listed chemical and the usage of chemicals are recorded. SDS is available on the internet etc.

Indicator 4.1.1 B

It must be ensured that lubricating oil is not misused (e.g., not used for equipment in the ocean). In case the oil is allowed to use for equipment under the ocean, aquaculture farmers shall use it in

accordance with its instructions.

Indicator 4.1.1 C

The chemicals shall be kept in the container and storage room which can be locked to prevent chemicals from contaminating aquaculture sites. The unnecessary equipment must be temporary kept at the storage and regularly disposed of, as leaving such equipment around may cause contamination.

Indicators 4.1.1 D and 4.1.1 E

Any organic tin compound is prohibited to use for antifoulant for nets and substances in the paint. Copper-base antifoulant for nets and substances in the paint is recommended. In case the antifoulant and paint are outsourced, information about paint shall be obtained. The auditor shall confirm the records of paint used by aquaculture farmers.

Indicator 4.1.1 F

Unneeded equipment (broken fishing nets, containers of chemical, etc.) can be one of the causations of contamination; thus, the equipment shall be regularly disposed methods and not left in the aquaculture farm.

Standard 4.1.2

This standard requires that water used for aquaculture shall be managed to avoid impact on water resources.

Indicator 4.1.2 A, 4.1.2 B and 4.1.2 C

The indicators require the implementation of a farm improvement plan to prevent environmental deterioration by mariculture. Another purpose is to confirm that the amount of production does not exceed the allowable level, so that the proper use of the site and conservation of environment are assured. To obtain actual information on the water quality, bottom materials, and use of the fishing ground, it must be confirmed that monitoring by the fisheries cooperative and others sets a sufficient number of survey points covering the whole fishing ground. These indicators can be confirmed by verifying compliance with standards 2.1.1 to 2.1.3.

Indicator 4.1.2 D

This indicator requires the in-land aquaculture facilities to obtain the rights of water usage from local government and to use the water for aquaculture within the permitted range. The auditor shall confirm the permission issued by local government, the amount of intake water per hour (or the specification of water pomp) and no decrease of water amount at the source due to water intake for aquaculture use

last three years.

Indicator 4.1.2 E

For in-land farming facilities, it is ideal to release the wastewater after proper treatment. There are no laws to regulate the wastewater from aquaculture farms in Japan. It must be confirmed that the wastewater meets the wastewater standard as follows.

1	Biochemical oxygen demand (BOD)	< 10 mg/L (rivers)
2	Chemical oxygen demand (COD)	< 8 mg/L (ocean)
3	Suspended solids (SS)	< 50 mg/L

Indicator 4.1.2 F

This indicator requires land-based aquaculture facilities that rear seawater fish to establish a standard for chloride ion concentration in the vicinity of the drainage outlet and to take measures to prevent salinization of freshwater when the wastewater is drained into freshwater areas. The standards are based on the salt concentration of water available for agricultural use. If these standards are exceeded, it is necessary to take measures to remove salt.

Indicator 4.1.2 G

This indicator is applied for the in-land aquaculture facilities where seawater fish is reared and waste water goes into the fresh water areas. The concentration of chloride ion at the drain port of waste water shall be regulated to avoid salinization. The concentration of chloride ion shall be set base on the standard of agricultural water. In case the concentration of chloride ion exceeds the standard, the measures of desalinization shall be taken.

Standard 4.1.3

This standard requires that the density of aquatic animals shall be controlled adequately, and organic matter shall be monitored to maintain the natural purification capability.

Indicator 4.1.3 A

This indicator concerns the load from aquaculture production (organic matter) that can cause deterioration of the benthic environment. An index of suitable location for fish farms (ISL) is calculated using the formula [(depth of water) x (flow rate^2)]. From this result, it must be confirmed that the annual total production does not exceed the ISL (ISL $\geqq$ 0.1, Annual production $\leqq$ 1,500 ton; 0.1 > ISL $\geqq$ 0.75, Annual production $\leqq$ 1,000 ton; 0.75 > ISL $\geqq$ 0.50, Annual production $\leqq$ 500 ton; 0.50 > ISL $\geqq$ 0.25, Annual production $\leqq$ 250 ton). The documents are used to confirm,

for example, the rearing density regulated by the local government, as well as that environmental indicators from monitoring over the last several years show no deterioration trend.

The documents are further used to confirm that no decrease in feeding efficiency in the rearing conditions in the last several years and no increase in the frequency of fish disease outbreaks have been observed. The monitoring of the benthic environment is conducted using as indicators macrobenthos and sulfides, as well as the dissolved oxygen on the lower layers. It is to confirm that the aquaculture environment is healthy enough to satisfy the standards given in the Operational Notice Concerning Basic Principles to Ensure Sustainable Aquaculture Production (August 30, 1999).

Indicator 4.1.3 B

Aquaculture farms where cannot set the ISL (where the current flow is not regularly measured), the COD of the sediment shall be satisfied with Indicator 2.1.1 B. Also, the auditor shall confirm the monitoring result of sediment shall not show the decreasing trend.

Indicator 4.1.3 C

Feed residuals must be reduced, since residual feed is a type of waste originating in aquaculture production that can adversely affect the benthic environment, by accumulating on the sea bottom. The auditor shall confirm the specific procedures to treat the leftover feed in accordance with the Indicator 2.1.4 D. Also, the leftover feed shall not be wasted in the aquaculture sites.

Standard 4.1.4

This standard requires to confirm whether there is waste (other than feed residues) that may accumulate on the sea bottom in the case of disposal in the ocean. When such waste is identified, it must be properly disposed on the land. Unused parts of cultured algae should be disposed of on land as much as possible, and environmental management, such as improvement of the sediment environment, should be conducted in cases where the disposal may affect the sediment environment in the surrounding sea area.

Criterion 4.2

Feed shall be used properly to optimize the health of aquaculture animals as well as to minimize impacts on natural resources.

4.2.1	Feed, feed additives, and feed ingredients shall be used in accordance with the Act on Safety Assurance and Quality Improvement of Feeds (Act No. 35 of 1953) and other relevant laws and regulations. Feed used for each aquaculture unit shall be

	recorded and traceable.	
Indicator	A	This indicator can be conformed as standards 2.1.4 and 3.3.1 are conformed.
4.2.2	The species and origin of fish used to produce fish meal and fish oil shall be traceable. The fish oil and fish meal shall not originate from endangered species[1] or from Illegal, unregulated and unreported (IUU) fisheries.	
Indicators	A	Under the limited conditions[2] where moist pelleted feed (hereinafter called "moist pellet") is used, for the feed ingredients of moist pellet, the fish species, fishing area, provider, quantity of purchase, etc. are recorded and records of purchase are kept.
	B	Information on manufactured feed and feed additives, such as the manufacturer, provider, name of the product, serial number, quantity, date of purchase, composition, etc. is recorded and records of purchase are kept.
	C	Warranty documents are obtained for manufactured feeds and feed additives showing conformity with the Act on Safety Assurance and Quality Improvement of Feeds, the origin of manufactured feed materials (fish meal, oil, etc., must be traceable to identify the species of the raw material fish and fishing area), or records are made of oral representations by suppliers and are kept.
	D	The written policy for responsible procurement of feed ingredients is obtained from the feed manufacturer.
	E	Only feeds that do not originate from illegal, unregulated and unreported (IUU) sources are used. Necessary information can be obtained from the catch certificate in accordance with EU's IUU regulation, or the origins of the feed used are verified and traceable.
	F	The fish used as a material for fish meal and fish oil are not endangered.
4.2.3	In principle, the unprocessed fish such as whole fish caught, mollusks, crustaceans, etc., shall not be used as a direct feed source during the rearing stage of cultured fish. The protein sources of feed shall not be the same species and genus as the species being farmed.	
Indicators	A	Unprocessed fish shall not be used as a direct feed source.
	B	Moist pellet is not continuously used for feeding during the rearing stage. In the case of exceptional use, moist pellet is prepared and fed in accordance with the methods that meet all the specified conditions.
	C	Use as feed of the same species or same genus as the cultured fish is prohibited.

[1] Endangered species are specified in the Act on Conservation of Endangered Species of Wild Fauna and Flora.
[2] Meaning of limited condition is shown in P.33 (2)

4.2.4	The amount of fish meal and fish oil in feed shall be reduced appropriately during the rearing stage of cultured fish.	
Indicators	A	Manufactured feed containing low amounts of fish meal is used during the rearing stage of cultured fish.
	B	Efforts are made to reduce the proportion of fish oil used to the extent that it can be substituted by fish oil from fishery processing residue or vegetable oil and fat.

Standard 4.2.1

This standard requires that feeds, feed additives, and fishery pharmaceuticals used for the cultured fish do not adversely impact the aquatic life living in the aquaculture farm and its surroundings. As long as the feeds and feed additives are used in conformity with the Act on Safety Assurance and Quality Improvement of Feeds (Act No. 35 of 1953) and other relevant laws and regulations, their safety is ensured. No antibacterial agent used as feed additive for aquaculture animals are permitted. Compliance with this standard is therefore considered to be confirmed if Standard 2.1.4 and 3.3.1 are met.

Standard 4.2.2

This standard aims to ensure the sustainable utilization of fisheries resources by securing retroactive traceability up to the country of origin, preventing the use of endangered species as feeds, and monitoring the adverse effect of illegal fisheries on natural resources. In principle, the applicant must purchase feeds from suppliers who assume responsibility for meeting this standard. Aquaculture farmers shall obtain the information about the indicators of A to F by written documents from feed manufactures.

Indicators 4.2.2 A, 4.2.2 B and 4.2.2 C

These indicators require that the origin of manufactured feed materials must be traceable to identify the species of the raw material fish and fishing area. Since the information are related to food safety, these indicators can be confirmed by verifying compliance with Indicators 3.3.1 A, 3.3.1 B and 3.3.1 C.

Indicators 4.2.2 D

The auditor shall confirm that the applicant obtains the written policy for responsible procurement of feed ingredients from the feed manufacturer and the policy must include the consideration for conservation of target stocks used as feed ingredients.

Indicators 4.2.2 C, 4.2.2 E and 4.2.2 F

The auditor shall observe quality certificate and other documents provided by feed manufactures and/or interview memos between applicants and feed manufactures. For indicators E, the auditor shall confirm that the fish meal and oil are originated from the countries where the procedures for the management of fishing vessels and fishery resources are prepared and such countries are listed on the Information on States and their Competent Authorities Notified under Article 20 (1) and (2) of IUU Regulation (EC).

It is preferable that fish used as feed ingredients are sourced from the eco-label certified fisheries and/or the fisheries operated in accordance with catch limit and other management measures based on scientific resource assessment. In case the origin of fish used for fish meal and oil is uncertain, the applicant must stipulate such fact and collect information on all the possible species. The country of origin must be identified, or the ingredient must be procured from a feed manufacturer who has established a traceability system to allow its identification. In addition, the results of stock assessment can be found on the web sites. The auditor shall confirm the impacts on the fish used for feed through the results of stock assessment and others.

In some countries that produce fish meal, there is possibility of illegal labor forced by fishery operators of the raw materials. Although it is often difficult to collect such information, it is desirable for aquaculture producers who wish to obtain this certification to confirm that they regularly request information disclosure in this regard from feed manufacturers.

Standard 4.2.3

This standard restricts the direct feeding of unprocessed fish (no treatment such as heating or drying is applied after the fish caught), whether frozen or fresh, and the use of the same species and same genre as the raw material of feed during the rearing period of farmed fish.

Direct use of raw fish and shellfish as a feed has concerns for sustainable aquaculture production from three perspectives. First, the raw fish-based feed is generally higher in dissipation rate than the solid compound feed (e.g. dry compound feed or extruder compound feed); the latter is considered to have a greater negative environmental impact. Second, this may lead to a decrease in natural resources such as pelagic fish. Last, the thawing drip of frozen fish may lead to environmental impact and disease spread.

Moist pelleted feed (hereinafter called “moist pellet”) is the pelletized feed used with unprocessed frozen fish crushed into fine pieces by a crusher, added with a binder and powdered feed (mash)

containing nutrients such as vitamins and minerals, stirred well, and then molded into a pellet by a granulator. The moist pellet has been traditionally used for carnivorous fish in Japan. In some fish species, conversion to solid compound feed has been progressed. However, there are some aquaculture producers who have to use the moist pellet in limited conditions to respond to the growth problems (growth stagnation and disease resistance during the low water temperature period) or the quality of their products required by the market (consumers).

Moist pellet has a lower risk of environmental impact than raw fish feed, but it is not necessarily equivalent to the solid compound feed. In addition, considering the fact that it is difficult to completely switch to the solid compound feed due to the delay in the technical development of the solid compound feed that does not hinder the growth of specific fish species and the fact that it is difficult for small-scale producers to completely switch to solid compound feed due to management reasons such as the time and cost required for the transformation and abolition of feeding facilities, it is necessary to establish a transition period to the solid compound feed, and to lead the improvement step by step until these factors are eliminated.

For the above reasons, the following conditions must be satisfied in exceptional cases where the moist pellet is used as a feed:

1) Continuous use of moist pellet during the rearing period is not permitted.

2) As exceptional conditions, there are specific, unresolved technical reasons for the use of moist pellet during the rearing period applicable to (1), such as, the need to promote feeding of cultured fish during the low water temperature period (Yellowtail 18C or less, Amberjack 20C or less, Red Sea Bream 15C or less), quality control and improvement of the product (use within one month before landing), treatment of diseases (administration of medicine), and time required for transformation or abolition of feeding facilities.

3) When the fish is used for moist pellet, information such as fish species, fishing area, distributor, quantity, date of purchase, etc. should be obtained and recorded, and purchase slips also should be stored (need to meet the indicator 4.2.2 A).

4) There are no concerns about overfishing or IUU fishing in the fish used for moist pellet (need to meet the indicator 4.2.2 E).

5) The fish for moist pellet and fish used in powder feed (mash) should not be derived from the same species and same genres of the cultured fish.

6) Moist pellet should be prepared in an appropriate mixing ratio with the mash, bound in a way that drip does not flow into the water environment, and used in a way that prevents dissipation.

7) In consideration of the parasite risk of the product, fresh fish should not be used for moist pellet.

8) The environmental load caused by the use of moist pellet is reflected in the indicators 4.1.2 A - C

and 4.1.3 A - C. These indicators must be met.

As an exception, when the use of moist pellet is permitted for the purpose of quality control and improvement of the product, the specified condition (2) above requires that the moist pellet be used within one month before landing. However, if a producer can present clear data (e.g. fat content, measured values of target ingredients, results of sensory tests, breaking strength, etc.) indicating that the desired quality cannot be achieved without using the moist pellet for more than one month, the scheme owner may permit the moist pellet to be used for the minimum period required.

Indicator 4.2.3 A

Unprocessed fish shall not be used as a direct feed source to prevent environmental impact since unprocessed fish are generally more diffused into the water than manufactured feed, solid compound feed and moist pellet. The auditor shall confirm that only manufactured feed, solid compound feed and moist pellet (under the specific conditions) are used through the aquaculture log, etc.

Indicator 4.2.3 B

The use of moist pellet that does meet the above specified conditions (1) - (8) should be in non-conformity. Aquaculture farms that use moist pellet continuously during the rearing period is in conditionally conformity if they have a clear policy of conversion to solid compound feed and a clear transition plan. It should be noted that the status of the transition plan until the transition is completed should be checked at the annual audit, and the appropriate implementation of the transition plan should be requested.

This indicator does not permit intermittent use, for instance, use solid compound fed for two days and moist pellet for one day alternatively. Although it does not mean the direct use of unprocessed fish, the concerns about the use of moist pellet cannot be fully ruled out, and it is recommended using solid compound feed exclusively during the rearing period. Specific examples of transition plans are described in "Appendix 2, Transition to MEL AMS Version 2.0" at the end of this guideline. If it is difficult to assess the appropriateness of the transition plan, contact the certification bodies and the scheme owner.

Indicator 4.2.3 C

The use of the same fish species/genus from processing residues and for frozen fish as raw material feed is prohibited.

Standard 4.2.4

Indicators 4.2.4 A and 4.2.4 B

In principle, this scheme certifies the producer who endeavors to reduce the use of fish meal and oil. However, while there are some fish species that research on low fish meal feed and alternative of fish oil has progressed and solid compound feed is commercially available, there are other fish species that solid compound feed is not commercially available. It is also necessary to consider that the use of low fish meal feed or alternative of fish oil may lead to a decrease in the palatability and disease resistance of farmed fish.

Regarding those species for which research has not advanced, it must be noted that such approaches for the species that research has not advanced may violate the principle of health and welfare of aquatic animals; for instance, a threat of reducing feeding preference and ability of anti-disease caused by the use of low fish meal feed or alternative of fish oil. Currently, the ratio of fish meal and fish oil as a numerical target is not established to be met the conformity. Instead, the producer must show their recognition of the importance of reducing the use of fish meal and fish oil, present data or documentation of the current use and describe efforts made to reduce the use of fish meal and fish oil. If the auditor confirms such approaches are evaluated, these are determined to be compliant.

In the case that compound feed with low fish meal ratio comparing with the one of commercially available is used or the ratio of fish meal of compound feed used is lower than the one used for all aquaculture species (about 43%), it can be regarded as a measure of using low fish meal feed. Since the nutritional requirements of fish at the seeding production and juvenile stage are significantly different from those of fish at the rearing stage, this indicator is not applicable.

Criterion 4.3

Seed shall be used properly to minimize any impacts on natural resources.

4.3.1	Hatchery-raised seed shall be used preferentially at the aquaculture site where the seed is available.	
Indicators	A	Hatchery-raised seed are used preferentially at the aquaculture site when the seed is available.
	B	Seeds to be introduced are examined as needed, and the seeds are separated in a proper manner until the results are available.
	C	When seeds are imported from a foreign country or from a region where a specific disease has been observed in the past, a non-disease certificate and test results are obtained.

4.3.2	The use of wild seeds shall be justifiable when the seeds were collected legally without negative impact on natural resources and the environment.	
Indicators	A	Information about the rearing history at the seed production facilities is confirmed and recorded before the introduction of seed into the aquaculture farm.
	B	Where wild seeds are used, proper resource assessment is conducted on the species of seeds.
	C	The fisher, provider, fishing ground, fishing method, dates of catch and purchase, average weight and total weight (or number of individuals), and other necessary information are confirmed and recorded.
	D	The seeds are caught properly and legally by a certified fisher in accordance with the relevant laws and regulations.
	E	The impact of bycatch on natural resources is considered.
4.3.3	Use of genetically modified organisms shall be prohibited without proper implementation of environmental assessment.	
Indicator	A	The same as above.

Standard 4.3.1

Hatchery-raised seed shall be used preferentially at the aquaculture farms where the seed is available to minimize impact on wild stock.

Indicator 4.3.1 A

The auditor shall confirm the use of artificial seeds base on Indicator 2.2.4 A.

Indicator 4.3.1 B and 4.3.1 C

These indicators require confirming that measures are taken to prevent proliferation of serious diseases derived from the seeds. These indicators can be confirmed by verifying compliance with Indicators 2.2.4 B, 2.2.4 C and 2.2.4D.

Standard 4.3.2

In case the technology for hatchery-raised seed production has not been developed, the use of wild seeds cannot be avoided. In this case, the use can be allowed conformity with all the indicators of this standard.

Indicator 4.3.2 A

This indicator requires that the information on production history should include the producer of the

seeds, date of purchase, amount of purchase, feed of the seeds, and history of the use of pharmaceutical products.

The bivalve seeds are generally collected by seed collector placed at the sea surface. In addition to bivalve seeds collected inside of aquaculture facilities, the seeds collected at other sea areas for the use of aquaculture shall be confirmed production history at the collection sites and kept those records in order to ensure the traceability. For Indicator 4.3.2 A, the auditor shall confirm the production history includes name of producer, date of purchase, amount of purchase, types of seeds, methods of seed collection, etc.

Indicator 4.3.2 B, 4.3.2 C, 4.3.2 D and 4.3.2 E

In view of the current conditions described above, standard 4.3.2 accepts the use of wild seeds on the condition that the wild seeds are caught by a certified catcher in compliance with relevant regulations and in consideration of minimizing the impact on natural resources. Yellowtail, for example, is one of the fish species for which proper resource assessment is conducted and restriction on fishing is not considered necessary. Among the species under restriction on fishing, in certifying the fish species (Bluefin tuna) for which technology of hatchery seed production has not been established, or a sufficient level of supply has not been secured, compliance is confirmed on the condition that the volume of seed collection is in compliant with the fishing restriction.

When measures to minimize the influence on natural resources are taken into consideration, it is assumed that the bycatch species are properly released (either by the seed catcher or at the aquaculture farm) and that measures (fishing gear and methods) to avoid bycatch are used, if available. The auditor should observe that aquaculture farmers collect information about fishing methods by the seed collector and that the collector complies with the relevant regulations of the local government.

Criterion 4.4

Aquaculture shall be operated properly to minimize any impacts on the aquaculture sites and surrounding environment.

4.4.1	Aquaculture shall be operated in compliance with the relevant laws and regulations on habitat and biodiversity, and the result of environmental assessment. In case sensitive habitat is identified, recovery of resources shall be carried out.	
Indicators	A	The area of the aquaculture operation is not, or is not adjacent to, a habitat of endangered species.
	B	If the area of the aquaculture operation or its surrounding area is or is adjacent to a habitat of endangered species, proper measures are taken to prevent impact

		on the habitat.
	C	The number of aquaculture animals escaping from the aquaculture sites is recorded during the transfer of animals or in a natural disaster (e.g., typhoon).
	D	Proper measures are taken to prevent the escape of aquaculture animals.
4.4.2	In case a hazardous organism belongs to an endangered species, the species shall be eliminated through non-lethal measures, except when there is a concern about the safety of workers or when a priority is given to euthanasia of a moribund organism.	
Indicators	A	Animals harmful to aquaculture production are identified. When an animal is identified, the status of the animal (e.g., endangered species) is determined.
	B	When harmful animals are designated as an endangered species, the animals are removed by proper methods.

Standard 4.4.1

This standard requires minimizing the impact of aquaculture on the environment, including influence on the habitat and vulnerable habitat within and surrounding the aquaculture farm. Two major acts, Basic Act on Biodiversity (Act No. 58 of June 6, 2008) and Nature Conservation Act (Act No. 85 of 1972), are applied to this standard. In this document, the "vulnerable habitat" is defined as nature conservation areas and waters and important waters rich in biodiversity designated under the Nature Conservation Act and/or Act on the Protection of Fishery Resources.

Indicators 4.4.1 A and 4.4.1 B

Many aquaculture farms have been in operation for many years before the establishment of Basic Act on Biodiversity and the demarcated fishing right systems for mariculture areas are regulated by the local governments. The auditor shall confirm whether the local government of aquaculture site prepare the regional biodiversity strategy in accordance with Article 6, responsibility of business, and Article 13. If the strategy is prepared, the auditor shall confirm whether aquaculture farmers totally and systematically implement the strategy for the conservation of biodiversity and the sustainable utilization of aquatic resources.

Where protected wild organism and/or vulnerable habitat defined as standard 4.4.1 exists inside or surrounding areas of aquaculture sites, the auditor shall confirm no impact of aquaculture activities on the habitat of those organisms by observing the map of aquaculture facility and their habitat (e.g. on the homepage of Ministry of Environment: http://www.env.go.jp/nature/index.itml) as well as study report on the status and population of those organisms. Also, this standard can be conformed with the conformity of indicators F and G of 4.1.2.

If the information about status and population of protected organisms are limited, the auditor shall confirm the no negative impact of aquaculture activities on the environmental quality of fishing sites last three years. Where new facility of either mariculture or in-land aquaculture was constructed, the auditor shall confirm whether the environmental assessment was conducted in advance.

Indicators 4.4.1 C

The escape of cultured fish may lead to lower genetic diversity through cross breeding with wild fish. Although it is difficult to avoid the escaping of fish from aquaculture facilities, this indicator requires aquaculture farmers to record the number of aquaculture animals escaping from the aquaculture sites. Aquaculture farmers should record the numbers of escaped fish and send the information to the relevant organizations when necessary. These operations constitute the requirements for conformity with this indicator. The number of escape fish can be calculated based on the number of fish counted while they are separated into other cages with their growth. The auditor shall confirm the validity of calculation methods, the record of fish number and no rapid increase of number of escape fish.

Indicator 4.4.1 D

The “proper maintenance” refers that the applicant regularly replaces the nets, uses the nets within usage life of those and prepares countermeasures against natural disasters such as typhoon. The auditor shall confirm the systematic measures to prevent the escape of aquaculture animals incase natural disasters arise.

Standard 4.4.2

Indicators 4.4.2 A and 4.4.2 D

These indicators require ensuring that the applicant identifies wild organisms that may cause feeding damage in the aquaculture farm and checks whether such organisms are designated as endangered species. In case the identified organisms are endangered species, it must be confirmed that such organisms are eliminated through non-lethal measures. In case of in-land aquaculture, where the aquaculture ponds are located inside of facilities, auditor shall confirm the structure of facility which prevent wild animals from entering to the inside of facilities.

End.

Appendix 1: Guidelines for MEL Aquaculture of Unit of Certification

The following guidelines are established for how to determine the unit of certification described in the AMS Guidelines. Definitions of terms such as units of certification units and classification of certification shall be in accordance with the main text of the AMS Ver.2.0.

1. Guidelines

As a general rule, the unit of certification shall be those that are operated by an aquaculture farmer in one aquaculture area under the same management regulations. However, if the following requirements are satisfied, multiple farmers can be subject to a scope of certification if they are organized as a group. Three categories of "multi-site certification," "partial certification" and "group certification" are established as a classification of certification.

1) Same Administrative Division

Since the aquaculture farms subject to the assessment are managed in accordance with the same administrative regulations, ordinances, etc., the unit of certification shall be within the range of the prefecture even if it is the widest. When an aquaculture farm to be assessed is located in a bay spanning multiple prefectures, the unit of certification is determined in consideration of the regulations (aquaculture density, water quality evaluation, etc.) of each prefecture.

2) Similar Rearing Environment

In determining the scope of certification, in principle, it shall be analogous that the natural environment in which the aquaculture farm to be assessed is located and the rearing environment where the fish cages are installed effected by tidal currents or etc. in the sea area.

3) Same Management Rule

An applicant for certification that organizes a management entity that owns a farm or a group of farms shall conduct aquaculture operation under the same management, procedures, and recording methods defined comprehensively for the farms under assessment.

2. Classification of Certification

1) Multi-Site Certification

A single management entity that owns multiple aquaculture farms is certified for all aquaculture farms. It is conducted under the (1) the same administrative division, (2) similar rearing environment, (3) same management regulations, and in some circumstances, internal audit functions.

2) Partial Certification

A single management entity that owns more than one farm is certified for particular farms.

As an additional condition for partial certification, the applicant is required to report the number of fishes farmed such as the number of juveniles introduced and etc. and the number of fishes shipped. This is to clearly distinguish aquatic animals raised in the certified farms from these in uncertified farms among multiple fish farms. The number of farmed fishes is usually less than the number of shipped fishes from the relationship of survival rate. In addition to the initial assessment, the auditor also ensures the number of farmed fishes and that of shipments (the number of logo mark used in the case of obtaining CoC certification) during the annual audit, ad hoc audit and renewal audit, as well.

3) Group Certification

A case where an aquaculture area (or aquaculture pond) used jointly by fisheries cooperatives to which multiple small-scale aquaculture farmers belong is certified under the same management rules conducted. Or, the case of obtaining certification for aquaculture under the guidance of the trading companies or under the same management rule.

This assumes that fishery cooperatives, fishery production cooperatives and local trading companies are represented to be certified. When certified and uncertified aquaculture farms coexist in a single fishing ground, there is a possibility that problems in the rearing environment (water quality, etc.) may come up to the surface, and it is necessary to obtain a prior agreement from both sides. In some situations, it is required to have an internal audit system.

3. Points of Attention on Multi-Site and Group Certifications

In the assessment of multi-site certification and group certification, especially when the number of affiliated farmers is large, it is necessary to confirm that an applicant subject to certification has a system of internal audit and that internal audit is conducted on a regular basis in accordance with the system. Its method of operation and performance will influence rational decisions to taper the number of audit sample. An internal audit is a self-audit similar to an annual audit, and the certification body and the scheme owner confirm the contents of the audit as appropriate.

In the future, it is expected that a vertically integrated business model will emerge in which most of the aquaculture value chain functions from production (feed, seed, and aquaculture), processing, distribution, and sales are operated in-house. The scheme will be required to conduct assessments integrated with the CoC certification, and will respond appropriately to such case.

Appendix 2 Transition Measure to MEL AMS Version. 2.0

With the entry into force of the MEL AMS (Aquaculture Management Standard) Ver. 2.0, non-conformity may occur when a new applicant who uses moist pellet obtains a new certification or when a currently certified producer who uses moist pellet and transitions from Ver. 1.0 to Ver.2.0. In order to minimize the impact on such producers with transition approaches to Ver. 2.0, the following transitional measures will be taken:

1) If there is a specific policy on how to proceed with the conversion of moist pellet to solid compound feeds (e.g. dry compound feed or extruder compound feed) and it is confirmed that the conversion is being implemented in accordance with the policy, then, although it is conditional, the scope of certification can be subject to be assessed by MEL AMS Ver. 2.0.
2) Conversion to solid compound feed should be in place within approximately three years.
3) The auditor assesses the adequacy of producer's policy for conversion to solid compound feed and its transition plan. If the auditor finds it difficult to assess its validity, the decision of the scheme owner shall be sought.
4) The meaning of "transition plan to conversion" assumes the cases that a producer presents specific efforts. For instance, use solid compound feed in a part of fish cages and confirm the rearing performance. If there is no problem on the rearing performance, it could be expanded to a half of the cages, and the whole shift is made in the third year. Or the producer presents a policy to increase the use of solid compound feeds gradually every year.

Appendix 3: Water Quality Standard

Aquatic Water Standard Prepared by Japan Fisheries Resource Conservation Association (2018)

Parameter	Criteria Value		
	River	Lake	Ocean
BOD	・Natural Breeding: ≦ 3mg/L (Salmon, Trout, Sweetfish: ≦ 2mg/L) ・Bottom Condition: ≦ 5mg/L (Salmon, Trout, Sweetfish: ≦3mg/L)	N/A	N/A
COD	N/A	CODmn (Acid Method) ・Natural Breeding: ≦ 4mg/L (Salmon, Trout, Sweetfish: ≦ 2mg/L) ・Rearing: ≦ 5mg/L (Salmon, Trout, Sweetfish: ≦ 3mg/L)	CODOH (Alkaline Method) The criteria value of desirable COD-OH (alkaline method) in general sea area, Nori seaweed cultured farm and coastal area of enclosed inner bays are temporarily suspended.
Nitrogen	N/A	・Carp, Crucian Carp: ≦ 1.0mg/L ・Smelt: ≦ 0.6mg/L ・Salmonidae, Sweetfish ≦ 0.2mg/L	・Fisheries Category 1: ≦ 0.3mg/L ・Fisheries Category 2: 0.3 – 0.6mg/L ・Fisheries Category 3: 0.6 – 1.0mg/L ・ Nori Seaweed: 0.07 – 0.1mg/L (Inorganic Nitrogen) ・Wakame Seaweed: 0.028mg/L
Phosphorus	N/A	・Carp, Crucian carp: ≦0.1mg/L ・Smelt: ≦0.05mg/L ・Salmonidae, Sweetfish ≦0.01mg/L	・Fisheries category 1: ≦ 0.03mg/L ・Fisheries category 2: 0.03 – 0.05mg/L ・Fisheries category 3: 0.05 – 0.09mg/L ・ Seaweed aquaculture: 0.007 – 0.014 mg/L (Inorganic phosphorus)
Dissolved Oxygen (DO)	・General: ≧ 6mg/L (Salmon, Trout, Sweetfish: ≧ 7mg/L)	・General: ≧6mg/L (Salmon, Trout, Sweetfish: ≧7mg/L)	・General: ≧ 6mg/L ・Closed coastal water in summer: ≧ 4.3mg/L

<table>
<tr><td rowspan="2">pH</td><td>6.7 – 7.5</td><td>6.7 – 7.5</td><td>7.8 – 8.4</td></tr>
<tr><td colspan="3">Rapid change of pH which adversely affects living organisms is not observed.</td></tr>
<tr><td>Suspended Solid (SS)</td><td>・≦ 25mg/L
(SS added by human: ≦ 5mg/L)
・Avoidance behavior is not observed.
・Negative impact on the plant growth is not observed.</td><td>・ Salmon, Trout, Sweetfish: ≧ 7mg/L
(Visibility ≧ 4.5m)
・Warm Water Fish: ≦ 3.0mg/L
(Visibility ≧ 1.0m)</td><td>・SS added by human: ≦ 2mg/L
・Enough light for the growth of seaweed at a water depth is observed.</td></tr>
<tr><td>Water Color</td><td colspan="3">Enough light for the photosynthesis is observed. Avoidance behavior is not observed.</td></tr>
<tr><td>Water Temperature</td><td colspan="3">Rapid change of water temperature which adversely affects living organisms is not observed.</td></tr>
<tr><td>E. coli</td><td colspan="3">・≦ 1,000MPN/100mL
・Oysters for eating raw: ≦ 70MPN/100mL</td></tr>
<tr><td>Oil</td><td colspan="3">・Oil is not detected in the water.
・Oil film is not observed at the water surface.</td></tr>
<tr><td>Hazards Substance</td><td colspan="3">Each criteria value of hazards substance is determined separately.</td></tr>
<tr><td rowspan="2">Bottom Sediment</td><td colspan="2">・Mud and spherotilus are not observed at the bottom.</td><td>・COD-OH ≦ 5mg/L (Dried Mud)
・Sulfide ≦ 0.2mg/L,
・Normal Hexane Extracts ≦ 0.1%</td></tr>
<tr><td colspan="3">・Negative impact of suspended solids on the development and growth of seeds is not observed.
・The value of hazards substance detected by dissolution test based on Act on Prevention of Marine Pollution and Maritime Disaster must be below ten times the criteria value.
・The concentration of cadmium and PCB must be below the criteria value.
・Dioxin ≦ 150pgTEQ/g</td></tr>
</table>