

Pilot project for the environmental technology verification
In the field of water purification technology
for lakes and reservoirs

Protocol for the verification tests on water purification technology for lakes and reservoirs

Mar. 22, 2005

Water Environment Department,
Environmental Management Bureau,
Ministry of the Environment

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Main section

I. Introduction

1. Purpose and concepts

Verification tests in the field of water purification technologies for lakes and reservoirs, hereinafter referred to as “this Technology Field,” a field of the pilot project for the environmental technology verification, hereinafter referred to as “this Project,” are intended to show users the environmental protection effect and other important performance of target technologies by providing objective data based on the tests.

This protocol for the verification, which describes the general concept of verification tests and gives other information, is expected to help Verification Organizations review test procedures and provide a common foundation on which verification tests in this Technology Field are conducted. On the other hand, target technologies in this Technology Field are innovative, and purification needs in lakes and reservoirs are extremely diverse. Defining a uniform method of conducting verification tests may lead to results that are meant nothing to users.

Verification Organizations and the committee on the pilot project for the environmental technology verification are expected to fully understand the objectives of this Project and the intent and details of this protocol for the verification and make flexible decisions on target verification technologies before conducting verification tests.

2. Target technologies

Water purification technologies for lakes and reservoirs are technologies for removing pollutants, such as organic matter and nutrient salts, improving transparency of water, and controlling elution from sludge on the bottom. They shall be able to be used directly on site. However, technologies that require large civil work (for dredging of sludge on the bottom, introduction of water for purification, etc.) are outside the scope of this Project.

3. Definitions of terms and phrases

The definitions of the major terms and phrases used in this protocol for the verification are in accordance with those of the Japanese Industrial Standards (hereinafter referred to as “JIS”). The standards in JIS particularly relevant to this protocol for the verification (hereinafter referred to as “this Protocol”) are as follows:

JIS K 0102 “Testing methods for industrial waste water”

JIS B 8530 “Glossary of terms for pollution control equipment”

In addition, the terms and phrases defined for the purpose of this Project are listed in Table 1.

Table 1 Definitions of terms and phrases used in this Protocol

z	Definition
Target verification technology	A mechanism for the removal of water pollutants and improvement of water quality to be verified in the verification test. The target verification technology should have a clear scientific basis.
Target verification apparatus	An apparatus to be used in the verification test among the apparatuses/equipment representing the embodiments of the target verification technology
Test Site	A place or water body where a target verification apparatus is to be installed and the verification test is to be conducted
Verification items	Purification performance of the target verification apparatus, adverse effects of the apparatus, and other major items to be monitored in a verification test
Monitoring items	Items to be examined or analyzed other than verification items that help to ensure proper maintenance of the target verification apparatus and to evaluate verification items
Verification applicant	A person wishing to have his/her own technology verified. If the applied technology is selected as a target verification technology, the verification applicant will be referred to as an “environmental technology developer.”
Environmental technology developer	A person who possesses a target verification technology. Until the applied technology is selected as a target verification technology, the person is referred to as a “verification applicant.”

4. Types and outline for verification tests

(1) Types of verification tests

This verification test is intended to verify the performance and effects of a target verification apparatus in water bodies in the following categories:

- Effect on water quality (water purification performance and adverse effects on water quality)
- Effect on bottom sediment (bottom sediment purification performance and adverse effects on bottom sediment)
- Effect on organisms
- Other effects on the environment
- Maintainability of the apparatus

(2) Verification testing process

The verification test will be conducted according to the steps specified below:

i. Selecting target verification technologies

The Verification Organization will select target verification technologies based on applications submitted by verification applicants.

ii. Designing a verification test

The Verification Organization will design a verification test and prepare a Test Plan in cooperation with the environmental technology developer and the owner/manager of a Test Site, following the steps below:

- Specifying the objectives of the verification test
- Setting verification test conditions
- Specifying the individuals and organizations involved in the test
- Specifying verification items, monitoring items, and the test period
- Determining analytical and sampling methods
- Establishing a Test Plan that includes specific procedures, a schedule, and the individuals in charge, based on the results of the above items

iii. Conducting a verification test

The Verification Organization will conduct a verification test according to the Test Plan described above in response to changing situations. The Verification Organization may subcontract part of the verification test to external test organizations.

iv. Data assessment and reporting

The Verification Organization will analyze all data collected for verification, and compile a report on the verification test (hereinafter referred to as the “Verification Report”). The Verification Report will be examined in the committee on the pilot project for the environmental technology verification, and submitted to the Ministry of the Environment for approval. The Verification Organization may subcontract an external organization to do the verification work and prepare a draft of the Verification Report.

II. Verification test system

1. Ministry of the Environment

- Comprehensively administer the entire pilot project for the environmental technology verification and examine the verification test system
- Establish and administer the committee on the pilot project for the environmental technology verification and its working groups
- Create a protocol for the verification
- Select Verification Organizations
- Entrust and financially support Verification Organizations by bearing the expenses relevant to the verification tests
- Approve target verification technologies
- Approve Verification Report
- Create an Environmental Technologies Verification database (hereinafter referred to as “ETV database”) for the dissemination of environmental technologies

2. The committee on the pilot project for the environmental technology verification

- Offer advice on the management of the entire pilot project for the environmental technology verification
- Offer advice on the comprehensive evaluation of verification test results

3. Working group on the water purification technology for lakes and reservoirs

- Offer advice on management of the entire pilot project for the environmental technology verification in the field of water purification technologies for lakes and reservoirs
- Offer advice on creating a protocol for the verification
- Offer advice on the selection of Verification Organizations
- Offer advice on approval of the Verification Report

4. Verification Organizations

- Administer the verification test under the consignment of the Ministry of the Environment
- Invite target verification technologies from the public and select technologies to be verified
- Establish and administer respective Technology Panels
- Select Test Sites
- Establish a Test Plan
- Conduct and manage the target verification tests based on the Test Plan (May subcontract part of the verification test to an external organization)
- When part of the verification test is subcontracted to an external organization, ensure that the quality management system which is required in the Protocol is indeed functioning properly at the subcontractor.
- Ensure the health and safety of all persons involved in the verification test during the test period
- Ensure the means of communication among all participants in the verification test, adjust schedule, and coordinate other matters pertaining to the verification test
- Audit the procedures for the verification test
- Perform sampling, monitoring, measurement, and analysis under the consignment of the

Ministry of the Environment

- Manage the data/information obtained in the verification tests
- Prepare the Verification Report
- Check the setting of a test area and restoration of the area to its original state by the environmental technology developer.

5. Technology Panels

- Offer advice on the selection of target verification technologies
- Offer advice on the preparation of Test Sites
- Offer advice on the preparation of the Test Plan
- Offer advice on the problems that may occur during the verification tests
- Offer advice on the issuance of the Verification Report

6. Environmental Technology Developers (Verification Applicants)

- Submit existing performance data on the target verification technology to the Verification Organization
- Provide the Verification Organization with its O&M manual
- Cooperate with Verification Organizations in establishment of the Test Plan
- Set a test area in the Test Site and transport and install the target verification apparatus at their expense and on their own responsibility
- Bear, in principle, the costs for maintenance of the target verification apparatus. In addition, bear the costs for chemicals, supplies, and utilities that may be additionally required.
- Technically assist the Verification Organization in maintenance or monitoring of the target verification apparatus, if necessary
- Cooperate with the Verification Organization in preparing the Verification Report
- Restore the Test Site to its original state in consultation with the owner/manager of the Test Site under the supervision of the Verification Organization after the verification test is finished
- If agents, microbial preparations, or animals or plants are used, submit the results of studies/analyses of their effects on the human body, the results of ecological effect testing, and information from which the possibility of raising alien invasive species issues can be examined to the Verification Organization when applying for verification (as a verification applicant)

7. Owners/Managers of Test Sites

- Cooperate with the Verification Organization, such as by providing information necessary for the verification test, in designing the Test Plan
- Cooperate in the verification test in accordance with the Test Plan
- Provide transportation and technical assistance in accordance with the agreement among the Verification Organization, environmental technology developer, and owner/manager of the Test Site
- Provide the Verification Organization with information about any changes or fluctuations that may affect the water quality in the Test Site
- Discuss the restoration of the Test Site to its original state with the environmental technology developer

III. Selection of target verification technologies

1. Application

A verification applicant shall apply to a Verification Organization for verification of the applicant's proprietary technology/product. Items to be specified in the application form and documents to be submitted with the application form are described below. The verification applicant shall fill in the necessary information in the "Application form for verification" set forth in Appendix 1, and submit the application form together with the designated documents to the Verification Organization.

- a. Company name, address, division of the person in charge, name of the person in charge, contact address, name of the technology/product
- b. Overview of the technology
- c. Overview of in-house test results
- d. Product data
- e. Developmental status and past delivery record
- f. Innovativeness of the technology
- g. Other relevant or unique features (if any)
- h. Test method proposals
- i. Documents to be attached to the application form (technical specifications, detailed results of in-house tests, an O&M manual, a written proposal of verification test methods, a document to certify the composition and safety of agents/microbial preparations to be used, information from which the possibility of raising alien invasive species issues can be examined)

2. Selection of target verification technologies

Based on advice from the Technology Panel, the Verification Organization shall comprehensively examine applications, select target verification technologies and obtain approval from the Ministry of the Environment. The selection criteria are as follows:

- a. Formal requirements:
 - Does the applied technology fall under the target verification technology field described in "1. Target technologies" on page 1?
 - Is the application form properly filled in?
 - Is the technology at a commercialization stage?
 - Were there any publicly-funded, similar verification tests of the same technology before?
- b. Possibility of verification
 - Is it possible to complete the verification from cost and organizational standpoints?
 - Is it possible to establish a suitable Test Plan?
- c. Environmental protective effect, etc.
 - Is it possible to scientifically explain the principle and mechanism of the technology?
 - Is there any possibility of the technology causing environmental side effects?
 - Does it provide an adequate environmental protective effect in comparison with the conventional technologies in Table 2?
 - Is it an innovative technology in comparison with the conventional technologies in Table 2?
 - Are the verification test methods proposed by the environmental technology developer

scientifically valid?

- Can the safety of ecosystems and human beings be secured when the agents/microbial preparations are used?
- Can appropriate measures be taken against alien invasive species? (Refer to Appendix 4.)

Table 2 Pollutant removal efficiency of major water quality verification technologies (%)

Category of technology	P-COD	D-COD	T-COD	P-TN	D-TN	NH ₄ -N	(NO ₂ +NO ₃)-N	T-N	P-TP	D-TP	T-P	SS	Chlorophyll a
Swamp introduction	10-50	0-30	-	10-50	0-20	0-40	0-50	10-50	30-90	0-30	10-60	30-80	-
Soil treatment	30-95	10-80	-	30-95	-	20-95	0-10	-	60-95	50-90	-	30-95	-
Seepage water way	25-75	0-10	-	20-70	0-10	0-10	0-5	-	25-75	0-10	-	30-90	-
Upflow filtration	50-95	0-5	-	30-90	0-5	0-5	0	-	30-90	0-5	-	50-95	-
Suspended solid precipitation (DCF method)	10-50	0	-	5-50	0	0	0	-	5-55	0-5	-	10-60	-
Contact oxidation water way	10-50	20-60	20-80	5-30	10-50	0-95	0	-	5-30	10-50	-	20-80	-
Direct aeration	-	10-20	-	-	-	5-90	0-10	-	-	0-10	-	-	-
Bottom sludge covering	40-90*	30-90#	-	20-90*	20-70#	20-90#	-	-	20-90*	10-90#	-	20-90*	-
Nutrient salt inactivation	-	-	-	-	-	-	-	-	-	30-95#	30-95#	-	-
Treatment by floating-leaved plants	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecosystem control	-	-	-	-	-	-	-	-	-	-	-	-	-
Artificial circulation of lake water	-	-	-	-	-	-	-	-	-	-	-	-	-
Circulation of lake water by pumping	70-95	-	50-90	-	-	-	-	30-90	-	-	30-90	50-95	-
Beach-shaped lakeshore	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetated lakeshore	-	-	-	-	-	-	-	-	-	-	-	-	-

(Source) Lake Water Quality Improvement Technology Application Manual (draft) (Ministry of Construction 1987)

* Ratio to bottom sludge that has drifted up

Ratio to current elution load

IV. Designing of a verification test

The Verification Organization shall design a verification test with reference to verification test methods proposed by the environmental technology developer at the time of application (Refer to page 34 (要ページ確認)).

Based on “1. Objectives and basic concept of the verification test,” the Verification Organization shall design the entire verification test in such a way that merits and demerits of the target verification technology can be seen quantitatively. The Verification Organization shall have a substantial exchange of opinions on merits of the target verification technology with the environmental technology developer and try to bring out the merits from different perspectives. On the other hand, the Verification Organization shall point out possible problems of the target verification technology that the environmental technology developer does not recognize or possible medium- or long-term problems from a broad perspective.

If agents, microbial preparations, or animals or plants are used, the Verification Organization shall ensure the safety of the agents or microbial preparations or take measures against alien invasive species (Refer to Appendix 4). Along with these safety measures or measures against alien invasive species, the Verification Organization shall consider the necessity of further measures to prevent the proliferation of these agents or plants or animals for minimizing damage from them.

1. Determination of objectives of the verification test

Based on proposals by the environmental technology developer, the Verification Organization shall clarify the objectives of the verification test. In determining the objectives of the verification test, the following shall be taken into consideration:

- Is the intent or purpose of the development of the target verification technology reflected?
- Is the performance of the target verification technology stated by the developer taken into consideration?
- Are adverse effects or side effects to be noted taken into consideration?

Based on the objectives of the verification test, the Verification Organization shall determine the following:

- Verification test conditions
- Verification items and target levels
- Monitoring items
- Test period

If an inconsistency is encountered at the stage of preparation, the Verification Organization shall review the objectives of the verification test.

2. Setting of verification test conditions

(1) Test Site

The Verification Organization shall select a water body that provides a Test Site, and obtain approval from the owner of the Test Site.

In selecting a Test Site, the Verification Organization shall check that a verification test can be conducted in the water body according to the framework of this Protocol. Lake water quality factors for which environmental standards are established should be checked in selecting a Test Site.

In installing the target verification apparatus and other relevant facilities, the environmental technology developer and the Verification Organization shall give consideration to their harmony with surrounding environments and minimize their effects on irrigation or businesses around there. Modifications during the test period, if required, shall be discussed among the Verification Organization, the owner of the Test Site, and the environmental technology developer. After the verification test is finished, the environmental technology developer shall restore the Test Site to its original state under the supervision of the Verification Organization.

The Verification Organization, in cooperation with the owner/manager of the Test Site, shall restrict access to the Test Site and make other efforts to prevent acts that upset the Test Site or interfere with the functions of the target verification apparatus.

(2) Verification test conditions

In a field test, test conditions must be set in such a way that effects other than those of the target verification apparatus can be removed.

One possible method of removing effects other than those of the target verification apparatus is setting a control area. Another method is setting a Business As Usual (BAU) baseline based on past measurement results or data obtained in a similar water body near the Test Site. What method is appropriate depends on the characteristics of the target verification technology or the water body that provides a Test Site, so an appropriate one for the target verification technology shall be decided by the Verification Organization. In the event of contingencies, two or more methods should be considered.

Verification test conditions provide important information when the applicability of the target verification technology to other water bodies is examined. If the target verification technology is tested under extreme test conditions, thorough consideration shall be given in advance to how those conditions should be interpreted in examining the applicability of the technology to other water bodies.

The Verification Organization shall describe verification test conditions along with the results of the examination of the conditions in the Test Plan. Among verification test conditions, parameters that should be kept within a certain range throughout the test period shall be set as monitoring items, which are described later.

(3) Checking of conditions before starting a verification test

The Verification Organization shall identify and collect information about verification items and monitoring items to be obtained before starting a verification test in the Test Site or test area. The Verification Organization shall take and analyze samples if necessary.

(4) Supplementary or preliminary tests

The Verification Organization shall consider the necessity of conducting supplementary or preliminary tests in addition to a field test. The Verification Organization may consider conducting supplementary tests to complement the results of the field test. Performing mathematical calculations to complement the results of a field test is a major supplementary test. If necessary, the Verification Organization may conduct a preliminary test before a field test, in consultation with the environmental technology developer. The Verification Organization shall mention in the Test Plan the results of the examination of the necessity of conducting supplementary and preliminary tests and tests that they recognized as necessary.

3. Determination of verification items

The Verification Organization shall determine verification items according to the objectives of the verification test so that the characteristics of the target verification technology can be suitably verified, and describe them in the Test Plan.

Verification items are categorized into the following two types:

- Items set to verify the major performance of the target verification technology
- Items set to check for adverse effects/side effects of concern

The Verification Organization shall decide appropriate verification items of these two categories in light of statements of the environmental technology developer and the characteristics of the target verification technology.

The Verification Organization shall also consider target water quality and other levels that the target verification apparatus should or is expected to achieve with the developer and describe the target levels and the grounds for the levels in the Test Plan. Though this Project is not intended to judge technologies by given standards, this information is important to determine whether or not the target verification technology works as designed and it can be designed appropriately.

The Verification Organization shall decide the frequency and timing of sampling for each verification item (Refer to Table 3). If certain data must be obtained

- before a test area or the target verification apparatus is set, or
- after the test area or the target verification apparatus is set,

exactly when to take samples shall be specified in the Test Plan.

Table 3 Examples of the frequency of sampling

Verification item	Frequency of sampling
Verification items regarding water quality effect	About once a week
Verification items regarding bottom sediment effect (Solids))	Basically, take and analyze samples twice, or when the test is started and ended. However, if abnormalities are found in these analyses, samples taken at other points of time must be analyzed. For this reason, store solids when the bottom sediment (pore water) is sampled.
Verification items regarding bottom sediment effect (Other than solids)	About once a month
Verification items regarding biological effect (Field test)	A total of about 3 to 4 times, or when the test is started and ended, and at mid-points between them

(1) Verification items regarding water quality effect

Verification items regarding the water quality effect refer to the entire items that indicate the water quality of a water body, such as transparency, though the environmental standards for them are not established other than those other items in the lake environmental standards,. The Verification Organization shall examine the water purification performance of the target verification apparatus and the possibility of its effects on water quality, and set items to be monitored to verify these effects as verification items regarding water quality effect.

Standard verification items to be monitored for adverse effects/side effects are listed in Table 4. The Verification Organization shall examine these standard verification items for unnecessary items or for items to be added and determine appropriate verification items (They shall examine these items in light of the characteristics of the technology and may omit unnecessary items).

Table 4 Standard verification items regarding water quality effect

Standard verification item
Chemical oxygen demand (COD _{MN})
Total nitrogen
Nitrate nitrogen
Nitrite nitrogen
Total phosphorus
pH
Amount of dissolved oxygen
Amount of suspended solids
Coliform bacteria count

(2) Verification items regarding bottom sediment effect

Verification items regarding the bottom sediment effect refer to all items that indicate the conditions of or changes in the bottom sediment of a water body. The Verification Organization shall examine the effects of the target verification apparatus on bottom sediment, and set items to be monitored to verify these effects as verification items regarding the bottom sediment effect (Refer to Table 5). These items' consistency with the

verification items regarding the water quality effect shall be ensured.

Standard verification items to be monitored for adverse effects/side effects are listed in Table 5. Table 5 shows the findings (color and odor of bottom sediment) and improvement of anaerobic conditions (oxidoreduction potential (ORP)). The Verification Organization shall examine these standard verification items for unnecessary items or for items to be added and determine appropriate verification items (They shall examine these items in light of the characteristics of the technology and may omit unnecessary items).

Table 5 Verification items regarding bottom sediment effect

Category	Verification item	Description
Standard verification item	Findings	Color and odor of bottom sediment
	Improvement of anaerobic conditions	Oxidoreduction potential (ORP)
Other verification items	Items regarding pore water	Items that are consistent with verification items regarding water quality effect
	Items regarding solids	Total carbon, total nitrogen, total phosphorous, etc.

(3) Verification items regarding biological effect

The Verification Organization shall examine the effects of the target verification technology on organisms, and set items to be analyzed to verify these effects as verification items regarding biological effect.

If agents or microbial preparations are used, the verification applicant shall submit to the Verification Organization with an application form the results of ecological effect tests listed in Table 6. These tests shall be conducted by a laboratory complying with the GLP standards of the Law Concerning Examination and Regulation of Manufacture, etc. of Chemical Substances for test facilities conducting tests of new chemicals. The Verification Organization shall also describe the results of these ecological effect tests submitted with the application form in the Verification Report.

Verification items to be monitored for adverse effects/side effects in a field test are listed in Table 7. The Verification Organization shall examine these standard verification items for unnecessary items or for items to be added and determine appropriate verification items (They shall examine these items in light of the characteristics of the technology and may omit unnecessary items. If rare species inherent in the water body have been observed, items to cover those species shall also be added). If ecological effects are found during a field test, or if measures to cope with alien invasive species are not in place, the Verification Organization shall immediately discontinue the verification test. In order that the Verification Organization can immediately decide to discontinue the verification test, it shall set verification items and standards that provide grounds for such a decision, and describe them in the Test Plan.

Table 6 Ecological effect tests whose results must be submitted by a verification applicant when agents or microbial preparations are used

Target	Verification item	Test method
Phytoplankton	Algae growth inhibition	OECD test guideline No. 201
Zooplankton	Daphnia acute immobilization	OECD test guideline No. 202
Fish	Acute toxicity to fish	OECD test guideline No. 203

Table 7 Verification items regarding biological effect: field test

Category	Verification item	Description
Standard verification item	Phytoplankton	Chlorophyll a, population and group count of each species
	Zooplankton	Population and group count of each species
Other verification items	Others	Population of each benthic species (bivalves, insects, etc.), effect on swimming animals such as fish

(4) Verification items regarding environmental load

The Verification Organization shall examine environmental load other than the above-mentioned effects that may be caused by the use of the target verification apparatus, and set items to be examined to evaluate the environmental load and the cost of properly disposing of the resultant waste as verification items regarding environmental load. Standard verification items regarding environmental load as well as their descriptions and the basic concepts of measurement methods are listed in Table 8. The Verification Organization shall examine these standard verification items for unnecessary items or for items to be added and determine appropriate verification items regarding environmental load.

Table 8 Standard verification items regarding environmental load

Verification item	Description/basic concept of measurement	Relevant cost
Amount of sludge produced	Dry weight of sludge and wet weight of sludge (kg/day) and moisture content	Disposal cost
Types and amounts of waste products other than sludge)	Amounts of waste products (kg/day). Record handling categories such as industrial waste or general waste from business activities.	Disposal cost
Noise	Use a noise level meter to measure noise level, if possible.	
Odor	Determine odor concentrations by the triangle odor bag method, the triangle odor flask method or other methods.	
Qualitative evaluation such as ease of treatment of sludge, waste products and foul odor	Ease of secondary treatment, effective use test, etc.	(As appropriate)

(5) Verification items regarding operations and maintenance

The Verification Organization shall examine the O&M performance of the target verification apparatus, and set items to be examined to evaluate the cost required for the O&M as verification items regarding O&M. Especially, problems that may arise when an operator in charge is not sufficiently capable of conducting O&M shall also be considered. Standard verification items regarding O&M as well as their descriptions and the basic concepts of measurement methods are listed in Table 9. The Verification Organization shall examine these standard verification items for unnecessary items or for items to be added and determine appropriate verification items regarding O&M.

Table 9 Standard verification items regarding operations and maintenance

Category	Verification item	Description/basic concept of measurement	Relevant cost
Electricity use and material consumption	Electricity and other resource consumptions	Determine from the value of the current integrators in all apparatuses (kWh/day)	Cost for electricity
	Types and amounts of wastewater treatment chemicals	Determine by a constant rate pump or an indicator installed in the wall of the storage tank.	Cost for chemicals
	Types and amounts of microbial preparations, etc.	As appropriate	Cost for preparations
	Other consumables	As appropriate	Cost for consumables
O&M performance	Period required for startup of the target verification apparatus	Time (in appropriate units)	-
	Number of operators, and the level of operator skill required for O&M of the target verification apparatus	Maximum number of operators and working hours for each operation item Technicality and difficulty of O&M	Labor cost
	Durability of the target verification apparatus	Great upset during a field test and its effect on the target verification apparatus	-
	Reliability of the target verification apparatus	Stability to regular fluctuations in the system	-
	Method of restoring from problems	Ease of and problems in resumption	-
	Evaluation of O&M manual	Readability, understandability and problems	-

4. Determination of monitoring items

In addition to verification items, the Verification Organization shall set items to be monitored to ensure proper operation of the target verification apparatus and to evaluate the verification results as monitoring items and specify them in the Test Plan.

Along with the monitoring items given in the O&M manual (parameters to check whether the target verification apparatus is normally operated), the Verification Organization may add monitoring items that they recognize as necessary. Standard monitoring items are summarized in Table 10.

Some target verification technologies may require basic information on pollutant balance. The Verification Organization shall also consider to determine monitoring items other than standard types.

Table 10 .Monitoring items

Category		Monitoring item
Standard monitoring items	Items to be monitored with respect to the target verification apparatus	Items specified in the O&M manual
	Items to be monitored with respect to the Test Site	<ul style="list-style-type: none"> ● Weather, precipitation, and maximum and minimum temperatures in the Test Site (Use data observed in the nearest weather station.) ● Weather, temperature, and water temperature during work ● Water level and water volume
Other monitoring items	Items to be monitored with respect to influx areas, etc.	<ul style="list-style-type: none"> ● Influent pollutant load or data indicating load changes

5. Determination of the test period

In light of the characteristics of the Test Site and polluted water to be treated, the characteristics of the target verification technology (how long it takes to start working, duration of the effect, etc.), and the characteristics of verification items, the Verification Organization shall determine the following periods and specify them in the Test Plan:

(1) Preparation period

The Verification Organization shall determine a time limit by which the installation and adjustment of the target verification apparatus should be completed, and identify fixtures or parts that need replacing periodically, and agents, microbial preparations, or other consumables to be used by the time limit in consultation with the environmental technology developer and the owner/manager of the Test Site. The configuration of the target verification apparatus may not be changed after the time limit. The frequency and methods of maintenance required in the period of a field test shall also be determined in the preparation period, in consultation between the environmental technology developer and the Verification Organization.

(2) Field test period

A field test period or when a field test should be started and the period of the test required to establish the performance of the target verification technology shall be determined.

The test period may be extended, depending on directions of the environmental technology developer or the characteristics of the Test Site or raw water. The period of malfunction and shutdown shall not exceed 10% of the entire period of the Test Plan. In the event that the period of malfunction or shutdown exceeds 10% of the entire period, the test period shall be extended.

Though the configuration of the apparatus may not be changed in the field test period, the frequency or methods of maintenance may be changed as appropriate. Changes of the frequency or methods of maintenance determined in the preparation period, if required, shall be decided in consultation between the environmental technology developer and the Verification Organization, and the timing of the changes and other details about the changes shall be described in the Verification Report.

(3) Follow-up period

If the characteristics of the target verification technology require a follow-up study after the target verification apparatus is removed, the Verification Organization shall set a follow-up study period, or when the study should be started and ended.

6. Establishment of the Test Plan

The Verification Organization shall establish the Test Plan in consideration of the characteristics of the Test Site, the characteristics of polluted water, technical specification for the target verification technology, and other conditions. The Verification Organization shall establish the Test Plan, based on the information provided by the environmental technology developer and the owner of the Test Site, and the advice of the Technology Panel. The items to be included in the Test Plan are listed in Appendix 2.

The Verification Organization shall obtain approval for the Test Plan from the environmental technology developer and the owner/manager of the Test Site.

V. Verification test methods

1. Preparation of the target verification apparatus

As soon as the Test Site becomes ready to accept the target verification apparatus, the environmental technology developer shall install the apparatus in the Test Site. The environmental technology developer shall specify modifications regarding the equipment, O&M, and the operational conditions, to ensure that the operation of the target verification apparatus including pre- and post-processing required is efficient and stable.

The environmental technology developer shall attach to all constituent devices of the target verification apparatus, where it is readily accessible, data plates indicating the following items:

- Name of device/apparatus
- Serial number
- Production number
- Company name, address, name of the person in charge, emergency contact address of the environmental technology developer
- Electrical requirements (volts, phase, amps, and Hertz)
- Precautions on transporting and handling
- Cautions and alarms (ensure readability and visibility)
- Volume or flow rate (if applicable)

The Verification Organization shall supervise the preparation of the Test Site including the test area. The Verification Organization shall record the conditions, findings, and results of the preparation of the target verification apparatus, including pre- and post-processing, during the preparation period, and describe them in the Verification Report.

2. Monitoring and maintenance

A target verification apparatus requires periodical monitoring and maintenance in order to maintain stable operation and thereby ensure proper operation and increase the efficiency of operation throughout the test period. The Verification Organization shall coordinate the roles of those involved in the test for all monitoring and maintenance procedures, and describe them in the Test Plan. The Verification Organization shall assign monitoring and maintenance work to fully skilled or experienced persons.

(1) Regular monitoring and maintenance

Persons in charge of monitoring and maintenance shall perform maintenance on the target verification apparatus during the test period in accordance with the O&M manual. Persons in charge of monitoring and maintenance shall prepare daily reports on maintenance activities. Daily reports shall contain the following information:

- Place of work, date, and person in charge
- Weather, temperature, water temperature, water level (for a test in a lake), and water volume (test in a place other than lakes) when maintenance work was performed
- Results of monitoring of the target verification apparatus (measurements of monitoring items)
- Details of maintenance work and results
- Findings on the Test Site/target verification apparatus

These daily reports may be used when the Verification Report is prepared. Daily reports shall be attached to the Verification Report if the Verification Organization deems it necessary.

Throughout the test period, the Verification Organization shall summarize and keep a record of daily observations of weather, precipitation, maximum and minimum temperatures announced by the nearest weather station.

To ensure stable operation of the target verification apparatus, these O&M activities may be conducted beyond the frequency or level specified in the O&M manual. In that case, the Verification Organization shall distinguish the O&M activities required for the target verification technology from actual O&M activities in preparing the Verification Report.

If the need arises to change the frequency or methods of maintenance after a field test is started, the frequency or methods of maintenance shall be changed in consultation between the environmental technology developer and the Verification Organization. The Verification Organization shall describe the new frequency or methods of maintenance and when the changes were applied in the Verification Report.

(2) Actions in the event of abnormal conditions

The Verification Organization will inform the environmental technology developer as soon as possible in the event of abnormal conditions. The Verification Organization should take the actions for restoring the apparatus to stable operation specified by the environmental technology developer. In the event of unforeseen circumstances, the Verification Organization will take the actions together with the environmental technology developer.

The conditions, cause and result, and method for resumption under abnormal conditions shall be described in the Verification Report. When the cause is unclear or it is not possible to judge whether the conditions are indeed unusual, the sampling data obtained during the period is used in the statistical analysis for the Verification Report. When the conditions are judged as unusual, additional samples shall be taken as soon as the apparatus returns to steady operation.

If verification items regarding biological effect exceed levels that the Verification Organization sets as limits to discontinue a field test, the verification test shall be immediately discontinued and appropriate measures of protection taken.

(3) Summarization of cost information

In cooperation with the environmental technology developer and the owner of the Test Site, the Verification Organization shall collect and sort the data required for cost estimation for O&M, such as the costs for processing sludge and waste, for electricity at the Test Site, for wastewater treatment chemicals, and for other consumables, to the extent possible.

3. Sampling

Water samples for analysis shall be taken in accordance with the procedures described in the relevant JIS standards shown in Table 11. The Verification Organization shall describe the measurement methods for items of field research such as pH and temperature in the Test Plan with reference to “JIS K 0094 7.2 Water temperature” and other relevant standards. The devices used for sampling shall also be described in the Test Plan.

Bottom sediment samples and pore water shall be extracted according to the bottom sediment examination method specified by the Ministry of the Environment in March 2001.

4. Analysis of water quality

The major verification items regarding water quality effect and the analytical methods are summarized in Table 11. Analytical methods for other verification items regarding the water quality effect shall, in principle, be in accord with the methods described in relevant JIS standards and regulations. However, other methods may be employed if the Verification Organization and the committee on the pilot project for the environmental technology verification determine that those methods provide adequately accurate analyses.

Table 11 Major verification items regarding water quality effect and analytical methods

Item	Method
COD _{Mn}	JIS K 0102 17
TOC	JIS K 0102 22.0 or 22.2
SS	MoE Notification No. 59, 1971 “Environmental standards regarding water pollution” Appendix Table 8
T-N	JIS K 0102 45.1 or 45.2
NH ₄ -N	JIS K 0102 42.2, 42.3 or 42.5
NO ₂ -N	JIS K 0102 43.1
NO ₃ -N	JIS K 0102 43.2.1, 43.2.3 or 43.2.5
T-P	JIS K 0102 46.3
PO ₄ -P	JIS K 0102 46.1.1
Transparency	JIS K 0102 9
Clarity	Determine using a Secchi disk
DO	JIS K 0102 32
Coliform bacteria	Most probable number quantitation method (MoE Notification No. 59, 1971 “Environmental standards regarding water pollution” Appendix Table 2)

5. Analysis of bottom sediment

Bottom sediment or elution shall be analyzed or tested according to the bottom sediment examination method specified by the Ministry of the Environment in March 2001. Bore water shall be analyzed according to “4. Analysis of water quality.”

6. Bioanalysis

The major verification items regarding biological effect and the analytical methods are summarized in Table 12. Analytical methods for other verification items regarding biological effect shall, in principle, be in accord with the methods described in relevant JIS standards and regulations or the OECD test guidelines.

Table 12 Major verification items (for field test) regarding biological effect and analytical methods

Item	Method
Phytoplankton	JIS K 0101 64.3
Zooplankton	JIS K 0101 64.4
Chlorophyll a	Single wavelength absorptiometry or high-performance liquid chromatography

Table 13 (Reference) Major ecological effect test methods

Item		Method	Required/not required in this
Phytoplankton	Algae growth inhibition	OECD test guideline No. 201	
Zooplankton	Daphnia acute immobilization	OECD test guideline No. 202	
	Daphnia reproduction	OECD test guideline No. 211	
Fish	Acute toxicity to fish	OECD test guideline No. 203	
	Prolonged toxicity to fish	OECD test guideline No. 204	
	Toxicity to early life stage fish	OECD test guideline No. 210	
	Short-term toxicity to embryo to larval stage fish	OECD test guideline No. 212	
	Biological concentration	OECD test guideline No. 305	
Others	Activated sludge respiratory inhibition	OECD test guideline No. 209	

○...The results of ecological effect tests with a circle shall be submitted by the verification applicant when agents or microbial preparations are used.

7. Others

The Verification Organization shall restrict access to the Test Site and take other measures to prevent acts that upset the verification test.

VI. Preparation of the Verification Report

The Verification Organization shall report the results of the verification test in the Verification Report. The Verification Report shall contain the following:

- Executive summary (Refer to Appendix 3.)
- Introduction and background
- Overview of the target verification technology and apparatus
 - Principle and configuration of the target verification technology
 - Specifications and capacity of the target verification technology
- Overview of the Test Site
 - General conditions of the water body
 - Conditions of the Test Site (conditions of the isolated water mass, water transmission/drainage systems when the apparatus is installed outside the lake, etc.)
 - Location of the target verification technology
- Method and conditions of the verification test
 - Schedule of the entire verification test
 - Monitoring items (method and date)
 - Verification items (target levels and methods and dates of sampling, analysis, and calibration)
- Results and discussions of the verification test (The measurement and analytical results shall be shown in tables and graphs.)
 - Monitoring items
 - Verification items (If targets have been set, whether they were achieved or not shall be evaluated/analyzed and described.)
 - Report of outliers
 - (If necessary, consider scaling up the target verification technology or examine the applicability of the technology to other water bodies.)
- Appendix
 - Quality control of data
 - Auditing of the quality management system

As basic materials of the Verification Report, the Verification Organization shall submit the O&M manual, records of O&M, records of sampling and analyses, records of auditing of the quality management system, and other records with the Verification Report to the Ministry of the Environment.

Based on requests of the environmental technology developer or opinions of the Technology Panel, the Verification Organization shall examine the necessity of considering problems involved in scaling up the target verification technology, points to remember when the technology is applied to a larger water body, and the applicability of the technology to actual water bodies. If the necessity is confirmed, the results of the consideration shall be described in the Verification Report. They may be accompanied by opinions of the environmental technology developer.

The Verification Organization prepares a draft of the Verification Report and, after obtaining the consent of the environmental technology developer concerning the description and discussions by the Technology Panel, finalizes the Verification Report. The Verification Report submitted to the Ministry of the Environment shall be discussed by the working group and approved by the Ministry of the Environment.

VII. Remarks in conducting the verification test

1. Quality control of data

(1) Data-quality indicator

Data on verification items must be accurate and reliable. Data on verification items contains errors and variation due to various factors, such as the individual who conducts measurement, the sample storage condition, the reagents used, and the analytical environment, so the Verification Organization shall control the accuracy of the data properly during the entire test period, from sampling and analytical procedures to the rounding up of the results.

Quantitative data-quality indicators (DQIs) could include the following:

- Precision (standard deviation or range obtained by measuring several subsamples of the same sample)
- Completeness (percentage of the number of valid samples that should have been taken)

In preparing the Test Plan, data that requires quality management using DQI, if any, shall be identified, and acceptable limits and criteria, and evaluation procedures shall be specified and described in the Test Plan.

The accuracy of data that does not require accuracy control based on DQIs shall be controlled by complying with the standard work procedures, performing dual measurement, or taking other measures.

(2) Measurement and data acquisition

For quality control of data, the following requirements should be given during measurement and data acquisition:

- The Verification Organization shall report assumptions on which the Test Plan is based, as well as all sampling locations and the samples to be collected there to the Technology Panel when designing the Test Plan.
- Any time sampling and analysis of samples are conducted, a record of these actions and confirmation should be kept.
- The Verification Organization shall report non-standard sampling methods and devices, if any, to the Technology Panel when designing the Test Plan. The Technology Panel shall assess the appropriateness of the methods or devices and give the Verification Organization advice.
- The requirements for sample handling, storage location, and transportation shall be checked in advance.
- Sample labels, custody forms, and sample custody log shall be recorded.
- All analytical methods and instruments used shall be described in the Test Plan.
- Calibration methods of all analytical instruments, such as requirements for calibration and calibration standards, shall be specified in the Test Plan.
- Any type of data not obtained by measurement, such as that obtained through interviews and the like, should be examined to determine the limitation on the use.

2. Management, analysis, and presentation of data

The data obtained in the verification test includes quantitative data such as measurements of verification items, the amount of chemicals used for treatment, and the amount of waste sludge, as well as qualitative data such as that on the reliability and operability of the target verification apparatus and necessity of operators. The methods for management, analysis, and presentation of these data are as follows:

(1) Data management

Data should be managed securely, as described in "Appendix 0: Quality management system to be constructed at the Verification Organizations, 3. Quality management system, (3) Control of documents and records" on page 27. For this purpose, a Verification Organization shall appoint a data quality manager.

(2) Data analysis and presentation

The data obtained in the verification test should be analyzed statistically and presented. All mathematical expressions used for statistical analysis shall be given in the Verification Report. The data not subjected to the statistical analysis (including that obtained under abnormal conditions) shall be reported in the section of “report of outliers” in the Verification Report.

Analysis and presentation of quantitative measurements of monitoring items

- Table showing all measurements of monitoring items
- Graph showing daily variations in monitoring items during the test period

ii Analysis and presentation of measurements of verification items

- All sample analysis results
- Graph showing daily variations in verification items during the test period
- Removal efficiency of the target verification apparatus (Calculate using the pollutant load in Table 14.)

Table 14 Calculation of removal efficiency

Removal efficiency	$\frac{(C_{\text{infi}} \times V_i - C_{\text{effi}} \times V_i)}{C_{\text{infi}} \times V_i} \times 100\%$	<p>C_{infi}: Pollutant concentration of influent water on measurement date i</p> <p>C_{effi}: Pollutant concentration of treated water on measurement date i</p> <p>V_i: Water volume on measurement date i</p>
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Analysis and presentation of verification items regarding O&M

- Summary of findings
- Summary of the operability and reliability of the target verification apparatus (indicating both stable operation and upset conditions)
- Summary of the usability of the O&M manual
- Summary of the reliability of the target verification apparatus and variations in verification items regarding O&M observed during the verification test
- Summary of O&M skill required
- Monthly average maintenance hours
- Table or graph showing the amounts of sludge produced
- Table or graph showing the amounts of waste produced except sludge
- Table or graph showing the amounts of wastewater treatment chemicals used
- Table or graph showing the amounts of microbial preparations or other agents used
- Table or graph showing electricity consumptions
- Table or graph showing the amounts of other consumables used

3. Environment, health and safety

The Verification Organization should take strict environment, health and safety measures with respect to the verification test. In establishing a Test Plan, relevant environmental problems and potential hazards regarding the verification test and Test Site should be identified, and countermeasures against them should be specified. The Verification Organization should inform the personnel at the Test Site, including employers and employees who are not involved in the verification test, of the potential hazards and the countermeasures against them. The following, among others, are to be discussed in establishing a Test Plan:

- Precaution regarding the operation of the target verification apparatus, emission of processed wastewater, and generation of secondary products
- Biological, chemical and electrical hazards
- Handling, storage and discharge of the chemicals relevant to the verification test
- Handling and discharge of residues and waste relevant to the verification test
- Material Safety Data Sheet
- Compliance with local regulations regarding electricity and plumbing
- Exhaust and ventilation systems, when gases are generated in the target verification apparatus
- Prevention of fires
- Confirmation of emergency contacts (emergency medical, fire fighting, etc.)
- Ensuring of occupational health and safety
- Others

The address and phone number of emergency contacts, and of the nearest hospital should be listed on one page. The sheet should be displayed in a suitable location, protected with a transparent plastic cover.

Appendix 0: Quality management system to be constructed at the Verification Organizations

Introduction

The Verification Organizations participating in the pilot project for the environmental technology verification should desirably construct the quality management system in accordance with JIS Q 17025:2000 (ISO/IEC 17025:1999) "General requirements for the competence of testing and calibration laboratories." In this Appendix, some elements of the quality management system that are required to be constructed at Verification Organizations that do not have such a quality management system in accordance with the above standard will be described.

1. Scope

The quality management system specified in this Appendix is applicable to all departments or procedures relevant to the verification test in the Verification Organization. In addition, if part of the verification test is subcontracted to an external organization, that organization is also included in the scope of application.

The Verification Organization in which all departments relevant to the verification test have already received the following certification, JIS Q 17025:2000 (General requirements for the competence of testing and calibration laboratories) or JIS Q 9001:2000 (Quality management systems - Requirements), will be regarded as satisfying the requirements specified in this Appendix.

2. References

JIS Q 17025:2000 (ISO/IEC 17025:1999) General requirements for the competence of testing and calibration laboratories

JIS Q 9001:2000 (ISO 9001: 2000) Quality management systems – Requirements

3. Quality management system

(1) Organization and responsibility

The organization concerned shall be an entity that can be held legally responsible.

The responsibilities of key personnel in the organization relevant to the verification tests shall be clearly defined.

Appoint a member of the staff as a quality manager (however named) who, irrespective of his or her other duties and responsibilities, shall have defined responsibility and authority for ensuring that the quality system is implemented and followed at all times.

(2) Quality system

The organization concerned shall establish, implement, and maintain a quality management system appropriate to the scope of its activities regarding the verification test.

In the quality management system, the quality policy regarding the verification test and the procedures for the quality management system shall be documented. These documents shall be communicated to and understood by the appropriate personnel.

The policy shall include the following:

- a) The organization's commitment to ensuring the quality of verification tests
- b) The organization's statement on the quality standard of the verification tests
- c) The objectives of the quality system
- d) A description of the construction and implementation of the quality management system

In addition, the system for promoting verification tests, as well as the role, responsibility, and authority of the personnel concerned, shall be documented.

(3) Control of documents and records

The organization concerned shall control documents such as the standards regarding the verification tests

(protocol for the verification and relevant standards) and the Test Plan, as well as drawings, software, specifications, written directives, and manuals.

With respect to document control, the following shall be ensured:

- a) All documents shall be reviewed and approved for use by authorized personnel prior to their issuance.
- b) All documents shall contain a description of the relevant documents to ensure that appropriate documents can be found easily and are available at any time at all Test Sites.
- c) Invalid and/or obsolete documents shall be promptly removed or be assuredly prevented from unintended use.
- d) The management method for documents as data shall be specified and maintained.
- e) The form for records and the location of documents, as well as the inspection method, shall be specified and maintained.

In addition, records regarding the verification tests shall be identified, properly collected, indexed, specified for usage, filed for applications, maintained, and adequately discharged, and the storage period for them shall be decided. In particular, records in the original copy of the test data, data and information that enable trace audits, records of calibrations, records of the persons involved, each individual report published, and copies of calibration certificates shall be stored for a predetermined period.

(4) Subcontracting of the tests

If the organization concerned subcontracts to perform the verification test, the organization shall select a competent external organization, and demand the same quality management as that of the Verification Organization.

(5) Purchase of goods and services

The organization concerned shall examine, by appropriate measures such as inspection, whether the goods and services purchased from external sources that may affect the quality of verification tests satisfy the requirements specified in the protocol for the verification, and shall not use them for the verification tests until this examination is completed.

In addition, the organization shall evaluate the suppliers of goods and services, and make a list of the approved suppliers.

(6) Control of complaints and nonconforming tests

The organization concerned shall have a system and method that shall be implemented when any of its verification tests or the results of these tests do not conform to the protocol for the verification or other specifications for any reason. The organization shall have a system and method for handling contingencies such as complaints from environmental technology developers, the inhibition of impartiality, information leaks, and others. These systems shall include the person in charge and personnel required for the handling of such cases.

(7) Corrective and preventive actions

When any of its verification tests or the results of these tests do not or may not conform to the protocol for the verification or other specifications, the organization concerned shall investigate the reasons and take corrective or preventive actions.

(8) Audit

The organization concerned shall conduct audits to judge whether the verification test has been properly conducted. When the verification test is subcontracted to an external organization, the operations of the subcontracted organization shall be audited.

The audit shall be conducted at least once during the test period. If the verification test lasts for 2 years or more, the audit shall be conducted periodically, and the frequency of the audit shall desirably be more than once per year.

In addition, the audit shall be conducted by personnel who are independent of the verification test to as great an extent as possible. The results of the audit shall be reported to the superintendent of the organization concerned.

4. Technical requirements

(1) Personnel

The organization concerned shall ensure the competence of all who operate specific equipment for the verification test, perform tests, evaluate results, and sign test reports. The personnel performing specific tasks shall be qualified on the basis of appropriate education, training, and/or demonstrated skills, as required.

(2) Accommodation and environmental conditions

The facilities for the verification test, including but not limited to energy sources, lighting, and environmental conditions, shall be such as to facilitate correct performance of the tests. The organization concerned shall ensure that the environmental conditions do not invalidate the results or adversely affect the required quality of any measurement. Particular care shall be taken when the verification test is undertaken at sites other than a permanent laboratory facility.

The organization concerned shall monitor, control, and record environmental conditions of the test in accordance with the protocol for the verification, the Test Plan, and other standards. Tests shall be stopped when the environmental conditions jeopardize the results of the tests.

(3) Test methods and method validation

The organization concerned shall use appropriate methods and procedures for all tests within its scope and determine the test methods in accordance with the protocol for the verification.

When the method to be used is not specified in the protocol for the verification, the organization concerned shall select either an appropriate method disclosed in international standards, regional or national standards, scientific texts, or the like, or a method specified by the manufacturer of the equipment. When it is necessary to use methods not covered by standard methods, these shall be subject to agreement with the verification applicant, and their validity shall be appropriately examined prior to use. Validation is the confirmation by examination that the requirements for a specific intended use are fulfilled. The validation shall be conducted based on discussion and subsequent approval by the Technology Panel.

When computers or automated equipment are used for data management, the organization concerned shall provide suitable environmental and operational conditions for the purpose of managing the computers and automated equipment properly, to ensure that there is no loss or improper conversion of data as a result of accidental erasure.

(4) Equipment

The organization concerned shall be furnished with (or leased) all items of the equipment required for the execution of verification tests. If a piece of equipment can only be operated by authorized personnel, the organization concerned shall specify the equipment. Equipment that has been subjected to overloading or mishandling, gives suspect results, or has been shown to be defective or outside specified limits, shall be taken out of service until it has been repaired and confirmed to perform correctly.

(5) Measurement traceability

All equipment used for tests that has a significant effect on the accuracy or validity of the result of the verification test shall be calibrated before being put into service.

(6) Sampling

The organization concerned shall take samples of reagents, materials, or products in accordance with the protocol for the verification.

(7) Handling of test and calibration items

If necessary, the organization concerned shall transport, receive, handle, protect, store, retain, and/or dispose of test items in accordance with the protocol for the verification.

(8) Verification of data and assurance of test result quality

The data resulting from the verification test shall be recorded in such a way that trends are detectable and, where practicable, statistical techniques shall be applied to the review of the results. This verification shall be

conducted by a person other than the one who conducts the verification test.

(9) Reporting the results

The organization concerned shall report the results of the test conducted accurately, clearly, unambiguously, and objectively in accordance with the protocol of the verification tests.

Appendix 1: Application form for verification

[Applicant]

Company name		
Address		
Division and name of person in charge		
Contact address	TEL:	FAX:
	e-mail:	
Name of technology/product		

1. Overview of the technology

<p>Category of the technology (Check all that apply)</p> <p>1. Physical treatment</p> <p>2. Chemical treatment (Use agents in a closed environment. Use agents in an open environment.)</p> <p>3. Biological treatment (Use organisms/microbial preparations in a closed environment.) Use organisms/microbial preparations in an open environment.)</p> <p>4. Others</p>
<p>Configuration and process flow diagram: Use diagrams to show the constituent systems of the environmental technology and the process flow.</p>
<p>Principle of purification: Give a brief description of the scientific mechanism of water purification.</p>
<p>Purpose and goal of development: What functions was the technology designed to provide and under what conditions? Give specific targets or other quantitative descriptions.</p>
<p>Comparison with conventional technologies: Clearly describe the characteristics of the technology that make it different from conventional technologies, and improvements made to it.</p>

2. In-house test results

Person in charge of measurement*	
Date of measurement*	

How to check whether the goal of development was achieved or not

Give the following information in a table:

- ☐ Test items to check whether the goal of development was achieved or not and standards on which whether it was achieved or not are judged
- ☐ Test methods for these test items

Give the results of these test items. Give numerical values wherever possible.

Data on the apparatus

Item		Description
Name of the target verification apparatus		
Serial number		
Name of the manufacturer		
Dimensions	W (mm)	
	D (mm)	
	H (mm)	
Weight (kg)		
Necessity of pre- and post-treatment		No • Yes Describe in detail:)
		(
Additional equipment		No • Yes Describe in detail:)
		(
Life of the target verification apparatus		

Environmental impact and electricity use and material consumption*

Item	Unit	Measurement value, etc.
Amount of waste sludge	kg/day	
Amount of generated waste	kg/day	
Possibility of generating noise and foul odor		
Electricity and other power use	Kwh / day	
Types and amounts of wastewater treatment chemicals* ()	kg/day	
Give the chemical names in parentheses ()	kg/day	
()	kg/day	
Types and amounts of microbial preparations, etc. ()	kg/day	
Amount of other consumables ()	kg/day	
()	kg/day	
Give the consumable names in parentheses ()	kg/day	
Amount of other consumables ()	kg/day	

* Fill in the following fields if microorganisms, animals, or plants are used:

Microorganism, animal, or plant species to be used	
Invasive species previously observed	

Results of maintenance

Control item Give control items such as "refilling of wastewater treatment chemicals," "sludge/waste treatment," and "periodic inspection."	Time required for each control	Frequency of control Circle month, week, or day. Give the number of times in parentheses.
	() min	() times per (month, week, day)
	() min	() times per (month, week, day)
	() min	() times per (month, week, day)
	() min	() times per (month, week, day)

Approximate cost

Expense item	Unit cost	Quantity	Total
Initial cost			
Civil work			
Construction			
Main unit			
Additional equipment			
Running cost (per month)			
Wastewater treatment chemicals			
Microbial preparations			
Other consumables			
Sludge disposal			
Waste disposal			
Electricity			
Yen/m ³ of treated water			

3. Developmental status and past delivery record

Check the number that best describes the current situation.

1. The apparatus is only available as a pilot unit and is not commercialized.
2. The apparatus has already been commercialized and is available as a product.
3. The apparatus has past delivery records.

Describe the past records in detail:

4. Innovativeness of the technology

Describe patents, utility model patents, or others filed or granted, scientific papers disclosed, past awards, and the like.

5. Other relevant or unique features (if any)

6. Safety of agents or microbial preparations to be used and the results of ecological effect tests

If the technology uses agents or microbial preparations, present the following:

- Results of literature research or analysis on the effects of the agents or microbial preparations on human

beings or other organisms, such as pathogenicity or production of toxic substances

- Results of ecological effect tests conducted according to relevant OECD test guidelines (for agents preparations)
- Results of ecological effect tests conducted according to relevant OECD test guidelines (for microbial preparations)

For details about ecological effect tests, refer to Table 6 on page 13.

Submit with the application form the results of ecological effect tests conducted by a laboratory complying with the GLP standards of the Law Concerning Examination and Regulation of Manufacture, etc. of Chemical Substances for test facilities conducting tests of new chemicals.

Conduct these tests or research at the verification applicant's expense. If the results of ecological effect tests are not attached to the application form, the application may not be accepted.

7. Proposal of verification test methods

Submit a separate proposal of verification test methods for verifying the performance of your technology. Proposed verification test methods are one of the key criteria in selecting target technologies. Propose scientific and practicable methods.

In preparing this proposal, add modifications or new items in the following fields as required:

Overview of verification test methods [Submit a separate, detailed proposal.]

Verification test conditions <input type="radio"/> Scale of the target verification apparatus <input type="radio"/> Design of the test area, methods of obtaining data from controls, etc.
List the purpose and goal of development described before, and items to be verified to check the performance of the apparatus, and summarize the following for these items in a table: <input type="radio"/> Frequency and method of sampling <input type="radio"/> Test and analysis methods <input type="radio"/> Target levels and the grounds for the levels
Test period and timing
Work schedule for maintenance, expected number of staff required for maintenance, etc.

【Documents to be attached to this application form】

- ☐ Technical specification for the technology/product
- ☐ Detailed in-house test results
- ☐ O&M manual
- ☐ Proposal of verification test methods (Be as specific as possible.)
- ☐ Information about agents or microbial preparations to be used (Name the components of the agents, or major microorganisms used in the microbial preparations.)
- ☐ If agents or microbial preparations are used, attach the following: results of literature research or analysis on the effects of the agents or microbial preparations on human beings, such as pathogenicity or production of toxic substances, and the results of ecological effect tests conducted by a laboratory complying with the GLP standards of the Law Concerning Examination and Regulation of Manufacture, etc. of Chemical Substances for test facilities conducting tests of new chemicals.

Appendix 2: Test Plan

The Test Plan is intended to present the objectives and design of a verification test, test procedures or methods, and work schedules. The Test Plan shall contain the following information:

1. Cover sheet/approval of the verification test participants/table of contents

A cover sheet for the Test Plan and names of pilot project participants (responsible official of the Verification Organization, the environmental technology developer, the owner/manager of the Test Site, etc.) who approved the Test Plan shall be given.

2. Participating organizations and personnel responsibilities

Organizations participating in the verification test and the representatives

3. Test Site description

- Name, address, and owner/manager of the Test Site
- Overall conditions of the water body (area of the water body, water depth, past time-varying data on water quality, pollutant balance, conditions of the lakeshore, characteristic layers of aquatic life, etc.)
- Conditions of the Test Site (conditions of the isolated water mass, water transmission/drainage systems when the apparatus is installed outside the lake, etc.)
- Location of the target verification apparatus

4. The target verification technology and apparatus description

- Principle of the target verification technology, system configuration including pre- and post-processing
- Processing and load capacity, dimensions, and weight of the target verification apparatus
- Required consumables, expendables, electricity and other resource consumptions
- Work items required for the maintenance of the target verification apparatus
- Conditions under which the target verification apparatus is operated normally
- Physical and chemical nature and frequency of the generation of sludge and waste, precautions on handling
- Level of operator skill required for the maintenance of the target verification apparatus
- Noise and foul odor control, housing requirement

5. Details of the verification test

(1) Test period

- Test period and entire schedule

(2) Startup of the target verification apparatus

- Startup schedule for the target verification apparatus
- Remarks on startup

(3) Monitoring

- Monitoring items
- Measurement/monitoring methods for the monitoring items, place of monitoring, and monitoring schedule

(4) Water quality survey

- Verification items regarding water quality effect and target levels
- Sampling method, devices for sampling, sampling schedule (frequency), storage method, storage period
- Analytical methods and instruments, calibration methods, calibration schedule

(5) Bottom sediment survey

- Verification items regarding bottom sediment effect and target levels
- Sampling method, devices for sampling, sampling schedule (frequency), storage method, storage period
- Analytical methods and instruments, calibration methods, calibration schedule

(6) Biological survey

- Verification items regarding biological effect
- Sampling method, devices for sampling, sampling schedule (frequency), storage method, storage period
- Analytical methods and instruments, calibration methods, calibration schedule

(7) Environmental load survey

- Verification items regarding environmental load
- Sampling method, devices for sampling, sampling schedule (frequency), storage method, storage period
- Analytical methods and instruments, calibration methods, calibration schedule

(8) Maintenance performance survey

- Verification items regarding O&M
- Sampling method, devices for sampling, sampling schedule (frequency), storage method, storage period
- Analytical methods and instruments, calibration methods, calibration schedule

6. Quality control of data

- Types of data that use a data quality indicator (DQI), such as precision, completeness, etc., as well as the method
- Necessity of providing additional quality-control information, such as data on the calibration of devices for sampling and analytical instruments, relevant information, etc. (All unprocessed data will be described in the Verification Report as an Appendix.)

7. Management, analysis and presentation of data

(1) Data management

Data that are to be managed and forms in which the data should be managed

(2) Analysis and presentation

Methods of data analysis and presentation

8. Audit

- Audit group
- Audit procedures
- Audit schedule

9. Appendix

- O&M manual provided by the environmental technology developer
- Other literature and data used as reference in preparing the Test Plan

Appendix 3: Form of Verification Summary Report

Target verification technology/environmental technology developer	
Verification Organization	
Verification test period	From to

1. Overview of the target verification technology

Flow sheet	Principle
(Diagram)	

2. Overview of the verification test

○ Overview of the Test Site

Name of the water body	
Address	
Overall conditions of the water body	

- Specifications and capacity of the target verification apparatus

Classification	Item	Specifications and capacity
Facility overview	Name/type	
	Dimensions (mm), weight	
Design conditions	Substance(s) to treat	
	Capacity per day (m ³ /day)	
	Capacity per hour (m ³ /hour)	
	Quality of raw water	
	Quality of treated water	
	Treatment method	
Others		

3. Results of the verification test

(Attach graphs or tables to show changes in the verification items with time.)

○ Items regarding environmental impact

Item	Unit	Verification results
Amount of generated sludge	kg/day	
Amount of generated waste	kg/day	
Noise		
Foul odor		

○ Items regarding used resources

Item	Unit	Verification results
Electricity consumption	kwh / day	
Amount of chemicals used for treatment		

○ Items regarding O&M

Control item	Time required for each control	Frequency of control

○ Qualitative findings

Item	Findings
Findings regarding water quality	
Period required for startup of the target verification apparatus	
Period required for shutting down the target verification apparatus	
Number of operators required for O&M	
Skill of operators required for O&M	
Reliability of the target verification apparatus	
Method of restoring from problems	
Evaluation of O&M manual	
Others	

○ Opinions of the Technology Panel on the applicability of the technology to actual water bodies

(Reference information)

Note: All the product information in this page is provided by the environmental technology developer in an application for a verification test at its own responsibility. The Ministry of the Environment and the Verification Organization assume no responsibility for the information.

○ Product data

Item		Description (to be filled by the environmental technology developer)				
Name						
Type						
Name of manufacturer (distributing agent)						
Contact addresses	TEL / FAX	TEL() - / FAX() -				
	Website	http://				
	E-mail	@				
Dimensions, weight						
Necessity of pre- and post-treatment		<div style="display: flex; justify-content: space-between;"> [<div style="text-align: center;"> No • Yes Describe in detail: </div>] </div>				
Additional equipment		<div style="display: flex; justify-content: space-between;"> [<div style="text-align: center;"> No • Yes Describe in detail: </div>] </div>				
Life of the target verification apparatus						
Period of time required for startup						
Approximate cost		Expense item		Unit cost	Quantity	Total
		Initial cost				
		Running cost (per month)				
Yen/m³ of treated water						

○ Additional information on this technology (delivery record, past awards, patents or utility model patents, cost concept, etc.)

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Appendix 4: Opinions of the working group on this Technology Field on alien species (FY2005)

An alien species is defined as “a species, subspecies, or lower taxon, introduced outside its normal past or present distribution, including any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce” (6th Conference of the Parties to the Convention on Biological Diversity in April 2004).

In this Technology Field, many water purification technologies that use the basic principle or actions of ecosystems have been proposed. Technologies based on these biological actions cannot be described as environment-friendly technologies if they have serious adverse effects on the indigenous ecosystem in the water body where they are used. Alien species may be introduced intentionally for water purification by vegetation or using microorganisms or microbial preparations, or accidentally in artificial floating islands. Whether they are introduced intentionally or accidentally, they require sensitive handling.

The Ministry of the Environment established the “Policy on Alien Species (Foreign Species)” in August 2002.*1 In this Policy, policies on preventive measures, research and monitoring, preemptive measures, control of introduced species, and education are compiled. For invasive alien species, among other alien species, the “Invasive Alien Species Act” (promulgated in June 2004) and the “Basic Policy for Preventing Adverse Effects on Ecosystems Caused by Invasive Alien Species” (adopted in a Cabinet meeting in October 2004) were established.*1

In light of the context of this Project, the most effective, highest-priority measure is taking preventive measures, which should be executed by Verification Organizations and Technology Panels. Excerpts from the “Policy on Alien Species (Foreign Species)” about preventive measures are given below. Verification Organizations shall examine preventive measures against alien species for technologies proposed by verification applicants in reference to this Policy.

In using invasive alien animals or plants or microbial preparations, the “Policy on Alien Species (Foreign Species),” the “Invasive Alien Species Act,” and the “Basic Policy for Preventing Adverse Effects on Ecosystems Caused by Invasive Alien Species” must be observed. In addition, their effects on ecosystems or the safety of their use must be confirmed to prevent alien invasive species problems from occurring.

Excerpts from the “Policy on Alien Species (Foreign Species)” compiled by the Ministry of the Environment about preventive measures

3. Preventive measures

3-1 Concept of intentional introduction

The Guiding principles*2 require that before alien species are determined to be introduced intentionally, risk analyses including environmental assessment should be conducted whether they are introduced from outside the country or from other areas within the country. Alien species introduced intentionally may be used in a confined area, released intentionally into the environment, or used in other different ways. For this reason, different preventive measures must be taken depending on how such alien species are used.

- Intentional introduction of alien species is categorized into the following three types:

Alien species (foreign species) are released intentionally into the environment (as a natural enemy, etc.).

1. The Policy on Alien Species does not give full consideration to microorganisms or other taxonomic groups for which sufficient knowledge has not yet been accumulated.
2. Refers to the “guiding principles on the prevention of the effects of alien species that threaten ecosystems, habitats, and species, their introduction, and impact mitigation” established by the Parties to the Convention on Biological Diversity.

- ii Alien species (foreign species) are made available to unspecified people (sold as pets, etc.).

Alien species (foreign species) are used in a laboratory, a fence, an enclosed space, or other confined areas depending on their characteristics so that they cannot escape or settle (for experiments, zoos, etc.).

Appropriate preventive measures must be taken according to the possibility that alien species introduced may

settle in the environment and have an impact on biodiversity, or to whether they are released into the environment (categories i and ii) or used in a confined area (category iii).

3-1-1 Concept of intentional release into the environment

- Before alien species (foreign species) are released into the environment, the effects of their use must be assessed. A system that requires such alien species to be checked for impacts on biodiversity must be established (Alien species whose use is approved under laws are excluded. In that case, such approval should be based on examinations by experts).
- Before species of category II-a, III-a, or IV-a are released into the environment, the effects of their use must be assessed. In addition, the effects of use of species of category III or IV, including species that do not fall under III-a or IV-a, must also be assessed before they are released if they have a high chance of having impacts on biodiversity.
- However, for species of category II or III that have been released into the environment many times with no evidence of escape or settlement and have had no impacts on biodiversity, the effects of their use need not always be assessed if they have been examined by experts.
- When organisms distributed in the past are introduced again, the effects of their use should be assessed even if they fall under category I (native species).
- In principle, those who plan to introduce alien species must assess the effects of their use based on information collected on their own, and the validity of the assessment results must be verified by administrative authorities.
- In checking the effect assessment, administrative authorities must seek the opinions of experts about the accuracy of data and the validity of the assessment results. These experts should also be involved in the categorization of species.
- In order to be practical, this prior assessment of the effects of alien species above should be performed for the introduction of species from outside the country. The same approach should be employed for the introduction from other areas within the country in principle. However, because a mechanism that examines the movement of organisms within the country is not in place, procedures for examining such movement of organisms and other rules should be established separately for areas that require caution or other areas that are important in preserving biodiversity.

3-1-2 Items to be assessed in effect assessment and use of alien species based on assessment

- Major items (examples) to be assessed in effect assessment when animals or plants are used are listed in Tables 9-4 to 9-4. Effect assessment should be made from two major perspectives: their possibility of settling in the environment and their possibility of having an impact when they settle. Data that allows objective assessment must be provided for these items to be assessed.
- Those who plan to introduce alien species must collect and assess data on the ecological characteristics of the species, such as their habitats, feeding habits, and temperature adaptability, data on the environment where they are to be introduced, and other data related to the items to be assessed.
- If the results of effect assessment show that there is no possibility of having adverse effects, or that the possibility of having adverse effects can be eliminated by taking measures to reduce them, the species can be used.
- In many cases, it is difficult to make quantitative assessments based on data to determine whether alien species can be used or not. Thus, the transparency of assessment procedures and information used for assessment must be ensured, and opinions of experts must be widely invited from an ecological perspective.

3-1-3 Measures to reduce effects

- The following measures can be taken to reduce the effects of the release of alien species into the environment:
- For alien species intentionally released into the environment, monitor the effects of their use and take measures against the effects.
- For alien species to be raised, take measures to identify them or keep track of them in the course of

distribution so that appropriate measures can be taken when they escape.

- Take measures to control the reproduction of alien species in order to prevent unintended increases in the population or their settlement in the environment when they escape.
- Alien species cannot be used before steady implementation of measures to reduce the effects of their use is ensured.

3-1-4 Concept of intentional introduction for use in a confined area

- Alien species (foreign species) introduced for use in a confined area have a low chance of escaping to or settling in the environment. Thus criteria for confinement should be set so that alien species can be used when their use conditions meet the criteria.
- Criteria for confinement depend on whether the alien species are animals or plants and on the species, because the definition of confinement varies from one species to another. Basically, whether or not their use is deemed as use in a confined area should be decided by whether or not they are used with facilities to avoid their exposure to outside environments or their escape to or settlement in the environment.

3-2 Concept of accidental introduction

- Routes of accidental introduction of alien species into Japan must be identified, and their effects must be examined separately for each of the routes. Major routes of accidental introduction are given below:

Agricultural industry: weed mixed into feed

Fisheries industry: entry of aquatic organisms following movement of water

Shipping industry: entry of aquatic organisms following discharge of ballast water

Construction industry: entry of organisms mixed into construction materials, such as sand

- Periodical monitoring in distribution bases of alien species (foreign species) must be considered.
- To prevent accidental movement of species within the country, transport of materials to islands and other areas that require caution should be monitored for accidental introduction. These areas should be monitored for routes of entry of alien species. If accidental introduction occurs, measures that those involved in the route should take must be clarified.

Reference

.Brief overview of the pilot project for the environmental technology verification

1. Objectives

Many innovative environmental technologies that are already at a practically applicable stage and seem to be useful have not come into wide use because end users, including local municipal entities, companies, consumers, and the like, cannot use the technologies with confidence due to the lack of objective evaluation of the environmental protective effect and the like.

Accordingly, in this pilot project for the environmental technology verification, with respect to the innovative environmental technologies that have not been widely accepted as described above, the environment protective effect and others will be objectively verified by an independent organization on an experimental basis.

It is hoped that the pilot project for the environmental technology verification will accelerate the dissemination of the environmental technologies developed by venture companies and the like, and contribute to the activation of economic activity through environmental protection and the advancement of regional environmental industries.

2. What the “verification” means

In the pilot project for the environmental technology verification, the environmental protective effect and the like of particular environmental technologies will be verified through the collection of objective data based on various tests and others. There is a similar term, “certification,” in which the suitability to the standard of an environmental technology is judged in terms of the performance that a technology should provide. The present project does not conduct such “certification.”

3. System for promoting the project

The pilot project for the environmental technology verification will be conducted by the Ministry of the Environment in cooperation with the “Verification Organizations” (local municipal entities, etc.), which are independent organizations that conduct technology verification under the entrustment and contract of the Ministry of the Environment.

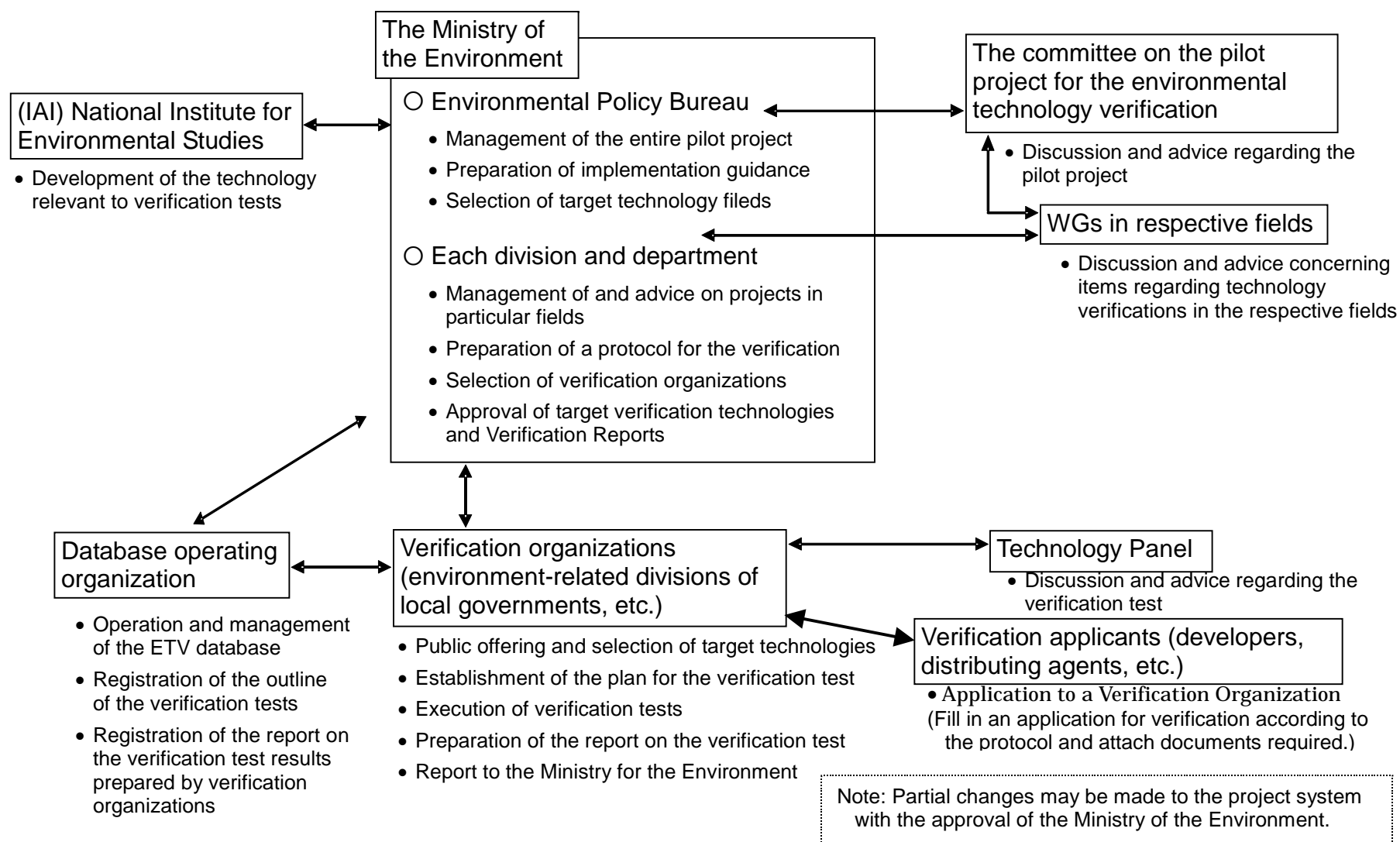
4. Procedures of the project

The pilot project for the environmental technology verification will generally be conducted in accordance with the following procedures:

- (1) The Ministry of the Environment will identify the needs of the technology developers / distributing agents, users, and others, through the use of questionnaires or the like.
- (2) The Ministry of the Environment will select target verification technology fields based on discussions in the committee on the pilot project for the environmental technology verification.
- (3) The Ministry of the Environment will prepare a “protocol for the verification,” which establishes the specific methods of technology verification regarding the selected target verification technology fields.
- (4) The Ministry of the Environment will select the “Verification Organizations,” which are the independent organizations that conduct the verification tests.
- (5) The Verification Organizations will invite applications from companies and the like for the technology to be verified.
- (6) The Verification Organization will select the technologies to be verified in the project from among the applications, following discussion in a panel consisting of the specialists.
- (7) The Verification Organizations will conduct verification tests on the selected technologies in accordance with the protocol for the verification.
- (8) The Verification Organizations will summarize the results of the test in report form, notify the

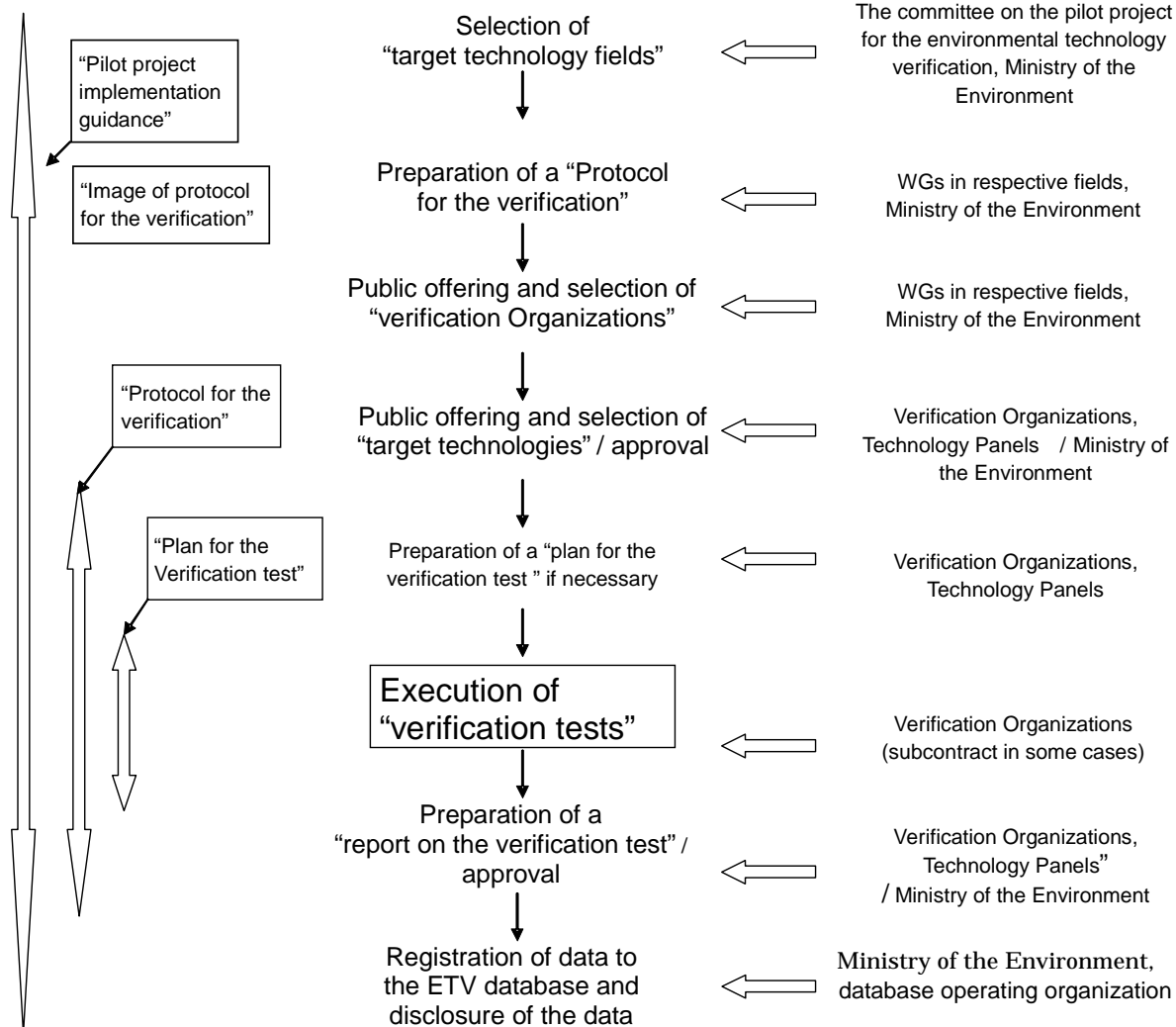
technology developers/distributing agents of them, and report to the Ministry of the Environment. In addition, the report will be registered in a database on the Internet and made available to the public

II. System for promotion of the “pilot project for the environmental technology verification”



III. Flow of the pilot project for the environmental technology verification

Basic reference for promotion of the project and its period of application



IV. Prospectus for organizing the working group on the water purification technology for lakes and reservoirs in the committee on the pilot project for the environmental technology verification for 2004

1. Objective of the working group

The working group on the water purification technology for lakes and reservoirs is established for the purpose of discussing based on specialized knowledge “water purification technology for lakes and reservoirs,” a technology field in which technology verification is scheduled to be conducted in 2004, in the pilot project for the environmental technology verification and thus promoting the project smoothly and efficiently

2. Items to be investigated and discussed

(1) Field of water purification technology for lakes and reservoirs

(i) Preparation of a protocol for the verification

(ii) Selection of Verification Organizations

(iii) Confirmation of Verification Reports

(iv) Other items relevant to execution of the project

(2) How future verification tests shall be conducted, and the selection of candidate technology fields

3. Organization and others

(1) The working group consists of 10 or fewer members.

(2) The working group has a chairperson.

(3) The chairperson will supervise the working group.

(4) The members will be appointed by UFJ Institute Ltd., from among academic experts, well-informed individuals, and the like relevant to verification tests on water purification technology for lakes and reservoirs, with the approval of the Water Environment Department of the Ministry of the Environment.

(5) The members will be under commission for the period from the date of appointment by UFJ Institute Ltd. to the end of the same fiscal year.

(6) In addition, participants and interested parties in the pilot project for the environmental technology verification may also attend the meetings of the working group as observers and the like, if necessary.

4. Disclosure of the discussion and others

Meetings of the working group will, in principle, be held in public. However, the chairperson may hold a closed meeting of the working group if a public meeting may cause significant obstacles to fair and neutral discussion, and provide particular individuals with unfair benefit or detriment.

5. Secretariat

The general affairs of the working group will be processed by UFJ Institute Ltd., with the consent of the Water Environment Department of the Ministry of the Environment.

The committee on the pilot project for the environmental technology verification for 2004

List of the members of the working group on the water purification technology for lakes and reservoirs

Mitsumasa Okada	Director, Graduate School of Engineering, Hiroshima University
Yukihiro Shimatani	Professor, Faculty of Engineering, Kyushu University
Hitoshi Tanaka	Chief, Water Environment Group, Center for Environmental Science in Saitama
Takehiko Fukushima	Professor, Graduate School of Life and Environmental Sciences, University of Tsukuba
Sadaomi Mizuguchi	Water Environment Subsection Chief, Expert Member, Environmental Policy Division, Department of the Environment, Aichi Prefectural Government

< Secretariat (Ministry of the Environment) >

Susumu Ota	Director, Water Environment Management Division, Water Environment Department, Environmental Management Bureau
Yuji Yoshioka	Deputy Director, Water Environment Management Division, Water Environment Department, Environmental Management Bureau
Hiroshi Noguchi	Lake Water Quality Preservation Manager, Water Environment Management Division, Water Environment Department, Environmental Management Bureau
Kazuhisa Matsuda	Deputy Director, Policy Planning Division, Water Environment Department, Environmental Management Bureau
Kenji Ueda	Managing Officer, Office of Environmental Research and Technology, Environmental Policy Bureau

< Secretariat (UFJ Institute Ltd.) >

Shintaro Munakata	Researcher, Environmental Policy Consulting Department
Naoki Yoshizawa	Researcher, Environmental Policy Consulting Department
Kotaro Shimizu	Researcher, Environmental Policy Consulting Department

V. Particulars discussed in the working group on the water purification technology for lakes and reservoirs

(FY2004)

First meeting: 13:30 to 15:30. February 8, 2005

- Pilot project for the environmental technology verification
- Results of surveys conducted by local governments
- Water purification technologies for lakes and reservoirs
- Protocol for the verification (draft)

Second meeting: 10:00 to 12:00. February 28, 2005

- Protocol for the verification (third draft)

Third meeting: 16:00 to 18:00. March 22, 2005

- Protocol for the verification (final draft)
- Selection of Verification Organizations