

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

(Third edition)

Environmental Management Bureau,
Ministry of the Environment

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Main section

I. Introduction

1. Purpose and concepts of this project

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 (i.e., in this field of technology, this refers to the purification of water of lakes and reservoirs) and other important performance (i.e., in this field of technology, this refers to performances regarding the environmental protection of lakes and reservoirs) 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 removal of pollutants (i.e., organic substances, nutritive salts) and algae, 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

Term/Phrase	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
Survey items	Items that are measured in relation to the verification of performance of the target verification apparatus and potential environmental impact caused by the apparatus. The items include not only those directly used for verification, such as measurement data for water quality and bottom sediment, but also the supplemental information, such as water temperature and amount of precipitation.
Verification applicant	A person wishing to have his/her own technology verified. If the technology is to be applied to more than one business, designate one representative business as the verification applicant in the application. 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:

- Water quality category (water purification performance and adverse effects on water quality)
- Bottom sediment category (bottom sediment purification performance and adverse effects on bottom sediment)
- Biology category (removal performance of living organisms harmful to water quality, and adverse environmental impact on the ecology)
- Other environmental impacts

(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 (p. 8).

ii. Designing a verification test

The Verification Organization shall design verification tests and develop Test Plans with reference to the verification test methods (p. 41) proposed by the environmental technology developer in cooperation with the owner or administrator of the Test Site, following the steps below:

- Determine the objective of the Verification Test (p. 11)
- Determine the conditions of the Verification Test (p. 11)
- Determine survey items, target levels, and methods of sampling and measurement/analysis (p. 13)
- Determine the test period and schedules (p. 18)

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. Preparation of a Verification Report

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") (p. 21). 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
- Establish and administer the committee on the pilot project for the environmental technology verification
- Select a target verification technology field
- Select a Verification Management Organization
- Subcontract operation of verification tests to the Verification Management Organization and bear the costs
- Approve a protocol for verification tests
- Approve a Verification Organization
- Subcontract operation of verification tests to the Verification Organization and bear the costs
- Approve a Verification Report
- Create an Environmental Technologies Verification database for dissemination
- Provide the logo for the verified technology.

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 selection of a Verification Management Organization
- Offer advice on the comprehensive evaluation of verification test results

3. Verification Management Organization

- Prepare a protocol for the verification test and obtain approval of the Ministry of the Environment.
- Select Verification Organizations and obtain approval of the Ministry of the Environment.
- Approve target verification technologies
- Determine the items for the fee associated with the verification test and collect the fee
- Subcontract operation of verification tests to the Verification Organization

4. 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

5. 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.

6. 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

7. 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)

8. Owners or 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 (possible verification test periods must be given)
- 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, test results for leaching from the filling materials, etc.)

2. Selection of target verification technologies

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 (issues that need to be examined also from the standpoint of science and technology)
 - 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. (issues that need to be examined mainly from the standpoint of science and technology)
 - Is it possible to scientifically explain the principle and mechanism of the technology?

- Does it have potential for an environmental protection effect?
- Is there any possibility of the technology causing environmental side effects?
- Does the technology have originality?
- Are the verification test methods proposed by the environmental technology developer scientifically valid?
- Is the safety of humans and the ecosystem assured?
- Is the safety of the chemicals and biological remediation agents which are to be used assured?
- Can appropriate measures be taken against alien invasive species?
(Refer to Appendix 4.)

IV. Designing of a verification test

1. Determination of objectives of the verification test

The objectives of the verification tests are:

- verification regarding water purifying performance for lakes and reservoirs, and environmental protection performance for lakes and reservoirs
- examination of potential harmful effects or side-effects.

The Verification Organization shall consider the essence of development and goals for the environmental technology, and give a concrete form to the objectives of the verification test.

2. Determination of verification test conditions

The Verification Organization shall conduct a thorough study of the following issues prior to applying for Verification Organization, and build a system which makes the implementation of verification tests possible.

(1) Test Site

The Test Site shall be selected by the Verification Organization and permission of the owner or administrator of the Site shall be obtained. In selecting a Test Site, the Verification Organization shall ensure that the implementation of the verification test based on the framework indicated in the protocol for the verification is possible.

In installing the target verification apparatus, 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. 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 or 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

The experimental conditions shall be maintained to allow the verification of water purifying performance, bottom sediment purifying performance, and performance regarding the removal of living organisms harmful to the water quality of the target verification apparatus.

Methods to consider the effects of natural environment conditions include setting up a control, and comparison with the past observation results or with the observation results of the surrounding water bodies similar to the area in question. 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.

Table 2. Test Site data format (extracted from the application form for the selection process of Verification Organizations)

Information regarding the water body considered for the Test Site	
Name	
Address	
Water body type (e.g., reservoir, dam lake) and primary uses (e.g., irrigation, recreation)	
Scale of the water body (i.e., lake area, depth, the average number of days of retention, etc.)	
Major problems of the water body (e.g., eutrophication, foul odor, deterioration of scenic views)	
Data on water quality, incomings and outgoings of pollutant, etc. (Give information in detail as far as is known.)	
Other	(Affix a map(s), photograph(s), etc. showing the conditions of the intended water body and surrounding areas.)

Information regarding the area around the Test Site	
How much space can be secured for the installation of the target verification apparatus?	
How much space can be secured for work?	
How to secure the electric power source?	
Access to the Test Site (e.g., Is heavy equipment accessible?)	

3. Determination of survey items, target levels, and methods of sampling and measurement/analysis

Regarding the items (1) to (6) of Table 3, the Verification Organization shall determine the survey items which are required for the objectives (p. 11) of the verification test, and the survey items which are for supplemental use. The sampling locations shall also be determined.

The Verification Organization shall conduct a study on the target purifying performance levels for the specific survey items. The scope of this project is not to judge the technologies by particular criteria; however, the target levels serve as important indicators to show whether the target verification technology functioned as expected.

The Verification Organization shall determine the methods of sampling and measurement/analysis for the survey items according to the relevant JIS and regulations, and survey methods and guidelines defined by official institutions. The Verification Organization may adopt methods other than those mentioned above, if the Technology Panel judges that a sufficient precision can be achieved.

Table 3. Overview of the survey items

Examination category		Purpose of the verification test (p. 11)		To be used supplementarily
		Verifying performance	Examining potential impact	
Verification test types (p. 2)	(1) Impact on water quality	○	○	○
	(2) Impact on bottom sediment	○	○	○
	(3) Impact on biology	○	○	○
	(4) Other environmental impacts	-	○	○
(5) Operations and maintenance of the apparatus		-	-	○
(6) Other		-	-	○

○: Whether there are applicable survey items or not must be reviewed

-: Basically there is no need for reviewing

(1) Regarding impact on water quality

When determining survey items, etc., the Verification Organization shall consider the purpose of water uses of the Test Site, such as the life environment items regarding lakes and reservoirs shown in the attached Table 2 (2) Lakes and Reservoirs, “Environmental Standards Regarding Water Pollution,” MoE Notification No. 59, published on December 28, 1971.

Table 4. Examples of the survey items regarding water quality (life environment items regarding lakes and reservoirs)

Item	Referenced literature
Hydrogen ion concentration (pH), chemical oxygen demand (COD), suspended solids (SS), dissolved oxygen (DO), total coliform	Regarding the lake/ reservoir types AA, A, B, and C
Total nitrogen (T-N), total phosphorous (T-P)	Regarding the lake/reservoir types I, II, III, IV, and V

Total zinc (T-Zn)	Regarding the lake/reservoir types biology A, biology special AA, biology B, and biology special BB
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(2) Regarding impact on bottom sediment

When determining survey items, etc., the Verification Organization shall study the bottom sediment remediation effects achieved by the target technology, and potential impact on bottom sediment, while considering the coherence with the reviewing results of the impact on water quality.

The methods of sampling and measurement/analysis shall be determined chiefly in accordance with the “Methods of Bottom Survey, MoE, 1988,” or the “Methods of Bottom Survey, MoE, in March 2001.”

Table 5. Examples of the survey items regarding bottom sediment

	Item
Findings	Color and odor of bottom sediment
Items regarding improvement of anaerobic conditions	Oxidoreduction potential (ORP)
Items regarding pore water	T-N, T-P
Items regarding solids	Total organic carbon, T-N, T-P

(3) Regarding impact on biology

The survey items regarding impact on the biology are characterized by the following two types:

- survey items which shall be tested at the verification applicant’s own responsibilities and expenses prior to the test at the Site, and the results of which need to be submitted to the Verification Organization at the time of filing an application,
- survey items which shall be tested at the Test Site by the Verification Organization

i. Survey items which shall be submitted to the Verification Organization by the verification applicant

For technologies utilizing chemicals and biological remediation agents, the verification applicant shall submit the results of the ecological impact test as shown in Table 6, which should be performed by the laboratory institutions conformable to the “Standards concerning Laboratory Facilities which Perform Tests for New Chemical Substances and the like” (Chemical Substances Control Law, GLP Standards), to the Verification Organization.

For technologies utilizing materials with harmful components which may leach into the environment, the verification applicant shall submit the results of the leaching test performed based on the JIS K 0058-1, “Test Methods for Chemicals in Slags - Part 1: Leaching Test Method” to the Verification Organization.

The Verification Organization may determine the necessary tests prior to the testing at the Site, and request the verification applicant to submit the results of the tests. The results of the tests shall be included in the Verification Report.

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

Target	Item	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

ii. Survey items which shall be examined by the Verification Organization at the Test Site

The Verification Organization shall examine the survey items regarding the performance of the removal of living organisms which are harmful to water quality, and regarding the adverse effects and side-effects on living organisms. If the adverse effects or side-effects are detected, or if it was identified that the introduced species problems are not sufficiently managed, the Verification Organization shall immediately cancel the on-site Test; in order to act in this manner, the Verification Organization shall conduct a study in advance regarding the survey items and judgment criteria to cease the test. In the case where the presence of a rare species is identified at the Site, in particular, thorough review shall be conducted.

The methods of sampling and measurement/analysis shall be determined primarily in accordance with the relevant JIS, SCOR/UNESCO methods (chlorophyll a), OECD Test Guidelines (Ecological impact test).

Table 7. Examples of survey items regarding impact on biology

Target	Item
Phytoplankton	Chlorophyll a, population and group count of each species
Zooplankton	Population and group count of each species
Others	Population of each benthic species (bivalves, insects, etc.), effect on swimming animals such as fish

(4) Other environmental impacts

In consideration of the environmental impact other than those mentioned above, which are accompanied by the use of the target verification apparatus, the Verification Organization shall review the adequacy of the standard set of survey items shown in Table 8, and determine the survey items.

Table 8. The standard set of survey items regarding environmental load

Item	Measurement method, etc.	Relevant cost
Amount of sludge or sludge-derived waste	Dry weight of sludge and wet weight of sludge (kg/day) and moisture content	Disposal cost
Types and amounts of waste products (excluding the waste related to 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.	

(5) Operations and maintenance of the apparatus

In consideration of the characteristics of O&M peculiar to the target verification apparatus, the Verification Organization shall review the adequacy of the standard set of survey items shown in Table 9, and determine survey items. Especially, problems that may arise when an operator in charge is not sufficiently capable of conducting O&M shall also be considered.

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 chemicals	As appropriate	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
	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	-

(6) Other survey items

The Verification Organization shall review the necessity of survey items regarding the items that are not included from (1) to (5), and determine survey items as appropriate.

Table 10. Examples of other survey items

Item	
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.) ● Water temperature, water level, amount of water
Items to be monitored with respect to influx areas, etc.	<ul style="list-style-type: none"> ● Influent pollutant load or data indicating load changes
Other items	If the O&M manual instructs the monitoring of items other than the above items, review the items.

4. Determination of test period and schedules

In consideration of the objectives of the verification test and peculiarities of the Test Site (e.g., the average number of days of retention, influent condition of pollutant load, seasonal trend of deterioration of water quality, potential freezing in winter time), characteristics of the target verification apparatus (e.g., time required until treatment effect is recognized, retention period of the treatment effect), the Verification Organization shall determine the following periods and work schedules.

(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 or 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.

During the test period, modification of the configuration is not allowed; however, change and revision of the frequency and method of O&M can be reviewed as appropriate. In this case, the environmental technology developer and Verification Organization shall discuss the change, and the time at which the change was made, contents of the change, and the reason for the change shall be described.

(3) Follow-up period

If 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.

5. Establishment of the Test Plan

Based on the information reviewed as described above, the Verification Organization shall prepare the Test Plan which contains all the items of Appendix 2. The Verification Organization shall obtain approval for the Test Plan from the environmental technology developer, and the owner or manager of the Test Site.

V. Verification test methods

1. Preparation of the target verification apparatus

The environmental technology developer shall set up the target verification apparatus at the Test Site.

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. The Verification Organization shall record the conditions, findings, and results of the preparation of the target verification apparatus during the preparation period, and describe them in the Verification Report.

2. Maintenance

A target verification apparatus requires periodical 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 maintenance procedures, and describe them in the Test Plan.

(1) Regular maintenance

Persons in charge of maintenance shall perform maintenance on the target verification apparatus during the test period in accordance with the O&M manual. Persons in charge of 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
- Details of maintenance work and results
- Findings on the Test Site and 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) The response to an emergency situation of the target verification apparatus

The Verification Organization will inform the environmental technology developer as soon as possible in the event of emergency situation of the target verification apparatus. 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 emergency situation of the target verification apparatus 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 described in 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. 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
 - Sampling locations
- Method and conditions of the verification test
 - Schedule of the entire verification test
 - The target levels, methods of sampling, analysis, and apparatus calibration, and test date for each survey item
- Results and discussions of the verification test (The measurement and analytical results shall be shown in tables and graphs.)
 - Results of each survey item (If targets have been set, whether they were achieved or not shall be evaluated/analyzed and described.)
 - Report of outliers
 - Points to be aware of when examining the applicability to other actual water bodies
 - Comments by the committee members of the Technology Panel (i.e., points to be heeded, opinions on the topic of the Technology Panel meeting, etc.)
- 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, sampling and analyses, records of auditing of the quality management system, and other records with the Verification Report to the Ministry of the Environment.

The Verification Organization shall review some points to be aware of for the cases where a reader conducts a study on the potential applicability to other actual water bodies while taking the opinions of the environmental technology developer and Technology Panel into consideration, and include the opinions in the Test Report for reference purposes. If the opinions of the environmental technology developer contradict those of the Verification Organization, identify the distinction between the two opinions and both can be included in the report.

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

Measurement data 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 survey items include quantitative data, such as water quality measurements, amount of chemicals/biological remediation agents used, amount of sludge and sludge-derived waste, and qualitative data, such as reliability and operational ease of the target verification apparatus, and number of staff required for operation. 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 32. For this purpose, a Verification Organization shall appoint a data quality manager.

(2) Data analysis and presentation

The quantitative data shall be organized in the forms of tables and graphs, and statistically analyzed if necessary. All of these results shall be included in the verification report. 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.

i Examples of analysis/presentation of data regarding water quality, bottom, and biology

- Tables showing all the data
- Graph showing daily variations in items during the test period
- Removal efficiency of the target verification apparatus

ii Analysis and presentation of measurements of verification items

- Table or graph showing the amount of sludge and sludge-derived waste
- Table or graph showing the amounts of waste produced except sludge
- Table or graph showing the amount of chemicals/biological remediation agents 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
- 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

3. Environment, health and safety

The Verification Organization should take strict environment, health, and safety measures with respect to the verification test. The environment, health, and safety management program should be included in the Test Plan. In the management program, 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 items are to be discussed in the environment, health and safety management program:

- Precaution regarding the operation of the target verification apparatus and emission of processed wastewater

- Biological, chemical and electrical hazards
- Material Safety Data Sheet
- Handling, storage and disposal of chemical substances related to verification tests
- Handling and disposal of residue and waste related to verification tests
- Compliance with local regulations regarding electricity and plumbing
- Exhaust and ventilation facilities in case of generation of gas in target verification apparatuses
- Prevention of fires
- Confirmation of emergency contacts (emergency medical, fire fighting, etc.)
- Ensuring of occupational health and safety
- Others

The entire environment, health and safety management program, including Material Safety Data Sheets, should be properly stored and available for inspection by anyone at the Test Site. 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.

4. Fees

(1) Setting up and collecting fees

Among all the expenses for the verification test, the environmental technology developer shall bear the fees for four of the expense items: "measurement, analysis and the like," "expendables associated with testing," "labor costs" and "travel expenses (i.e., of the Verification Organization)."

When announcing a call for the submissions of target verification technologies, the Verification Organization shall determine the estimation of these three items, register the estimated fee at the Verification Management Organization, and explicitly show the amount of the estimated fee at the time of the announcement. The major contents of the fee items that need to be calculated are shown in (2), and the Verification Organization shall determine the estimated fees in consultation with the Verification Management Organization and environmental technology developers, as necessary. Although the estimated fee may range to some extent, it shall be as concrete as possible.

After developing the Test Plan, but before starting the verification test, the Verification Organization shall finalize the amount of test fee and the due date of the payment, on which an adjustment has been made with the Verification Management Organization, and provide the above information to the environmental technology developer. The amount of fee shall be determined in consultation with the Verification Management Organization and the environmental technology developer, as necessary. In principle, the payment due date shall be before the starting date of the verification test. The environmental technology developer shall receive the above notification, and make payment for the fee to the Verification Organization by the due date.

When presenting the finalized test fee, the Verification Organization shall ensure the environmental technology developer be informed that verification items and incurred fees may be added in the course of the verification test; and when the addition of a test item and fee is made, the Verification Organization shall discuss such additions with the Verification management Organization and the environmental technology developer.

If a verification test was not completed for any reason, the Verification Organization shall explain the circumstances for the incompleteness to the Ministry of the Environment and Verification Management Organization to obtain an approval from them, and then discuss with the environmental technology developer, calculate the expenses involved in the portion of the test carried out, and determine the revised amount of fee which needs to be

paid by the environmental technology developer.

- Measurement, analysis, etc.

This fee item is the expenses, such as measurement, analysis, and the O&M item survey, and included subcontracting fee (analysis cost).

- Expendables associated with the test

This fee item is the expenses for the expendables accompanying the implementation of the test. Mainly the following expenses are included. The items below, consumables such as sampling bottles, may be included in the subcontracting fee (analysis cost).

- Consumables (sampling bottles, etc.)
- Power and water fee that measurement equipment and the like consume.

The consumables related to device operation and O&M are mainly the following items, which depend on target verification technologies, Test Sites etc. A verification applicant shall prepare them and bear those costs (not necessary to be included in the fee).

- Chemical expenses (chemicals for waste water treatment and others)
- Expense for preparing chemicals (preparing micro organic chemicals)
- Power and water fee which equipment consumes
- Expense for generated waste treatment
- Labor costs (i.e., of the Verification Organization)

This item is the expense of labor required for construction confirmation, attendance and sampling.

- Travel expenses (i.e., of the Verification Organization)

This item is the expenses of travel to the Test Site made by the Verification Organization, and typical expenses are as follows:

- Expenses of public transportations (e.g., fare, express fare)
- Expenses of vehicle use (e.g., vehicle use fee, fuel fee, highway toll)
- Daily travel allowance
- Accommodation expense

Delivery cost of sampling and the like (including the cost of delivery service) should be included in the case of transportation.

- Other

The Verification Organization can include general administrative costs in the fee as necessary.

Table 13. Examples of fee items

Measurement/analysis	Breakdown of costs		Remarks
Item	Breakdown of costs		
Labor costs	Total	Survey for on-site work planning	
(On-site work)	Verification items (related to water and benthic quality and organism)	Sampling	Periodic test Within-day test Within-week test
	Impact on the environment of those rather than the above items	On-site survey	Amount of sludge and wastes derived from sludge Noise Odor
	O&M items regarding equipment	On-site survey	Resource uses O&M performance
	Other verification items	On-site survey	Test Site Inflow area Others
Wages of assistant personnel	Total	Survey for on-site work planning	
(On-site work)	Verification items (related to water and benthic quality and organism)	Sampling	Periodic test Within-day test Within-week test
	Impact on the environment of those rather than the above items	On-site survey	Resource uses O&M performance
	O&M items regarding equipment	On-site survey	Environmental impact Resource uses O&M performance
	Other verification items	Flow rate survey	Test Site Inflow area Others
Equipment rent	Verification items (related to water and benthic quality and organism) Impact on the environment of those rather than the above items	Sampling equipment	Water sampling tools
		Other	Water thermometer, etc.
		Amount of sludge and wastes derived from sludge	Scale Others
		Types and amount of wastes	Scales Others
		Sampling of noise	Sound level meter Data processing device Others
		Sampling of odor	Pumps Wind speed meter Thermometer/humidity meter Others
		Survey of resource uses	Electric power meter Clamp logger Other
		Flow rate survey	Flow rate meter Data logger Other
Subcontracting fees (Analytical work)	Water quality items	Water quality	PH BOD COD SS n-HEX Coliform bacteria count T-N T-P
			O&M items
	Odor	Odor index Odor strength	
	Noise	Noise level	
Expendables associated with the test			
Item	Breakdown of costs		Remarks
Expendables (On-site work)	Water quality items	Sampling containers	Polyethylene jars Glass jars Sterilized jars Conduit, etc.
		Other	
	O&M items	Sludge sampling containers	Glass jars
		Odor sampling containers	Tetra bags
		Noise measurement equipment	Batteries, etc.
Other	Conduit, etc.		

Expendables (O&M)	Monitoring items	Flow rate survey	Conduit, etc.	Shall be borne by the verification applicant.
	Expendables	Treatment chemicals		
		Biological remediation agents		
		Other		
	Electricity fees	Electricity fees		
	Water fees	Water fees		
Waste treatment costs	Waste treatment costs			
	Other	Equipment, etc.		

Travel expenses				
Item	Breakdown of costs		Remarks	
Travel expenses	On-site work costs and travel expenses to the Test Site of the Verification Organization	Travel expenses	Fare	Travel by public transportations or by car. If using public transportations, a need for delivery costs of samples and the like may arise (e.g., package delivery costs).
			Express fare	
		Vehicle use, etc.	Vehicle use fees	
			Fuel costs	
			Highway tolls	
	Daily travel allowances			
	Hotel fees			

Note: The Verification Organization can include general administrative costs in the fee as necessary.

5. Change and cancellation of verification tests

(1) Addition of verification items by request of the environmental technology developer

When addition of verification items is requested by the environmental technology during the verification test, the Verification Organization shall assess whether it is an appropriate revision in light of the purport of the project, which is the objective verification by the third party, in consideration of the opinions of the Technology Panel, and may revise the Test Plan in consultation with the Verification Management Organization and the environmental technology developer.

If revision of the test fee arises due to the change, the Verification Organization shall determine a new amount of the test fee, which should be paid by the environmental technology developer in consultation with the Verification Management Organization and the environmental technology developer. Once the new fee is set, the Verification Management Organization shall promptly prepare paperwork for collecting the supplemental fee from the environmental technology developer.

(2) Cancellation (declining) of test by request of the environmental technology developer

When cancellation (declining) of the verification test is requested by the environmental technology developer during the course of the verification test, the Verification Organization shall report the request of cancellation to the Ministry of the Environment and the Verification Management Organization to obtain an approval, and cancel the test.

If revision of the test fee arises due to the change, the Verification Organization shall determine a new amount of the test fee which should be paid by the environmental technology developer in consultation with the Verification Management Organization and the environmental technology developer. () Once the new fee is set, the Verification Management Organization shall promptly prepare paperwork for the refund of the test fee to the environmental technology developer.

Note (): The environmental technology developer shall bear the portions of cost, which were required up to the point of cancellation. For the remaining portion of the paid-fee that was not used by the time of cancellation, the Verification Organization shall determine whether or not to refund and use it for the research of technological improvement, etc. in consultation with the Verification Management Organization and the environmental technology developer. The Verification Organization shall provide the environmental technology developer the portion of the test data which was obtained by the costs borne by the environmental technology developer.

(3) Addition of test items by judgment of the Verification organization

When the Verification Organization has judged that addition of test item(s) is necessary in light of the purport of the project, which is the objective verification by the third party, Note (*) the Verification Organization shall make a revision to the Test Plan in consultation with the Verification Management Organization and the environmental technology developer. Note (*2)

If the revision of the test fee arises due to the change, the Verification Organization shall determine a new amount of the test fee, which should be paid by the environmental technology developer in consultation with the Verification Management Organization and the environmental technology developer. Once the new fee is set, the Verification Management Organization shall promptly prepare paperwork for collecting supplemental fee from the environmental technology developer.

Note (*): The situations include the cases in which some secondary impact, which was not expected at the time of planning, has been observed, and therefore it is judged

that the verification item(s) should be added.

Note (*2): If an agreement was not reached with the environmental technology developer regarding the revision of the test, the Verification Organization shall obtain an agreement from the environmental technology developer regarding the entry of description to the Test Report stating that the portion of data for the items, which should be measured based on the judgment of the Verification Organization, has not been obtained.

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, 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> <ol style="list-style-type: none"> 1. Physical treatment 2. Chemical treatment (Use agents in a closed environment. Use agents in an open environment.) 3. Biological treatment (Use organisms or microbial preparations in a closed environment. Use in an open environment.) 4. Others
<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>
<p>Length of period required for set up</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: <div style="float: right; border-left: 1px solid black; border-right: 1px solid black; height: 40px; margin-left: 10px;"></div>
Additional equipment		No . Yes Describe in detail: <div style="float: right; border-left: 1px solid black; border-right: 1px solid black; height: 40px; margin-left: 10px;"></div>
Life of the target verification apparatus		

Environmental impact and electricity use and material consumption

Item	Unit	Measurement value, etc.
Amount of sludge and sludge-derived waste	kg/day	
Amount of generated waste	kg/day	
Possibility of generating noise and foul odor		
Electricity and other power use	kWh / day	
() Amount of chemicals/biological remediation	kg/day	
a g g e n t s u s e d () Give the chemical names in parentheses ())	kg/day	
	kg/day	
() Types and amounts of microbial preparations,	kg/day	
e t c .) Amount of other consumables ()	kg/day	
	kg/day	
() Give the consumable names in parentheses	kg/day	
) Amount of other consumables ()	kg/day	
	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 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 (yen)	Quantity	Total (yen)
Initial cost			
Civil work			
Construction			
Main unit			
Additional equipment			
()			
Running cost (per month)			
Cost of chemicals/agents			
Cost of biological remediation agents			
Other expendables			
Sludge disposal			
Waste disposal			
Electricity			
Maintenance			
1 m ³ yen/target water volume of			

3. Developmental status and past delivery record

Check the number that best describes the current situation.

1. The apparatus has already been commercialized and is available as a product.
2. 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 15.

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.

For technologies which have potential leaching of components from the filling material, etc., submit the results of the leaching test as an attached document at the time of filing an application.

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.]

<p>Verification test conditions</p> <ul style="list-style-type: none"> ○ Scale of the target verification apparatus ○ Design of the test area, methods of obtaining data from controls, etc.
<p>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:</p> <ul style="list-style-type: none"> ○ Frequency and method of sampling ○ Test and analysis methods ○ Target levels and the grounds for the levels
<p>Test period and timing (i.e., specific time period during which the applicant can be engaged in works as an environmental technology developer)</p>

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.
- Results of the leaching test for the components of filling materials, etc.

Appendix 2: Test Plan

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 or 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 or 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.)
- Sampling locations
- 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) Impact on water quality

- Verification items and target levels
- Sampling method, devices for sampling, sampling schedule (frequency), storage method, storage period

- Analytical methods and instruments, calibration methods, calibration schedule

(4) Impact on bottom sediment

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

(5) Impact on biology?

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

(6) Other environmental impacts

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

(7) Operations and maintenance of the apparatus

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

(8) Other survey items

- Verification items
- 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

<p>Flow sheet</p> <p style="text-align: center;">(Diagram)</p>	<p>Principle</p>
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2. Overview of the verification test

○ Overview of the Test Site

Site for treatment	Name/location		
	Water body type/water use situations		
	Scale	Area: Depth:	Volume: Average number of days of retention:
	Influent conditions		
	Other		
Site for control	Name/location		
	Water body type/water use situations		
	Scale	Area: Depth:	Volume: Average number of days of retention:
	Influent conditions		
	Other		

○ Specifications and capacity of the target verification apparatus

Classification	Item	Specifications and capacity
Facility overview	Name/type	
	Dimensions (mm), weight (kg)	
	Number of units installed and the location (i.e., underwater, water surface, outside of the water body)	
Design conditions	Affected items and the targets	

	Area (m ²), volume (m ³), target water volume	
	Operating hours	

○ The installation state of the target verification apparatus and sampling locations

(Attach a diagram.)

○ Verification test schedule

(Organize the actual schedule in a spreadsheet format (or calendar format).)

3. Results of the verification test

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

(The verification test results must be reported in two pages.)

○ Items regarding environmental impact

Item	Unit	Verification results
Amount of sludge/sludge-derived waste generated	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, etc. used		

○ 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	

○ Points to be aware of when considering applicability to other 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		No/Yes (Describe in detail:)			
Additional equipment		No/Yes (Describe in detail:)			
Life of the target verification apparatus					
Period of time required for startup					
Approximate cost The assumptions for the estimation (i.e., water volume of the target water body, operation hours, etc.) must be given here		Expense item		Unit cost (Yen)	Total (Yen)
		Initial cost			
		Civil work expenses			
		Construction work expenses			
		Main body equipment expenses			
		Ancillary equipment expenses			
		()			
		Running cost (per month)			
		Chemical/agent expenses			
		Biological remediation agent expenses			
		Expenses of other expendables			
		Sludge treatment expenses			
		Waste treatment expenses			
Electric power fees					
Maintenance expenses					
yen/target water volume of 1 m ³					

○ 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:
 - i 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.).
- iii 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

I. 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 Verification Management Organizations which prepare a protocol, solicit and select Verification Organizations, and set up and collect fees and with Verification Organizations that conduct verification tests.

4. Procedures of the project

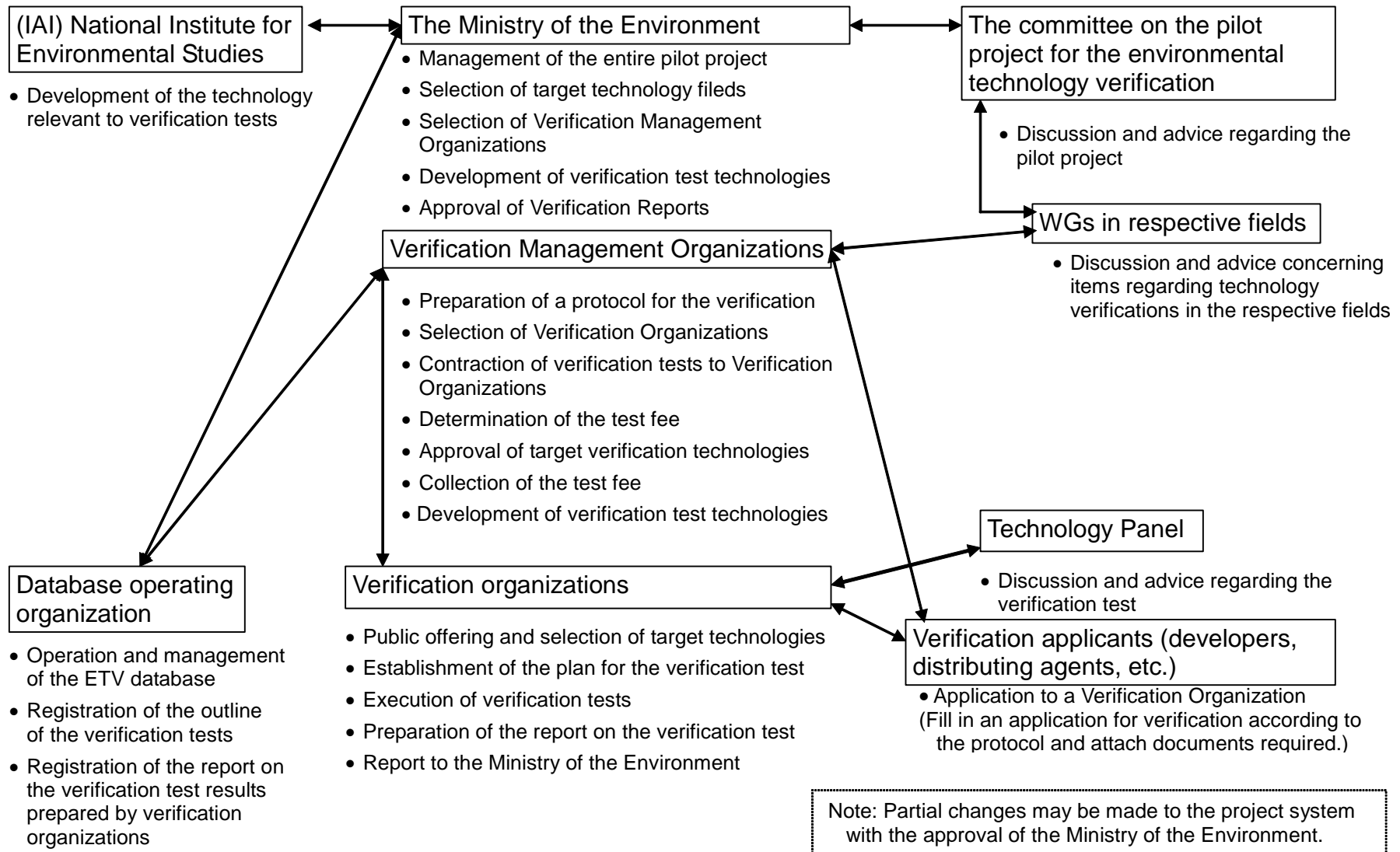
The pilot project for the environmental technology verification will generally be conducted in accordance with the following procedures:

- (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 shall select a "Verification Management Organization," which is in charge of the preparation of the Protocol, solicitation and selection of Verification Organizations, determination of the test fee items and collection of the fees.
- (4) The Verification Management Organizations will prepare a “protocol for the verification,” which establishes the specific methods of technology verification regarding the selected target verification technology fields.
- (5) The Verification Management Organizations will select the “Verification Organizations,” which are the independent organizations that conduct the verification

tests.

- (6) The Verification Organizations will invite applications from companies and the like for the technology to be verified.
- (7) The Verification Organization shall discuss and review the submitted technologies in its expert committee to select technologies that are the subject of verification.
- (8) The Verification Organizations will conduct verification tests on the selected technologies in accordance with the protocol for the verification.
- (9) The Verification Organization shall organize the test results into a report, which will be given to the Verification Management Organization and the Ministry of the Environment. In addition, the report will be registered in a database on the Internet and made available to the public.
- (10) The Ministry of the Environment will distribute logo marks to the verified technologies.

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

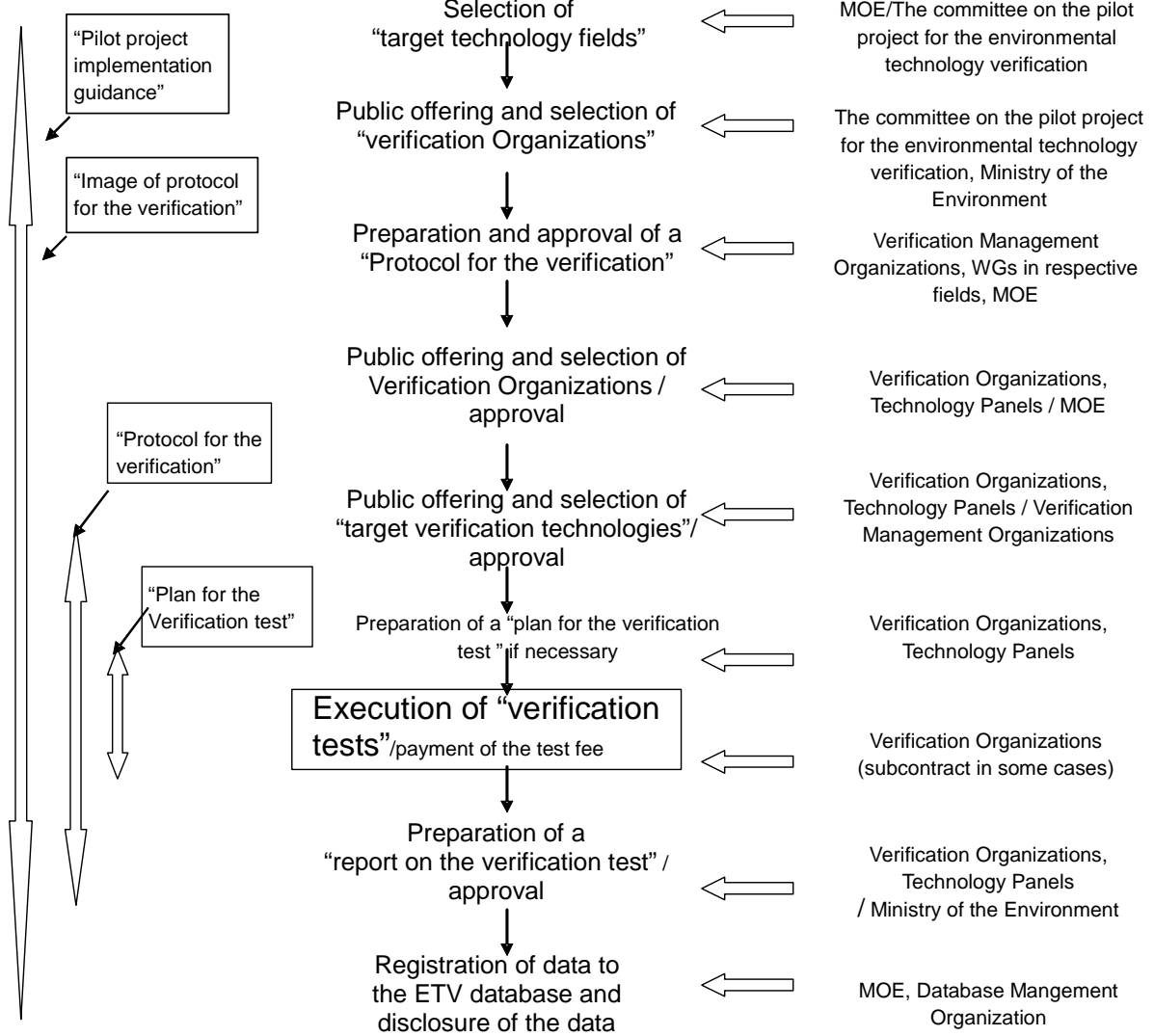


III. Flow of the pilot project for the environmental technology verification

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

Flow of the project

Responsible party



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 2006

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 2005, 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) Determination of fee items

(iii) Selection of Verification Organizations

(iv) Confirmation of Verification Reports

(v) 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 Mitsubishi UFJ Research and Consulting Co., 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 Management Division of the Ministry of the Environment.

(5) The members will be under commission for the period from the date of appointment by Mitsubishi UFJ Research and Consulting Co., 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 Mitsubishi UFJ Research and Consulting Co., Ltd., with the consent of the Water Environment Management Division of the Ministry of the Environment.

The committee on the pilot project for the environmental technology verification for 2006

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

Mitsumasa Okada	Executive Vice-president, 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 Mnakuchi	Water Environment Subsection Chief, Expert Member, Environmental Policy Division, Department of the Environment, Ehime Prefectural Government

< Secretariat (Ministry of the Environment) >

Tatsuya Mochiduki	Director, Water Environment Management Division, Environmental Management Bureau
Jun-ichiro Yamada	Deputy Director, Water Environment Management Division, Environmental Management Bureau
Katsumasa Suzuki	Deputy Director, Water Environment Management Division, Environmental Management Bureau

< Secretariat (Mitsubishi Research Institute, INC.) >

Takashi Uchino	Senior Staff Researcher, Resources and Recycling Research Group, Global Environment Research Division
Takeshi Matsuki	Staff Researcher, Regional Environment Research Group, Global Environment Research Division
Michiya Marui	Research Assistant, Resources and Recycling Research Group, Global Environment Research Division
Masakazu Moribe	Research Assistant, Resources and Recycling Research Group, Global Environment Research Division

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

(FY2005)

First meeting: 14:00 to 16:30. April 25, 2005

- Public offering of Verification Organizations
- Hearing from applicants for Verification Organizations
- Selection of Verification Organizations
- Protocol for the verification (draft)

Second meeting: 13:00 to 16:40. February 1, 2006

- Verification Report (draft)
- Revision of the protocol for the verification_

Third meeting: 10:00 to 14:00. March 23, 2006

- Verification Report (draft)
- Protocol for the verification

(FY2006)

First meeting: 10:30 to 12:30. July 6, 2006

- Selection of Verification Organizations (new)
- Verification status of the Verification Organizations (continued)
- Transfer to the fee collecting system
- Upcoming review schedule

Second meeting: 10:00 to 12:00. January 24, 2007

- Verification Report (draft)
- Concept of the fee collecting system
- Revision of the protocol for the verification_

Third meeting: 10:00 to 12:00. March 8, 2007

- Verification Report (draft)
- Concept of the fee collecting system
- Revision of the protocol for the verification_