Environmental Quality Monitoring Methodology Development Section

List of Monitoring Project in 1993

1-(3)-1	:	Study on environmental quality in Pathumthani Province.
1-(3)-2	:	The effects of salty soil problem on water quality in Moon River and Tributaries
1-(3)-3	:	Study on water pollution in Tapee and Pum-Duang Rivers, Suratthani Province
1-(3)-4	:	Study and develop on the monitoring methodology of contaminated lead from Battery factory by using biological samples.
1-(3)-5	:	Study and develop on the monitoring methodology of toxic chemical residue in coastal zone by using Green Mussel
1-(3)-6	:	Study and develop on the monitoring methodology of Arsenic residue at Park Pa-Nang by using biloical samples.
1-(3)-7	:	Study and develop on the monitoring methodology of pesticide residue at the agricultural area in watershed areas of the country
1-(3)-8	:	Measurement of SO_2 and NO_x by long term passive sampler at Lignite Power Plant in Lampang, Thailand
1-(3)-9	:	ASEAN Network on Environmental Monitoring (ASNEM)
1-(3)-10	:	Acid rain monitoring program in Thailand

1--(3)--1 : Monitoring in 1993

a. Theme : Study on environmental quality in Pathumthani Province

b. Description :

1) Study and survey on water pollution problem

2) Study and survey on air and noise pollution problem

c. Duration : October 1992 - September 1993

d. ERTC person (s) in charge :

Admin : 1) Ms. Pornthip Puncharoen, EQMMD
- Water quality

2) Mr. Kanok Suksomsank, EQMMD
- Air/noise quality

Technical : Water Quality
- Ms. Sirinapha Srithongtim, ESAMD
- Ms. Naraporn Sritragul, ESAMD
- Ms. Ruchaya Boonyatumanon, ESAMD
- Ms. Duangchan Settha, EQMMD
- Ms. Chidchanok Srivirat, EQMMD
- Ms. Panthip Mathong, EQMMD

: Air/noise quality
- Mr. Werathep Kiratitadaniyom
- Mr. Teerathep Piromchart
- Ms. Mullika Puranamara
- Mr. Suthaschai Boonyasitthipol
- Mr. Sathaporn Klomkaew
- Mr. Mongkol Khorwai
- Mr. Pornchai Patiwanarak

e. Name of JICA Expert (s) and his (their) participation in detail :

Mr. Ichiro Aoi and Mr. Kiyotsugu Shirai - Study and survey on noise pollution

Dr. Mamoru Sakata - Study and survey on air pollution

f. Equipment of be used :

Supplied by Thai Government :

- Water Sampler
- SCT meter
- DO meter

Supplied by Japanese Grant Aid :

See attached no. __(Rm. 323)

See attached no. __(Mobile Lab)

See attached no.___(Rm 120)

See attached no. __(Rm 125)

See attached no. __(Rm 127,217)

g. Expenditure :

300,000 Baht

h. Cooperation with other Department or other organization :

-Pathumthani Province

i. Outcome and further action :

1) To survey and analyse water quality in Chao Phraya river and Klongs within Pathumthani province totally 46 stations in December 1992, April 1993 and September 1993. The parameters to be analysed are DO, BOD, TOC, salinity, temperature, conductivity, heavy metals and pesticides.

2) To survey and measure air quality in Pathumthani Province totally 6 stations in December 1992, April 1993. The parameter to be measured are Carbonmonoxide, Ozone, Sulfur dioxide, Nitric oxide, Nitrogen dioxide, Methane, Non-methane hydrocarbon, Suspended particulate matter and lead.

3) To survey and measure noise level totally 120 stations. Each station for 10 minutes during day and night in April 1993

j. Evaluation :

It has been found that water pollution is the majority issue of environmental problem in Pathumthani Province. The causes of pollution mostly came from domestic and industrial wastes due to the rapid expansion of economic growth in Pathumthani Province.

1 —(3)— 2 : Monitoring in 1993

a. Theme : The effects of salty soil problem on water quality in Moon river and tributaries.

b. Description : 1) Study the dispersion of salinity in Moon river and tributaries

2) Study the effect of salty soil problem from salt-farming.

e. Duration : October 1992 - September 1993

d. ERTC person (s) in charge :

Admin. : 1) Ms. Pornthip Puncharoen, EQMMD

Technical : 2) Mr. Janewit Wongsanoon, EQMMD

3) Ms. Sirinapha Srithongtim, ESAMD

4) Mr. Anurak Chanthong EQMMD

5) Ms. Lumyai Chaiyo, EQMMD

6) Ms. Cheeranan Pantachak, ESAMD

e. Name of JICA Expert (s) and his (their) participation in detail :

none

f. Equipment to be used :

Supplied by Thai Government :

- Water sampler
- SCT meter
- DO meter
- fundamental parameter analysis equipments

Supplied by Japanese Grant Aid :

- see attached No.___ (Rm 203)

g. Expenditure :

300,000 Baht

h. Cooperation with other Department or other Organization :

- Pollution Control Department
- The Office of Environmental Policy and planning

i. Out-come and further action :

1) To survey and analyse water quality in Moon river and

tributaries totally 37 stations in December 1992, March 1993 and June 1993. The parameters to be analysed are DO, salinity, acidity, alkalinity, kardness, chloride, conductivity, pH, temperature.

2) To identify the effect and dispersion of salty soil from salt-farming to water quality in Moon river

j. Evaluation :

It has been found that the water quality in Moon virer at Amphoe Pimai, Nakorn-sritammarat Province was effected by the dispersion of salty-soil from the salt farming activity, especially in dry season.

1 —(3)— 3 : Monitoring in 1993

a. Theme : Study on water pollution problem in Tapee and Pum-Duang rivers, Suratthani Province.

b. Description : 1) Study the causes of water pollution problem in these two rivers.

2) Survey and analyse water quality in the rivers

c. Duration : October 1992-September 1993

d. ERTC person (s) in charge :

Admin : 1) Ms. Pornthip Puncharoen, EQMMD

Techmical : 2) Mr. Janewit Wongsanoon, EQMMD

3) Ms. Sirinapha Srithongtim, EQMMD

4) Mr. Anurak Chanthong, EQMMD

5) Ms. Cheeranan Pantachak, EQMMD

6) Ms. Lumyai Chaiyo, EQMMD

e. Name of JICA Expert (s) and his (their) participation in detail :

None

f. Equipment to be used :

Supplied by Thai Government :

- Water Sampler
- SCT meter

Supplied by Japanese Grant Aid :

- see attached no.____ (Rm. 203)

g. Expenditure :

300,000 Baht

h. Cooperation with other Department or other organization :

- Pollution Control Department
- The Office of Environmental Policy and Planning

i. Outcome and further action

1) To survey and analyse water quality in Tapee and Pum-duang rivers totally 15 stations in December 1992 and April 1993. The parameters to be analysed are DO, COD, pH, temperature, salinity, total solid, suspended solid, alkalinity, choride, conductivity, hardness, pH

2) To identify the effect of the water drainage from dam reservoir and distillery plant to water quality in Tapee and Pum-duang rivers

j. Evaluation :

In 1988, the water quality in Tapee and Pumduang rivers were deteriorated and the large amount of fishes were died because of dissolved oxygen depletion. It had been found that the problem was occured mainly by wastewater drainage from dam reservoir and distillery plant without proper control. The results from this study has been shown that the existing condition of water quality in these two river has tendency to be improved and suitable for aquatic life. Anyway, the monitoring should be done at least 2 times per year and the wastewater drainage from dam reservoir and distillery plant must be controlled to prevent shock load to aquatic surviving.

1 —(3)— 4 : Monitoring in 1993

a. Theme : Studied and developed on the methodology of contaminated lead monitoring from Battery factory by using biological samples

b. Description :

Studied and sampling the biological sample, water, sediment, hair from the sampling point around and in the factory to analyse for lead contamination.

c. Duration : sept 1992-sept 1993

d. ERTC person (s) in charge :

Admi : Ms. Sukanya Boonchalermkit
Mr. Janewit Wongsanoon
Ms. Naraporn Sritrakul

Technical : Mr. Anurak Janthong

e. Name of JICA Expert (s) and his (their) participation in detail :

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f. Equipment to be used :

Supplied by Thai Government : water sampler, grab sampler

Supplied by Japanese Grant Aid : See attached No.____(Rm. 217)

Supplied by JICA Technical Cooperation :

g. Expenditure :

200,000 Baht

h. Cooperation with other Department or other organization :

- Industial Works Department

i. Outcome and further action :

1. Water sample (20) sediment (20), hair (119)
2. Questionnaire 119 sets
3. Sampling point 37 points

j. Evaluation :

- The analysis of samples are on-going

1 —(3)— 5 : Monitoring in 1993

a. Theme : Studied and developed on the methodology of toxic chemical residue monitoring at coastal zone by using Green mussel.

b. Description :

To monitor and sampling the Green mussel at the coastal zone to analyse for toxic chemical residue.

c. Duration : sept 1992-sept 1993

d. ERTC person (s) in charge :

Admi : Ms. Sukanya Boonchalermkit
Mr. Janewit Wongsanoon

Technical : Ms. Thipammorn Nuhdaroon
Ms. Naraporn Sritrakul
Mrs Daisy Morknoy
Ms. Ruchaya Boonyatumanond
Ms. Chuanpit Boonyoy

e. Name of JICA Expert (s) and his (their) participation in detail :

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f. Equipment to be used :

Supplied by Thai Government : Grap sampler, water sampler

Supplied by Japanese Grant Aid : See attached NO.____(Rm. 217)
NO.____(Rm. 120)

Supplied by JICA Technical Cooperation :

g. Expenditure :

300,000 Baht

h. Cooperation with other Department or other organization :

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i. Outcome and further action :

1. Sample : Sediment (12) Green mussel (12)
2. parameter : Heavy metal, PCBs
3. Sampling areas : 12 provinces

j. Evaluation :

- The analysis of samples are on-going

1 —(3)— 6 : Monitoring in 1993

a. Theme : Studied and developed on the methodology for Arsenic residue monitoring at Park Pa-Nang by using biological samples

b. Description :

Studied and monitoring Arsenic residue in Park Pa-Nang Bay by sampling water, sediment, fish, shrimp and plankton.

c. Duration : sept 1992-sept 1993

d. ERTC person (s) in charge :

Admi : Ms. Sukanya Boonchalermkit
Mr. Janewit Wongsanoon

Technical : Ms. Lamyai Chaiyo
Ms. Naraporn Sritrakul
Mrs. Daisy Morknoy

e. Name of JICA Expert (s) and his (their) participation in detail :

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f. Equipment to be used :

Supplied by Thai Government : Grab sampler, water sampler, planktonet

Supplied by Japanese Grant Aid : See attached NO.___(Rm. 217)

Supplied by JICA Technical Cooperation : -

g. Expenditure :

300,000 Baht

h. Cooperation with other Department or other organization :

-

i. Outcome and further action :

1. Sampling point - 10 points
2. Parameter - Arsenic
3. Sample - Sediment, water, Plankton, Shrimp

j. Evaluation :

- The analysis of samples are on-going

1 —(3)— 7 : Monitoring in 1993

a. Theme : Studied and developed on the methodology of pesticide residue monitoring at the agricultasel area in watershed areas of the country

b. Description :

sampling and analyse pesticide residues in agricultural products

c. Duration : sept 1992-sept 1993

d. ERTC person (s) in charge :

Admi : Ms. Sukanya Boonchalermkit
Mr. Janewit Wongsanoon
Ms. Ruchaya Boonyatumanond

Technical : Mr. Panomporn Wongparn

e. Name of JICA Expert (s) and his (their) participation in detail

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f. Equipment to be used :

Supplied by Thai Government : Grab sampler

Supplied by Japanese Grant Aid : See attached NO. ____(Rm. 120)

Supplied by JICA Technical Cooperation : -

g. Expenditure :

300,000 Baht

h. Cooperation with other Department or other organization :

-

i. Outcome and further action :

1. Sampling areas : 11 provinces
2. Parameters : PCB, OCP
3. Samples : Agricultural product (such as fruit, vegetable 250 samples)
sediment (30 samples)

j. Evaluation :

- The analysis of samples are on-going

1-(3)-8 : Monitoring in 1993

a. Theme : Measurement of SO_2 and NO_x by Long Term Passive Sampler at Lignite Power Plant in Lampang, Thailand.

b. Description : In Lampang, 2025 MW. Electric Power Plant is operating by burning of 3% w/w sulfer contain lignite coal. Both SO_2 and NO_x, gaseous pollutants, are emitted to the atmosphere and caused some effect to people and plants nereby. ERTC and JICA experts are conducted a research program to monitor levels of SO_2 and NO_x in the ambient by using long term passive sampler. Ten sampling locations around lignite mine was selected in order to study distribution pattern of SO_2 and NO_x from the source.

e. Duration : March, 1993 to Febuary, 1994

d. ERTC person(s) in charge :

Almin : 1. Ms. Pornthip Puncharoen
2. Mr. Kanog Suksomsankh
3. Mr. Weerathep Kiratitadaniyom
4. Ms. Mullika Puranamara

Technical : 1. Mr. Mongkol Khorwai
2. Mr. Pornchai Phatiwanarak

e. Name of JICA experts and their participation in detail :

1. Mr. Hirano (Yokohama Environmental Research Institute)
2. Dr. Mamoru Sakata, JICA long term expert

f. Equipment to be used :

Supplied by Thai Government : none

Supplied by Japanese Grant Aid : none

Supplied by JICA Techuical Cooperation : 1. Ion Chromatograph.
2. Passive samplers.

g. Expenditure : for survey and sampling (120,000 Baht)

h. Cooperation with other organization :

1. Pollution Control Department.
2. Office of the Environmental Policy and Planing
3. Electricity Generating Authority of Thailand (EGAT)

i. Outcome and further action :

1. To have the cooperation between ERTC and other agencies concerned.

2. To develop the long term passive sampler to be suitable for Thailand's climate condition.

3. To practice of monitoring and analysis method by using of long term passive sampler.

4. To consider new monitoring technique of SO_2 and NO_x to concerned agencies in Thailand and other countries.

5. To report situation of air pollution problem in Lampang and other effective areas in Thailand (for SO_2 and NO_x).

j. Evaluation : The long term passive samplers can measure SO_2 and NO_x concentration in the ambient air. This showed that some reseach work can be used long term passive sampler for SO_2 and NO_x measurement instead of expensive SO_2 and NO_x analyzer.

1-(3)-9 : Monitoring in 1993

a. Theme : ASEAN Network on Environmental Monitoring (ASNEM)

b. DEscription : At the discussions of Japan-ASEAN Environmental Experts Metting (JAEEM) in Tokyo, September 1990, agreed that the Government of Japan should be convened to consider the issues of technical details of ASNEM. As the discussion progressed, the Government of Thailand by ERTC, Department of Environmental Quality Promotion, Ministry of Science, Technology and Environment, is conducted environmental monitoring network throughout the ASEAN member countries and monitoring of ambient air quality will be the first activity of the ASNEM.

c. Duration : Year 1992-1996

d. ERTC person(s) in charge :

Admin : 1. Ms. Monthip S. Tabucanon
2. Ms. Pornthip Puncharoen
3. Mr. Kanog Suksomsankh
4. Mr. Weerathep Kiratitadaniyom
5. Ms. Mullika Puranamara

e. Name of JICA Expert(s) :

1. Dr. Mamoru Sakata (former expert)
2. New expert. (Coming on April, 1994)

j. Equipment to be used :

Supplied by thai Goverement : none

Supplied by Japanese Grant Aid : Ambient air monitoring station (Room 323)
: Two set of moving station (See attached documents no.

g. Expenditure : will be funding by JICA.

h. Cooperation with other Department or arganization :

1. Concerned organization in Thailand
1.1 Pollution Control Dept.,
1.2 Office of the Environmental Policy and Planing
1.3 EGAT
1.4 Health Dept.

1.5 Bangkok Metropolitan Administration

1.6 others

2. Concerned agencies from ASEAN member countries.

i. Outcome and further action :

1. To have cooperative program between ASEAN members countries in term of technology transfer and information exchange.

2. To operate monitoring network program on water pollution, solid waste, toxic substauces as further steps

j. Evatlation : ERTC and JICA conduct a workshop of ASNEM since March, 1991. After that workshop, ERTC's staff and JICA expert visited agencies concerned in each countries, and each member countries was agreed to join this project.

1-(3)-10 : Monitoring in 1993

a. Theme : Acid Rain Monitoring program in Thailand

b. Description : Acid Rain is one of a important environmental issues. During the last two decades, thailand was rapidly change in economics and population. Large amout of fuel are burned for supporting industrial and transportation section. Emission of air pollutants from fuel burning caused air quality changed in many area, and caused acid rain problem at the same time. This need to be conducted a monitoring program of acid rain to obsurve problems status in Thailand.

c. Duration : 1993-1997 (Fiscal year)

d. ERTC Person(s) in charge :

Admin : 1. Ms. Pornthip Puncharoen
2. Mr. Kanog Suksomsankh
3. Ms. Mullika Puranamara

Technical : 1. Mr. Sathaporn Klomkaew
2. Mr. Mongkol Khorwai
3. Mr. Pornchai Phatiwanarak

e. Name of JICA Expert(s) : - (waiting for new long term expert)

f. Equipment to be used :

Supplied by Thai Government : Autometic Rain Sampler (4 sets)

Supplied by Japanese Grant Aid : Automatic Rain Analyzer (1 set) (KIMOTO).

Supplied by JICA Tedhuical Cooperation : Automatic Rain Analyzer (1 set) (DKK).

g. Expenditure : Survey and Sampling by Thai side.

h. Cooperation with other Dept.

1. Pollution Control Dept.
2. Office of Environmental Policy and Planing
3. Dept. of Health
4. Meteorological Dept.
5. Other

i. Outcome and fuether action :

1. To know situation of acid rain problem in Thailand.

2. To have cooperative program between concerned agencies.

3. To have technology transfor from JICA expert.

4. To be used as basic information on Acidic Deposition in ASEAN Countries project.

j. Evaluation : ERTC will get automatic rain samplers within 6 months and will locate in 3 region of Thailand. This workplan will be vary important for mitigation plan.

List of Monitoring Projects in 1994

2-(3)-1 : Research and development of water quality monitoring methodology

2-(3)-2 : Pesticide monitoring programme in the Mekong Basin, Thailand.

2-(3)-3 : Study and develop on the monitoring methodology of Arsenic residue at Park Pa-Nang by using biological samples.

2-(3)-4 : Study and develop on the monitoring methodology of pesticide residue at the agricultural areas in watershed areas of the country

2-(3)-5 : Study and develop on the monitoring methodology of toxic chemical residue at coastal zone by using Green Mussel.

2-(3)-6 : Study and develop on the monitoring methodology of industrial toxic chemical by using biological sample.

2-(3)-7 : Measurement of SO_2 and NO_x by long term passive sampler at Lignite Power plant in Lampang, Thailand.

2-(3)-8 : ASEAN Network on Environmental Monitoring (ASNEM)

2-(3)-9 : Acid rain monitoring in Thailand

2-(3)-10 : Environmental noise from industrial activities

2—(3)— 1 : Monitoring in 1994

A a. Theme :

Research and Development of Water Quality Monitoring Methodology

b. Description :

Water quality monitoring is one of the most important elements of water quality management and control. The information and data obtained from the survey and monitoring programs will indicate characteristics and severity of pollution problems including their impacts on the surrounding environment. The information can then be used as a guideline for setting up control and abatement plan, management strategies and implementation in order to maintain or improve water quality in any water resources to meet a satisfied level for beneficial uses.

According to the ERTC's role for conducting research and development in the matter of environmental quality monitoring to be used for the national planning in environmental quality management. The study on water quality monitoring will be conducted in order to develop the monitoring technique which are suitable to the need of water quality monitoring in each area. The uniform monitoring techniques will be transfered to local government agencies in local areas and encourage their efficiency in conducting water quality monitoring

The objectives of the project are as follows :

1) To study on surface water quality monitoring
   - Chao Phraya river
   - Songkhla lake
2) To study on coastal water quality monitoring
   - Industrial area in Eastern Sea Board.

c. Duration :

1 October 1993 - 30 September 1995

d. ERTC person (s) in charge

Admin : 1) Ms. Pornthip Puncharoen, EQMMD+

Technical : 2) Ms. Sirinapha Srithongtim, ESAMD++

3) Ms. Fairda Malem, EQMMD

4) Ms. Pantip Mathong, EQMMD

5) Mr. Anurak Chanthong, EQMMD

6) Mr. Natdanai Tuanmina, EQMMD

7) Ms. Pornthip Promnimit, EQMMD

8) New recruitment staff in December 1994, EQMMD

e. Equipment to be used :

Supplied by Thai Government :

- Grab Sampler
- Water sampler
- DO meter
- SCT meter
- pH meter
- Core sampler

Supplied by Japanese Grant Aid :

- See attached no.____ (Rm. 203)
- See attached no.____ (Rm. 120)
- See attached no.____ (Rm. 217)

f. Expenditure

2,500,000 Baht

g. Cooporation with other Department or other organization :

- the Office of Environmental Policy and Planning
- Pollution Control Department

B. Expected JICA's contribution

Experts in water quality monitoring technique in the area of coastal water

Note * Environmental Quality Monitoring and Methodology Development Section

** Environmental Sample Analysis and Methodology Development Section

2—(3)—2 : Monitoring in 1994

A a. Theme :

Pesticide Monitoring programme in the Mekong Basin, Thailand

b. Description :

1) To monitor the regional trends of pesticides in fishes and water in environment by collecting and analysing the samples twice per year in 10 stations in Mekong river and tributaries.

2) To evaluate the possible impact of toxic substances on different species of fish in various location

3) To predict possible effects of pesticide contaminated water and fish to the public health

4) To establish a system to provide early recognition of water problems arising from current and future development activities

c. Duration : December 1993-November 1994

d. ERTC person (s) in charge

Admin : 1) Ms. Monthip Sriratana Tabucanon

2) Ms. Pornthip Puncharocn, EQMMD

Technical : 3) Ms. Ruchaya Boonyatumanon, ESAMD

4) Mr. Janewit Wongsanoon, EQMMD

5) Mr. Anurak Chanthong, EQMMD

e. Equipment to be used :

Supplied by Thai Government

- Gas Chromatography and accessories (Donated by Interim Committee for Co-ordination Investigations of the Lower Mekong Basin)

f. Expenditure :

- 3000 us.$ for sample analysis excluding chemical and accessories. The other expenses will be in-kind by Thai Government.

g. Cooperation with other department or other organization :

- Department of Enery Affairs, Ministry of Sciences, Technology and Environment.

- Interim Committee for Co-ordination Investigations of the Lower Mekong Basin.

2—(3)— 3 : Monitoring in 1994

A

a. Theme : Studied and developed on the methodology of arsenic residue monitoring at Park Pa-Nang by using biological samples

b. Description :

1. Justification

Due to the problem of arsenic residue in Ron-phibul district. Nakorn-srithamarat province which has been occurred by mining tin around this area. After the process of separating tin, lot of arsenopyrite minerals have been contaminated in the environment especially in surface and underground water. Those Arsenopyrite minerals are the big source of arsenic which can be affected to people who drink these contamination water. The most serious case of this problem is epidermistal cancer

From the report of National epidermic committee (1992) be found that the arsenic residue has been distributed from Park pa-nang river into the Park pa-nang bay which is the most important area for aquatic organism culture such as fish, shrimp etc, Even now the residual concentration was found lower than standard. Anyway, it can be accumulated and become to be the serious problem soon.

Thus, to know the real situation of this problem in Park pa-nang bay and to develop the method for monitoring, Environmental Reseach and Training Center (ERTC) has set up a project: Studied and developed on the methodology of arsenic residue monitoring at Park-pa-nang by using biological sample such as plankton and other small aquatic organisms, because those small organisms are the beginning phase of the food chain system. If those are accumulated by arsenic it means that the higher phase of organisms (such as fish, cow, cat., dog, human being etc) must be got the arsenic residue too. Even they don't eat or drink foods and water from those area (Ron-phibul district and Park pa-nang bay).The environmental quality standard division, Office of the National Environment Board found that most people can get arsenic into their bodies by eating sea-foods. Besides this, the arsenic inorganic compounds which are found in aquatic organisms can be transformed (biotransform) into the complicated arsenic organic compound, such as arsenobetaine,

arsenocholine, arseniumpholipids, So beyond to monitoring the situation of arsenic residue in water, soil and sediment, biological samples (such as plankton, shrimp etc) should be more concentrated.

2. Purpose

1. To understand the real situation of arsenic residue in biological samples such as plankton and other aquatic organisms

2. To develop the method for arsenic residual monitoring by using biological samples.

3. To develop the method for collecting biological samples

4. To compare the concentration of arsenic residues which were found between biological samples and others such as water, soil, sediment

5. To consider the possibility of using biological samples to indicate the environmental quality in the studied area

3. Target

To develop the method for arsenic residual monitoring technique by using biological samples (such as plankton, shrimp etc) in order to strengthen the environmental monitoring activities,

4. Type of project

To conduct the survey and identify the concentration of arsenic residues in biological samples around Park pa-nang bay by compiling existing collect different kinds of environmental arsenic for identifying the arsenic residual concentration.

5. Studied Area and period of Project

Around the Park pa-nang bay, Nakorn-srithumarat Province

c. Duration : September 1992 - September 1996

d. ERTC person (s) in charge :

Admi : 1. Ms. Sukanya Bunchalermkit

2. Mr. Janewit Wongsanoon

Technical : Ms. Lamyai Chaiyo

e. Equipment to be used :

Supplied by Thai Government : Grab sampler, Water sampler, Plankton net, pH meter, SCT-meter

Supplied by Japanese Grant Aid : See attached No. ___(Rm. 120)

See attached No. ___ (Rm. 217)

Supplied by JICA Technical Cooperation : -

f. Expenditure :

300,000 Baht

g. Cooperation with other Department or other organization :

Prince's Songklanakarin University

B. Expected JICA's contribution

1. Request for short term or long term experts in the field of toxicology and biostatistic

2. PC Computer Model 80486DX2-66 Hard disk < 200 MB+printer 1 set

3. Plankton net 5 sets

4. Handy type pH meter 2 sets

5. Handy type salinity meter 2 sets

a a. Theme : Studied and developed on the methodology of pesticide residue monitoring at the agricultaral areas in watershed areas of the country

b. Description :

1 Justification

Due to the use of pesticides in Thailand is being widespread in all part of country especially in the agriculture. This is the most important factor to make the pesticide residues in the environment. Those toxic chemical will be remained on foods, agricultural prducts. including human being and environments. The level of residual concentrations in each kind of samples have been found differently and now the trend is increasing to be higher than the standards, which can be affected to human's health and the quality of environment

So, Environmental Research and Training Center, has considered and concentrated about problems from pesticide which become more seriouly and will be affected to the economic of country in future, has set up a project "Studied and developed on the methodology of pesticide residue monitoring at the areas of river's source and agricultural areas of the country" in order to develop the method of pesticide residue monitoring, such as the method for collecting environmental and biological samples. etc.

2. purpose

1. To know the real situation of pesticide residue at the source of rivers and agricultural areas around the country

2. To develop the method for collecting environmental and biological samples in order to strengten pesticide residue monitoring efficiency and accuracy

3. To publish the new metholology of pesticide residue monitoring which has been developed to the related agency

3. Target

To develop the method for collecting environmental and biological samples in order to strengten pesticide residue monitoring effeciency and accuracy

4. Type of project

Study and survey the situation of pesticide residues in the environment and agricultural product at the areas of river's source and agricultural areas around the country by collecting background information which have been found in those areas including collecting samples to analyse the pesticide residues. Form all of these data which can be used for setting the environmental plan and also can be used for developing the method of pesticide residue monitoring in the future

5. Studied areas

Around the areas of river's source and agricultural areas in all part of country

c. Duration : September 1992 to September 1997

d. ERTC person (s) in charge

Admi : 1. Ms. Sukanya Boonchalermkit

2. Mr. Janewit wongsanoon

Tech : Mr. Panomporn Wongparn

e. Equipment to be used

Supplied by Thai Gooernment : Grab sampler, watersampler pH meter

Supplied by Japanese Grant Aid: See attached NO. ___(Rm. 120)

Supplied By JICA Technical Cooperation :-

f. Expenditure : 300,000 Baht/year

g. Cooperation with other Department or other organization :-

B. Expected JICA's constribution :

To request expert in assisting the monitoring plan.

2—(3)— 5 : Monitoring in 1994

A a Theme : Studied and developed on the methodology of toxic chemical residue monitoring at coastal zone by using Green mussel

b Deseiption :

1. Justification

Due to recently the use of toxic chemicals has increased more and more every year, but lack of effective measurement to manage whole system of toxic chemicals such as import, using, destroying those toxic waste. So many-kind of toxic chemical residues has been contaminatld widely through the environment. Green mussel is a kind of aquatic aminal which is a popular food also affected by those chemical residue. On the other hand, Green mussel is also a suitable sample which can be used for studying and monitoring the accumulation of toxic chemicals around coastal zone of country, because it is stock-still animal

Environmental Research and Training Center has set up a project "Studied and developed on the methodology of toxic chemical residues monitoring at coastal zone by using Green mussel in order to know the real situation of toxic chemical residues in Green mussel. for the safty of consumer in the country and also for export this product (Green mussel) to another country

2. Purpose

1. To study the real situation (kind and concentration) of toxic chemical residues in Green mussel and in environment.

2. To study the sources which discharge toxic chemicals to environment around coastal areas

3. To develop the method for collecting Green mussel, water and sediment

3. Target

To Know the situation of toxic chemical residues in Green mussel and in the environment around the coastal zone of country and to develop the method for collecting samples. in this area. in order to strengten environmental monitoring efficiency

d. Studied area

Eastern and Western coasts in the sountern part of Thailand including the upper coasts such as Rayong, Chonburi etc

c Duration : September 1992-Sept. 1997

d ERTC person (s) in charge :

Admi : 1. Ms. Sukanya Boonchalermkit

2. Mr. Janewit Wongsanoon

Tech : Ms. Thipammorn Nuhdarun

e Equipment to be used :

Supplied by Thai Government : Grab sampler, Water sampler, pH meter, SCT meter

Supplied by Japanese Grant Aid : See attached No.___(Room 217, 120)

Supplied by JICA Technical Cooperation :-

f Expenditure : 300,000 Baht/year

g Cooperation with other Department or other organizatian :-

B. Expected JICA's contribution

Budget for operating the training course/seminar 2 time/year

2 —(3)— 6 : Monitoring in 1994

A

a Theme : Studied and developed on the methodology of industrial toxic chemical monitoring by using biological sample

b Descraiption :

1. Justification

Many kind of factories are established along the main rivers's bank of Thailand, in every part of country, such as Chao phraya and Tha chin rivers in the central part, Tha pee and Pumdaung rivers in the southern part, Mun and Chi river in the north-eastern part etc. Those factories must affected to the quality of environment in that area such as air and noise pollution, water pollution, the most important problem in that most factories discharge some toxic chemical or waste into the river which can be affected to aquatic organism and also caused many serious problem to human being who live close to these factories

Thus, to know the situation of this problem and to develop the method for monitoring industrial toxic chemical residues. Environmental Reseaech and Training Center has set up a project "Studied and developed on the methodology of industrial toxic chemical monitoring by using biological sample, such as fish, small shrimp, mollusk etc.

2. Purpose

1. To study the real situation of toxic chemical from related factories which stand close to the Mun and Chi rivers in the north-eastern part

2. To study and monitor the toxic chemicals which are discharged into the river by feeding aquatic organism along the river's bank

3. To study and monitor the situation of toxic chemical residues in the water and sediment

4. To compare the analystical data between biological samples and the others such as water, soil and sediment

5. To consider the possibility of using biological sample to indicate the situation of toxicity in the river which affected by toxic chemical residues from factories

3. Target

To develop the method for industrial toxic chemicals monitoring by using aquatic organism to be a indicator

4. Studied area

Mun and Chi river's bank which factories are estabished close there

c Duration : Sept 1993-Sept 1998

d ERTC person (s) in charge :

Admi 1. Ms Sukanya Boonchalermkit

2. Mr. Janewit Wongsanoon

Tech 1. Mr. Anurak Janthong

e equipment to be used :

Supplied by Thai Government : floating basket for keeping fish in river,

Supplied by Japanese Grant Aid :

Supplied by JICA Technical Coopera See attached No. ___(Rm. 217)

See attached No. ___(Rm. 120)

f Expenditure :

300,000 Baht

g Cooperation with other Department or other organization :-

B. Expected JICA's contribution

Request for short term expert in the field of industrial toxic chemical monitoring

2-(3)-7 : Monitoring in 1994

a. Theme : Measurement of SO_2 and NO_x by Long Term Passive Sampler at Lignite Power Plant in Lampang, Thailand.

b. Description : In Lampang, 2025 MW. Electric Power Plant is operating by burning of 3% w/w sulfer contain lignite coal. Both SO_2 and NO_x, gaseous pollutants, are emitted to the atmosphere and caused some effect to people and plants nereby. ERTC and JICA experts are conducted a research program to monitor levels of SO_2 and NO_x in the ambient by using long term passive sampler. Ten sampling locations around lignite mine was selected in order to study distribution pattern of SO_2 and NO_x from the source.

e. Duration : March, 1993 to Febuary, 1994

d. ERTC person(s) in charge :

Almin : 1. Ms. Pornthip Puncharoen
2. Mr. Kanog Suksomsankh
3. Mr. Weerathep Kiratitadaniyom
4. Ms. Mullika Puranamara

Technical : 1. Mr. Mongkol Khorwai
2. Mr. Pornchai Phatiwanarak

e. Name of JICA experts and their participation in detail :

1. Mr. Hirano (Yokohama Environmental Rescarch Institute)
2. Dr. Mamoru Sakata, JICA long term expert

f. Equipment to be used :

Supplied by Thai Government : none

Supplied by Japanese Grant Aid : none

Supplied by JICA Techuical Cooperation : 1. Ion Chromatograph.
2. Passive samplers.

g. Expenditure : for survey and sampling (120,000 Baht.)

h. Cooperation with other organization :

1. Pollution Control Department
2. Office of the Environmental Policy and Planing
3. Electricity Generating Authority of Thailand (EGAT)

B. Expected JICA's Contribution :

1. Provide 1 set of Ion Chromatograph and recommended spare parts.

2. Provide 2 sets of Automatic Injector for 2 Ion Chromatograph.
3. Technical transfer from JICA expert.

2-(3)-8 : Monitoring in 1994

a. Theme : ASEAN Network on Environmental Monitoring (ASNEM)

b. Description : At the discussions of Japan-ASEAN Environmental Experts Metting (JAEEM) in Tokyo, September 1990, agreed that the Government of Japan should be convened to consider the issues of technical details of ASNEM. As the discussion progressed, the Government of Thailand by ERTC, Department of Environmental Quality Promotion, Ministry of Science, Technology and Environment, is conducted environmental monitoring network throughout the ASEAN member countries and monitoring of ambient air quality will be the first activity of the ASNEM.

c. Duration : Year 1992-1996

d. ERTC person(s) in charge :

Admin : 1. Ms. Monthip S. Tabucanon
2. Ms. Pornthip Puncharoen
3. Mr. Kanog Suksomsankh
4. Mr. Weerathep Kiratitadaniyom
5. Ms. Mullika Puranamara

e. Name of JICA Expert(s) :

1. Dr. Mamoru Sakata (former expert)
2. New expert. (Coming on April, 1994)

j. Equipment to be used :

Supplied by thai Goverement : none

Supplied by Japanese Grant Aid : Ambient air monitoring station (Room 323)
: Two set of moving station (See attached documents no.

g. Expenditure : will be funding by JICA.

h. Cooperation with other Department or arganization :

1. Concerned organization in Thailand
1.1 Pollution Control Dept.
1.2 Office of the Environmental Policy and Planing
1.3 EGAT
1.4 Health Dept.

1.5 Bangkok Metropolitan Administration

1.6 others

2. Concerned agencies from ASEAN member countries.

B. Expected JICA's Contribution

- Lecturer from Japan for training course.
- Budget for training course.

2-(3)-9 : Monitoring in 1994

a. Theme : Acid Rain Monitoring program in Thailand

b. Description : Acid Rain is one of a important environmental issues. During the last two decades, thailand was rapidly change in economics and population. Large amout of fuel are burned for supporting industial and transportation section. Emission of air pollutants from fuel burning caused air quality changed in many area, and caused acid rain problem at the same time. This need to be conducted a monitoring program of acid rain to obsurve problems status in Thailand.

c. Duration : 1993-1997 (Fiscal year)

d. ERTC Person(s) in charge :

Admin : 1. Ms. Pornthip Puncharoen
2. Mr. Kanog Suksomsankh
3. Ms. Mullika Puranamara

Technical : 1. Mr. Sathaporn Klomkaew
2. Mr. Mongkol Khorwai
3. Mr. Pornchai Phatiwanarak

e. Name of JICA Expert(s) : - (waiting for new long term expert)

f. Equipment to be used :

Supplied by Thai Government : Autometic Rain Sampler (4 sets)

Supplied by Japanese Grant Aid : Automatic Rain Analyzer (1 set) (KIMOTO).

Supplied by JICA Tedhuical Cooperation : Automatic Rain Analyzer (1 set) (DKK).

g. Expenditure : Survey and Sampling by Thai side.

h. Cooperation with other Dept.

1. Pollution Control Dept.
2. Office of Environmental Policy and Planing
3. Dept. of Health
4. Meteorological Dept.
5. Other

B. Expected JICA's contribution

1. 2 set of Automatic Rain Sampler.

2. 5 set of pH meter and 5 set of Electro-conductivity meter.

3. Technique transfor form JICA expert.

2-(3)-10 : Monitoring 1994

a. Theme : Environmental Noise from Industrial Activities.

b. Description : Noise problem from industrial sector seem to be serious during passed decade. Due to rapid economic growth in many province of Thailand, new industrialized area are now increasing up in many region such as Mabtapud and Lheam-Chabong industrial estate in eastern seaboard. By the development of industrial section, it caused noise pollution and noise anoyance to the residents.

c. Duration : 1994

d. ERTC person(s) in charge

Admin : Ms. Pornthip Puncharoen

Mr. Kanog Suksomsankh

Mr. Weerathep Kiratitadaniyom

Mr. Mullika Puranamara

e. Equipment to be used :

Supplied by Thai Government : none

Supplied by Japanese Grant Aid : Saond Level Meters

Supplied by JICA Technical Cooperation : none

f. Expenditure : from Thai side around 30,000 Baht.

g. Cooperation with other Department :

1. Dept. of Industrial Works
2. Pollution Control Dept.
3. Office of Environmental Policy and Planing

B. Expected JICA's contribution :

- Advisory from Mr. Shirai
- Measurement, and evaluation from Mr. Shirai

Environmental Technology and Research Development Section

Form - 1

1—(1)—1 : Research in 1993

a. Theme :

The Study on Prediction Model of Road Traffic Noise Level

b. Name of Researchers :

Ms. Phaka S. (Research Section)

Mr. Kanog S. (Monitoring Section)

c. Name of JICA Experts and their participation :

Mr. I. AOI (- Jun. 1993)

Mr. K. SHIRAI (Jun. 1993 -)

d. Duration :

1992 - 1994

e. Objectives :

Road traffic noise has become a big social problem in Thailand. There is the "Scheme of Environmental Impact Assessment (EIA)" in Thailand, but there is no suitable prediction system for implementing this scheme. Therefore, a prediction system is considered to be necessarry for solving the noise pollution problem in Thailand.

This basic model for prediction has been developed by Mr. AOI. But this present model needs upgrading to include much more measuring data. So far it has been used only for surface roads. Because elevated roads are being constructed and planned rapidly in Bangkok, we must develop or improve a usable model for elevated roads.

f. Outcomes :

In 1992, we got the data of power level from running vehicle and noise level from flat roads, and developed this basic prediction model. In 1993, we got the data of noise level from very wide roads. In 1994, we will get the data of noise level of other kinds of roads, and complete this model.

After this model is improved, it will become possible to implement the Scheme of Environmental Impact Assessment.

g. Research Procedure :

Plan of improvment of this model

1. Study on noise measurement technology and noise prediction methodology

This study is carried out in 1993

2. Collection data of noise level and traffic of other kinds of roads, such as elevated roads and very wide roads

This collection of data is being partically carried out in 1993.

3. Data analysis, model improvement, and programing for using computer

This will be carried out in 1994.

4. Conclusion and report writing

This will be carried out in 1994.

h. Expenditure :

20,000 Baht (Research Section)

50,000 Baht (Monitoring Section)

i. Equipment used :

Supplied by Thai Government :

Supplied by Japanese Grant Aid :

Sound Level Meter, Level Recorder, Tripod,

Supplied by JICA Technical Cooperation :

j. Evaluation :

The basic model for prediction has been developed by the former expert.

More counterperts who are mainly engaged in this research will be designated from November 1993.

The model will be continued testing and expected to be completed by September 1994.

Note : Since ERTC budget is limited in 1992, the budget related to research on noise has been transfered for the training purpose.

2-(2)- : Research in 1994

A.

a. Theme :

The Study on Prediction Model of Road Traffic Noise Level

b. Name of Researchers :

Ms. Phaka S. (Research Section)

Mr. (Research Section)

c. Duration :

1992 - 1994

d. Objectives :

See another paper

(Research in 1993, e. Objectives)

e. Research Procedure :

See an attached paper

("Work Plan on 1994")

f. Expenditure :

180,000 Baht (Research Section)

g. Equipment to be used :

Supplied by Thai Goverment :

Supplied by Japanese Grant Aid :

Sound Level Meter, Level Recorder, Traipod,

Supplied by JICA Technical Cooperation :

B. Expected JICA's contribution

To transfer knowledge and technics which are based on much experience in Japan by a dispatched long term expert.

C. JICA Team's comments on above "B"

We need the counterparts who are majored in Noise pollution research.

LIST OF COUNTERPARTS AT ERTC

Name: Ms.Phaka Sukasem Nickname: Bay

Sex: Male Female Date of birth: 10 July 1955

Address: 67/383, Jangwatana Rd., Don-muang, Bkk, Thailand
Tel: -

Educational Background: Bachelor Master Doctor Others

Univ. of Bachelor: Chiangmai University
Faculty of Univ.: Faculty of Science
Subject of Special Study: Chemistry

Univ. of Master: Mahidol University
Faculty of Univ.: Faculty of Public Health
Subject of Special Study: Environmental Health

Work Experience: 15 Years
Service at ERTC: 2 Years Position: Section Chief

Experienced Works at ERTC

Study Work:
1) Study on Prediction Model of Road Traffic Noise Level
2) Study on Environmental Contaminants on Aquatic Organisms
3) Study on Solid Waste Treatment by using Composter unit

Section: Admin. Tech.Trans. Monit. Research Anal. Infor.

Works at Present

Study Work:
1) Study on Prediction Model of Road Traffic Noise Level
2) Study on Environmental Contaminants on Aquatic Organisms

Have you ever been trained in Japan? Yes No

Subject of Training: Asbestos and Heavy Metals analysis

Period: Institute of Hygenic, Kyoto University and Ehime University
Post Held:

JICA Experts in Charge

Name of Experts: 1) Mr. K. Shirai 2) Mr. M. Mizobuchi 3) Dr. K. Kadokami
Subjects of Technical Transfer: 1) Study on Prediction Model of Road Traffic Noise Level
2) Study on Environmental Contaminants on Aquatic Organisms
3) Study on Solid Waste Treatment by using Composter Units

Form - 1

1 —(1)— 2 : Research in 1993

a. Theme :

Study on Development of Wastewater Treatment for Shrimp - Farming Wastewater

b. Name of Researcher(s) :

Mr.Piya Sansanayuth

Mr.Sunthorn NgdNgam

Miss Variga Sawaittayotin

c. Name of JICA Expert (s) and his (their) participation :

Dr.Yoshio Matsui, Wastewater treatment advisor (long term 1991-1992)

Mr.Munehiko Mizobuchi, Water analysis advisor (long term 1993-1994)

Mr.Masami Matsui, Wastewater treatment advisor (short term)

d. Duration :

October 1991 - September 1993

e. Objectives :

The objective of the research is to develop wastewater treatment system for shrimp farming operation. The research attempts to develop the system that can be implemented by shrimp farmers. The system will be studied based on environmental technology and engineering principles as well as social and economic aspects.

f. Outcome :

The rescarch is expected to introduce a wastewater treatment system which can be implemented by shrimp farmers

g. Research Procedure :

1. Laboratory experiments

Laboratory experiments can be devided into 6 items as follows.

- Analysis of water and wastewater qualities
- Coagulation experiment
- Experiment on nitrification process
- Experiment on nutrient removal by algae
- Experiment on nutrient removal by biomass
- Experiment on screening halobacteria from biomass

2. Field experiment

A wastewater treatment model is set up at the selected area. Treatment efficiencies of the model will be examined.

3. Study on implementation of the treatment model

According to the study on implementation of the treatment model mentioned in procedure no 2, there are some weak points of the model as follows;

- Coagulation treatment needs high technology operation and instruments such as chemical feeder and mixing equipment. Therefore, it seems not to be suitable for practical use
- It was found that the volume of wastewater is really huge, and moreover, the treatment concept of using oyster shells as media needs the wastewater to circulate in the system for a period of time. Therefore, it is difficult to modify the model for practical use.

It was found that every shrimp-farming areas have wastewater pathways along shrimp farms. It would be useful if these pathways are improved to act as treatment system. Therefore, wetland treatment is studied as follows:

- Study on treatment efficiencies of soil, sand, and gravel by column test.
- Study on treatment efficiencies of wetland and fish by using mini model.

h. Expenditure :

253,098 baht

i. Equipment used :

Supplied by Thai Government :

1. Salinity meter
2. Refrigerator

Supplied by Japanese Grant Aid : -

1. HITACHI U-1100 Spectrophotometer
2. Refrigerator
3. Autoclave
4. Centrifuge
5. Incubator
6. Ice maker
7. Water bath
8. Hot plate
9. Fume hood
10. Ultrasonic cleaner
11. TOC analyzer
12. Blender
13. Ultrasonic pepette cleaner
14. Convention oven
15. Electric muffle furnaces
16. Electric drying oven

Supplied by JICA Technical Cooperation :

1. Roller pumps
2. pH meter
3. HACH DR/2000 Spectrophotometer
4. Shaker
5. DO meter

j. Evaluation :

The research was planned to be completed in September 1993. However, it took much more time than expected to find an appropriate method for wastewater treatment. It has been found that wetland treatment seem to be an appropriate method. Therefore, the period of the research is extended for one more year in order to study in more details for the wetland treatment.

Form - 4

2-(1) : Research in 1994

A. Theme :

Study on Development of wastewater Treatment for Shrimp-Farming Wastewater

b. Name of Researcher(s) :

Mr. Piya Sansanayuth

Miss Ammaraporn Phadungcheep

Miss Variga Sawaittayotin

c. Duration :

October 1993 - September 1994

d. Objectives :

The objective of the research is to develop wastewater treatment system for shrimp farming operation. The research attempts to develop the system that can be implemented by shrimp farmers. The system will be studied based on environmental technology and engineering principles as well as social and economic aspects.

e. Research Procedure :

1. Study on optimum retention time for the wetland model.
2. Study on efficiency of the wetland model after increasing the amount of food extract in wastewater.
3. Study on efficiency of the model at different water depths in the wetland model.
4. Study on how to treat hydrogen sulfide in the effluent.
5. Study on efficency of the model by using actual wastewater.
6. Set the model at shrimp-farming area.
7. Report preparation.

Parameter analyzed : BOD, COD, SS, TN, TP, NH_3-N, NO_3-N, NO_2-N, TOC, H_2S, pH, Salinity

Number of samples : 500 samples

f. Expenditure :

350,000 baht

g. Equipment used :

Supplied by Thai Government :

1. Salinity meter
2. Refrigerator

Supplied by Japanese Grant Aid : -

1. HITACHI U-1100 Spectrophotometer
2. Refrigerator
3. Autoclave
4. Centrifuge
5. Incubator
6. Ice maker
7. Water bath
8. Hot plate
9. Fume hood
10. Ultrasonic cleaner
11. TOC analyzer
12. Blender
13. Ultrasonic pepette cleaner
14. Convention oven
15. Electric muffle furnaces
16. Electric drying oven

Supplied by JICA Technical Cooperation :

1. Roller pumps
2. pH meter
3. HACH DR/2000 Spectrophotometer
4. Shaker
5. DO meter

B. Expected JICA's contribution :

- An expert having experience related to wastewater treatment from shrimp farming
- Technology transfer emphasizing research on wastewater treatment.

C. JICA Team's comments on above "B"

LIST OF COUNTERPARTS AT ERTC

Name: Piya Sansanayuth Nickname: -

Sex: (Male) Female Date of birth: March 20,1963

Address: 20 Soi soda, Suknothai Rd., Dusit, Bangkok
Tel: -

Educational Background: Bachelor (Master) Doctor Others

Univ. of Bachelor: Kasetsart Universety
Faculty of Univ.: Engineering
Subject of Special Study: Civil

Univ. of Master: Univ of Southwestern Louisiana
Faculty of Univ.: Engineering
Subject of Special Study: Civil (Public Works)

Work Experience: - Years
Service at ERTC: 1 Years Position: Researcher

Experienced Works at ERTC

Routine Work: -
Study Work: Researching on wastewater treatment
Others: -

Section: Admin. Tech.Trans. Monit. (Research) Anal. Infor.

Works at Present

Routine Work: -
Study Work: Researching on wastewater treatment.
Others: -

Have you ever been trained in Japan? Yes (No)

Subject of Training: -

Period: -
Post Held: -

JICA Experts in Charge

Name of Experts: Mr.Munehiko Mizobuchi
Subjects of Technical Transfer: Water Analysis

Form - 1

1—(1)—3 : Research in 1993

a. Theme : Study on solid waste treatment by using composter unit

b. Name of Researcher (S) :

: 1. Ms. Phaka Sukasem

2. Mr.Utein Sermsri

C.Name of JICA Expert (S) and his (their) participation :

Dr. Hiroshi Murata - Advisor

Dr. Kiwao Kadokami - Advisor

d.Duration :

Oct. 1992 - Sept 1993

e.Objective :

To study the appropriate technique for solid waste treatment or reducing.

f.Outcome :

Application of composter unit to the solid waste from restaurant or small food industrial.

g.Research Procedure :

1. The Japanese household composter unit was applied in Thai condition with gaboge from ERTC canteen.
2. Volume, weight and temperature were measured everyday (except Sat.and Sun)

h.Expenditure :

i.Equipment used :

Supplied by Thai Government : None

Supplied by Japanese Grant Aid : Plat form scale, Moisture balance

Supplied by JICA Technical Cooperation : Composter Units, Thermometer

j.Evaluation :

Within 6 months, gabage can reduce 78% . Measured temperature are in the range 50-58°c. The condition of decomposition is anaerobic. It should improve the condition to aerobic that will make the decompose faster.

Note : 1) The waste treatment by using composter unit will be continued by adding dry bacteria.

2) Since ERTC budget is limited in 1992, the budget related to research on solid waste treatment has been transfered for the training purpose.

2-(1) : Research in 1994

A. Theme :

Study on Development of wastewater Treatment for Shrimp-Farming Wastewater

b. Name of Researcher(s) :

Mr. Piya Sansanayuth

Miss Ammaraporn Phadungcheep

Miss Variga Sawaittayotin

c. Duration :

October 1993 - September 1994

d. Objectives :

The objective of the research is to develop wastewater treatment system for shrimp farming operation. The research attempts to develop the system that can be implemented by shrimp farmers. The system will be studied based on environmental technology and engineering principles as well as social and economic aspects.

e. Research Procedure :

1. Study on optimum retention time for the wetland model.
2. Study on efficiency of the wetland model after increasing the amount of food extract in wastewater.
3. Study on efficiency of the model at different water depths in the wetland model.
4. Study on how to treat hydrogen sulfide in the effluent.
5. Study on efficency of the model by using actual wastewater.
6. Set the model at shrimp-farming area.
7. Report preparation.

f. Expenditure :

350,000 baht.

g. Equipment used :

Supplied by Thai Government :

1. Salinity meter
2. Refrigerator

Supplied by Japanese Grant Aid : -

1. HITACHI U-1100 Spectrophotometer
2. Refrigerator
3. Autoclave
4. Centrifuge
5. Incubator
6. Ice maker
7. Water bath
8. Hot plate
9. Fume hood
10. Ultrasonic cleaner
11. TOC analyzer
12. Blender
13. Ultrasonic pepette cleaner
14. Convention oven
15. Electric muffle furnaces
16. Electric drying oven

Supplied by JICA Technical Cooperation :

1. Roller pumps
2. pH meter
3. HACH DR/2000 Spectrophotometer
4. Shaker
5. DO meter

B. Expected JICA's contribution :

- An expert having experience related to wastewater treatment from shrimp farming
- Technology transfer emphasizing research on wastewater treatment.

C. JICA Team's comments on above "B"

LIST OF COUNTERPARTS AT ERTC

Name: Ms.Phaka Sukasem Nickname: Bay

Sex: Male Female Date of birth: 10 July 1955

Address: 67/383, Jangwatana Rd., Don-muang, Bkk, Thailand
Tel: -

Educational Background: Bachelor Master Doctor Others

Univ. of Bachelor: Chiangmai University
Faculty of Univ.: Faculty of Science
Subject of Special Study: Chemistry

Univ. of Master: Mahidol University
Faculty of Univ.: Faculty of Public Health
Subject of Special Study: Environmental Health

Work Experience: 15 Years
Service at ERTC: 2 Years Position: Section Chief

Experienced Works at ERTC

Study Work:
1) Study on Prediction Model of Road Traffic Noise Level
2) Study on Environmental Contaminants on Aquatic Organisms
3) Study on Solid Waste Treatment by using Composter unit

Section: Admin. Tech.Trans. Monit. Research Anal. Infor.

Works at Present

Study Work:
1) Study on Prediction Model of Road Traffic Noise Level
2) Study on Environmental Contaminants on Aquatic Organisms

Have you ever been trained in Japan? Yes No

Subject of Training: Asbestos and Heavy Metals analysis

Period: Institute of Hygenic, Kyoto University and Ehime University
Post Held:

JICA Experts in Charge

Name of Experts: 1) Mr. K. Shirai 2) Mr. M. Mizobuchi 3) Dr. K. Kadokami
Subjects of Technical Transfer: 1) Study on Prediction Model of Road Traffic Noise Lev
2) Study on Environmental Contaminants on Aquatic Organisms
3) Study on Solid Waste Treatment by using Composter Units

Form - 1

1—(1)— 4 : Research in 1993

a. Teme : Study on water quality classification by saprobity index

b. Name of Researcher(s) :

1. Ms.Juthatip Yooyen
2. Ms.Savaros Nivetbovornchai
3. Mr.Ammaraporn Phadungcheep

c. Name of JICA Expert(s) and his (their) participation :

-None-

d. Duration :

October 1991 - September 1993

e. Objectives :

The objective of the research is to categorize the quality of some important water resources in Thailand in terms of Biological Indicator by using aquatic insects.

f. Outcome :

The research is expected to classify water quality of some watershed (Ping, Wang, Yom, Nan, Moon, Chi, and Surat) by biotic index. The result of this research can be applied for environmental management around the water basin as well as environmental education for the children.

g. Research Procedure :

The procedure can be devided into 5 items as follows :

1. Collecting the aquatic insrect on respect of quality.
2. Taxonomy
3. Drawing and Photograph
4. Calculation of the index
5. Report and presentation

h. Expenditure :

286,445 Baht

i. Equipment used :

Supplied by Thai Government : Stereo microscope, Fluorescence lamp. and its accessory.

Supplied by Japanese Grant Aid :

1. Light Microscope
2. Electron microscope
3. Light Microscope with camera
4. Refrigerater

Supplied by JICA Technical Cooperation : -none-

j. Evaluation :

This research was planned to completed within 3 years. Two years of collection the insect had been done. However, the sample is still in need for further step of calculation the biotic index. The samples were taken from the watershed of Ping, Wang, Yom, Nan, Chi, Moon, and Surat. The first four watersheds are finished and the last two watersheds still under taking.

Form - 4

2-(1)- : Research in 1994

A.

a. Theme : Study on water classification by saprobity index

b. Name of Researcher(s) :

1. Ms. Juthatip Yooyen
2. Ms. Arunnee
3. Mr. Surasak

c. Duration : October 1993- September 1994

d. Objectives :

The objective of the research is to categorize the quality of some important water resources in Thailand in terms of Biological Indicator by using aquatic insects.

e. Research Procedure :

The procedure can be devided into 5 items as follows :

1. Collecting the aquatic insrect on respect of quality.
2. Taxonomy
3. Drawing and Photograph
4. Calculation of the index
5. Report and presentation

f. Expenditure : 300,000 Baht

g. Equipment to be used :

Supplied by Thai Government : Sterco microscope, Fluorescence lamp and its accenary

Supplied by Japanese Grant Aid :

1. light microscope
2. Electron microscope
3. light microscope with camera
4. DO. measuerement
5. pH. measurement
6. current meter
7. Incubator (low)
8. Refrigerator

B. Expected JICA's contribution :

To dispatch expert who can be the advisor of this research.

C. JICA Team's comments on above "B"

LIST OF COUNTERPARTS AT ERTC

Name: Ms. Juthatip Yooyen Nickname: Tim

Sex: Male ✓Female Date of birth: 10.12.04

Address: 31 Moo 6 Petkasaem Rd. Pasicharaen Bangkok 10160 Tel: 467 5594

Educational Background: Bachelor ✓Master Doctor Others

Univ. of Bachelor: Kasetsart University
Faculty of Univ.: Forestry Faculty
Subject of Special Study: Biological-Chemistry

Univ. of Master: KHON-KAEN
Faculty of Univ.: Science
Subject of Special Study: Environmental Science (Aquatic Microbiology)

Work Experience: 11 Years
Service at ERTC: 3 Years Position: Environmental Scientist

Experienced Works at ERTC

Routine Work: Research, set up Siminar and conference
Study Work: Research,
Others:

Section: Admin. Tech.Trans. Monit. ✓Research Anal. Infor.

Works at Present

Routine Work: Research
Study Work:
Others:

Have you ever been trained in Japan? ✓Yes No

Subject of Training:

Water Pollution

Period: 4 months.
Post Held: NIES. Tsukuba

JICA Experts in Charge

Name of Experts: Dr. Yutaka Yoshiyasu.
Subjects of Technical Transfer: Biological Indicator

Form - 1

1 —(1)— 5 : Research in 1993

a.Theme : Toxicity of Environmental Contaminants on Aquatic Organisms

Sub-title 2 : Determination of heavy metals accumulated in freshwater fish (1993-1994)

b.Name of Researcher (S) :

: 1. Ms. Phaka Sukasem Scientist
2. Ms.Jonggol Sreechai "
3. Mr.Utein Sermsri "

C.Name of JICA Expert (S) and his (their) participation :

Mr. Munehiko Mizobuchi : Advisor

d.Duration : Thai fiscal year 1993-1994

e.Objective : 1) To understand the heavy metals accumulated in freshwater fish, water and sediments
2) To evaluate the quality of water resources in the study area

f.Outcome : 1) To understand the pollution level of water resources in study area.
2) The studied data will be useful in establishing standard of maximum residue levels of heavy metals in water resources.

g.Research Procedure

1. Review literature and planning
2. Sample collection (fish, water, sediment)
3. Sample analysis
4. Data interpretation
5. Reporting

h.Expenditure : In 1993 339,535 Baht

i.Equipment used :

Supplied by Thai Government : Graphite Furnace AAS (Perkin-Elmer), Autopipette

Supplied by Japanese Grant Aid : Flame AAS (Perkin-Elmer),Hot plate, Refrigerator, Deep freezer storage room, Fume hood, Freeze dryer,

Supplied by JICA Technical Cooperation : plasma asher.

j.Evaluation : The study on sample analysis is on-going.
Water 32 samples (finished digestion)
Sediment 32 samples (not yet)
Fish 120 samples (80% finished digestion)
(fish sample are devided into three parts; muscle, liver and remainding)
Elements; Zn, Mn, Fe, Pb, Cu, Cr, Cd, Hg

2-(1) : Research in 1994

A.

a. Theme : Toxicity of Environmental Contaminants on Aquatic Organisms

Sub-title 2 : Determination of heavy metals accumulated in freshwater fish (1993 - 1994)

Sub-title 3 : Study on Bio-magnification of heavy metal through aquatic food-chain (1994-1996)

b. Name of Researcher (S) :

1. Ms.Phaka Sukasem Scientist
2. Ms.Jonggol Sreechai "
3. Mr.Utein Sermsri "

c. Duration : 1994-1996

d. Objective :

⊛ To study the accumulation of heavy metals through aquatic food-chain and to develop a mathematical model

e. Research Procedure :

1. Review literature and planning
2. Select study area and plan to collect sample
3. Sample collection
4. Sample analysis
5. Data interpretation
6. Develop a mathematical model
7. Report

f. Expenditure : In 1994 220,000 Baht

g. Equipment to be used :

Supplied by Thai Government : Graphite Furnace AAS (Perkin-Elmer), Autopipette

Supplied by Japanese Grant Aid : Flame AAS (Perkin-Elmer),Hot plate, Refrigerator, Deep freezer storage room, Fume hood, Freeze dryer,

Supplied by JICA Technical Cooperation : plasma asher.

B. Expected JICA's contribution :

To dispatch expert who can help in research planning and mathematical model developing.

C. JICA Team's comments on above "B"

LIST OF COUNTERPARTS AT ERTC

Name: Ms.Phaka Sukasem Nickname: Bay

Sex: Male Female Date of birth: 10 July 1955

Address: 67/383, Jangwatana Rd., Don-muang, Bkk, Thailand
Tel: -

Educational Background: Bachelor Master Doctor Others

Univ. of Bachelor: Chiangmai University
Faculty of Univ.: Faculty of Science
Subject of Special Study: Chemistry

Univ. of Master: Mahidol University
Faculty of Univ.: Faculty of Public Health
Subject of Special Study: Environmental Health

Work Experience: 15 Years
Service at ERTC: 2 Years Position: Section Chief

Experienced Works at ERTC

Study Work:
1) Study on Prediction Model of Road Traffic Noise Level
2) Study on Environmental Contaminants on Aquatic Organisms
3) Study on Solid Waste Treatment by using Composter unit

Section: Admin. Tech.Trans. Monit. Research Anal. Infor.

Works at Present

Study Work:
1) Study on Prediction Model of Road Traffic Noise Level
2) Study on Environmental Contaminants on Aquatic Organisms

Have you ever been trained in Japan? Yes No

Subject of Training: Asbestos and Heavy Metals analysis

Period: Institute of Hygenic, Kyoto University and Ehime University
Post Held:

JICA Experts in Charge

Name of Experts: 1) Mr. K. Shirai 2) Mr. M. Mizobuchi 3) Dr. K. Kadokami
Subjects of Technical Transfer: 1) Study on Prediction Model of Road Traffic Noise Lev
2) Study on Environmental Contaminants on Aquatic Organisms
3) Study on Solid Waste Treatment by using Composter Units

i.Equipment used :

Supplied by Thai Government : shimadzu. GC-14 A, micro-syringe, cryofocussing system, vacuum pump, rechargable battery, capillary column (CBP-1 non polar.),diwar bottle, Heated gas sampler shimadzu HGS-2, Sample loop, Nitrogen gas (UHP) cylinder, Hydrogen gas (UHP) cylinder, Flush sampler shimadzu FLS-1.

Supplied by Japanese Grant Aid : Air compressor, Transformer, HC/CO meter, stainless steel packed column refrigerator, deep freezer storage room, ultrasonic cleaner, digital thermometer, thermal anemometer, stop watch.

Supplied by JICA Technical Cooperation : shimadzu. GC-14 A, vacuum box, Tedlar bag, Liquid nitrogen container, gas tight syringe, squalane stainless steel, capillary column, tape heater, gas sampler.

j.Evaluation :

Using this analytical system, we can count for more than 200 peaks from gasoline sample. We believe that this is one of the most excellent separation ability for the study of HCs composition.

Form - 1

1—(1)— 6 : Research in 1993

a.Theme : Determination of Hydrocarbon Composition in 4-stroke gasoline engine exhaust gas.

b.Name of Researcher (s) :

Ms.Hathairatana GARIVAIT

Ms.Wanna LAOWAKUL

Mr.Sunthorn NGODNGAM

c.Name of JICA Experts (s) and his (thier) participation :

DR. MAMURU SAKATA

d.Duration :

Oct. 1991 - Sept. 1993

e.Objectives :

1.To describe the methodology, the validation and the application of the method to measuring individual hydrocarbon in gasoline engine exhaust gas

2.To study the detailed composition of hydrocarbon in automobile exhaust gas

f.Outcome :

1.The analytical technique for determination of precise hydrocarbon compositions in automobile exhaust gas for Thailand

2.Useful data for environmental control concerning automobile emission

g.Research Procedure :

1.Literature review

2.Planning

3.Install the analytical system

4.Conditioning GC, prepare for analysis

5.Preliminary Study

h.Expenditure :

326,157.- Baht

LIST OF COUNTERPARTS AT ERTC

Name: Ms.Hathaikatana GARIVAIT Nickname: MOUE (ムー)

Sex: Male (Female) Date of birth: July 10, 1961.

Address: 956/5 Soi Wat Khae Samsen Nakornchaisri Rd, Bangkok 10300
Tel: 241-4352

Educational Background: Bachelor Master Doctor Others

Univ. of Bachelor: University of PARIS 7
Faculty of Univ.: Faculty of Science
Subject of Special Study: Physical Chemistry

Univ. of Master: University of PARIS 7
Faculty of Univ.: Faculty of Science
Subject of Special Study: Physical Chemistry

Work Experience: 4 Years For water and wastewater Laboratory/Technolc
Service at ERTC: 2 Years Position: Environmental Scientist

Experienced Works at ERTC

Routine Work:
Study Work: Determination of Hydrocarbon Composition in 4-stroke gasoline engine
Others: exhaust gas.

Section: Admin. Tech.Trans. Monit. Research Anal. Infor.

Works at Present

Routine Work:
Study Work: Determination of hydrocarbon Composition in 4-stroke gasoline engine
Others: exhaust gas

Have you ever been trained in Japan? (Yes) No

Subject of Training: Elemental Analysis of Aerosols.

Period: 4 months
Post Held: NIES, Tsukuba and NETI, TOKOROZAWA

JICA Experts in Charge

Name of Experts: Dr. Mamuru SAKATA
Subjects of Technical Transfer: AIR POLLUTION

Environmental Sample Analysis and Methodology Development Section

1-(1)-1 Research in 1993

a. Theme : Development of analytical method of PCBs in air, water and soil samples

b. Name of researchers:
Ms. Rychaya Boonyatumanond, Ms. Wanna Laovakul

c. Name of JICA Expert and his participation :
Dr. Seiji Watanabe
Technical advice on the whole work

d.. Duration : October 1992 to September 1993

e. Objectives:
To develop congener-specific PCB quantification method by using Kanechlor products as secondary standard.
To survey distribution of PCBs in air, water, soil and organisms in Thailand.
To discuss about behavior of PCBs under the tropical meteorological conditions.

f. Outcome :
86 PCB peaks of an equivalent mixture of Kanechlor 300, 400, 500 and 600 separated by an SE-54 capillary column were identified and their contents were calculated. This mixture can be used as secondary standard.
Residue levels of PCBs around a storage of used capacitors and transformers were found to be heavily contaminated with PCBs.
Flux of PCBs volatilization from the ground contaminated with PCBs was estimated to be greater than that of washing out due to rainfall. Constant of PCBs volatilization was expected to be faster than those under temperate meteorological conditions.

g. Procedure :
To obtain contents of PCB peaks of equivalent mixture of Kanechlor 300, 400, 500 and 600, this mixture was submitted to GC/MS (SIM) analysis.
Each PCB peak was identified according to comparison with published PCB congeners pattern and data on RRIs of congeners.
Distribution of PCBs was elucidated on the basis of analyses of air, water, soil and sediment collected around an storage of used capacitors and transformers.

By the retrospective analysis of obtained data, the flux of PCBs was estimated for each pathway between the compartments..

h. Expenditure :

i. Equipment to be used :
Supplied by Thai Government : GC/ECD
Supplied by Japanese Grant Aid : GC/MS, ether distillation unit, GC/ECD, anemometer, low volume air sampler, rotary evaporator, aging oven, ice maker, solvent distillation unit, water bath
Supplied by JICA Technical Cooperation : core sampler, solvent distillation unit, soxlet extractor,

j. Evaluation :
This study was valuable for understanding the behavior of semi-volatile pollutants in tropical environment.
C/Ps might acquire the sampling and analytical techniques on PCBs in various environmental media.
However, knowledge on interpretation, reporting results are not enough so that, further training is necessary.
This study may assist the formulation of policy on the management of hazardous chemicals.

1-(1)-2 : Research in 1993

a. Theme : Study and development of organophosphorous pesticides analytical methods in water sample and biological sample

b. Name of Researcher : Sirinapha Srithongtim, Cheeranan Pantachak

c. Name of JICA Experts and their participation :
Norio Ohashi (short term expert), Seiji Watanabe, Kiwao Kadokami (short term expert)

d. Duration : October 1992 to September 1993

e. Objectives :
To acquire the analytical methods of organophosphorous pesticides residued in water and agricultural crops.
To utelize acquired methods for ERTC training course.
To survey organophosphorous pesticide contamination in agricultural crops.

f. Outcome :
C/P gave lecture on analytical methods of organophosphorous pesticides in the training course.
About 500 agricultural crop samples were submitted to organophosphorous pesticides analysis.

g. Procedure :
An analytical method recommended by JICA expert was examined with respect to recovery and cleanup efficiency.

h. Expenditure :

i. Equipment to be used :
Supplied by Thai Government :
Supplied by Japanese Grant Aid : GC/MS, GC/FPD, disperser (homogenizer)
Supplied by JICA Technical Cooperation : solvent distillation unit

j. Evaluation :
Analytical method was acquired by C/P. However, analyses of agricultural crop samples have not completed. Therefore, the analyses should be continued.

1-(1)-3 : Research in 1993

a. Theme : Laboratory Quality Assurance

b. Name of Researchers : Ms. Orasai Intarapanich, Ms.Somjai Simachaya and other members of "Committee on Laboratory Quality Assurance"

c. Name of JICA Experts and his participation : Yoshiyasu Ambe (short term expert), Seiji Watanabe
Gave lecture on Laboratory Quality Assurance.
Advice various matters concerned laboratory quality assurance

d. Duration : January 1993 to September 1993

e. Objectives :
To grasp the situation of analytical jobs of ERTC
To improve the reliability of analytical data produced in ERTC

f. Outcome :
Conceptual idea on laboratory quality assurance has disseminated among committee members.

g. Procedure :
Study about technique applied to laboratory quality control trough lecture by JICA expert and discussion within members of the committee.

h. Expenditure :

i. Equipment to be used :
Supplied by Thai Government :
Supplied by Japanese Grant Aid : BAAS
Supplied by JICA Technical Cooperation : certified environment standard material

j. Evaluation : C/Ps have just understood the importance and necessity of laboratory quality assurance. This theme have to be continued.
Problems in quality assurance of analysis in ERTC could not be revealed clearly through this activities. Therefore, it is needed to find out the problems which each analytist has faced.

2-(1)- 1 : Research in 1994

A.
a.Theme : Development of simple micro-extraction method for the analyses of water sample

b. Name of researcher : Ms. Ruchaya Boonyatumanond

c. Duration : From October 1993 to January 1994

d. Objectives :
To simplify the analytical methods of river water samples in order to save necessary labors to analyze river water samples and so that to increase frequency of observation, widen the covering area of monitoring and improve reproducibility of analysis.

e. Research Procedure :
Micro-extraction method and Sep-pak cleanup are examined with respect to recovery and efficiency.

f. Expenditure :
solvent
Sep-pak
Certified Pesticide standard; available

g. Equipment to be used :
Supplied by Thai Government : GC/ECD
Supplied by Japanese Grant Aid : Magnetic stir, rotary evaparator
Supplied by JICA Technical Cooperation : Solvent distillation unit

B. Expected JICA's contribution :
Technical suggestion on verifying analytical method

C. JICA Team's comments on the above "b".
JICA expert can train C/P. The planed subject is important for minimizing the labor efforts.

2-(1)-2 : Research in 1994

A.
a. Theme : Development of analytical methods on carbamate pesticides residued in various emvironmental samples

b. Name of researcher : Ms. Ruchaya Boonyatumanond

c. Duration : February 1994 to September 1994

d. Objectives :
To acquire the analytical method of carbamate pesticides developed by Tonogawa for analyses of canal water sample.
To calculate the detection limit of this method.
To elucidate the status of carbamate pesticide contamination of canal.

e. Procedure :
1. carry out spike-recovery test of carbamate pesticides using canal water.
2. calculate the detection limit according to the methods recommended by ?.
3. analyze water samples from a canal connecting to agricultural field.

f. Expenditure :
solvent
Sep-pak
capillary column
helium gas for GC/MS

g. Equipment to be used :
Supplied by Thai Government :
Supplied by Japanese Grant Aid : GC/MS
Supplied by JICA Technical Cooperation : GC/FPD, GC/ECD

B. Expected JICA's contribution :
To teach about sampling, analytical technique, documentation

C. JICA Team's comments on the above "B"
JICA expert can train C/P.

2-(1)-3 : Research in 1994

A.
a. Theme : Laboratory Quality Assurance

b. Name of Researchers : Ms. Orasai Intarapanich, Ms. Somjai Simachaya and other members of "Committee on Laboratory Quality Assurance"

c. Duration : October 1993 to September 1993

d. Objectives :
To grasp the situation of analytical jobs of ERTC
To improve the reliability of analytical data produced in ERTC

e. Procedure :
1. To request each committee member to write down quantity and types of samples, employed methods, using reference materials, analytical equipment, detection limit of methods
2. To discuss how to improve quality assurance on the basis of the answer
3. To prepare a document summarized the above

f. Expenditure :

g. Equipment to be used :
Supplied by Thai Government :
Supplied by Japanese Grant Aid :
Supplied by JICA Technical Cooperation :

B. Expected JICA's contribution :
To give technical advice on quality assurance in the committee meeting

C. JICA Team's comments on the above "B"
JICA expert trains C/Ps.

2-(1)- 4 : Research in 1994

A.
a.Theme : Development of analytical methods on polycyclic aromatic hydrocarbons (PAHs) residued in the canal water for tap water

b. Name of researcher : Ms. Ruchaya Boonyatumanond

c. Duration : From October 1993 to January 1994

d. Objectives :
Since PAHs are expected to pollute canal water for the tap water supply, it is needed to make clear the levels of PAHs in the water. If heavy pollution is revealed, which may cause adverse health effect on tap water consumers, further study for understanding the mechanism of pollution that includes study on identification of source, transferring process of PAHs, their behavior in the water.

e. Research Procedure :
To establish analytical methods for PAHs by using GC/MS on the basis of isotope dilution quantification, CANADA EPA.
To analyze some canal water samples collected from ---- Klong.
To interpret the results with respect to spatial distribution, degree of contamination by comparison with residue levels in different areas in the literature.

f. Expenditure :
solvent
deuterium labeled PAH standards (surrogate), sorbent cartridge for cleanup, helium gas, capillary column

g. Equipment to be used :
Supplied by Thai Government :
Supplied by Japanese Grant Aid : GC/MS, HPLC, rotary evaporator
Supplied by JICA Technical Cooperation : Solvent distillation unit

B. Expected JICA's contribution :
Technical suggestion on verifying analytical methods

C. JICA Team's comments on the above "b"
JICA expert trains C/P.

LIST OF COUNTERPARTS AT ERTC

Name: Ms. Somjai Simachaya Nickname: Mun

Sex : Male Female Date of birth: July 31, 1961

Address : The Environmental Research and Training Center Klong Luang, Phathumthani Tel. 577-1136-7

Educational Background : Bachelor Master Doctor Others

Univ. of Master: Chiangmai
Faculty of Unic.: Science
Major Field of Study: Chemistry

Work Experience : 8 Years
Service at ERTC: 5 Years Position: Environmental Scientist

Experienced Works at ERTC

Routine Work: analyse rain water from ERTC Project and from Pollution control center department
Study Work: Development of analytical method of ionic composition in rain water
Others:

Section: Admin. Tech. Trans. Monit. Research Anal. Infor.

Works at Present

Routine Work: analyse rain water from ERTC project and from Pollution Control Department
Study Work: Development of analytical method of ionic composition in rain water
Others: coordinator of Laboratary Quality Assurance Project

Have you ever been trained in Japan? Yes NO

Subject of Training:
Environmental Pollution Centrol Studies

Period: 8 months
Post Held: Environmental Pollution Control Centre

JICA Experts in Charge

Name of Experts: Dr.M.Sakata (long term) ,Dr.Tanaka(short term)
Subjects of Tchnical Transfer: Acid rain

1-(1)-_____ : Research in 1993

a. Theme : Development of analytical method of ionic composition in rain water.

b. Name of Researcher (s) :

Ms. Somjai Simachaya, Ms.Wanna Laowakul, Ms.Sriwan Prongthong

c. Name of JICA Expert (s) and his (their) participation:

Dr.M.Sakata

He taught about experiment and instrument.

d. Duration: October 1992- September 1993

e. Objectives :

1. To study properties and chemical composition of Acidic Deposition
2. To study the intensity of pollutants in acid rain
3. To develop analytical method for rain water in Thailand

f. Outcome : See attached NO.1

g. Research Procedure:

collect the rain sample each evidence by used deposit gauge rain collector at ONEB and ERTC, analysed the samples by used Ion chromatograph

h. Expenditure : 50,000 baht.

i. Equipment used :

Supplied by Thai Government:

Supplied by Japanese Grant Aid : Ion Chromatograph "HITACHI" 2 set

Supplied by JICA Technical Cooperation : standard solution, Anion Column,Cation Column.

j. Evaluation : See attached NO. 2

Note : Complete this from by ERTC and JICA Team.

If any discrepency btween ERTC and JICA Team, describe both opinions.

If any change of themes, describe so that and complete the froms according to the new themes.

Attached NO.1

f. outcome : 102 wet samples and 73 dry samples were collected and analysed. The result shows high concentration of Sulphur dioxide and Nitrogen oxides at ERTC and ONEB. To compare result between standard solution from Japan and standard reagent prepared by ERTC's staff.

Attached NO.2

j. Evaluation:

The results is not clear because we used deposit gauge as collector and effect from dust. Therefore next year project, We plan to use rain collector such as wet only, Horiba collector and deposit gauge to compare the results.

The capacity of each instrument can analyse only 5 samples /day. And because sometime the electricity is cut down. Therefore many samples are not analyse and left in 4c° room.

LIST OF COUNTERPARTS AT ERTC

Name: Ms, Wanna Laowagul Nickname: Jurian

Sex : Male Female Date of birth: April 1, 1964

Address : The Environmental Research and Training Center Klong Luang, Phathumthani Tel. 577-1136-7

Educational Background : Bachelor Master Doctor Others

Univ. of Master: Chiangmai University
Faculty of Unic.: Faculty of science
Major Field of Study: Chemistry

Work Experience : 3 Years 10 months
Service at ERTC: 3 Years Position: Environmental Scientist

Experienced Works at ERTC

Routine Work:
Study Work: Determination of NO_x in ambienfair by using TGS-ANSA method and passive sampler.

Section: Admin. Tech. Trans. Monit. Research Anal. Infor.

Works at Present

Routine Work:
Study Work: Determination of hydrocarbon Compasition in 4-stroke gasoline engine exhaust gas.

Have you ever been trained in Japan? Yes NO

Subject of Training:
- offensive Odor
- Measurement of NO_2, NO_x and SO_2 by diffusion sampler.
- Study on acid gas such as HCl HNO_3 and SO_2 by Ion chromatography.

Period: 3 months and 2 weeks
Post Held: - The Tokyo Metropolitan Research Institute for Environmental Protection
- Keio University
- The Environmental science Institute of Hyogo Prefectrue.

JICA Experts in Charge

Name of Experts: Dr.Mamuru SAKATA
Subjects of Tchnical Transfer: Air Pollution

Form - 1

1-(1)-_____ : Research in 1993

a. Theme : Development of analytical method of ambient NO_x by wet analysis.

b. Name of Researcher (s) :

Ms. Wanna Laowakul

c. Name of JICA Expert (s) and his (their) participation:

Dr.Mamuru SAKATA, he taugh about NO_x and instrument

d. Duration: October 1992- September 1993

e. Objectives :

1. To study the analytical methodology for determination of ambient NO_x by wet analysis suitable for Thailand.
2. To describe the methodology, the validation and the application of the method to measuring ambient NO_x in Thailand.

f. Outcome : 1. the analytical methodology for determination of ambient NO_x by wet analysis for Thailand

2. To study the determination of ambient NO_x in Thailand for basic data

g. Research Procedure: See attached NO.1

h. Expenditure : 60,000 baht.

i. Equipment used :

Supplied by Thai Government:

Supplied by Japanese Grant Aid : See attached NO.2

Supplied by JICA Technical Cooperation :

Column,Cation Column.

j. Evaluation : See attached NO. 3

Note : Complete this from by ERTC and JICA Team.

If any discrepency btween ERTC and JICA Team, describe both opinions.

If any change of themes, describe so that and complete the froms according to the new themes.

2-(1)-_____ : Research in 1994

A.

a. Teme : Development of analytical method of ionic composition is rain water

b. Name of Researcher (s) :

Ms. Somjai Simachaya

c. Duration: October, 1993 - September, 1994

d. Objectives :

1. to study properties and chemical compositions of rain water for each collectot
2. to use the data for database in Thailand.
3. to continue work from last year.

e. Research Procedure :

to collect wet and dry samples from the rain collector such as Automatic rain collector, Deposit gauge, Horiba rain collector and compare the result.

f. Expenditure : 50,000 baht. (Excluded anion and cation Column.)

g. Equipment to be used :

Supplied by Thai Government : -

Supplied by Japanese Grant Aid : Ion Chromatograph "HITACHI"

Supplied by JICA Technical Cooperation:

B. Expected JICA's contribution : Anion Column, Cation column, Ion Chromatograph

- Advice on selection of sampling site, analysis data and evaluation
- Give lecture on Ion Chromatograph
- Auto injector and Stabilizer.

C. JICA Team's comments on above "B"

attached NO 1

g. Research Prcedure:

1. Literature review

2. Planning

3. Instrumental and chemical preparation

4. Study on analytical metholology for determination of ambient NO_x by TGS-ANSA method. Ambient nitrogendioxide (No_2) is collected by bubbing air througha solution of triethanolamine, O-methoxyphenol and sodiam metabisulfite. Ambient nitric oxide (NO_2)is oxidised by potassium permanganate ($KMnO_4$)The nitrite ion produced during sampling is determined colormetrically by reacting the exposed absorbingreagent with sulfanilamide and 8-anilino-1naphthalenesulfonic acid,ammonium saltand measuring the absorbance of the highlycolored azo dye at 550 nm.

5. Study on analytical methodology for determinationof ambient No_x by passive sampler.NO and NO_2 in the atmosphere are collected eachcollecting part of sampler by the principleof diffusion. NO_2 is calculated form thequantity collected at NO_2 collecting partand at the NO_x collecting part NO is oxidizedto NO_2 by reaction of PTIO. This $NO_2$is also collected at the NO_x collecting partwe can get NO_x quantity as a total quanfityof $NO+NO_2$

6. Comparing two analysis method between TGS-ANSA method and passive sampler.

7. Sampling and analysis.

8. Data evaluation and writing the report.

attached NO. 2

i. Equipment used:

Supplied by Thai Goverment : diaphragm pump, Thermometer, impringer

Supplied by Japanese Grant Aid:

1 Wet gas meter il/Rev

2 Transformer

3 Balance

4 Ultrasonic

5 Fume hood

Supplied by JICA Technical Cooperation : Passive Sampler

attached NO. 3

j. Evaluation : It is found that the concentrations of ambient NO_x analysed by using passive sampleris almost the same as those analysed byTGS-ANSA method. The passive sampler methodis more suitable than TGS - ANSA methodbecause of its low expense, and simpleoperation moreover, sample collecting apparatusof the passive sampler method are light,easy to carry and no need for power supply. The outcome of the study will be useful for furthur study of ambient NO_x distribution from automobile on the roadside.

Researeh in 1994

A.

a. Theme:Development of analytical method of Sulphur dioxide and Nitrogen oxides at road-side and industrial area.

b. Name of Researcher(s)

Ms. Somjai Simachaya

c. Duration : October,1993 - September,1994

d. Objectives :

1. to develope analytical method by using passive sampler
2. to study on distribution of Sulplur dioxide and Nitrogen oxides. at road-side and industrial area

e. Researeh Procedure

1. collect air sample by used passive sampleer 5 inter-sections. in Bangkok 24 hours.,3 days continue. 6 times/year. And collect sample in industrial area such as Rayong and Chonburi 24 hours,3 days continue. 3 times/year (summer, rainy and winter season)
2. Analyse the sample by used uv-vis Spectrometer and Ion Chromatograph

f. Expenditure : 337,500 baht.

g. Equipment to be used:

Supplied by thai Govemment:-

Supplied by Japanese Grant Aid : Ion Chromatograph, UV-vis Spectrometer

Supplied by JICA Teehnical Cooperation -

B. Expected JICA'S Contribution - Advice on selection of sampling site
- Analyse data and evaluation
- Passive Sampler
- Anion column
- Cation Column

Information Service and Statistic section

ENVIRONMENTAL RESEARCH AND TRAINING CENTER

Director (1) Ms. Monthip Sriratana Tabucanon

(12) Environmental Technology Transfer Section	(15) Environmental Quality Monitoring Methodology Development Section	(15) Environmental Technology and Research Development Section	(14) Environmental Sample Analysis and Methodology Development Section	(4) Information Service and Statistic section
( ) Mr. Somchai Winichnantharat	( ) Ms. Pornthip Puncharoen	( ) Ms. Phaka Sukasem	( ) Mr. Manit Urakane	( ) Mr. Soros Khunkhrua
( ) Mr. Vottiphan Satitavon	( ) Ms. Sukanya Boonchalermkit	( ) -2-	( ) Ms. Pacharee Naovarat	( ) -1-
( ) Ms. Anong Dechachaat	( ) -2-	( ) -2-	( ) Ms. Orasai Intarapanich	( ) -1-
( ) Mr. Sornchai Moonchum	( ) Mr. Kanog Suksomsang	( ) -2-	( ) Mr. Sumate Suvannarod	( ) -1-
( ) Mr. Thanaphan Suksa-ard	( ) Mr. Janewit Wongsanoon	( ) Ms. Juthatip Yuyen	( ) Ms. Somjai Sirachaya	
( ) Mr. Wichan Suksavang	( ) Mr. Nattapong Junsombat	( ) Ms. Hathairatana Garivait	( ) Ms. Sirinapha Srithongtim	
( ) Ms. Busaba Ob-ay	( ) Mr. Verathep Geratitadaniyom	( ) Ms. Nittaya Nugranart	( ) Ms. Ruchaya Boonyatumanonth	
( ) Ms. Jindarat Kwanphirod	( ) Ms. Mulliga Buranamara	( ) Mr. Sunthon Yotyam	( ) Mr. Sira Chunchaid	
( ) Mr. Apiwat Piromrean	( ) Ms. Fairda Salem	( ) Ms. Amraporn Padungcheep	( ) Mr. Perapong Sunthondacha	
( ) Mr. Sawan Jamkajarn	( ) Mr. Sutudchai Bunyasidtiphol	( ) Mr. Surasak Saebong	( ) Ms. Naraporn Sribrakul	
( ) Mr. Rat Ruanchodvit	( ) -1-	( ) Ms. Wanna Laowakul	( ) Ms. Jeranun Puntajuk	
( )	( ) -1-	( ) Mr. Piya Soasanayut	( ) -1-	
	( ) -1-	( ) -1-	( ) -1-	
	( ) -1-	( ) -1-		
	( ) -1-	( ) -1-		

BUDGET EXPENDITURES.
FY 1993.

ข. แผนงานควบคุมคุณภาพสิ่งแวดล้อม

1. งานศูนย์วิจัยและฝึกอบรมด้านสิ่งแวดล้อม (ERTC) 20,385,900 บาท

1. ค่าจ้างชั่วคราว TEMPORARY STAFF 3,745,500 บาท
เป็นค่าจ้างเจ้าหน้าที่ปฏิบัติงานภาคสนาม

2. ค่าตอบแทน ใช้สอยและวัสดุ ALLOWANCE EXPENSE AND INVENTORY 6,176,900 บาท

2.1 ค่าตอบแทน ALLOWANCE 64,800 บาท

2.1.1	ค่าอาหารทำการนอกเวลา	42,000 บาท
2.1.2	ค่าตอบแทนผู้ปฏิบัติงานให้ราชการ	15,000 บาท
2.1.3	ค่าเบี้ยประชุมกรรมการ	7,800 บาท

2.2 ค่าใช้สอย EXPENSE 2,663,800 บาท

2.2.1	ค่าเบี้ยเลี้ยง ค่าเช่าที่พักและค่าพาหนะ	232,000 บาท
2.2.2	ค่าซ่อมแซมครุภัณฑ์ยานพาหนะและขนส่ง	12,000 บาท
2.2.3	ค่าซ่อมแซมครุภัณฑ์	1,000,000 บาท
2.2.4	ค่าจ้างเหมาบริการ	1,419,800 บาท

2.3 ค่าวัสดุ INVENTORY 3,448,300 บาท

2.3.1	วัสดุสำนักงาน	200,000 บาท
2.3.2	วัสดุเชื้อเพลิงและหล่อลื่น	38,400 บาท
2.3.3	วัสดุงานบ้านงานครัว	70,000 บาท
2.3.4	วัสดุไฟฟ้าและวิทยุ	25,000 บาท
2.3.5	วัสดุโฆษณาและเผยแพร่	27,700 บาท
2.3.6	วัสดุวิทยาศาสตร์หรือการแพทย์	2,500,000 บาท
2.3.7	วัสดุหนังสือ วารสารและตำรา	550,000 บาท
2.3.8	วัสดุคอมพิวเตอร์	30,000 บาท
2.3.9	วัสดุเครื่องแต่งกาย	7,200 บาท

3. ค่าสาธารณูปโภค GENERAL PUBLIC 2,712,000 บาท

3.1 ค่าไฟฟ้า ELECTRICITY	2,400,000	บาท
3.2 ค่าโทรศัพท์ TELEPHONE	228,000	บาท
3.3 ค่าสาธารณูปโภคอื่น ๆ OTHERS	84,000	บาท
4. ค่าครุภัณฑ์ ที่ดินและสิ่งก่อสร้าง	2,401,500	บาท
4.1 ค่าครุภัณฑ์ NON-EXPENDIABLE EQUIPMENTS	2,401,500	บาท
4.1.1 ครุภัณฑ์สำนักงาน STATIONERY EQUIPMENTS	81,500	บาท
(1) เครื่องเข้าเล่มหนังสือ 1 เครื่อง	45,000	บาท
(2) ตู้เหล็ก 2 ตอน 2 ตู้	14,000	บาท
(3) ชั้นวางเอกสาร 4 ชั้น 6 ที่	12,000	บาท
(4) ตู้เหล็ก 4 ลิ้นชัก 3 ตู้	10,500	บาท
4.1.2 ครุภัณฑ์วิทยาศาสตร์และการแพทย์ EQUIPMENTS	2,320,000	บาท
(1) เครื่องวิเคราะห์หาปริมาณโลหะ 1 เครื่อง	2,300,000	บาท
(2) รถเข็นสารเคมี 1 คัน	20,000	บาท
5. รายจ่ายอื่น OTHERS BUDGET	5,350,000	บาท
(1) ค่าจ้างศึกษาวิจัยเพื่อพัฒนาวิธีการติดตาม BUDGET FOR MONITORING ตรวจสอบคุณภาพสิ่งแวดล้อม	5,000,000	บาท
(2) ค่าใช้จ่ายในการจัดอบรมและสัมมนา BUDGET FOR SEMINAR.	350,000	บาท

BUDGET EXPENDITURES.
FY 1994.

100

ข. แผนงานควบคุมคุณภาพสิ่งแวดล้อม EETC Project.

1. งานศูนย์วิจัยและฝึกอบรมด้านสิ่งแวดล้อม 26,719,700 บาท

1. ค่าจ้างชั่วคราว FIELD 1,939,500 บาท
เป็นค่าจ้างเจ้าหน้าที่ปฏิบัติงานภาคสนาม

2. ค่าตอบแทน ใช้สอยและวัสดุ ALLOWANCE EXPENSE AND INVENTORY 6,825,700 บาท

2.1 ค่าตอบแทน ALLOWANCE 212,800 บาท

2.1.1 ค่าอาหารทำการนอกเวลา OVERTIME 105,000 บาท

2.1.2 ค่าตอบแทนผู้ปฏิบัติงานให้ทางราชการ AUTHORITY 100,000 บาท

2.1.3 ค่าเบี้ยประชุมกรรมการ 7,800 บาท

2.2 ค่าใช้สอย EXPENSE PERDIUM RENT CONVEYANCE 2,931,800 บาท

2.2.1 ค่าเบี้ยเลี้ยง ค่าเช่าที่พักและค่าพาหนะ 232,000 บาท

2.2.2 ค่าซ่อมแซมครุภัณฑ์ยานพาหนะและขนส่ง 12,000 บาท

2.2.3 ค่าซ่อมแซมครุภัณฑ์ RENOVATIONS 1,000,000 บาท

2.2.4 ค่าจ้างเหมาบริการ SERVICE + MAINTENANCE 1,557,800 บาท

2.2.5 ค่ารับรองและพิธีการ RECEPTION 30,000 บาท

2.3 ค่าวัสดุ INVENTORY 3,681,100 บาท

2.3.1 วัสดุสำนักงาน STATIONERY 300,000 บาท

2.3.2 วัสดุน้ำมันเชื้อเพลิงและหล่อลื่น FUEL AND LUBRICANT 36,400 บาท

2.3.3 วัสดุงานบ้านงานครัว KITCHEN UTENSILES 50,000 บาท

2.3.4 วัสดุไฟฟ้าและวิทยุ ELECTRICITY AND RADIO ACCESSARY 25,000 บาท

2.3.5 วัสดุโฆษณาและเผยแพร่ ADVERTISE 27,700 บาท

2.3.6 วัสดุวิทยาศาสตร์หรือการแพทย์ CHEMICAL AND GLASS WARE 2,500,000 บาท

2.3.7 วัสดุหนังสือ วารสารและตำรา BOOK JOURNAL AND TEXT BOOK 650,000 บาท

2.3.8 วัสดุคอมพิวเตอร์ COMPUTER ACCESSARY 70,000 บาท

2.3.9 วัสดุเครื่องแต่งกาย UNIFORM 20,000 บาท

3. ค่าสาธารณูปโภค PUBLIC HEALTH 2,712,000 บาท

3.1 ค่าไฟฟ้า ELECTRICITY 2,400,000 บาท

3.2 ค่าโทรศัพท์ TELEPHONE 228,000 บาท

3.3 ค่าสาธารณูปโภคอื่น ๆ OTHERS 84,000 บาท

4. ค่าครุภัณฑ์ ที่ดินและสิ่งก่อสร้าง 9,542,500 บาท

4.1 ค่าครุภัณฑ์ (NON-EXPENDABLE EQUIPMENTS) 2,472,500 บาท

4.1.1 ครุภัณฑ์สำนักงาน STATIONERY		360,500 บาท
(1) เครื่องพิมพ์สำเนาระบบดิจิตอล DIGITAL COPY	1 เครื่อง	165,000 บาท
(2) เครื่องถ่ายเอกสารความเร็ว 20 แผ่นต่อนาที COPY MACHINE	1 เครื่อง	80,000 บาท
(3) เครื่องตัดกระดาษไฟฟ้า PAPER BIND CUTTING	1 เครื่อง	50,000 บาท
CABINETS (4) ตู้ใส่หนังสืออ้างอิง	1 ตู้	15,000 บาท
CABINETS (5) ตู้เหล็กเก็บเอกสาร 2 ตอน มีฝาบานเลื่อน	2 ตู้	15,000 บาท
CABINETS (6) ตู้เก็บเอกสาร 4 ลิ้นชัก (มอก)	3 ตู้	10,500 บาท
SHELF (7) ชั้นไม้วางเอกสาร 4 ลิ้นชัก	5 ที่	10,000 บาท
SHELF (8) ชั้นไม้วางหนังสืออ้างอิง	1 ที่	10,000 บาท
CABINETS (9) ตู้เหล็กเก็บกระดาษโปสเตอร์	1 ตู้	5,000 บาท
4.1.2 ครุภัณฑ์โฆษณาและเผยแพร่ ADVERTISE		48,000 บาท
(1) อุปกรณ์อักษรวิ่ง	1 ชุด DISPLAY BOARD	48,000 บาท
4.1.3 ครุภัณฑ์วิทยาศาสตร์หรือการแพทย์ EQUIPMENTS		1,720,000 บาท
AUTOCAVE (1) เครื่องอบฆ่าเชื้อระบบไอน้ำ	1 ชุด	300,000 บาท
HIGH VOLUME SAMPLER (2) เครื่องเก็บตัวอย่างสารพิษในอากาศ	1 ชุด	300,000 บาท
PCB HIGH VOLUME SAMPLER (3) เครื่องเก็บตัวอย่าง PCB ในอากาศ	1 ชุด	200,000 บาท
LOW VOLUME SAMPLER (4) เครื่องเก็บตัวอย่างตัวอย่างฝุ่นละอองซนิดแยกขนาด	1 ชุด	200,000 บาท
FILTER WATER (5) เครื่องกรองน้ำ	1 เครื่อง	150,000 บาท
CLEAN BENCH (6) ตู้เตรียมตัวอย่างโลหะหนักในดะกอนดิน	1 ชุด	100,000 บาท
MICROWAVE (7) เครื่องเตรียมอาหารเลี้ยงเชื้อแบคทีเรีย	1 ชุด	100,000 บาท
HEATING MENTEL (8) เตากลั่นหาปริมาณซีโอดี	1 ชุด	100,000 บาท
CLEAN BENCH (9) ตู้ควบคุมสภาวะอากาศ	1 ชุด	100,000 บาท
S-T-C METERS (10) เครื่อง S-T-C มิเตอร์	2 ชุด	90,000 บาท
MASS FLOW METERS (11) แมสโฟลมิเตอร์	2 ชุด	60,000 บาท
GAS WELDING (12) อุปกรณ์เชื่อมโลหะโดยใช้แก๊ส	1 ชุด	20,000 บาท
4.1.4 ครุภัณฑ์คอมพิวเตอร์		284,000 บาท
UPS (1) เครื่องควบคุมและสำรองไฟฟ้า (UPS) ขนาด 1 KVA	2 เครื่อง	84,000 บาท
CD-ROM READER (2) CD-ROM READER	1 เครื่อง	80,000 บาท

(3) โมเด็ม (MODEM) ขนาดความเร็วไม่ต่ำกว่า 57000 BPS 1 เครื่อง	60,000	บาท
(4) เครื่องไมโครคอมพิวเตอร์สำหรับงานประมวลผลระดับสูง 1 ชุด (ฮาร์ดดิสก์ ความจุไม่น้อยกว่า 120 MB)	60,000	บาท
4.1.5 ครุภัณฑ์ไฟฟ้าและวิทยุ	22,000	บาท
(1) เครื่องตรวจวัดกระแสไฟฟ้า 1 ชุด	22,000	บาท
4.1.6 ครุภัณฑ์งานบ้านงานครัว	38,000	บาท
(1) เครื่องซักผ้า 1 เครื่อง	20,000	บาท
(2) เครื่องอบผ้า 1 เครื่อง	18,000	บาท
4.2 ค่าที่ดินและสิ่งก่อสร้าง	7,070,000	บาท
4.2.1 สิ่งก่อสร้าง	7,070,000	บาท
(1) ค่าก่อสร้างอาคารหอพัก 1 หลัง	7,070,000	บาท
งบประมาณทั้งสิ้น	17,700,000	บาท
ปี 2537 ตั้งงบประมาณ	7,070,000	บาท
ปี 2538 ผูกพันงบประมาณ	10,630,000	บาท
5. รายจ่ายอื่น	5,700,000	บาท
(1) ค่าใช้จ่ายในการศึกษาวิจัยเพื่อพัฒนาวิธีการติดตามตรวจสอบคุณภาพสิ่งแวดล้อม	5,000,000	บาท
(2) ค่าใช้จ่ายในการจัดอบรมและสัมมนา	700,000	บาท

Master Plan for Identifying Training Needs

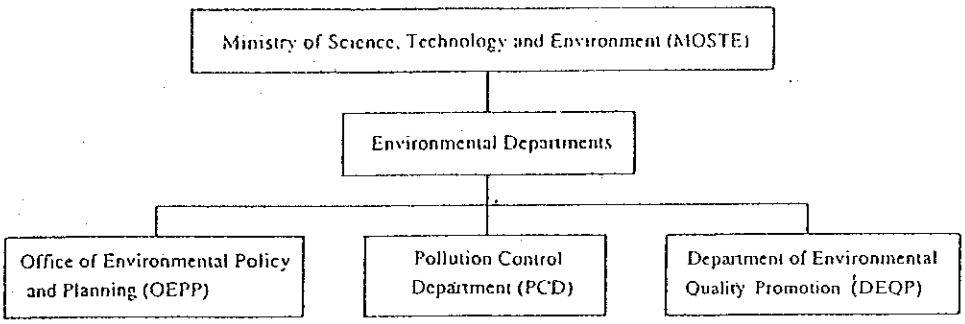
The master plan is conducted by Kasetsart University in co-operating with Kasetsart University.

The objectives of the master plan are as follows :

1. To identify the details of curriculum of each training course.
2. To identify the list of concerned Departments and number of participants from government and NGO to be invited to attend the training course.
3. To identify the capable lecturers in each training course.
4. To set up plan for follow-up the after training.
5. To prepare the inventory list of lecturers and experts in government and non-government sectors who are involved in research, training and management field.

The master plan is to be completed by November 1993.

4. a MINISTRY'S ORGANIZATION



Secretarait
Environmental Policy and Planning Div.
Natural Resources and Environmental Management Div.
Environmental Impact Evaluation Division
Urban Environment and Area Planning Div.
International Environmental Affairs Division
Conservation of Natural and Cultural Heritage Division
Office of Environmental Fund
Eastern Region Evnvironmental Office
Northeastern Region Environmental Office
Southern Region Environmental Office
Northern Region Environmental Office

Secretarait
Water Quality Management Div.
Air and Noise Quality Management Division
Toxic Substance and Solid Waste Management Div.
Legal Petitions and Complaints Division
Pollution Management Coordination Division

Secretarait
Environmental Promotion Division
Environmental Information Division
Environmental Research & Training Center (ERTC)

③　ＭＯＳＴＥ環境３局の所掌業務（ＭＯＳＴＥより入手）

The Office of Environmental Policy and Planning has the following mandate :

1) Making policy and plans to foster and maintain the quality of national environment in accordance with other national policy, including evaluation measures;
2) Coordinating environmental quality plans as stated in the Enhancement and Conservation of National Environmental Quality Act; B.E. 2535;
3) Monitoring and preparing the report on state of the environment;
4) Coordinating the management of natural resources according to the policy and planning on the National Environmental Quality Promotion and the National Economic and Social Development Plan as well as the Environmental Quality Management Plan;
5) Carrying out environmental impact evaluation of private or governmental activities or projects with possible damage to environmental quality;
6) Setting the position, direction, cooperative coordination and participation in international environment commitments;
7) Recommending policy directions, administration and management coordinating procedures of the Environmental Fund, as well as mobilization of funding for the Fund as directed by the law on the Enhancement and Conservation of National Environmental Quality Act, B.E.2535;
8) Implementing and coordinating environmental initiatives in rural areas;
9) Carrying out other activities as mandated by the law

The Department of Environmental Pollution Control is responsible for:

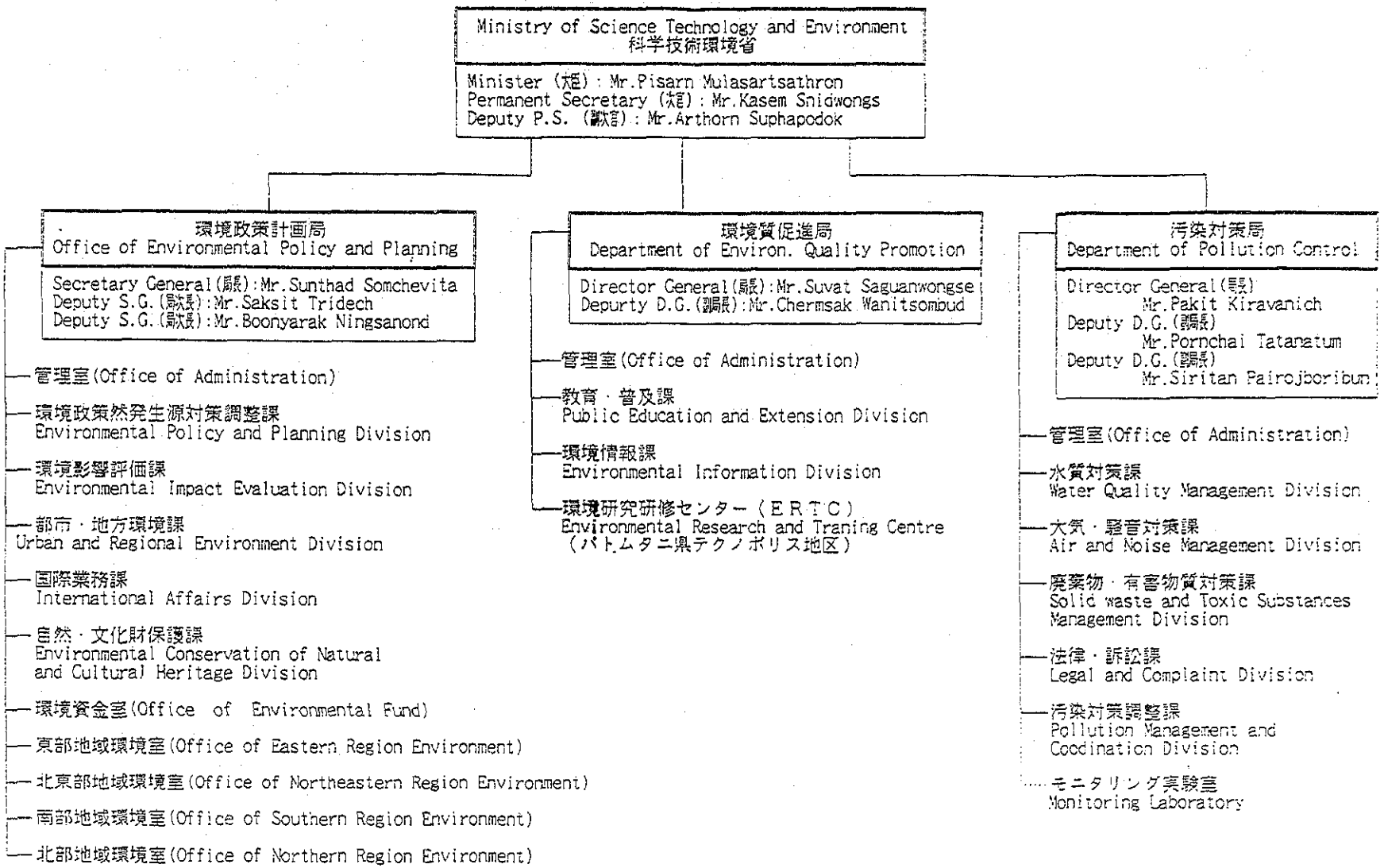
1) Recommending initiatives for pollution control within the framework of the National Environmental Quality Plan
2) Proposing standards for both the environmental quality and pollution source control;
3) Providing a plan for environmental quality and measures for the control and solution of environmental problems resulting from pollution;
4) Monitoring and preparing reports on pollution;
5) Developing the system, pattern and methods suitable for different systems to be applied for the management of water, air, noise, toxic substances and wastes control;
6) Carrying out pollution control measures as permitted by the Enhancement and Conservation of Environmental Quality Act;
7) Handling petitions concerning pollution problems
8) Implementing measures as directed by law

The Department of Environmental Quality Promotion is in charge of :

1) Providing public education and liaison with the media on environmental protection;
2) Collecting and establishing a database on environmental information and technology;
3) Providing basic environmental knowledge to other government agencies, the private sector and the general public;
4) Studying and researching for appropriate technology in environmental quality promotion
5) Providing technology transfer of environmental techniques to different target groups.
6) Performing other functions specified by law.

④ 専門家チーム提出資料

タイ国科学技術環境省における環境行政部局の組織図（１９９３年１０月１日現在）



1st Nov. 1993

Organization of Environmental Research and Traning Center

Director

Ms.Monthip Sriratana Tabucanon(C-8)

* Permanent Staffs : 43 (in arrangements)　　** Temporary Staffs : 63

Administration Section P: 2 T: 8	Environmental Technology Transfer Sub-Division P:10 T: 11	Environmental Quality Monitoring Sub-Division P: 9 T: 28	Environmental Technology & Research Development Sub-Division P: 9 T: 7	Environmental Sample Analysis Methodology Development Sub-Division P:11 T: 4	InformationService & Statistic Sub-Division P: 4 T: 5
Ms.Siriluch H. (C-4)	Mr.Somchai W. (C-7)	Ms.Pornthip P. (C-7)	Ms.Phaka S. (C-7)	Mr.Manit U. (C-7)	Mr.Soros K. (C-6)
Ms.Pavana P. (C-2)	Mr.Yottiphan S. (C-6)	Ms.Sukanya B. (C-7)	Ms.Juthatip Y. (C-5)	Ms.Patcharee N. (C-6)	
	Ms.Anong D. (C-6)	Mr.Kanog S. (C-6)	Ms.Hathiratana G. (C-5)	Ms.Orasai I. (C-6)	
	Mr.Songchai M. (C-6)	Mr.Janewit W. (C-4)	Ms.Nittaya N. (C-5)	Mr.Sumate S. (C-6)	
	Mr.Thanaphan S. (C-3)	Mr.Nattapong J. (C-4)	Mr.Piya S. (C-4)	Ms.Somjai S. (C-5)	
	Mr.Butsaba A. (C-3)	Mr.Verathep K. (C-3)	Ms.Wanna L. (C-3)	Ms.Sirinapha S. (C-5)	
	***Ms.Jindarat K. (C-3)	Ms.Farda M. (C-3)	Mr.Sunthon Y. (Sci.T.)	Ms.Ruchaya B. (C-4)	
	Mr.Apawat P. (C-3)	Mr.Sutudchai B. (C-3)	Ms.Amraporn P. (Sci.T.)	Mr.Narapon S. (C-4)	
	Mr.Rat R. (C-3)	Ms.Mullika B. (C-3)	Mr.Surasak S. (Sci.T.)	Ms.Jeranun P. (C-3)	
	Mr.Sawan S. (C-2)			Mr.Perapong S. (Sci.T.)	
				Mr.Sira C. (Sci.T.)	
Regular Staff 2	12	15	15	14	4

* regular of permanent staff is 63 persons.　** regular of temporary staff is 33 Persons.
(Extra Budget : 5 Persons of Technology Trancefer Sub-Division)
(Extra Budget : 25 Persons of Enbironmental Quality Monitoring Sub-Division)

*** underline's person is new staff on 1st Oct. 1993 , and 8 permanent staff was employed.

表－１　研究部門における研究課題

研究テーマ	サブ・タイトル（研究期間）	予算	C／P名
道路交通騒音の予測モデルに関する研究	・Leqに基ずくモデリング調査（'91～'93） ・各車種のPWL対策の有効性　1992年度 ・プログラミング・ソフト開発　1993年度	執行済 25.3万B 25.3万B	Ms.Phaka（'92） Mr.Kanog（'93） 職員（'94）
固体廃棄物及びリサイクルに関する研究	・固形廃棄物の処分場の調査（1992年度） ・コンポスト処理法（1993年度） ・固形廃棄物処理場の浸出水測定（1994年度）	執行済 執行済 不明	Ms.Phaka（'92） Ms.Sirinapa Ms.Nathapong （'93～'94）
水生生物の環境汚染物質による毒性に関する研究	・淡水魚への重金属の毒性（1992年度） ・淡水魚への重金属の蓄積（1993年度） ・水系食物連鎖の重金属の蓄積（'94～'96）	20.2万B 37.2万B 不明	Ms.Phaka （'92～'96）
えび養殖排水の処理技術の開発に関する研究	・家庭・産業排水の処理技術（'92～'96） ・えび養殖排水の処理技術（'91～'93）	20.2万B 30.3万B	Ms.Phaka（'92） Ms.Nittaya Mr.Piya （'93～'96）
ガソリンエンジン排ガス中炭化水素組成の測定	・自動車排ガスの化学組成（主題）（'91～'97） ・自動車排ガスの炭化水素（サブ）（'91～'93）	不明 執行済	Ms.Hathairata- na（'92～'97）
腐生植物指標による水質の分類化に関する研究	・生物指標としての水生生物研究.（'91～'93） ・Saprobity指標法の応用　1992年度 ・熱帯水生昆虫の分類　1993年度 1994年度	 20.3万B 25.3万B 不明	Ms.Juthayip （'92～'93）

表２　モニタリング部門における調査課題

モニタリング課題	備考
１．環境質モニタリング方法論開発の検討プロジェクト	1．地下水、廃棄物浸出水、騒音など
２．パトムタニ県における環境質開発プロジェクト	2．モデル地域調査（大気、水質、騒音など）
３．スラタニ県タピー川、ブンドゥアンにおける水質汚濁問題の検討	3．農薬及び重金属に焦点を絞った農業排水や工場廃水による河川の水質汚濁調査
４．ムーン川及び支流の水質における塩土壌問題の影響	4．タイ東北地方の塩害影響調査
５．ナコンシータマラート県パッ・パナン湾の生物試料における残留砒素の検討	5．同県周辺における鉱山からの排水中に含まれる砒素影響の調査
６．環境モニタリングに関するＡＳＥＡＮネットワーク・プロジェクト（ＡＳＮＥＭ）	6．ASNEMにおける活動は、ERTC研究員の補充が促進され、タイ国内のモニタリ
７．ＡＳＥＡＮ諸国における酸性降下物	7．ング体制が可能になった時点で実施され、酸性雨調査も同様である。

Environmental Training Course

Fiscal Year 1993

Training Course	1992			1993									Trainee (number)	Duration (day)
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep		
1. Waste Water Treatment Simple Technology (Class 1)				10-15									40	6
2. Waste Water Analysis Simple Techonology (Class 1)				17-22									25	6
3. Waste Water Analysis Simple Techonology (Class 2)				24-29									25	6
4. Waste Water Analysis Simple Technology (Class 3)				31--5									25	6
5. Waste Water Analysis Simple Techonology (Class 4)					7-12								25	6
6. Air Quality in Atmosphere Analysis					21-26								25	6
7. Noise Pollution						14-19							25	6
8. Waste Water Treatment Simple Techonology (Class 2)						21-26							40	6
9. Pesticides Analysis (Organophosphorus)							18-23						25	6
10. Air Quality Analysis (caused by industrial and vehicles)							25-30						25	6

Training Course	1992			1993									Trainee (number)	Duration (day)
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep		
11. Solid Waste Management								23-28					40	6
12. Natural Resources and Environmental Management								1-3					40	3
13. Environmental Quality Management Planning									22-25				40	4
14. Soil, Water, Forest and Coastal Resources Management										5-8			40	4
15. Water Pollution Management										18-23			40	6
16. Air Quality Management											8-10		40	3
17. Solid Waste Analysis											15-20		40	6
18. Noise & Vibration Management											29--1		40	4
19. Management for Toxic Substance caused by Agriculture Industrial												7-10	40	4
20. Environmental Impact Assessment												21-24	40	4
Total	-	-	-	19	17	12	12	9	4	10	12	9	680	104

First day is the day for dormitory registration

ＥＲＴＣの環境研修コースにおける研修員統計（１９９３年度）

研修コース	政府機関	地方機関	企業等	研修員人数	研修日数
１．汚水処理簡易技術（クラス１）	１３	２２	７	４２	６
２．汚水分析簡易技術（クラス１）	８	１１	３	２２	６
３．汚水分析簡易技術（クラス２）	３	１０	１	１４	６
４．汚水分析簡易技術（クラス３）	１	１１	—	１２	６
５．汚水分析簡易技術（クラス４）	８	６	—	１４	６
６．大気質分析の実習	７	７	２	１６	６
７．騒音汚染	１４	６	３	２３	６
８．汚水処理簡易技術（クラス２）	６	１７	１	２４	６
９．農薬分析（有機燐系農薬）	８	１０	１	１９	６
10．大気質分析（自動車・産業）	６	８	６	２０	６
11．廃棄物管理	８	２０	２	３０	６
12．資源と環境管理	１０	１０	１	２１	３
13．環境質管理計画	１２	２０	—	３２	４
14．土壌・水・森林・海岸資源管理	９	１１	１	２１	４
15．水質汚濁管理	１１	７	—	１８	６
16．大気質管理	１３	８	４	２５	３
17．廃棄物分析	５	１３	１	１９	６
18．騒音・振動管理	１０	３	４	１７	４
19．有害物質管理(農業・産業)	５	１６	１	２２	４
20．環境影響評価	１５	９	４	２８	４
研修員総数（%）	１７２ （３９）	２２５ （５１）	４２ （１０）	４３９ （100）	104

（注１）研修期間：１９９３年１月から９月まで

（注２）ＥＲＴＣ研修管理課：１９９３年１０月４日調べ

環境研修コース計画案（１９９４年度）
Environmental Traning Couse Plan ,1994

研修コース・プログラム Traning Couse Program	1993(2536)		1994(2537)								研修員数	日数	予算
	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	August			
1.Waste Water Treatment Technology (Class 3)	22-26										40	5	[illegible]
2.Environmental Quality Management Plan (Class 2)		13-17									40	5	61.960
3.Solid Waste Management (Class 2)			10-14								40	5	66.760
4.Basic Waste Water Analysis (Class 5)			24-28								25	5	77.560
5.Environmental Quality Management Plan (Class 3)				7-11							40	5	30.160
6.Waste Water Treatment Technology (Class 4)				21-25							40	5	39.760
7.Environmental Impact Assessment (Class 2)					7-11						40	5	61.960
8.Water Pollution Management (Class 2)					21-25						40	5	66.760
9.Pesticide Analysis(Organic Phosphorous) (Class 2)						25-29					25	5	66.760
10.Air Quality Management (Class 2)							9-13				40	5	66.760
11.Noise Pollution (Class 3)							23-27				25	5	66.160
12.Industrial & Agricultural Toxic Substance Management (Class 2)								14-17			40	4	61.960
13.National Research and Environmental Administration (Class 2)								27-30			40	4	59.560
14.Air Quality Analysis from Industrial Factory (Class 1)									11-15		25	5	66.760
15.Heavy Metal Analysis (Class 1)									25-29		15	5	66.760
16.Solid Waste Analysis (Class 3)										15-29	25	5	66.760
総 計	5	5	10	10	10	5	10	8	10	5	550	78	996.160

⑤　ＥＲＴＣ機材活用状況

1．無償資金供与機材　　160万円以上（専門家調べ）
2．無償資金供与機材　　160万円以上（ＥＲＴＣ調べ）
3．無償資金供与機材　　10万円以上160万円未満（専門家調べ）
4．技術協力供与機材　　160万円以上（専門家調べ）
5．技術協力供与機材　　10万円以上160万円未満（専門家調べ）

（機材利用・管理状況報告記載要領）

1．平成５年９月末現在

2．対象機材（携行機材・一般無償機材を含む）は、消耗品を除き、一品または一式の単価が１０万円以上のものとするが、次の区分に従い、分けて作成する。
　なお、一般供与機材、携行機材と一般無償機材とに分けて別葉にて作成する。

（１）
　①　対象機材
　　車両類（バス、トラック、ジープ、ワゴン、オートバイ等）及び一品または一式の単価が１６０万円以上のもの。
　②　記入要領
　　番号は年度別の通し番号とし、関連機材または設置場所ごとに分類して記載する。機材名は一般名称とし、（　）内にメーカー名及び型式（モデル名）等を記入する。価格は国内購入価格（Ｂ／Ｌ参照）で万円単位（千円で四捨五入）とする。
　　備考欄には、機材が十分に活用されていない場合または使用が困難な状態にある場合等に、その理由及び今後の処理方針（修理の要否他）等の特記事項を記入する。

（２）
　①　対象機材
　　一品または一式の単価が１０万円以上１６０万円未満のもの。
　②　記入要領
　　年度別、関連機材または設置場所等ごとに分類して記載する。機材名は一般名称とし、（　）内にメーカー名、規格、能力等を記入する。
　　処分理由欄には、
　　1）当該期間（１年）内に処分したものがある場合にその理由。
　　2）機材が十分に活用されていない場合または使用が困難な状態にある場合には、その理由及び今後の処理方針。
　　3）その他特記事項
　　を記入する。
　　なお、処分とは、相手国との合意の上で相当の理由により廃棄処分したものをいう。

3．利用状況は、次の区分により記号で表示する。また、定量的な表示が困難な場合は、年間平均の使用時間、走行距離、利用回数等のいずれか適当なものを併せて記入すること。
　Ａ：頻繁に使用（日常的に使用）。
　Ｂ：良く使用（週に１～３回）。
　Ｃ：特定の時期に集中的に使用（理由を備考欄または処分理由等欄に記入）。
　Ｄ：現在のところあまり利用されていない（年に３～１１回、理由を備考欄または処分理由等欄に記入）。
　Ｅ：特別な理由により使用されていない（理由を備考欄または処分理由等欄に記入）。

4．管理状況は、次の区分により記号で表示する。
　Ａ：点検整備が十分に行われ、常に使用可能な状態で管理している。
　Ｂ：使用に際しては特段の問題はなく、管理はおおむね良好。
　Ｃ：整備を行えば使用可能な状態にある。
　Ｄ：使用は困難な状態である。

1. 無償資金供与機材160万円以上（専門家調べ）

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

[A : More than 1.6 million Yen]

DATE : September 1993
SHEET NO : A-1

YEAR	NO.	ITEM	UNIT PRICE [1,000]	Q'TY	LOCATION	UTILIZ.	MAINT.	CODE NO.	REMARKS
1990	A 001 - G	Gas Chromatograph-Mass Spectrometer	70,200	1	120	A	A	1-1	活
	A 002 - G	X-Ray Fluorescence Spectrophotometer	17,450	1	218	E	C	1-3	停 スタッフ不足
	A 003 - G	Atomic Absorption Spectrophotometer	2,950	1	217	A	A	1-8-A-(1)	活
	A 004 - G	Atomic Absorption Spectrophotometer	2,350	1	217	A	A	1-8-A-(2)	〃
	A 005 - G	Atomic Absorption Spectrophotometer	2,320	2	217	A	A	1-8-A-(3)	〃
	A 006 - G	Atomic Absorption Spectrophotometer	8,400	1	217	C	A	1-8-A-(4)	〃 試料作成中 特殊使用
	A 007 - G	Atomic Absorption Spectrophoto.(Graphite	7,350	1	217	B	A	1-8-C	〃
	A 008 - G	Scanning Electron Microscope	14,250	1	216	D	C	1-22	停 スタッフ不足
	A 009 - G	Heavy Metals Waste Treatment Apparatus	4,700	1	225	E	B	1-25	活 充分な実験排水なし
	A 010 - G	Draft Chamber with Exhaust Scrubber	1,950	3	203/225/227	A	A	2-33-A	強電設備
	A 011 - G	Cold Storage Chamber	1,900	3	203/225/220	A～D	A～B	2-35-A	
	A 012 - G	Freezed Storage Chamber	2,710	1	220	E	B	2-35-B	サンプルがない ([illegible])
	A 013 - G	Portable SO2 Monitor	2,585	2	305/323	E/A	C/A	4-1	停 研修用 /
	A 014 - G	NOx Monitor	5,200	2	305/323	E/A	C/A	4-2	〃 〃 /
	A 015 - G	Portable CO Monitor	3,740	2	305/324	E/D	C	4-3	〃 〃 自動車が入手困難 なし
	A 016 - G	Ozone Monitor	2,450	2	305/323	E/A	C/A	4-4-A	〃 研修用 /
	A 017 - G	Oxidant Monitor	1,860	1	323	A	A	4-4-B	〃
	A 018 - G	Non-Methane HC Monitor	3,750	2	305/323	E	D	4-5	〃 故障多発 性能劣化
	A 019 - G	Zero Air Generator	3,770	1	323	E	C	4-22	〃 原料が高価
	A 020 - G	Gas Phase Diluter	5,250	1	323	E	C	4-23	〃 〃
	A 021 - G	A/V System for Seminar Room	5,865	1	Seminar Room	E	B	8-32	全く使われていない

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

[A : More than 1.6 million Yen]

DATE : September 1993
SHEET NO : A-2

YEAR	NO.	ITEM	UNIT PRICE	Q'TY	LOCATION	UTILIZ.	MAINT.	CODE NO.	REMARKS
1991		COMMON ANALYTICAL INSTRUMENTS							
	A 022 - G	FT-IR Spectrophotometer	5,300	1	313	E	C	1-4	故 スタッフ不足, 必要性少ない
	A 023 - G	Infrared Spectrophotometer	4,276	1	313	E	C	1-4-B	〃 〃
	A 024 - G	Double Monochrome UV/VIS	2,400	1	324	E	D	1-5-B	〃 よく使われたが 現在修理中
		Spectrophotometer							
	A 025 - G	Double Monochrome UV/VIS,	3,000	1	302	B	B	1-5-C(1)	故
		Spectrophotometer (CRT)							
	A 026 - G	Double Monochrome UV/VIS	3,000	1	127	D	B	1-5-C(2)	済 現在テーマ無し
		Spectrophotometer (CRT)							
	A 027 - G	Flurescence Spectrophotometer	5,400	1	127	D	B	1-6-A	済 現在テーマ無し
	A 028 - G	ECD Gas Chromatograph	2,230	2	122/204	B	B	1-9-A(1)	済 研究用
	A 029 - G	ECD Gas Chromatograph	2,230	2	204/301	B/D	B	1-9-A(2)	済/故 /スタッフ不足,テーマ休止
	A 030 - G	ECD/ECD Gas Chromatograph	3,702	1	121	B	A	1-9-A2	済
	A 031 - G	ECD/ECD Gas Chromatograph (Varian)	3,600	1	120	A	A	1-9-A3	〃
	A 032 - G	FID/FPD Gas Chromatograph	5,113	1	122	B	A	1-9-C1	〃
	A 033 - G	FID/FPD Gas Chromatograph	3,005	2	121/301	A/E	A/D	1-9-C2	済/故 /部品行方不明
	A 034 - G	FID/FPD Gas Chromatograph	2,500	2	121/302	A/E	A/D	1-9-E	〃 / 〃
	A 035 - G	Capillary Gas Chromatograph	9,850	1	121	B	A	1-10	済
	A 036 - G	High Preformance Liquid Chroimatograph	4,221	2	127/302	D/E	B/C	1-11	済/故 スタッフ不足,テーマ無し
	A 037 - G	Ion Chromatograph	4,610	1	324	A	A	1-12	故
	A 038 - G	Auto Analyzer	13,500	1	127	D	B	1-13-A	済 スタッフ不足
	A 039 - G	CHON Analyzer	6,523	1	302	D	C	1-15	故 テーマ無し

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

[A : More than 1.6 million Yen]

DATE : September 1993
SHEET NO : A-3

YEAR	NO.	ITEM	UNIT PRICE	Q'TY	LOCATION	UTILIZ.	MAINT.	CODE NO.	REMARKS
1991	A 040 - G	Thin Layer Chromato-scanner	3,060	1	302	E	C	1-17-A	研 テーマなし
	A 041 - G	Microscope (High performance)	1,796	1	~~302~~ 227	D	B	1-23-B	あまり利用されていない
	A 042 - G	High Speed Centrifuge	2,435	1	227	D	B	2-4-A	環 現在テーマなし
	A 043 - G	Freezed Dryer	2,435	1	225	B	A	2-13	
		INSTRUMENTS FOR WATER POLLUTION							
	A 044 - G	Potentiometric Automatic Titrator	1,605	1	222	D	B	2-45	環 現在テーマなし
	A 045 - G	TOC Analyzer	3,644	2	127/227	A/D	A/B	3-1	〃
	A 046 - G	Total Nitrogen Analyzer	5,750	1	127	D	B	3-4	〃 研修用
	A 047 - G	Total Phosphorus Analyzer	5,750	1	127	D	B	3-5	〃 〃
		INSTRUMENTS FOR AIR POLLUTION							
	A 048 - G	Dust Monitor (Beta-Ray Method)	1,947	1	323	A	A	4-6-(2)	大気
	A 049 - G	Acid Rain Monitor	2,720	1	ROOF	E	D	4-34	〃 故障
	A 050 - G	Air Pollution Monitoring Unit	24,000	2	MOBILE	E	C	4-35-(1)	〃 目的変更・用途検討中
	A 051 - G	Portable Automatic Sox Analyzer	2,276	1	305	E	C	4-39	〃 工場立入り調査なし
	A 052 - G	Portable Automatic Nox Analyzer	2,700	1	305	E	C	4-40	〃 〃
		INSTRUMENTS FOR NOISE AND VIBRATION							
	A 053 - G	Data Processing Unit	1,780	1	316	A	A	5-10-A	自
	A 054 - G	Real-Time Wave Analyzer	3,300	1	316	B	A	5-11	〃
		INSTRUMENT FOR TOXIC SUBSTANCES							
	A 055 - G	Acid Agent Distillation Unit	1,894	1	Separate Bldg	D	D	7-15	化. 分析方法の違いの為

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

DATE : September 1993
SHEET NO : A-4

[A : More than 1.6 million Yen]

YEAR	NO.	ITEM	UNIT PRICE	Q'TY	LOCATION	UTILIZ.	MAINT.	CODE NO.	REMARKS
1991		OTHER INSTURMENTS FOR TRAINING							
	A 056 - G	VTR Editing Set	1,778	1	AV ROOM.	E	B	8-4-B	大 VTR [illegible]
	A 057 - G	Micro Bus	3,900	1	ERTC	[illegible]		8-17-A	ERTCにて回答
	A 058 - G	Station Wagon	1,998	1	ERTC	[illegible]	[illegible]	8-17-B	
	A 059 - G	Land cruiser for Trailer	2,737	2	ERTC	[illegible]	[illegible]	8-17-C	
	A 060 - G	Trailer	7,819	2	ERTC	E	C	8-17-D	なし 目的変更・用途検討中
	A 061 - G	Lathe	3,926	1	116	E	B	9-1	大 使用されていない

2. 無償資金供与機材160万円以上（ERTL 調べ）

EQUIPMENT UTILIZATION & MAINTENANCE LIST (GRANT AID EQUIPMENT)

[A : More than 1.6 million Yen]

DATE : September 1993
SHEET NO : A-1

YEAR	NO.	ITEM	UNIT PRICE [1,000]	Q'TY	LOCATION	UTILIZ.	MAINT.	CODE NO.	REMARKS
1990	A 001 - G	Gas Chromatograph-Mass Spectrometer	70,200	1	120	B	B	1-1	
	A 002 - G	X-Ray Fluorescence Spectrophotometer	17,450	1	218	E	D	1-3	DO NOT HAVE EQUIPMENT FOR TREATMENT THE SAMPLE
	A 003 - G	Atomic Absorption Spectrophotometer	2,950	1	217	B	B	1-8-A-(1)	
	A 004 - G	Atomic Absorption Spectrophotometer	2,350	1	217	B	B	1-8-A-(2)	
	A 005 - G	Atomic Absorption Spectrophotometer	2,320	2	217	B	B	1-8-A-(3)	
	A 006 - G	Atomic Absorption Spectrophotometer	8,400	1	217	B	B	1-8-A-(4)	
	A 007 - G	Atomic Absorption Spectrophoto.(Graphite	7,350	1	217	B	B	1-8-C	
	A 008 - G	Scanning Electron Microscope	14,250	1	216	D	C	1-22	
	A 009 - G	Heavy Metals Waste Treatment Apparatus	4,700	1	225	B	B	1-25	
	A 010 - G	Draft Chamber with Exhaust Scrubber	1,950	3	203/225/220	B	B	2-33-A	
	A 011 - G	Cold Storage Chamber	1,900	3	203/225/220	A	A	2-35-A	
	A 012 - G	Freezed Storage Chamber	2,710	1	220	A	A	2-35-B	
	A 013 - G	Portable SO2 Monitor	2,585	2	305/323	A	B	4-1	
	A 014 - G	NOx Monitor	5,200	2	305/323	A	B	4-2	
	A 015 - G	Portable CO Monitor	3,740	2	305/324	A	B	4-3	
	A 016 - G	Ozone Monitor	2,450	2	305/323	A	B	4-4-A	
	A 017 - G	Oxidant Monitor	1,860	1	323	A	B	4-4-B	
	A 018 - G	Non-Methane HC Monitor	3,750	2	305/323	A	B	4-5	
	A 019 - G	Zero Air Generator	3,770	1	323	A	B	4-22	
	A 020 - G	Gas Phase Diluter	5,250	1	323	C	B	4-23	
	A 021 - G	A/V System for Seminar Room	5,865	1	Seminar Room	C	B	8-32	

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

[A : More than 1.6 million Yen]

DATE : September 1993
SHEET NO : A-2

YEAR	NO.	ITEM	UNIT PRICE	Q'TY	LOCATION	UTILIZ.	MAINT.	CODE NO.	REMARKS
1991		COMMON ANALYTICAL INSTRUMENTS							
	A 022 - G	FT-IR Spectrophotometer	5,300	1	313	D	A	1-4	
	A 023 - G	Infrared Spectrophotometer	4,276	1	313	D	B	1-4-B	
	A 024 - G	Double Monochrome UV/VIS	2,400	1	324	A	A	1-5-B	
		Spectrophotometer							
	A 025 - G	Double Monochrome UV/VIS,	3,000	1	302	D	C	1-5-C(1)	
		Spectrophotometer (CRT)							
	A 026 - G	Double Monochrome UV/VIS	3,000	1	127	C	C	1-5-C(2)	
		Spectrophotometer (CRT)							
	A 027 - G	Flurescence Spectrophotometer	5,400	1	127	D	B	1-6-A	
	A 028 - G	ECD Gas Chromatograph	2,230	2	122/204	A	B	1-9-A(1)	
	A 029 - G	ECD Gas Chromatograph	2,230	2	204/301	A	B	1-9-A(2)	
	A 030 - G	ECD/ECD Gas Chromatograph	3,702	1	121	B	B	1-9-A2	
	A 031 - G	ECD/ECD Gas Chromatograph (Varian)	3,600	1	120	C	B	1-9-A3	
	A 032 - G	FID/FPD Gas Chromatograph	5,113	1	122	C	B	1-9-C1	
	A 033 - G	FID/FPD Gas Chromatograph	3,005	2	121/301	A	A	1-9-C2	
	A 034 - G	FID/FPD Gas Chromatograph	2,500	2	121/302	C	B	1-9-E	
	A 035 - G	Capillary Gas Chromatograph	9,850	1	121	C	B	1-10	
	A 036 - G	High Preformance Liquid Chroimatograph	4,221	2	127/302	C	B	1-11	
	A 037 - G	Ion Chromatograph	4,610	1	324	A	A	1-12	
	A 038 - G	Auto Analyzer	13,500	1	127	C	B	1-13-A	
	A 039 - G	CHON Analyzer	6,523	1	302	D	C	1-15	

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

[A : More than 1.6 million Yen]

DATE : September 1993
SHEET NO : A-3

YEAR	NO.	ITEM	UNIT PRICE	Q'TY	LOCATION	UTILIZ.	MAINT.	CODE NO.	REMARKS
1991	A 040 - G	Thin Layer Chromato-scanner	3,060	1	302	D	C	1-17-A	
	A 041 - G	Microscope (High performance)	1,796	1	304	D	C	1-23-B	
	A 042 - G	High Speed Centrifuge	2,435	1	227	D	C	2-4-A	
	A 043 - G	Freezed Dryer	2,435	1	225	A	B	2-13	
		INSTRUMENTS FOR WATER POLLUTION							
	A 044 - G	Potentiometric Automatic Titrator	1,605	1	222	D	C	2-45	
	A 045 - G	TOC Analyzer	3,644	2	127/227	-C* -A	-B* -A	3-1	* for room 127
	A 046 - G	Total Nitrogen Analyzer	5,750	1	127	D	C	3-4	
	A 047 - G	Total Phosphorus Analyzer	5,750	1	127	D	C	3-5	
		INSTRUMENTS FOR AIR POLLUTION							
	A 048 - G	Dust Monitor (Beta-Ray Method)	1,947	1	323	A	B	4-6-(2)	
	A 049 - G	Acid Rain Monitor	2,720	1	ROOF	D	D	4-34	
	A 050 - G	Air Pollution Monitoring Unit	24,000	2	MOBILE	C	A	4-35-(1)	
	A 051 - G	Portable Automatic Sox Analyzer	2,276	1	305	D	B	4-39	
	A 052 - G	Portable Automatic Nox Analyzer	2,700	1	305	D	B	4-40	
		INSTRUMENTS FOR NOISE AND VIBRATION							
	A 053 - G	Data Processing Unit	1,780	1	316	C	A	5-10-A	
	A 054 - G	Real-Time Wave Analyzer	3,300	1	316	C	A	5-11	
		INSTRUMENT FOR TOXIC SUBSTANCES							
	A 055 - G	Acid Agent Distillation Unit	1,894	1	Separate Bldg	A	A	7-15	

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

[A : More than 1.6 million Yen]

DATE : September 1993
SHEET NO : A-4

YEAR	NO.	ITEM	UNIT PRICE	Q'TY	LOCATION	UTILIZ.	MAINT.	CODE NO.	REMARKS
1991		OTHER INSTURMENTS FOR TRAINING							
	A 056 - G	VTR Editing Set	1,778	1	AV ROOM.	C	C	8-4-B	
	A 057 - G	Micro Bus	3,900	1	ERTC	A	A	8-17-A	
	A 058 - G	Station Wagon	1,998	1	ERTC	A	A	8-17-B	
	A 059 - G	Land cruiser for Trailer	2,737	2	ERTC	A	A	8-17-C	
	A 060 - G	Trailer	7,819	2	ERTC	C	C	8-17-D	
	A 061 - G	Lathe	3,926	1	116	C	C	9-1	

3. 無償資金供与機材10万円以上160万円未満（専門家調べ）

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

[R: More than 100,000 Yen, Not exceeding 1.6 million Yen]

DATE : September 1994
SHEET NO : B-1

YEAR	NO.	ITEM	Q'TY SUPPLIED	Q'TY DISPOSED	Q'TY USABLE	UTILIZE	MAINT.	CODE NO.	LOCATION	REMARKS
1990	B 001 - G	Air Compressor	3	0	3	A	A	1-8-F		門上
	B 002 - G	Mercury Analyzer	4			B	A	1-14	203 (1)	浜田
	B 003 - G	Clean Bench	2					2-32		
	B 004 - G	AC Stabilizer	1					2-46-(1)		
	B 005 - G	Conference Unit	1					8-5		
	B 006 - G	Copy Machine	2					8-13		
	B 007 - G	Electric Typewriter	2					8-14		
	B 008 - G	D.P.E. Set for Electron Microscope	1	1	1	D	C	8-23	21 6	西田：スタッフ不在
	B 009 - G	Fixed Type Screen	1					8-30		
	B 010 - G	A/V System for Audio Visual Room	1					8-31		

EQUIPMENT UTILIZATION & MAINTENANCE LIST (GRANT AID EQUIPMENT)

[B: More than 100,000 Yen, Not exceeding 1.6 million Yen]

DATE : September 1993
SHEET NO : B-2

YEAR	NO.	ITEM	Q'TY SUPPLIED	Q'TY DISPOSED	Q'TY USABLE	UTILIZE	MAINT.	CODE NO.	LOCATION	REMARKS
1991		COMMON ANALYTICAL INSTRUMENTS								
1,320,000	B 011 - G	Single Beam UV/VIS Spectrophotometer	1	0	1			1-5-A-(1)	305	[illegible]
1,125,000	B 012 - G	Single Beam UV/VIS Spectrophotometer	4	0	4	A B	A A	1-5-A-(2)	203(3台) 227(1台)	[illegible]
400,000	B 013 - G	GM Survey Meter	1					1-18		
710,000	B 014 - G	NaI-Tl Scintillation Counter	1					1-19		
226,000	B 015 - G	Laboratory pH Meter	6			A	A	1-20-B	228.(1)	[illegible]
1,120,000	B 016 - G	High Precision pH Meter	1	0	1	D	C	1-20-C	324	[illegible]
410,000	B 017 - G	Ion Selective Electrode	2					1-21		
450,000	B 018 - G	Microscope	6	0	6	B	B	1-23-A	227(4台) Photo Lab.(2台)	[illegible]
284,000	B 019 - G	1ch. Recorder	2	0	2	E E	A A	1-24-A	122	[illegible]
332,000	B 020 - G	X-Y Recorder	2					1-24-B	122(1台)	[illegible] 〃
288,000	B 021 - G	2ch. Recorder	5			E E	A C	1-24-C	204(1台) 323(1台) 324(1台)	[illegible] 〃
		GENRALLY USED LABORATORY INSTRUMENTS								
411,000	B 022 - G	Sem-Micro Analytical Balance	4	0	4	A B	A A	2-1-A	201(2台) 321(1台) 324(1台)	[illegible]
1,532,000	B 023 - G	Micro Analytical Balance	1	0	1	A	A	2-1-B	201	[illegible]
144,500	B 024 - G	Top-Pan Electro Analyt Balance (6Kg)	5			A	A	2-2-A	125(1台)	[illegible]
198,600	B 025 - G	Top-Pan Electro Analyt Balance (3,100	5			A	A	2-2-B	125(1台) 204(1台)	[illegible]
196,800	B 026 - G	Top-Pan Electronic Analytical	5			A	A	2-2-C	201(1台) 204(1台) 323(1台)	[illegible]
		balance (Semi-micro)								
174,000	B 027 - G	Platform Scale	3					2-3-A		
240,000	B 028 - G	Platform Scale	1					2-3-B		

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

[B: More than 100,000 Yen, Not exceeding 1.6 million Yen]

DATE : September 1993
SHEET NO : B-3

YEAR	NO.	ITEM	Q'TY SUPPLIED	Q'TY DISPOSED	Q'TY USABLE	UTILIZE	MAINT.	CODE NO.	LOCATION	REMARKS
1991 470,000	B 029 - G	Tabletop Type Centrifuge	3	0	3	A B	A A	2-4-B	204 (1台) 127(1台), 226(1台)	[illegible] [illegible]
715,000	B 030 - G	Tabletop Type High Speed Centrifuge	1					2-4-C		
300,000	B 031 - G	Centrifuge	1	0	1	B	A	2-4-D-(1)	204	[illegible]
205,000	B 032 - G	Centrifuge	1					2-4-D-(2)		
523,500	B 033 - G	Muffle Furnace (for Organic)	2					2-5	304 (1台)	
420,000	B 034 - G	Muffle Furnace (for Metal)	3	0	3	A B	A A	2-6	228(1台) 127(2台)	[illegible]
435,000	B 035 - G	Vacuum Tupe Constant Temperature Oven	1	0	1	C	B	2-7	226	[illegible]: 現在必要性認められない
310,000	B 036 - G	Blowing Type Constant Temperature Ove	3	0	3	B/A/A	A	2-8-A	127/203/227	[illegible]
500,000	B 037 - G	Middle Temperature Oven	2	0	2	A	A	2-8-B	125	[illegible]
776,000	B 038 - G	High Temperature Oven	2			B	A	2-8-C	304 (1)	[illegible]
210,000	B 039 - G	Oven for Glass Wares	3			A	A	2-9	203(1), 127(1)	[illegible]
260,000	B 040 - G	Tabletop Type Autoclave	1	0	1	A	A	2-10	203	[illegible]
370,000	B 041 - G	Incubator	2	0	2	A	A	2-12-A	203	〃
1,500,000	B 042 - G	CO2 Type Incubator	1	0	1	B	B	2-12-B	227	〃
317,000	B 043 - G	Low Temperature Incubator	3	0	3	B/A/B	A	2-12-C	127/203/227	〃
1,253,000	B 044 - G	Constant Low Tempertature and Relative Humidity Incubator	1	0	1	B	B	2-12-D	227	〃
420,000	B 045 - G	Ice Cooling Rotary Evaporator	15			A B	A A	2-14-A	125(1台), 204(4台), 225(2台) 203(1台), 227(1台)	[illegible] この内3台は使[illegible] [illegible]
370,000	B 046 - G	Rotary Evaporator	2	0	2	B	A	2-14-B	125(1台) 225(1台)	[illegible]
573,000	B 047 - G	Centrifuging Type Test Tube Evaporato	2			E	A	2-14-C	125 (1台)	[illegible]

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

[B: More than 100,000 Yen, Not exceeding 1.6 million Yen]

DATE : September 1993
SHEET NO : B-4

YEAR	NO.	ITEM	Q'TY SUPPLIED	Q'TY DISPOSED	Q'TY USABLE	UTILIZE	MAINT.	CODE NO.	LOCATION	REMARKS
420,000	B 048 - G	Test Tube Evaporator	1	0	1	E	A	2-15	225	洗面：現在テーマ外
332,000	B 049 - G	Fraction Collector	3	0	3	E	A	2-16-A	122	洗面：〃
276,000	B 050 - G	Simple Type Fraction Collector	3			B	A	2-16-B	227(1)	清剤
209,200	B 051 - G	Shaker (Middle)	5			B B	A A	2-17-A	127(3台) 324(1台)	清浄剤： 暗室
479,000	B 052 - G	Shaker (Middle)	6			A	A	2-17-B	125(1台), 225(1台), 204(2台) 洗面	
193,000	B 053 - G	Reciprocating Shaker	3					2-17-C		
450,500	B 054 - G	High Speed Homogenizer	6			A B	A A	2-19-A	125(1台), 225(1台) 洗面 226(1), 227(1) 清浄剤	
417,000	B 055 - G	Cup Type Homogenizer	3			A	A	2-19-B	125(1台), 225(1台) 洗面	
162,500	B 056 - G	Aluminium Block Heater	4			E	A	2-20-A	204(1台), 225(1台) 洗面	：現在テーマ外
125,700	B 057 - G	Heater for 250ml Kjeldahl Flask	9					2-20-B		
169,400	B 058 - G	Heater	9			E	A	2-20-C	204(1台)	洗面：現在テーマ外
119,000	B 059 - G	Mantle Heater	5			E B	A A	2-20-D	204(2台) 226(2台)	洗面、現在テーマ外 清浄剤
179,000	B 060 - G	Multi Magnetic Stirrer	4			E	A	2-22-B1	204(1台)	洗面：現在テーマ外
190,000	B 061 - G	Heating Type Magnetic Stirrer	15			E A	A A	2-22-C	204(1台), 225(1台), 125(2台) 323(1台)	洗面：現在テーマ外 暗室
162,000	B 062 - G	Constant Water Bath	6					2-23		
560,000	B 063 - G	Rotary Vacuum Pump	1					2-24-B-(1)		
800,000	B 064 - G	Roller Pump	1	0	1	A	A	2-25-A	226	清浄剤
159,000	B 065 - G	Water Bath (6x2)	6			A B/E	A A/D	2-27-A	125(1台), 204(2台) 洗面 127(1)/324(1台) 清浄剤・暗室 / 修理中	
290,000	B 066 - G	Water Bath (10x2)	6			A	A	2-27-B	203(1)	清浄剤
648,000	B 067 - G	Cooling Unit	1					2-27-D		
945,000	B 068 - G	Ultrasonic Cleaner	3			A B	A B	2-28-A	203 324(1)	清浄剤 暗室
1,023,000	B 069 - G	Separate Type Ultrasonic Generator	1					2-28-B		

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

DATE : September 199?
SHEET NO. : B-5

[B: More than 100,000 Yen, Not exceeding 1.6 million Yen]

YEAR	NO.	ITEM	Q'TY SUPPLIED	Q'TY DISPOSED	Q'TY USABLE	UTILIZE	MAINT.	CODE NO.	LOCATION	REMARKS
137,500	B 070 - G	Small Power Ultrasonic Generator	6			A B	A B	2-28-C	227(1) 324(1台)	[illegible]
237,000	B 071 - G	Ultrasonic Pipette Cleaner	7			A B	A B	2-29-A	203(2台), 227(1台) 324(1台)	[illegible]
604,000	B 072 - G	Ion Exchanger	3	0	3	B A	B A	2-30-A	127(1台) 228(1台) 324(1台)	[illegible]
370,000	B 073 - G	Water Distillation Unit (All Glass)	3			B	B	2-30-B	203(1)	
1,333,000	B 074 - G	Water Distillation Unit	2					2-30-C		
205,000	B 075 - G	Freezer	1	0	1	A	A	2-37-A	225	[illegible]
460,000	B 076 - G	Ice Maker	1	0	1	A	A	2-38	225	″
1,086,000	B 077 - G	V-type Blender	1	0	1	E	A	2-43	225	″ [illegible]
		INSTRUMENTS FOR WATER POLLUTION								
164,000	B 078 - G	Handy Type DO Meter	5					3-3-A		
360,000	B 079 - G	Laboratory Type DO Meter	5			B	A	3-3-B	228	[illegible]
469,000	B 080 - G	Tintmeter	1	0	1	E	A	3-6	228	[illegible]
560,000	B 081 - G	Turbidity Meter	4					3-7		
200,000	B 082 - G	Conductivity Meter	3			B	A	3-8-B	227 324(1)	[illegible]
721,000	B 083 - G	Salinity Meter	1	0	1	B	A	3-9	227	[illegible]
1,333,000	B 084 - G	Automatic Water Sample	1					3-11		
109,000	B 085 - G	Ekman Burge Grab Sampler	6					3-14-(1)		
193,000	B 086 - G	Core Sampler	2			B	A	3-15-(1)	226	[illegible]
585,000	B 087 - G	Water Velocity Meter	3					3-15-(2)		
377,000	B 088 - G	Echo Sounder	2					3-16		
416,000	B 089 - G	Jar Tester	1					3-17		

EQUIPMENT UTILIZATION & MAINTENANCE LIST (GRANT AID EQUIPMENT)

(B: more than 100,000 Yen, Not exceeding 1.6 million Yen)

DATE : September 199?
SHEET NO : B-6

YEAR	NO.	ITEM	Q'TY SUPPLIED	Q'TY DISPOSED	Q'TY USABLE	UTILIZE	MAINT.	CODE NO.	LOCATION	REMARKS
241,000	B 090 - G	Automatic Dispenser	2					3-18-(1)		
241,000	B 091 - G	Automatic Dispenser	1					3-18-(2)		
126,000	B 092 - G	Table Type Gas Stove	15					3-25		
296,500	B 093 - G	Brush Washer	6					3-27		
330,000	B 094 - G	Microorganism Collector Unit	3					3-30		
145,000	B 095 - G	Sextant	1	0	1	E	A	3-31	127	海洋：現在使用されていない
		INSTRUMENTS FOR AIR POLLUTION								
258,000	B 096 - G	Dust Monitor	1	0	1	E	C	4-6-(1)	305	大気：研修用
343,000	B 097 - G	High-Volume Air Sampler	2	0	2	A/E	A/C	4-7	屋上/305	大気： /研修用
166,000	B 098 - G	Low-Volume Air Sampler	2	0	2	B/E	B/D	4-8	323(2台)	大気： /予備
540,000	B 099 - G	Anderson Air Sampler	1	0	1	C	C	4-9	305	大気：現在データなし
100,000	B 100 - G	Deposit Guage Dust Jar	3	0	3	A/E/E	A/C/C	4-10	屋上/305/320	大気： /研修用/予備
1,112,000	B 101 - G	Combined Wind Vane and Anemograph	1	0	1	A	A	4-11-A	屋上	大気
137,000	B 102 - G	Portable Combined Wind Vane and Anemo	3	0	3	D(1)/E	C	4-11-B	323(2) 324(1)	大気：野外調査，2セット不足
135,000	B 103 - G	Pluviometer	3	0	3	A/E(2)	A/C(2)	4-13	屋上(1)/324(2)	大気 /予備
256,000	B 104 - G	Ultra-Violet Meter	1	0	1	A	A	4-14-(1)	屋上	大気
163,000	B 105 - G	Ultra-Violet Meter	1	0	1	A	A	4-14-(2)	〃	〃
415,000	B 106 - G	Portable Black Fume Monitor	3	0	3	D(1)/E	C	4-18	323(2) 324(1)	大気：自動車検査のデータ
445,000	B 107 - G	Stack Sampler	1	0	1	E	C	4-24-(1)	305	大気：研修用
1,160,000	B 108 - G	Stack Sampler	1	0	1	E	C	4-24-(2)	305	〃 : 〃
333,000	B 109 - G	Gas Pump	2	0	2	E	C	4-25	305	〃 : 〃
270,000	B 110 - G	Gas Meter	1	0	1	E	C	4-26	305	〃 : 〃

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

DATE : September 1993
SHEET NO : B-7

[B: More than 100,000 Yen, Not exceeding 1.6 million Yen]

YEAR	NO.	ITEM	Q'TY SUPPLIED	Q'TY DISPOSED	Q'TY USABLE	UTILIZE	MAINT.	CODE NO.	LOCATION	REMARKS
1991 135,000	B 111 - G	Rotar Meter	2	0	2	E	C	4-27	305	[illegible]
142,000	B 112 - G	Mass Flow Meter	2	0	2	E	C	4-28	323	[illegible]
144,000	B 113 - G	Air Purifier	6					4-29		
292,000	B 114 - G	Datalogger	6	0	6	E/A/E(4)	C/A/C(4)	4-31	305 (1), 323(1) 測定車(4)	[illegible]
570,000	B 115 - G	Osilloscope (Digital)	2	0	2	E	C	4-33	323, 311	[illegible]
1,000,000	B 116 - G	Air Pollution Monitoring Unit	1	0	1	D	C	4-35-(2)	323	[illegible]
1,058,000	B 117 - G	Column Oven	1	0	1			4-36	122	
130,000	B 118 - G	Handy Type Oxygen Meter	1					4-37		
496,000	B 119 - G	Portable HC/CO Analyzer for Exhaust Gas	3			E(1)/C(1)	C	4-38	323(1), 324(1)	[illegible]
		INSTRUMENTS FOR NOISE AND VIBRATION								
201,000	B 120 - G	Sound Level Meter	9	0	9	A	A	5-1	311	[illegible]
384,000	B 121 - G	Level Recorder	9	0	9	A	A	5-3	〃	〃
124,000	B 122 - G	Tape Recorder	9	0	9	B	A	5-4-A	〃	〃
385,000	B 123 - G	High Precision Sound Meter	3	0	3	B	A	5-5	〃	〃
140,000	B 124 - G	All Weather Screen	9	0	9	A	A	5-7	〃	〃
190,000	B 125 - G	Piston Phone	3	0	3	B	A	5-8	〃	〃
227,000	B 126 - G	Tacho Meter	1	0	1	B	A	5-9	〃	〃
1,250,000	B 127 - G	Noise Monitoring Unit	2	0	2	B	A	5-12	〃	〃
348,000	B 128 - G	3ch Vibration Meter	3	0	3	A	A	5-14	〃	〃
964,000	B 129 - G	Turnable Band Pass Filter	1	0	1	B	A	5-15	〃	〃

EQUIPMENT UTILIZATION & MAINTENANCE LIST (GRANT AID EQUIPMENT)

[B: More than 100,000 Yen, Not exceeding 1.6 million Yen]

DATE : September 1991
SHEET NO : B-8

YEAR	NO.	ITEM	Q'TY SUPPLIED	Q'TY DISPOSED	Q'TY USABLE	UTILIZE	MAINT	CODE NO.	LOCATION	REMARKS
1991 224,000	B 130 - G	Accelerometer Calibrator	1	0	1	B	A	5-16	311	白井
240,000	B 131 - G	Transit	1	0	1	B	A	5-18	229	白井
		INSTRUMENTS FOR SOLID WASTE & HAZARDOUS								
311,000	B 132 - G	Top-Pan Electronic Balance (12 Kg)	2	0	2	B	A	6-1-C	319	MC
641,000	B 133 - G	Milling Machine	1	0	1	D	B	6-2	屋外	〃 現在他の研究室に
423,000	B 134 - G	Sieve Shaker	1	0	1	D	B	6-3	[illegible]	〃 していため 利用なし
1,012,000	B 135 - G	Hot Air Oven	1	0	1	C	B	6-4	319	〃 〃
500,000	B 136 - G	Calorie Meter	2	0	2	B	A	6-5	304/319	〃
250,000	B 137 - G	Kjeldahl Condensation Unit	1	0	1	A	A	6-8	319	〃
243,000	B 138 - G	NH3 Distillation Unit	2	0	2	C	B	6-9	304/319	〃 現在、他の研究室に / [illegible] 利用なし
612,000	B 139 - G	Flash Point Measurement Unit	2	0	2	D	B	6-11	304/319	〃 〃
1,386,000	B 140 - G	Corrosion Tester	1	0	1	D	B	6-12	319	〃 〃
230,000	B 141 - G	Constant Bath for Vapor Pressure Test	1	0	1	D	B	6-13	319	〃 〃
		INSTRUMENTS FOR TOXIC SUBSTANCES								
619,000	B 142 - G	High Speed Homogenizer	3	2 (?)	1	A	A	7-5	125 (1台)	[illegible]: 二台 ?
576,000	B 143 - G	Bottle Cabinet	2	0	2	A	A	7-8	125 (1台) 225 (1台)	[illegible]
444,000	B 144 - G	All Glass Solvent Refine Unit	3	0	3	A	A	7-9	125 (1) ETHER RM (2)	〃
864,000	B 145 - G	Soxhlet Extractor	1	0	1	B	A	7-10	225	〃
336,000	B 146 - G	Spirits Oil Extraction Unit	1	0	1	E	A	7-11	225	〃 : 現在テーマ無し
134,000	B 147 - G	Spray Chamber for Thin Layer Chromatograp	1	0	1	E	A	7-12	204	〃 〃

EQUIPMENT UTILIZATION & MAINTENANCE LIST [GRANT AID EQUIPMENT]

[B: More than 100,000 Yen, Not exceeding 1.6 million Yen]

DATE : September 1993
SHEET NO : 8-9

YEAR	NO.	ITEM	Q'TY SUPPLIED	Q'TY DISPOSED	Q'TY USABLE	UTILIZE	MAINT	CODE NO.	LOCATION	REMARKS
1991		OTHER INSTRUMENTS FOR TRAINING								
778,150	B 148 - G	Personal Computer (Thai/English)	10					8-2-A		
382,400	B 149 - G	Personal Computer	5					8-2-B		
544,500	B 150 - G	Personal Computer OHP System	1					8-2-D		
190,400	B 151 - G	Over-Head Projector	5					8-7		
305,200	B 152 - G	Slide Projector	5					8-8		
552,000	B 153 - G	Camera	1					8-12-A		
324,000	B 154 - G	Under Water Camera	1					8-12-B		
216,000	B 155 - G	Camera (35mm Auto-type)	2					8-12-C		
296,000	B 156 - G	Printing Machine	1					8-15		
635,000	B 157 - G	Binding Machine	1					8-16		
336,000	B 158 - G	O.P.E. Set	1					8-24		
168,000	B 159 - G	Drafting Set	4					8-25		
120,000	B 160 - G	Locker for Reagents	10					8-26		
		WORKSHOP INSTRUMENTS								
1,200,000	B 161 - G	Shearing Machine	1					9-6		
198,000	B 162 - G	Drilling Machine	1					9-10		
549,000	B 163 - G	Power Hacksaw	1					9-11		
180,200	B 164 - G	Cricular Saw	1					9-14-(1)		
270,000	B 165 - G	Power Planner	1					9-14-(2)		

EQUIPMENT UTILIZATION & MAINTENANCE LIST (GRANT AID EQUIPMENT)

[B: More than 100,000 Yen, Not exceeding 1.6 million Yen]

DATE : September 1993
SHEET NO : B-10

YEAR	NO.	ITEM	Q'TY SUPPLIED	Q'TY DISPOSED	Q'TY USABLE	UTILIZE	MAINT.	CODE NO.	LOCATION	REMARKS
1991 652,000	B 166 - G	Pipe Threading Machine	1					9-15		
523,000	B 167 - G	Tool Set	1					9-19		
150,000	B 168 - G	Working Bench	2					9-21		

4. 技術協力供与機材160万円以上（専門家調べ）

（160万円以上の機材）　　平成５年９月現在

供与年度	番　号	機材名（メーカー名・型式）	価格	数量	利用（保管）場所	利用状況	管理状況	備考（特記事項）
平成　3	A31-携	ﾏｲｸﾛ ﾊﾞｽ　NISSAN Urban	2,230	1	ERTC	A	B	ERTC管理
	A32-携	ｼﾞｰﾌﾟ　NISSAN Patrol	3,217	1	ERTC	A	A	専門家ﾁｰﾑ 管理
	A33-供	ｶﾞｽｸﾛﾏﾄｸﾞﾗﾌ　GC-14APF　島津	2,993	1	301	B	A	ES-302　大気
	A34-供	ｶﾞｽｸﾛﾏﾄｸﾞﾗﾌ　GC-8APF　島津	1,956	1	301	C	B	ES-303　大気　ﾃｰﾏ 休止
	A35-供	ﾌﾟﾗｽﾏｰﾘｱｸﾀｰ　PR-31　ﾔﾏﾄ	4,674	1	228	B	B	ES-306　水質
平成　4	A41-供	廃棄物焼却炉　GH 500　ｲﾝｼﾅｰ	12,821	1	ERTC　屋外	E	C	ES-401　廃棄　基礎未了
	A42-供	ｻｲﾝﾉｲｽﾞ信号発生器 1049A　B&K	4,743	1	315	B	A	ES-409　騒音
	A43-供	ｹﾙﾀﾞｰ蒸留装置　21276 Labconco	2,281	2	1台/226,1台/304	D	B	ES-414-3水質　検討中

5. 技術協力供与機材10万円以上160万円未満（専門家調べ）

（10万円以上160万円未満の機材）　　平成５年９月現在

供与年度	番　号	機材名（ﾒｰｶｰ・規格・能力）	供与数	処分数	現有数	利用状況	管理状況	処分理由等
平成　2	201-携	ﾊﾟｰｿﾅﾙ･ｺﾝﾋﾟｭｰﾀｰ EPSON 286Book	1	0	1	A	A	106　渡辺
	202-携	ﾜｰﾄﾞ･ﾌﾟﾛｾｯｻｰ CanoWord α 5000L	1	0	1	A	A	206　副島
	203-携	ﾊﾟｰｿﾅﾙ･ｺﾝﾋﾟｭｰﾀｰ Toshiba DYNABOOK	1	0	1	E	D	106　坂田　液晶体ﾃﾞｨｽﾌﾟﾚｰ劣化
	204-携	ﾋﾞﾃﾞｵ･ｶﾒﾗ CCD V-700	1	0	1	C	A	206　大谷　調査時のみ使用
	205-携	AS TREATER AS-5	1	0	1	D	B	226　溝渕　現在ﾃｰﾏ なし
	206-携	ｺﾋﾟｰ 機 Canon NP 4835i	1	0	1	A	A	106　専門家ﾁｰﾑ
平成　3	301-携	振とう機 IkemotoRika40307	1	0	1	C	B	203　門上
	302-携	ｶﾞｽｻﾝﾌﾟﾗｰ MGS-5	1	0	1	E	B	301　坂田　現在ﾃｰﾏ なし
	303-携	ﾊﾟｰｿﾅﾙ･ｺﾝﾋﾟｭｰﾀｰ NEC PC980	1	0	1	A	A	206　大谷
	304-携	HYDRIDE VAPOR GENE	1	0	1	B	B	217　溝渕
	305-携	ﾊﾟｰｿﾅﾙ･ｺﾝﾋﾟｭｰﾀｰ	1	0	1	C	A	120　渡辺　GC/MS の一部
	306-携	ｲﾝﾀｰﾌｪｰｽ	1	0	1	C	A	120　渡辺　として使用
	307-供	紫外分光光度計 U-1100 日立製	2	0	2	E	B	302,ES-301 坂田　研修用・不使用
	308-供	ｶﾞｽｸﾛﾏﾄｸﾞﾗﾌ GC-8APT 島津	1	0	1	C	B	301,ES-304 坂田　ﾃｰﾏ 休止
	309-供	ﾐﾆｴｱｰﾎﾟﾝﾌﾟ MP-601T 柴田	7	0	7	A／E	B	324,ES-305-1 坂田、2 台使用不能
	310-供	ｶﾞｽﾒｰﾀ W-NK-1A 品川	5	0	5	A／C	A／B	3/324,2/305 ,ES-305-3 坂田、調査用
	311-供	液体窒素容器 10 lit 柴田	1	0	1	A	A	301,ES-305-11　坂田
	312-供	ｶﾞｽ用注射器 100 ml 信和	2	0	2	D	B	301,ES-305-18坂田　分析方法変更
	313-供	真空ﾎﾟﾝﾌﾟ RP800ZII 入江	1	0	1	D	B	228,ES-307 溝渕　現在ﾃｰﾏ なし
	314-供	活性汚泥処理ﾃｽﾄ ASS-10P 宮本	1	0	1	D	B	226,ES-308 溝渕　現在ﾃｰﾏ なし
	315-供	微量定量ﾎﾟﾝﾌﾟ M65K500 三陽理	2	0	2	C	B	226,ES-309 溝渕　現在ﾃｰﾏ なし

（１０万円以上１６０万円未満の機材）

供与年度	番　号	機材名（メーカー・規格・能力）	供与数	処分数	現有数	利用状況	管理状況	処分理由等
平成　3	316-供	ミニポンプ　MP301CFT　柴田	2	0	2	C	B	227,ES-310 門上　テーマ 検討中
	317-供	溶媒蒸留装置　5 lit　柴田	2	0	2	A	A	125,ES-316 渡辺
	318-供	Soxhle抽出器　3 lit　柴田	1	0	1	C	C	225,ES-317 渡辺　特殊分析項目
	319-供	赤外線水分計　F-2BII　ケット科	2	0	2	B	A	319,ES-324 門上
	320-供	溶出振とう試験装TA-20S　東洋計	1	0	1	C	B	319,ES-325 門上　テーマ 検討中
	321-供	遠心分離機　H-7000S　国産遠	1	0	1	D	B	228,ES-327 溝渕　現在テーマ なし
	322-供	ポータブルジャーテスター　TS-4　東洋計	2	0	2	D	B	226,ES-329 溝渕　現在テーマ なし
	323-供	ローラーポンプ　RP-LVS　古江サイ	2	0	2	C	B	319,ES-330 門上　テーマ 検討中
	324-供	騒音計　NL-01A　リオン	6	0	6	A	A	311,ES-331 白井
	325-供	レベルレコーダ　LR-04　リオン	6	0	6	A	A	311,ES-332 白井
	326-供	振動計　VM-51　リオン	6	0	6	A	A	311,ES-336 白井
	327-供	精密騒音計　2230　B&K	1	0	1	A	A	311,ES-337 白井
	328-供	キャリブレーター　4230　B&K	1	0	1	A	A	311,ES-338 白井
平成　4	401-携	COテスター　COM-4	1	0	1	C	B	319　門上　テーマ 検討中
	402-携	ガステスター　MD-701	1	0	1	C	B	319　門上　テーマ 検討中
	403-携	THERMISTOR THERM. PSW-15M	1	0	1	C	B	319　門上　テーマ 検討中
	404-携	コーン・ペネトレーター　DIK-5520	1	0	1	C	B	319　門上　テーマ 検討中
	405-携	プリンター　LBP-B406E	1	0	1	A	A	206　大谷
	406-携	PHメーター　HM-30V	3	0	3	A	A	324,227,319　溝渕・坂田
	407-携	WATER TEMP METER　UC-32/35	3	0	3	B	B	2台/319,1台/227　溝渕
	408-携	レコダー　EPR-121A	1	0	1	B	A	319　門上

（１０万円以上１６０万円未満の機材）

供与年度	番　号	機材名（ﾒｰｶｰ・規格・能力）	供与数	処分数	現有数	利用状況	管理状況	処　分　理　由　等
平成　4	409-携	ｺｱｰｻﾝﾌﾟﾗｰ	1	0	1	C	B	226　溝渕　　現在ﾃｰﾏ なし
	410-携	ｿﾙﾍﾞﾝﾄﾚｽｻﾝﾌﾟﾗｰ　島津	1	0	1	C	A	122　渡辺　　特殊分析項目
	411-携	ﾜｰﾄﾞﾌﾟﾛｾｯｻｰ　SWP-M100　三洋	1	0	1	A	A	ﾘｰﾀﾞｰ 室　奥野
	412-携	DAT ﾃﾞｰﾀｰﾚｺﾀﾞｰ　PC204	1	0	1	B	A	106　白井
平成　4	413-供	流速計　J-771　横河ｳｴ	1	0	1	B	A	226,ES-402 溝渕
	414-供	比重計　SG-120　東京百木	1	0	1	B	A	226,ES-403 溝渕
	415-供	ｶﾞｽ体積計　W-NK-Da-1a　品川	1	0	1	E	C	302,ES-404-2 坂田　　ﾃｰﾏ未着手
	416-供	ｿｯｸｽﾚｰ抽出器　柴田	1	0	1	E	C	302,ES-404-8 坂田　　ﾃｰﾏ未着手
	417-供	電導度計　CM-60S　東亜	1	0	1	B	A	324,ES-404-10　坂田
	418-供	標準ｶﾞｽ発生装置　PD-1B　ｶﾞｽﾃｯｸ	1	0	1	E	C	301,ES-404-11　坂田　　ﾃｰﾏ未着手
	419-供	ｲｵﾝｸﾛﾏﾄｸﾞﾗﾌ　LC-10AD　島津	3	0	3	A	A	2台/227,1台/323,ES-408-1 溝・坂
	420-供	ｵﾝﾗｲﾝ 脱気装置　島津	3	0	3	A	A	2台/227,1台/323,ES-408-3 溝・坂
	421-供	ﾏﾆｭｱﾙｲﾝｼﾞｪｸﾀｰ　7125　島津	3	0	3	A	A	2台/227,1台/323,ES-408-4 溝・坂
	422-供	ｶﾗﾑｵｰﾌﾞﾝ　CTO-10A　島津	3	0	3	A	A	2台/227,1台/323,ES-408-8 溝・坂
	423-供	電気伝導度　CDD-6A　島津	3	0	3	A	A	2台/227,1台/323,ES-408-9 溝・坂
	424-供	ﾃﾞｰﾀ 処理　C-R7A　島津	3	0	3	A	A	2台/227,1台/323,ES-408-(2溝・坂
	425-供	電子天秤　AEG-220　島津	2	0	2	E	C	302,ES-408-(4) 坂田　　ﾃｰﾏ未着手
	426-供	天秤台　島津	2	0	2	E	C	302,ES-408-(4) 坂田　　ﾃｰﾏ未着手
	427-供	ｵｼﾛｽｺｰﾌﾟ　54501A　YHP	1	0	1	B	A	315,ES-411 白井
	428-供	ﾌﾟﾘﾝﾀｰ　HP-2225	1	0	1	B	A	315,ES-411 白井
	429-供	DOﾒｰﾀｰ　UK2000　ｾﾝﾄﾗﾙ 科	1	0	1	A	A	227,ES-412 溝渕

（１０万円以上１６０万円未満の機材）

供与年度	番　号	機材名（ﾒｰｶｰ・規格・能力）	供与数	処分数	現有数	利用状況	管理状況	処　分　理　由　等
平成　4	430-供	振とう培養恒温水槽JMC-B603三田村	1	0	1	B	A	226,ES-413 溝渕
	431-供	振とう培養機　TC-15　トーマス	1	0	1	B	A	226,ES-414-1 溝渕
	432-供	ｵｰﾄｸﾚｰﾌﾞ　SP32　ﾔﾏﾄ科学	1	0	1	A	A	226,ES-414-2 溝渕
	433-供	ﾌﾞﾚﾝﾀﾞｰ　CB-6　第一理化	1	0	1	E	C	125,ES-418 渡辺　部品交換依頼中
	434-供	ｲﾝｼﾞｪｸｼｮﾝﾕﾆｯﾄ　島津	2	0	2	C	A	122,ES-420 渡辺　特殊分析項目
平成　5	501-携	水質・土壌分析計　HACH DR-2000	1	0	1	A	A	228　溝渕
	502-携	分解器ﾀﾞｲｼﾞｪｽﾀｰﾙ　23130-21	1	0	1	B	A	228　溝渕
	503-携	ﾊﾟｰｿﾅﾙ･ｺﾝﾋﾟｭｰﾀｰ NEC PC-9821	1	0	1	A	A	106　白井
	504-携	ﾌﾟﾘﾝﾀｰ　NEC PC-PR1000/4	1	0	1	A	A	106　白井
	505-携	無停電電源装置 ｵﾑﾛﾝ BU601L	1	0	1	A	A	106　白井
	506-携	COD REACTOR　N045600-00	1	0	1	B	A	227　松井