

REPORT SNO 3805-98

Status Report 1997

**S**urveillance of  
Water Quality in the  
Songhua River System in  
Heilongjiang Province,  
P.R. of China



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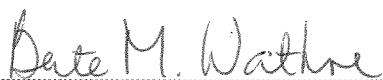
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**Abstract**

This report describes status of the project work performed during 1997 on "Surveillance of Water Quality in the Songhua River System in Heilongjiang Province, P.R. of China". A special report from the second project Workshop held in February/March 1997 gives in more detail the discussions and agreements from the second Workshop. A summary of the last project meeting held in Harbin, Heilongjiang 25 - 29 November 1997 is given in Annex C to this report.

4 keywords, Norwegian	4 keywords, English
1. ENSIS	1. ENSIS
2. Overvåking	2. Surveillance
3. Vassdrag	3. Water system
4. Luft	4. Air



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System in**

**Heilongjiang Province, P.R. of China**

**CHN 017**

## TABLE OF CONTENT

<b>1. ADMINISTRATION</b>	<b>4</b>
1.1 Background	4
1.2 Data collection	4
<b>2. ACTIVITIES IN THE SONGHUA RIVER CATCHMENT PER SECTOR</b>	<b>5</b>
<b>2.1 Industry</b>	<b>6</b>
2.1.1 Comments	6
2.1.2 Status	6
2.1.3 Line of Action	6
<b>2.2 Population</b>	<b>6</b>
2.2.1 Status	7
2.2.2 Line of Action	7
<b>2.3 Agriculture</b>	<b>7</b>
2.3.1 Status	7
2.3.2 Line of Action	7
<b>2.4 Land coverage</b>	<b>8</b>
2.4.1 Status	8
<b>2.5 User interests</b>	<b>8</b>
2.5.1 Status	8
<b>3. MONITORING DATA</b>	<b>8</b>
<b>3.1 Water chemistry</b>	<b>8</b>
3.1.1 Status	8
<b>3.2 Catchments-monitoring sites</b>	<b>9</b>
3.2.1 Status	9
<b>3.3 Water flow</b>	<b>9</b>
3.3.1 Comments	9
3.3.2 Status	10
<b>3.4 Biological Monitoring</b>	<b>10</b>
3.4.1 Status	10
<b>3.5 Quality Control Procedures</b>	<b>10</b>
3.5.1 Description	11
3.5.2 Status	11

<b>4. MONITORING EQUIPMENT</b>	<b>11</b>
4.1 Instrumentation evaluation and selection process	11
4.1.1 Status	12
4.2 Necessary equipment for all the on-line monitoring stations	12
<b>5. INFORMATION SYSTEM DEVELOPMENT</b>	<b>13</b>
5.1 Equipment	13
5.1.1 How things happened (or not happened)	13
5.2 Datahandling	14
5.2.1 Maps	14
5.2.2 Datamodel	14
5.2.3 Laboratory data	14
5.3 Modifying the ENSIS-system to Chinese use	14
<b>ANNEX A WATER QUALITY MONITORING LIST</b>	<b>15</b>
<b>ANNEX B THE NEED OF HARDWARE TO BE IN NORWAY AS PART OF THE PROJECT WORK</b>	<b>17</b>
<b>ANNEX C SUMMARY REPORT PROJECT MEETING IN HARBIN 25-29 NOVEMBER 1997</b>	<b>18</b>

## **Status report for 1997**

# **Surveillance of Water Quality in the Songhua River System in Heilongjiang Province, P.R. of China**

## **1. Administration**

### **1.1 Background**

The project "Surveillance of Water Quality in the Songhua River System in Heilongjiang Province, P.R. of China" was launched in November 1996, when an agreement was signed between the Norwegian Agency for Development Cooperation (NORAD) and The Chinese State Science and Technology Commission (SSTC). The year 1997 was the first full working year of the project. In this report, status for the project work by 31 December 1997 is described by the Norwegian project partners. The report could also provide input information to the Annual Report to be prepared by the Chinese partners of the project.

The NIVA report from the project meeting in Harbin 26 February - 3 March 1997 outlines important information on administrative matters, as well as a detailed workplan for the project (Report no 3641-97). Furthermore, this status report is also based on the outcome of the project Workshop in Harbin 17 - 22 November 1996 (NIVA Report of 17 February, 1997) and the project meeting in Harbin 25 - 29 November 1997 (Summary Report in Annex C).

A general feature as regards this project is that the administration activities have been considerably more time consuming than originally predicted, both before and after the Harbin 1997 meetings. This is due to project reorganising and budget revisions e.g. removal of the air monitoring part of the project.

An addendum to the contract between SSTC and NORAD was signed in September 1997. This addendum approved i.a. the final project budgets, listing also in more detail the allocations for 1997 and 1998. The 1997 budget should have been agreed in March 1997. This 6 months delay will also affect the further running of the project, i.e. the agreed workplan will need to be revised.

### **1.2 Data collection**

NIVA has taken stock of the information provided by HEPB. The following sections outline the original agreements between HEPB and NIVA as regards the information to be provided, the status as regards submission of information and further requirements.

NIVA considers that the general points outlined below are of importance for many of the sections described in this report:

1. The project would benefit greatly from having maps at a lower scale than the current 1: 1 000 000 maps e.g. 1:500 000.
2. The point sources need to be geo-referenced.
3. The 1996/1997 monitoring data should be made available as soon possible for the purpose of assessing the current water quality status and in the light of developing an abatement strategy.

The catchment area of the Songhua River is about 546 000 km<sup>2</sup>, out of which 310 000 km<sup>2</sup> are in the Heilongjiang province. Consequently it appears necessary to break down the information into smaller units (sub-divisions) in order to be able to develop an appropriate water management plan:

- description of current water quality in the Songhua River and its main tributaries (Nen Jia, Mudan Jia, Lalin Jia, Hulan Jia, Woken Jia, Tangwang Jia);
- identification of the most important pollution sources emanating from activities within agriculture, industry, as well as sewage;
- calculations of the pollution load from the identified pollution sources as regards the relevant parameters, at appropriate geographical areas;
- development of an abatement strategy on the basis of the before mentioned, taking into account any plans for improving the water quality agreed by relevant authorities in China

Hence, the work on the identified 'tasks' of the project are strongly related. This means for example that the tasks of 'Screening river water data. Quality Assurance' and 'Water discharge inventory' will need a successful outcome before the task 'Abatement strategy' can be fully developed.

H/EPB has identified oxygen depletion in the water bodies as the main environmental problem in the Songhua river. This occurs as a result of a considerable load of organic substances. In the development of an abatement strategy it should also be investigated whether there are other important environmental problems, such as problems linked to the load of nutrients from domestic and industrial sewage.

## **2. Activities in the Songhua river catchment per sector**

### **2.1 Industry**

H/EPB has agreed to provide paper copy maps for the preliminary presentation of industrial pollution sources, in total about 483 pollution sources.

H/EPB has agreed to provide data on discharges and other relevant information from the industrial plants in the catchment area of the Songhua river.

### **2.1.1 Comments**

483 industrial plants carry out measurements of their discharges/emissions, out of which 75 are responsible for 70% of the pollution load to water. 292 industrial plants have been identified as main pollution sources, out of which 217 have emissions only to air, 61 have emissions to air and discharges to water and 14 have discharges to water only. Less important sources to water and air (191) accounts for 30% of the total pollution load. In the period September 96-September 97, 680 small size plants were shut down due to inefficient technology and their relatively high energy consumption.

NIVA has emphasised that it is important that H/EPB provides a list of unique identification codes for each industrial plant. The industrial plants should be marked with this code on the map. In the case of big cities with several industrial plants, the industries should only be marked once, but indicated with a number range with detailed specification on the list (e.g. source 12-20). Furthermore the primary recipient for the industrial outlets should be indicated for each industrial plant.

### **2.1.2 Status**

78 industrial sites are indicated on a map (MAP 3). They are identified by a 8 digit code as follows:

- first digits-indicate the province, i.e. 23 is Heilongjiang
- digits 3 and 4 indicate the district, e.g. 05 is Shuangyashan city
- digits 5 and 6 indicate the type of industrial activity, e.g. 20 is tobacco processing
- digits 7 and 8 indicate the specific plant

The discharge of all industrial plants are analysed for COD, SS and pH. The rest of the analysis depend on the type of industry. NIVA has received information about discharges from about 80 main industrial plants for the year 1995 (see section Introduction as regards 1996/1997 data). The concentrations listed are based on 1-2 measurements per year. The information as regards the water flow is either based on water consumption or based on 1-2 measurements per year.

### **2.1.3 Line of Action**

On the basis of the information provided to date NIVA, in collaboration with H/EPB, will calculate the load of identified parameters from industrial plants (see also section 1.2). H/EPB has estimated that the current monitoring of industrial discharges will, for most parameters, provide the basis for estimating up to 70% of the total industrial load.

## **2.2 Population**

H/EPB has agreed to provide paper copy maps for the preliminary presentation of personal equivalents per administrative statistical unit and from each of the 11 main cities.

H/EPB has agreed to provide:

- data on the personal equivalents per statistical administrative units;
- which catchments/sub-catchments these administrative units drain into;



- data on the number of habitants in the 11 main cities located in the catchment area of the Songhua river.

### **2.2.1 Status**

NIVA has received information about:

- number of personal equivalents for each of 11 statistical administrative units (city and country population);
- water consumption, 'water from city', surface water, 'well water', sea water, 'repeated use of water', waste water discharge, waste water to be treated, waste water being treated, treated waste water which meets the standard, total waste water which meets the standard

### **2.2.2 Line of Action**

On the basis of the information provided to date NIVA, in collaboration with H/EPB, will calculate the organic load and the load of phosphorus and nitrogen (see also section 1.2). from domestic and industrial sewage. H/EPB has informed NIVA that it cannot provide information about domestic waste water discharges per sub-catchment, only per administrative district. The estimated average discharge of waste water is estimated to 75 litres per person and day.

## **2.3 Agriculture**

H/EPB has agreed to provide data on:

- the use of pesticides on the basis of the 11 sale statistics areas in the Song Hua Jia catchment;
- the use of artificial fertiliser on the basis of the said 11 sale statistics areas;
- agriculture coverage per administrative unit; and
- a list of the most commonly used pesticides, if available

### **2.3.1 Status**

NIVA has received information about:

- the use of fertiliser in 11 administrative areas;
- agriculture coverage in 11 administrative areas;
- type and coverage of cereals and vegetable production in 11 administrative areas;
- number of 7 different domestic animals in 11 administrative areas

H/EPH has informed NIVA that the information about the use of pesticides is being processed and will be sent to NIVA as soon as possible.

### **2.3.2 Line of Action**

On the basis of the information provided to date NIVA, in collaboration with H/EPB, will calculate the organic load and the load of phosphorus, nitrogen and pesticides from agriculture.

## **2.4 Land coverage**

H/EPB will provide paper copy maps for the preliminary presentation of the coverage of agricultural practices, mountain areas, forested areas etc. (land coverage).

### **2.4.1 Status**

No information seems to have been made available to date. It appears that the information is available on the basis of the 11 administrative units (see section 2.2). It is necessary to discuss this issue further with H/H/EPB in order to allow NIVA to make further progress. The issue of relevant maps also needs to be revisited (see also section 'introduction'). H/EPB has indicated that the data collection is ongoing.

## **2.5 User interests**

H/EPB will provide 1:500 000/1:1000 000 paper copy maps for the preliminary presentation of user interests.

### **2.5.1 Status**

NIVA has received a map (MAP 2), scale 1:100 000, where the following is indicated:

- Songhua river catchment
- three types of user interests

NIVA feels the need for more detailed discussions with HEPB as regards map presentations of information related to user interests. However, it appears that it will be difficult to gather more detailed information.

## **3. Monitoring data**

### **3.1 Water chemistry**

H/EPB has provided a complete data set from the Foxpro data base for the 1995 monitoring year (on floppy disk). NIVA has expressed the wish to obtain a copy of the data from the whole monitoring period, i.e. 1988-1996, in order to enable a better scientific assessment of the quality status of the Songhua river and its tributaries.

#### **3.1.1 Status**

NIVA has received the results of the monitoring carried out in 1995 at 46 monitoring sites. This issue can now be developed by NIVA with the aim of assessing:

- the water quality of the Songhua river and its tributaries;
- the current chemical monitoring programme and, if appropriate, suggest changes.

NIVA has also received one map, scale 1: 5000 000 on:

- water quality in the flooding season, 1995;
- water quality in the dry season, 1995.

It would nevertheless improve the outcome of these assessments if HEPB could provide: monitoring results for the period 1988-1995. See also section 'introduction' as regards the 1996 data. This view is not shared by H/EPB which thinks that the 1995 data is sufficient for the purpose of the current project.

### **3.2 Catchments-monitoring sites**

H/EPB will provide paper copy maps for the preliminary presentation of:

- river systems i.e. Songhua river and its main tributaries, lakes and the relevant catchment/sub-catchments
- monitoring stations (manual and automatic), including those where samples are taken for biological analysis, and hydrological monitoring stations

H/EPB has agreed to provide a map indicating:

- the 46 monitoring points on a 1:100000 map following an agreed code in order to allow the link to the monitoring data (monitoring station code);
- the 20 hydrological monitoring stations with a special indication of the 6 main stations;
- the biological monitoring stations;
- a table which indicates the monitoring station codes and gives an overview of responsible monitoring organisation.

#### **3.2.1 Status**

NIVA has received a map (MAP 1), scale 1:100 000, where the following is indicated:

- Songhua river catchment
- lakes and tributaries to the Songhua river
- monitoring stations

It will furthermore be necessary to indicate the catchments of the tributaries to the Songhua river- sub-catchments and to provide an overview of responsible monitoring organisations.

### **3.3 Water flow**

H/EPB has agreed to provide the relevant hydrological data on the water flow at the hydrological stations in 1995.

#### **3.3.1 Comments**

Following a request from NIVA, H/EPB has explained that the Heilongjiang Hydrological Agency is the competent authority as regards hydrological measurements. The measurement points in the Songhua River System do not concur with the monitoring points for the chemical and biological monitoring carried out by H/EPB. However, H/EPB is in principal willing to

co-ordinate such measurements on a regular basis during the chemical and biological monitoring campaigns, provided the relevant instruments are made available.

### **3.3.2 Status**

No information has been received. Water flow data from at least the year 1995 is necessary in order to allow NIVA to make further progress. This data is necessary i.a. in the pollution load calculations and the development of an abatement strategy. See also section 'introduction' as regards the 1996 data.

H/EPB has explained that it is possible to provide water flow data from about ten hydrological monitoring stations in the main stream of the Song Hua Jia. The data would be monthly averages for the years 1995 and 1996.

NIVA considers that it will be, in some cases, necessary to have access to water flow data on a daily to weekly basis, and is of the opinion that allowances for such data have been made in the agreed budget.

## **3.4 Biological Monitoring**

H/EPB has agreed to provide available data from 1995 and 1996 on:

- invertebrates (benthic organisms), 4 times a year, at 4 stations (2 stations in 1995) to be indicated specifically on a map;
- phytoplankton (glass in water for 2 weeks, composition, growth rate, biomass).

### **3.4.1 Status**

NIVA has received biomass data from the flooding season in the Nei river for 1996, i.e. data on zooplankton, phytoplankton and benthic organisms. The assessment of the biological monitoring data will be part of the more general assessment of the monitoring programme (see section 2.1), as well as the assessment of the water quality. This assessment would benefit from results from the availability of monitoring from 1995, as well as results from any biological monitoring having been carried out at other sites of the catchment than in the Nei river.

H/EPB has informed NIVA that the 1995 biomonitoring data will be made available as soon as possible.

## **3.5 Quality Control Procedures**

H/EPB has informed NIVA about:

- sampling instructions/methods/procedures; and
- methods/instructions/procedures at laboratories which have been adopted by H/EPB to increase the quality of the analysed parameters.

H/EPB will provide NIVA with a description in English of the above mentioned, based on the description below.

### **3.5.1 Description**

#### *Sampling:*

It is necessary to have collection procedures (method and equipment used), field treatment of samples (preservation) and procedures for transport and storage of samples.

#### *Laboratory:*

It is necessary to:

- carry out a comparison of results from currently used analytical methods with other analytical methods;
- carry out a comparison of results with other laboratories.
- explain whether certified reference material (for instance to calibrate instruments) is used;
- explain whether ionic balance estimates are used to check if sum cations is equal to sum anions.

### **3.5.2 Status**

No description of quality assurance procedures has been received. A description of quality assurance procedures, as originally agreed, is necessary.

H/EPB has informed NIVA that:

- in the H/EPB monitoring network there is also a quality assurance network;
- there is a QA/QC department within each monitoring station;
- the H/EMS is the head of the QA/QC network;
- according to the technical requirements of the monitoring to be carried out, the samples are to be sampled in the water column at a specific time;
- pH is to be measured *in situ*, the other parameters in the laboratory within a specific timeframe;
- there is no need for storage methods as the samples are analysed according to nationally defined methods.

## **4. Monitoring equipment**

### ***4.1 Instrumentation evaluation and selection process***

It has been NIVA's responsibility to find the best equipment for the water quality monitoring of the Songhua River, and much effort has been put into the evaluation and selection process. The evaluation process was build on NIVA's extensive experience in instrumentation for water quality assessment and the following guidelines were applied:

*Functional quality:* Selecting instruments that over time produce the most reliable data with minimal operator maintenance.

*Price:* Selecting instruments with a price/quality ratio that satisfies the project.

*Availability and Logistics:* Selecting instruments from manufacturers with an international network and reputation.

Products from the following producers were screened: ABB, GLI, YSI, Fox, Bran & Luebbe, Polymetron, Applicon and ISCO. An in depth evaluation was performed, and the results based on whether the instruments could meet the criteria set.

#### **4.1.1 Status**

This evaluation process was completed before the end of February 1997, i.e. before the March 1997 annual meeting between NORAD and SSTC in Beijing. NIVA's recommendations were presented before the said meeting.

As the agreement for the 1997 budgets was signed as late as in September 1997, the ordering process to follow the instrument selection was delayed. Due to climatic conditions, this delay is causing a one year delay in the installation of the water equipment in Heilongjiang. However, an instrument list is agreed and the ordering process has started.

Before ordering and installation of the agreed TOC instrument, satisfactory conditions for discharge of water from this instrument has to be described. Discharge water from the TOC instrument contains mercury, and needs special care and handling.

#### **4.2 Necessary equipment for all the on-line monitoring stations**

The instruments at each station should be placed in a housing meeting specific needs. Two pumps are normally necessary for taking river water into the instruments in the most secure way. To prevent sampling water from freezing during winter, the feeding pipeline has to be dug into the ground. The water outlet must be placed downstream the water intake or directly into the sewage system. Heating is needed inside the sampling room during winter time. The following specifications are given:

Feeding pipeline:	1" tubing, covered by soil for insulation
Filter:	Providing filtrated water to 500 $\mu$ m
Pumps:	Delivering approx. 15 l/min at the instrumentation level. It is suggested to use a pump with approx. 1,5 kg/cm <sup>2</sup>
Room temperature:	5 - 40° C
Tap water:	In-house for cleaning the instruments.
Electricity:	220 V AC, 50 Hz single phase preferably 10 - 16 amps. for the monitoring instruments and the water pump.
Telephone line:	To transfer the data

## **5. Information system development**

Due to the availability of IT equipment for the project at an early stage, the technical development is running almost according to plans. The development and adaptation of the ENSIS system is postponed with approximately 4 months.

After the workshop in November 1996, the technical development has followed the outline in the below listed activities' list:

### **5.1 Equipment**

NORGIT needs equipment to modify their applications, test the equipment to be sent to China, and for teaching our Chinese colleagues when they travel to Norway for training. There was in December 1996 an agreement between China and Norway about the data equipment necessary for this project.

The new hardware list for approval was sent December 1996. Technical discussions between NILU, NIVA and NORGIT were held. NORGIT also discussed the equipment with various companies. The issues of concern were in particular:

- How to manage the maintenance of the machines
- How to make use of the up link between the two installations sites in Harbin without having to copy the database.
- Discussions of the possible telecommunication solutions available
- Providing sufficient memory to manage large water-models
- Checking whether the air-models from NILU function on the platform

#### **5.1.1 How things happened (or not happened)**

NORGIT awaited replies on the above mentioned issues till January 1997. NORGIT also received offers from Compaq and Hewlett Packard in January 1997 with specific terms of payment in April 1997. Thereafter, NORGIT discussed the offers with our Chinese partner by sending several faxes from January 1997 up till January 1998.

NORGIT had to start the work with handling the data already received from our Chinese partner and therefore asked Danotec (Norwegian HP-distributor) to lend the equipment to NORGIT without any payment before April 1997.

This was done because the HP-offer was the best offer received. Neither NORGIT nor NIVA expect any problems with the contract, and understood that the early use of the equipment in China in July 1997 was a joint goal for our Chinese partner, NORGIT and NIVA. The problems encountered afterwards were totally unexpected.

In May 1997 NORGIT with the help of NIVA, had to pay the equipment from our funds. If this had not been done, the installation of the system for a minimum cost of 40.000 NOK would have been lost.

The equipment had to be operational in NORGIT by January 1997 to fulfil the project plan. NORGIT therefore brought the problems to the ENSIS group, and after discussions between NILU, NORGIT and NIVA an agreement was made with the Norwegian project leader that the alternative to return the equipment would represent 'a big set back' for the project. NORGIT would not have been able to work on the project for 2 months, and every activity would have to be postponed accordingly.

## **5.2 Datahandling**

### **5.2.1 Maps**

The development of the digital maps from the various paper maps received at the workshop started January 1997. The data was very specific (1:5000) for the Mundanjiang river. Some information from the Jiamusi was lacking. The digital map of the world for ESRI to fill in the lacking data was also received. The map became operational in August 1997.

### **5.2.2 Datamodel**

The datamodel had to be modified according to the Chinese requirements. This has been changed several times according to new information. The location of the stations were verified. NORGIT lack information on the geo reference of the discharge points and the catchment areas asked for at the Workshop in 1996. NORGIT therefore planned to place the MDACS-module (Manual Data Acquisition System) in China to fill in the lacking data. The system allows you to modify the data directly in the database.

### **5.2.3 Laboratory data**

NORGIT has used the examples from laboratory data received to modify the MDACS-module for Chinese use.

## **5.3 Modifying the ENSIS-system to Chinese use**

It was necessary to develop a Chinese/English multilingual module. NORGIT has made a technical description of the module and started the development in April 1997. The module had beta release in July 1997, according to the timeplan.

The telecommunication system to the science equipment has been developed and checked. The planning of the new activities, as a result of the new decision taken at the Workshop in November 1996 to have two installations in Harbin, and the actual management of data from the stations that were already fixed, started in January 1997. The modifications of the datamodel according to Chinese needs for the ENSIS-system, started in February 1997. The ADACS-system (Automated Data Acquisition system) was discussed with NIVA, and in an early face with NILU.

NORGIT and NIVA also had to make an evaluation of the consequences of the cut in the air-part of the project would have on NIVA and NORGIT work. This was made in August and September 1997.



## **Annex A - Water Quality Monitoring Instrument list**

The instruments marked in the instrument list with \* are already pre-ordered from Norway. This means that NIVA has informed the manufacturer that they will receive an order for this project. NIVA has asked them to prepare the contract in the name of HEPB, as the addendum states that the Chinese side shall sign the contract.

Because NIVA has negotiated prices for instruments both for the Heilongjiang and Yantai projects, NIVA has been able to obtain a very good price for this equipment. The pre-ordering was done in full agreement with NORAD. Even if the instruments are pre-ordered from Norway, they will be purchased by the Chinese side, as you (or SSTC ?) will be signing the contract.

The instruments not marked in the list are instruments left for you both to order and purchase locally. Some of them will be easy to buy in China, and unnecessary to bring from Norway. Some of them are equipment which are proposed by the Chinese side, and NIVA considers it is best to leave the ordering and purchasing to you. The important thing is to have all that is necessary for the monitoring activities. The extra IT-equipment has second priority, and can only be purchased if there is money left. Our comments are as follows:

\* = pre-ordered in Norway. Will be purchased by the Chinese side.  
(The manufacturer will send the necessary paper work).

\*\* = a special good offer from Poylmetron has been achieved.  
Confer with Mr. Arne Veil's fax on this topic

\*\*\* = Extra IT-equipment, not originally agreed. To be purchased only when there is money left after the originally agreed instruments are paid for.

## The List of Equipments for On-line Monitoring Stations for Songhuajiang River

21.name of product	22.item and specification	23.amount	25.trade country
Muti-function water quality system with autocleaning(incl. Turbidity;pH/Temp;Conductivity; Oxygen)	Polymetron	5	France
Ammonia analyser	Polymetron 8810	5	France
Nitrate analyser	Polymetron 8810	3	France
TOC analyser	Astro 1950	2	France
COD analyser	Applicon	1	Netherlands
Datalogger systems	Intab AAC-2	5	
ISCO water samplers	ISCO	3	
Batteries with charger&converter	Mascot	5	
Water level sensor(0-10m)	Dynamic	2	
Mobile telephone		1	
Compressor with tube	Polymetron	5	France
Spare parts	Polymetron		France
Trailer		1	
Filter (500 μm)		5	
Pump(6kg.30 l/min)		2	
Pump(1.5kg.20 l/min)		8	
Electric cable		1000m	
Rubber tubing(25-34mm)		1000m	
water tap		12	
Fittings		1	
Atomic Absorption		1	
Ion Chromatograph Spectrometer		3	
Monitoring boat		1	
Big screen		10	
Terminal computer		2	
Portable computer		1	
Plotter		1	
Laser printer		1	
HP 1600C printer		4	
Slide projector		1	
Cable		1000m	

Note: Computer equipments includes the equipments in the Ordrebekreftelse 2896-S10-K10, 2897-S10-K10, 2898-S10-K10, 2899-S10-K10.

For ⊗ - Pre-ordered from Norway

⊗⊗ - Special offer when delivered from Polymetron

⊗⊗⊗ - Second priority.

## **Annex B - The need of hardware to be in Norway as part of the project work**

"ENSIS version-2.0" is a complex system both regarding Hardware, Software, Instruments and Models. The installation and configuration of the system represents a difficult task, and the system has to be tested several times before delivery.

Therefore it is of great importance for the "ENSIS-group" to have access to the hardware in Norway. Since "ENSIS version-2.0" is a Client/Server solution, as a minimum one Server and one Client should be sent to Norway for each installation site.

The main reasons for why this is necessary are:

- The "ENSIS-group" will prefer to start working with new hardware 'from scratch'. This will be most efficient and give the best configuration
- The software will be adjusted to Chinese requirements, and the most efficient way of doing this is to install the software on the local hardware as soon as possible
- In Norway it will be easy to get access to necessary software if problems occur during installation.
- It will also be easy to get access to key-resources/personnel if problems occur during installation.
- Installation and testing in Norway will be more efficient. This is because it can be done by several people with different competence, and they can do other tasks while the installation/testing is running. If all installations were to take place in China, this would be done with fewer people and be more time consuming.
- In Norway installation and testing will be done by different people. This is an important task in the quality assurance of the system. In China this cannot be done to the same extent because of great costs related to travel, accommodation and reduced possibilities to use spare time during the testing process for work on other projects.
- Installation/testing in Norway is the basis for the existing project plan and budget. Installation in China would greatly enhance the project costs and new allocations for this activity would be needed. The project plan would have to be revised according to the extra time and costs consumption.
- The "Factory acceptance test" (FAT) can be accomplished at the factory, and can easily be compared to the basic "ENSIS" system. This is an important task in quality assurance of the system
- Part of the "Site acceptance test" (SAT) can be accomplished at the factory, and be more easily controlled. This is an important task in quality assurance of the system. A complete "SAT" must be done in China, but with greater confidence because the system (partly) already has been tested in Norway.
- Training of Chinese users is planned to take place in Norway. The most important reason for choosing this procedure, is that the training should be performed on the Chinese hard-/software to gain the highest quality of the training. It will also be more easy for the users to start their "ENSIS" work in China when they already are familiar with part of their own system from training in Norway.
- If installation should be carried out in China there would be no reason for the Chinese experts to go to Norway for training, and the possibilities for gaining additional knowledge from their travel would be lost.

**Annex C**

**SUMMARY REPORT**

**FROM**

**PROJECT MEETING IN HARBIN  
25-29 NOVEMBER 1997**

# Surveillance of Water Quality in the Songhua River System in Heilongjiang Province, P.R of China

CHN 17

## PROJECT MEETING IN HARBIN 25-29 NOVEMBER 1997

### SUMMARY REPORT

#### *Participation*

##### **HEPB**

Mr. Li Weixiang  
Mr. Liu Fengkai  
Mr. Guo Yuan  
Ms. Chen Aifeng  
Mr. Chen Jiahou  
Mr. Liu Jin  
Ms. Wu Yuehui  
Mr. Chen Young  
Mr Liu Sen  
Mr Li Ping  
Mr Shi Zhongtao

##### **NIVA**

Ms Bente M. Wathne  
Mr Stig A. Borgvang

#### *Agenda item 1: Opening*

Mr Li Weixiang opened the project meeting and welcomed the Norwegian visitors to Harbin. Thereafter the project group started its discussions, following the agenda for the meeting presented by HEPB.

## ***Agenda item 2: Project review***

Mr Guo Yuan outlined the following main events which had taken place since the project meeting in Harbin in March 1997:

- March 1997, when an agreement had been reached between SSTC and NORAD as regards changes in the original project plan, such as to discard the issue of air monitoring in the project; and to allocate the fund of this part of the project to water monitoring purposes.
- June 1997, during a visit of a Chinese delegation in Oslo (Norway), the Chinese and Norwegian partners had had a meeting in order to settle outstanding budgetary issues, resulting in the signing, by HEPB and NIVA, of the agreed project budget for phase 2 of the project (1997-1998);
- September 1997, an Addendum to the Agreement between SSTC and NORAD had been signed. This Addendum determined and approved the budget for 1997.
- The six months delay due to negotiations between SSTC and NORAD which had affected the running of the project and resulted in revisions of the previously agreed workplan.

It was furthermore explained that SSTC and NORAD were still discussing procedures as regards the purchase of equipment.

## ***Agenda item 3: Status as regards data and information collection***

NIVA stated that the 'Draft status report for the project Surveillance of Water Quality in the Songhua River, Heilongjiang Province, China' had been submitted to HEPB for comments mid-October. It was the intention to finalise the report after the current project meeting and to submit the report to NORAD and SSTC.

NIVA highlighted some important points, viz:

- the project would benefit greatly from having maps at a lower scale than the current 1:1000000 maps e.g. 1:500 000;
- the point sources need to be geo-referenced;
- the 1996 monitoring data should be made available as soon possible for the purpose of assessing the current water quality status and in the light of developing an abatement strategy.

Regarding the maps, HEPB explained that maps at a lower scale could not be made available due to relevant national Chinese rules. Regarding the geo-references, HEPB considered that it would probably be possible during the 'map digitalising part' of the project, provided that necessary funding was available.

The Status Report on the project was updated and revised according to more explicit information and new submission of data by HEPB. It will be finalised in December 1997. Further data submissions will be made according to the 1998 Work Plan.

#### ***Agenda item 4: ENSIS***

NIVA explained that version 2.0 of ENSIS was currently being tested. The installation date for the first part of the Chinese version of ENSIS, i.e. input of manual data, M-DACS, was depending on the procedure for delivering the equipment.

#### ***Agenda item 5: Water quality instrument installations***

The installation of the water quality instruments were discussed. Both NIVA and HEPB considered that the installation could not take place before the second half of May 98 due to climate conditions.

HEPB and NIVA agreed on the programme for the installation of the instruments and the implementation of the training programme. The main points were as follows:

- the training programme in Harbin would take place within a three days period in May-June 1998;
- five people from each of the monitoring stations would attend the training programme in Harbin;
- the monitoring station in Harbin would be established before the four others in order to be used in the training programme;
- each monitoring station would be staffed as follows:
  - operation of the instruments- two persons
  - maintenance of the instruments-one person
  - computing-one person
  - managing-one person
- HEPB would be responsible for transporting the monitoring equipment to the monitoring stations as soon as it has arrived in Harbin;
- there will be local training activities during installation of the equipment at the monitoring sites

#### ***Agenda item 6: Abatement Strategy***

The issue of abatement and abatement strategy was discussed. Both parties recognised the importance of this part of the project. However, it was pointed to the complexity of the tasks due to the large catchment area in question (310 000 km<sup>2</sup>), and the problems encountered to collect the necessary data.

NIVA pointed out that the work on the identified 'tasks' of the project were strongly related. This meant for example that the tasks of 'Screening river water quality data. Quality Assurance' and 'Water discharge inventory' would need a successful outcome before the task 'Abatement strategy' could be fully developed.

## **Agenda Item 7: Finances**

### **7.1 Budget for phase 2**

According to the comments from SSTC on the budget of the project, HEPB stressed that the Appendix II, Budget for Surveillance of Water Quality on the Songhua River, in the agreement between SSTC and NORAD was still valid. However, it was HEPB's view that the funds originally allocated for the air project should be used to purchase equipment for water monitoring purposes as SSTC had dropped the air part of the project in order to enable HEPB to improve its water monitoring capacity.

NIVA explained that the 'air part' of the project had been discarded because it was felt that it was necessary to put more emphasis and money on the 'water part' of the project. NIVA therefore held the view that the development of an Abatement Strategy was an essential part of the 'water part' of the project. In view of the complexity of developing such an Abatement Strategy for a catchment area of 310 000 km<sup>2</sup>, the amount originally allocated for such a development was highly insufficient.

HEPB explained that SSTC had not accepted the phase 2 budget provisions related to Abatement Strategy (430 000 NOK) in the budget for 1998, although it had been signed by HEPB and NIVA in Oslo in June 1997. The reason for SSTC's refusal to accept the budget provisions for the Abatement Strategy part (430 000 NOK) of the budget for 1998 was that, in SSTC's view, that amount of the original budget was originally allocated to air monitoring, and should therefore not be used for technical aid purposes. SSTC held the view that the above mentioned funds should be used to improve the water quality monitoring capacity of the Heilongjiang province. HEPB agreed with the comments from SSTC on this issue.

HEPB considered that the 250 000 NOK administration fee to SSTC should be used to enhance the water quality monitoring capacity of Heilongjiang province. HEPB stated that originally such funds were allocated for purchasing monitoring instruments. HEPB therefore expressed a wish to purchase 2 monitoring boats (120 000 NOK for each) and a Mass Spectrophotometer (440 000 NOK) with the adjustable funds mentioned above.

NIVA expressed the view that a successful development of the abatement strategy would be enhanced considerably by increasing the resources allocated for this task, see the agreed budget between HEPB and NIVA and the comments above related to the development of an Abatement Strategy.

Both HEPB and NIVA would like to develop further the Pollution Abatement Strategy by allocating funds from the technical aid expenditures for the deleted Air part of the project.

It was agreed to communicate all the above mentioned comments concerning the 1998 budget to SSTC and NORAD for further consideration..



## **7.2 Invoices**

NIVA's remuneration for 1997 was discussed on the basis of the invoice sent to HEPB by NIVA on 11 November 1997. NIVA had as yet not received any money for the work carried out to date in 1997.

HEPB explained that SSTC had firmly requested that the invoice be much more explicit in order to show all details. NIVA explained that the invoice had been developed according to normal NORAD requirements. NIVA would therefore seek NORAD's advise on this issue.

### ***Agenda item 8: Workplan for 1998***

As two major issues for the further development of the project remained unsolved at the end of the Project Meeting, NIVA expressed the view that the agreement on the Workplan for 1998 would need to be postponed until these issues were solved (see Agenda Item 7). Nevertheless, NIVA submitted a tentative Workplan which could be the basis for discussions when the issues under Agenda Item 7 were solved (see Annex).

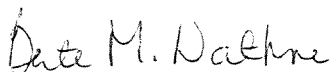
## *Participation of the Government of the Heilongjiang Province*

At the final day of the Project meeting, the Vice Governor of the Heilongjiang Province, Ms. Ma Shujie received NIVA's representatives at a banquet, where also the Director of Heilongjiang SSTC, Mr. He Lian and the Deputy Director of Heilongjiang SSTC, Mr. Dong Ruilin, were present. They expressed the support of the Heilongjiang Provincial Government to the project as well as to any future co-operative projects between China and Norway.

Both the representatives from HEPB and NIVA expressed the view that this report was a true reflection of the outcome of the Project Meeting. The report was therefore duly signed.

Harbin 29 November 1997

For NIVA



Ms Bente M. Wathne

For HEPB



Mr Guo Yuan

## ANNEX

### Major Project Activities for 1998

Activity	Date
Delivery of agreed data for water flow and catchment information (see Status Report of December 97)	By the end of December, 1997
Workshop in Harbin <ul style="list-style-type: none"><li>• Abatement strategy planning</li><li>• Project status</li><li>• Description of the water model</li><li>• Installation of the first part of the Chinese version of ENSIS (input of manual data, M-DACS)</li></ul>	March, 1998
Adaptation and testing of the Chinese version of ENSIS in Norway	March-July, 1998
Completion of preparations for installation of water quality instruments	May 1998
Installation of, and training on water quality instruments	May-June, 1998
Training of personnel from Heilongjiang in Norway	August, 1998
Modification of ENSIS	September - October, 1998
Workshop in Harbin <ul style="list-style-type: none"><li>• Installation of the first Chinese version of ENSIS</li><li>• Training in the use of the Chinese version of ENSIS</li><li>• Abatement Strategy Planning</li></ul>	October - November, 1998

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