JAPAN INTERNATIONAL COOPERATION AGENCY
EAST TIMOR TRANSITIONAL ADMINISTRATION

THE STUDY
ON
URGENT IMPROVEMENT PROJECT
FOR
WATER SUPPLY SYSTEM
IN
EAST TIMOR

FINAL REPORT

VolumeⅢ: APPENDIX

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THE STUDY
ON
URGENT IMPROVEMENT PROJECT
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IN
EAST TIMOR

FINAL REPORT

CONSTITUENT VOLUMES

VOLUME Ⅰ **SUMMARY REPORT**

VOLUME Ⅱ **MAIN REPORT**

VOLUME Ⅲ **APPENDIX**

VOLUME Ⅳ **QUICK PROJECT IMPLEMENTATION MANUAL**

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A.1 General

Due to the unavailability of an organized and complete laboratory in East Timor, the Lahane Water Treatment Plant Laboratory (henceforth lab), is located in the southern part of Dili was used extensively in the analysis of water samples collected from the different sampling points in East Timor. Due to the limited testing capacity of the existing lab, the JICA Study Team, as much as possible furnished the lab by providing lab equipment, apparatus, glassware and chemical reagents to be used for the water quality analysis. Refurbishment and improvement to the lab especially on the apparatus and chemical reagents are necessary to carry out accurate analysis of the water samples. As much as possible, the parameters that are significant in the investigation of the portability of the water supply in 15 towns of East Timor will be done during the study.

Due to the limited resources, a complete analysis of the water samples in terms of its chemical characteristics is not possible in this period. However, important and significant parameters outlined in the ***Guidelines for drinking water quality in East Timor*** (refer to the following paragraph **A.4**) were carried out in most cases. The JICA Study Team has tried its best to upgrade and improve the existing lab that would be used exclusively for the Study but would eventually be became very helpful in the operation of the water supply system in East Timor. Monitoring of the water quality is tantamount to the protection of the health of water consumers. In addition to this, the methods used for the treatment of water are related to the contaminants in a given water supply. Thus, the evaluation of the water quality from raw water sources was carried out for the above purpose.

The investigation done on the water samples and the explanations on the water quality evaluation are the representative of both the rainy and dry season in East Timor. The results of these investigations are shown in **Tables A.6-1~15** and **A.7**.

A.2 Method of Investigation

Special care on sampling collection and analysis of the water samples were observed during the investigation. Ideally, it is necessary to measure all the parameters of the guidelines for drinking water quality in order to check the portability of the existing water sources in East Timor. However, with the limited resources important and significant characteristics of all the water samples were analyzed, which include the parameters such as, total coliform, feacal coliform, turbidity, pH, electrical conductivity, salinity, TDS, nitrogen-ammonia, and fluoride. Other characteristics such as total alkalinity, total hardness, calcium-hardness, nitrate, nitrite, iron, manganese, sulfate and residual chlorine were analyzed in the lab on a case-to-case basis based on their necessity and purpose. On the rainy season investigation, coliforms were identified using slip of paper for only performing the qualitative test. In order to get further information of coliforms, Membrane Filter (MF) method has been introduced for the coliform test since dry season investigation. It can count the number of coliforms' colonies on the disposal petri dish using the presumptive culture media. The colony count result can be provided how much

bacteriological contamination is in each sample. **Table A.1** shows the criteria of selection for the parameters to be measured.

Table A.1 CRITERIA OF SELECTION FOR WATER QUALITY ANALYSIS

Type of Sample	Parameters	Criteria for Selection
All samples	Total & feacal coliform count, turbidity, pH, electrical conductivity, salinity, TDS, temperature, nitrogen-ammonia (NH_3-N) and fluoride (F^-)	Items are necessary to determine the portability and safety of drinking water to minimize health risks.
Water source (Raw water)	Alkalinity	A water characteristic necessary for the water treatment selection and processing.
Treated water (Chlorinated)	Residual Chlorine	To check the effectively of the chlorine dosage.
Representative samples from residential and public taps	Total alkalinity, total hardness, calcium-hardness, nitrate (NO_3), nitrite (NO_2), total iron (Fe), manganese (Mn) and sulfate (SO_4^{2-})	To monitor the quality of the water used by the consumers and to investigate excessive concentration of the constituents that may cause harmful effects on the distribution system and the consuming public.

Location of sampling points were strategically chosen from water sources (for raw water), reservoirs (for treated water), distribution system such as in household and public taps of schools, residences, market area, hospital and other public places of the study area. The transportation of samples from the each sampling site to the lab is considered that use a cooler box to avoid the intense heat and scorching sunlight, because inappropriate preserved condition makes frequently bringing about the margin of errors for several parameters.

The water samples taken from shallow wells, hand-pump wells and other water supply sources, e.g. bamboo pipeline system and water outcrop from the ground were not analyzed except those collected from Manatuto. On-site water quality analysis was performed to include the measurement of conductivity, salinity, TDS, temperature, pH and turbidity. Bacteriological quantative test for total Coliform was cultivated at 37 ℃ and for feacal Coliform at 44 ℃ for 22-24 hours using an incubator. The rest of the parameters were analyzed in the lab using a spectrophotometer (Hach DR-2010). Presently, Water & Sanitation Service (WSS), East Timor Transitional Administrator (ETTA) has already purchased an upper model of spectrophotometer (Hach DR-4000U). It is, however, not used for this investigation in order to be consistent with previous examination condition. **Table A.2** indicates a detailed explanation of the method of analysis.

Table A.2 METHOD OF WATER QUALITY ANALYSIS

Parameter	Method	Equipment	Remarks
pH	Colorimetric Method	Comparator (Phenol red indicator)	
Residual Chlorine	DPD Colorimetric Method	Comparator	
Conductivity	Electrode Metering	Conductivity Meter Hach sens **ion 5**	
TDS	Electrode Metering	Conductivity Meter Hach sens **ion 5**	
Salinity	Electrode Metering	Conductivity Meter Hach sens **ion 5**	
Temperature	Electrode Metering	Conductivity Meter Hach sens **ion 5**	
Turbidity	Nephelometric Method	Turbidimeter Hach Model 2100P	Specified by the USEPA
$NH_3 - N$	Salicylate Method	Spectrophotometer Hach DR-2010	
Fluoride (F^-)	SPANDS Method	Spectrophotometer Hach DR-2010	
Alkalinity	Titration Method (Neutralization)	Digital Titrator Hach Model 16900	
Total Hardness	EDTA Titrimetric Method	Digital Titrator Hach Model 16900	
Calcium Hardness	EDTA Titrimetric Method	Digital Titrator Hach Model 16900	
$NO_3 - N$	Cadmium Reduction Method	Spectrophotometer Hach DR-2010	
$NO_2 - N$	Diazotization Method	Spectrophotometer Hach DR-2010	
Iron (Fe)	Ferro Ver Method	Spectrophotometer Hach DR-2010	
Manganese (Mn)	Periodate Oxidation Method	Spectrophotometer Hach DR-2010	
Sulfate (SO_4^{2-})	Sulfa Ver 4 Method	Spectrophotometer Hach DR-2010	Specified by the USEPA
Total and Feacal Coliform Count	Membrane Filtration Method	Membrane Filtration Method	

A.3 Sampling Schedule and Locations

The water quality investigations for the rainy season started in March until April and for the dry season in October until November. Due to the unavailability of the chemical reagents, the first day of the schedule was allocated to training of local staff on proper handling procedures and analysis of the water samples, which forms part of the counterpart training and technology transfer. In the phase-II study period, the investigation was carried out in entirety cooperation with WSS.

The Study Team collected over 130 samples for rainy season and 150 samples for dry season representing the study area. Separate samples (about 50) were also collected in schools of Dili and Aileu, which form part of the promotion on water supply and sanitation in selected primary schools in the peri-urban and rural areas of East Timor. Most of the schools visited have no water supply facilities and a number of these schools were closed down primarily due to the post-referendum violence. Nevertheless, the Study Team was able to collect water samples to represent the schools of Dili and Aileu. The sampling schedule and location of sampling points is shown in **Table A.3-1** and **A.3-2**

Table A.3-1 SAMPLING SCHEDULE AND ACTIVITY FOR RAINY SEASON

Date	Day	Activity Grouping		Sampling Area	No. of Samples	Station
		A	B			
03/13	Mon	Training	Training	Dili	-	Dili
03/14	Tue	Sampling	Sampling	Dili	19	Dili
03/15	Wed	Sampling	Sampling	Liquica	4	Dili
03/16	Thu	Sampling	Sampling	Liquica	4	Dili
03/17	Fri	Sampling	Sampling	Manatuto	8	Dili
03/18	Sat	Sampling	Analysis	Maubisse + Aileu	5 + 7	Dili
03/19	Sun					
03/20	Mon	Analysis	Sampling	Baucau	11	Baucau
03/21	Tue	Sampling	Analysis	Ermera + Gleno	7 + 5	Dili
03/22	Wed	Analysis	Sampling	Viqueque	8	Baucau
03/23	Thu	Analysis	Sampling	Los Palos	5	Baucau
03/24	Fri	Sampling	Analysis	Atauro	5	Dili
03/25	Sat	Analysis	Analysis	Atauro	-	Dili
03/26	Sun					
03/27	Mon	Sampling	Analysis	Same	8	Ainaro
03/28	Tue	Sampling	Analysis	Ainaro	8	Ainaro
03/29	Wed	Analysis	Sampling	Suai	8	Suai
03/30	Thu	Analysis	Sampling	Suai	-	Suai
03/31	Fri	Analysis	Sampling	Maliana	8	Maliana
04/01	Sat	Analysis	Sampling	Maliana + Dili	-	Dili
04/02	Sun					
04/03	Mon	Sampling	Analysis	Schools @ Dili	10	Dili
04/04	Tue	Analysis	Sampling	Schools @ Dili	15	Dili
04/05	Wed	Sampling	Analysis	Schools @ Dili	10	Dili
04/06	Thu	Analysis	Sampling	Schools @ Aileu	6	Dili
04/07	Fri	Sampling	Analysis	Schools @ Aileu	5	Dili
04/08	Sat	Evaluation	Evaluation	Data Processing	-	Dili

Table A.3-2 SAMPLING SCHEDULE AND ACTIVITY FOR DRY SEASON

Date	Day	Activity	Sampling Area	No. of Samples	Station
10/12	Thu	Sampling, Analysis	Dili	16	Dili
10/13	Fri	Sampling, Analysis	Dili	8	Dili
10/14	Sat	Analysis	Dili		
10/15	Sun				
10/16	Mon	Sampling, Analysis	Liquica	9	Dili
10/17	Tue	Sampling, Analysis	Liquica	4	Dili
10/18	Wed	Sampling	Manatuto	10	Dili
10/19	Thu	Analysis	Manatuto		Dili
10/20	Fri	Sampling	Maubisse	8	Dili
10/21	Sat	Analysis	Maubisse		
10/22	Sun				
10/23	Mon	Sampling	Baucau	9	Dili
10/24	Tue	Analysis	Baucau		Dili
10/25	Wed	Sampling	Ailue	8	Dili
10/26	Thu	Analysis	Ailue		Dili
10/27	Fri	Sampling	Atauro	6	Dili
10/28	Sat	Analysis	Atauro		
10/29	Sun				
10/30	Mon	Sampling	Los Palos	7	Los Palos
10/31	Tue	Sampling	Los Palos	3	Dili
11/01	Wed	Analysis	Los Palos		
11/02	Thu	Sampling	Viqueque	9	
11/03	Fri	Sampling	Ailue	2	Dili
11/04	Sat	Analysis	Viqueque, Ailue		
11/05	Sun				
11/06	Mon	Sampling	Same	10	Dili
11/07	Tue	Analysis	Same		Dili
11/08	Wed	Sampling	Ainaro	8	Dili
11/09	Thu	Analysis	Ainaro		Dili
11/10	Fri	Sampling, Analysis	Ermera, Gleno	5+5	Dili
11/11	Sat	Analysis	Ermera, Gleno		
11/12	Sun				
11/13	Mon	Sampling	Suai	7	Suai
11/14	Tue	Sampling, Analysis	Suai	3	Dili
11/15	Wed	Analysis	Suai		Dili
11/16	Thu	Sampling	Maliana	8	Dili
11/17	Fri	Analysis	Maliana		Dili
11/18	Sat	Evaluation	Data Processing		

A.4 Water Quality Standards

The quality of the water is assessed in terms of its physical, chemical, and biological characteristics for its intended use. For this purpose, the values of the water quality parameters measured have to be assessed in terms of the suitability of the water for its intended use as public water supply. Guidelines or limiting values has to be set or followed for the concentrations of various constituents present in the water to make it acceptable for human consumption. However, with the absence of an established water quality standard in East Timor the WHO Standards for Drinking Water was used in the phase-I Study. Presently, the Guidelines for Drinking Water Quality in East Timor as presented in **Table A.4** were already enacted by WSS on August 31, 2000. Therefore, the new guidelines were adopted in the phase-II investigation. Moreover, regarding further more details of the Guidelines, an official document issued by ETTA and a table sheet of comparison of guideline values are attached as **Ref. A.1** and **Table A.5**.

Table A.4 GUIDELINES FOR DRINKING WATER QUALITY IN EAST TIMOR

Parameter	Unit	Guideline Value
A. Microbiological Quality		
Faecal Coliform	CFU/100 ml	0
Coliform Organisms	CFU/100 ml	0
B. Inorganic Constituents		
Fluoride (F)	mg/l	1.5
Nitrate (NO_3 as N)	mg/l	10
Nitrite (NO_2 as N)	mg/l	1.0
Ammonia (NH_3 as N)	mg/l	1.5
C. Aesthetic Quality		
Residual Chlorine (Cl)	mg/l	<5
Total Hardness	mg/l (as $CaCO_3$)	<200
Iron (Fe)	mg/l	NS/0.3
Manganese (Mn)	mg/l	0.5
pH		6.5 to 8.5
Total Dissolved Solids, (TDS)	mg/l	<1000
Sulfate (SO_4)	mg/l	250
Turbidity	NTU	<5

NS: not set

Ref. A.1

UNITED NATIONS **NATIONS UNIES**

ETTA

East Timor Transitional Administration

Water and Sanitation Service

Guideline number 04

GUIDELINES FOR DRINKING WATER QUALITY IN EAST TIMOR

1. General

1.1 ***The Guidelines for Drinking Water Quality in East Timor,*** hereafter ***The Guidelines***, has been drafted based on **Guidelines for Drinking Water Quality** (WHO, 1993), other guidelines in nearby countries, and various factors of natural, social and economic aspects in East Timor.

1.2 For the purpose of ***The Guidelines,*** drinking water is defined as water intended primarily for human consumption and preparation of food and beverages. ***The Guidelines*** does not cover bottled or packaged water and recreational use of water.

1.3 ***The Guidelines*** are recommended for adoption of any public or private drinking water enterprise in East Timor. Agencies working on water supply in East Timor should adopt ***The Guidelines*** when designing a project's target water quality.

1.4 ***The Guidelines*** provide guideline value and testing methods on a certain range of microbiological indicators, chemical substances and physical properties of water quality, to ensure the drinking water does not pose any significant health risk to consumers and is aesthetically acceptable.

1.5 Recommended testing methods have been listed in ***The Guidelines,*** however APHA Standard Methods are also acceptable when the recommended methods are not available**.**

1.6 ***The Guidelines*** present minimum requirements for drinking water quality, both aesthetically and from a public health viewpoint. Agencies should adopt a "best practice" approach to maintain the supply of water at the highest practicable quality. ***The Guidelines*** should never be seen as a license to degrade the water quality to the guideline level.

1.7 ***The Guidelines*** will be reviewed and modified as necessary from time to time.

2. Microbiological Aspect

2.1 Total Coliform and faecal Coliform counts are recommended as indicators to measure microbiological quality of water. The guideline values are listed in the Table 1.

Table 1 ***Guideline values***

Organism	*Unit*	*Guideline value*	*Testing Method*
Urban centers			
Total coliforms	CFU/100 mL	0	Membrane filtration
Faecal coliforms	CFU/100 mL	0	Membrane filtration
Rural communities			
Total coliforms	CFU/100 mL	10	Membrane filtration
Faecal coliforms	CFU/100 mL	0	Membrane filtration

2.2 The guideline values of total coliforms for rural communities set out in *Table 1* should also comply with following:

- *Coliforms should not be present in 3 consecutive samples*
- *If contamination is frequent, treatment is not available and sanitation protection can not be improved, an alternative source should be found*

3. Physical Properties

3.1 In general, physical characteristics of water are not of direct public health concern, but they do affect aesthetic quality of the water. They can also indicate whether corrosion or encrustation is likely to be a significant problem in pipes, fittings and equipment. Guideline values are listed in Table 2.

Table 2 ***Guideline values***

Physical Characteristics	*Unit*	*Guideline value*	*Testing Method*
PH		6.5-8.5	Colorimetric method
Turbidity	**NTU**	5	Nephelometric Method
Total dissolved solids	mg/L	1000	Electrode Metering
Hardness (as $CaCO_3$)	mg/L	200	EDTA Titrimetric Method

3.2 pH

New concrete tanks and cement-mortar-lined pipes can significantly increase pH and a value up to 9.2 may be tolerated provided monitoring indicates no deterioration in microbiological quality.

3.3 Taste and Odor

No guideline is set for taste and odor at the present time.

4. Chemical Substances

4.1 The guideline value for each chemical is the concentration that, based on present knowledge, does not result in any significant risk to the health of consumers over a lifetime consumption. Guideline values are listed in Table 3.

Table 3 ***Guideline values***

Substance	***Unit***	***Guideline value***	***Recommended testing method***
NH_3-N	mg/L	1.5	Salicylate Method
Nitrate (as NO_3 - N)	mg/L	10	Cadmium Reduction Method
Nitrite (as NO_2 - N)	mg/L	1	Diazotization Method
Iron	mg/L	0.3	FerroVer Method
Fluoride	mg/L	1.5	SPANDS Method
Manganese	mg/L	0.5	Periodate Oxidation Method
Sulfate	mg/L	250	Sulfa Ver 4 Method
Chlorine	mg/L	5	Colorimetric Method

Acronyms:

WHO: World Health Organization
APHA: American Public Health Association
WSS: Water & Sanitation Service, ETTA
ETTA: East Timor Transitional Administration
CFU: Colony Formed Unit
NTU: Nephelometric Turbidity Unit
TDS: Total Dissolved Solids
mg/L: milligrams per liter
mL: milli liter

Table A.5 COMPARISION OF GUIDELINE VALUES FOR WATER QUALITY IN NEARBY COUNTRIES

Parameter	Unit	Guideline Values				Health impact, aesthetic effect	Source or cause for drinking water
		East Timor	WHO	Indonesia	Australia		
Microbiological							
T. Coliform	CFU	0	0	0	0	infectious disease	rotten plant, soil, human or animal faeces
E.Coli	CFU	0	0	0	0	infectious disease	Sewage, animal faeces
Physical							
Turbidity	NTU	5	NS/5	NS/5	NS/5	effected disinfection, appearance	clay, silt, colloidal particles plankton, microscopic organisms
PH	-	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	below range: corrosion and encrustation; over range: deposition when hardness is high	chlorination can decrease pH, natural sources may be lime or other substance.
Temperature	°C	Not set	Not set	Ambient Air ±3°C	Not set		
TDS	mg/L	1000	NS/1000	NS/1000	NS/500	taste, scaling in pipes, corrosion	inorganic salt,(K, Na, Mn, Ca, Mg, Cl, Si, F, Fe, P, NO_3, NO_2 ,SO_4, CO_3, HCO_3,) small amount of organic matter, clay particles, silica fine etc..
Hardness	mg/L	NS/200	NS/200	NS/500	NS/200	<60, soft, but corrosive; 60-200 good quality;200-500 increasing scaling problem; >500, severe scaling problem, lather problem for launder.	mainly from Ca and Mg, but Mn, Sr, Fe, Ba also contribute

Odor and taste	-	Not set	should be acceptable	odorless and no taste	acceptable to most people	consumer complaints	many factors, chemical contamination
Chemical							
Nitrate-N	mg/L	10(as NO_3-N)	50 (as NO_3)	10(as NO_3-N)	50 (as NO_3)	can cause methaemoglobinaemia in infants	oxidation of organism waste, such as sewage effluent, inorganic fertilizer
Nitrite-N	mg/L	1(as NO_2-N)	3(as NO_2)	1(as NO_2-N)	3(as NO_2)	can cause methaemoglobinaemia in infants	reduction from nitrate
Ammonia	mg/L	1.5	NS/1.5	NS	NS/0.5	taste and odor	contamination of human or animal waste, fertilizer, disinfection by-product
Iron	mg/L	NS/0.3	NS/0.3	NS/0.3	NS/0.3	stains laundry, plumbing fixtures	natural source, rusting pipe
Parameter	***Unit***	***Guideline Values***				***Health impact, aesthetic effect***	***Source or cause for drinking water***
		East Timor	***WHO***	***Indonesia***	***Australia***		
Sulfate, SO_4^{2-}	mg/L	250	400/250	400	500/250	taste	natural source, flocculant ($Al_2(SO4)_3$), industrial pollution
Manganese	mg/L	0.5	0.5/0.1	0.1	0.5/0.1	taste, stains laundry, color, deposits in distribution systems	natural, alloy, steel, industrial pollution, corrosion of pipe
Fluoride	mg/L	1.5	1.5	1.5	1.5	dental or skeletal fluorosis	natural, fluoridation of water
Chlorine	mg/L	5	5	NS	5		

legend:

1. A/B: A present health-based guideline value; B present aesthetically recommended guideline value. For example, NS/5 means that the health-based guideline value has not been set, and the aesthetically recommended guideline value is 5.
2. NS: not set
3. Shaded values are under consideration
4. NTU: Nephelometric Turbidity Unit
5. WHO: World Health Organization
6. CFU: Colony formed unit
7. TDS: total dissolved solids

A.5 Water Quality Evaluation

A.5.1 Dili Water

The water quality analysis of the water samples in Dili show remarkable physical characteristics in terms of turbidity often exceeding ***the Guidelines for Drinking Water Quality in East Timor*** (hereinafter *the Guidelines*) limit of 5 NTU in rainy season. This characteristic of the water was exhibited in the samples collected from the treated surface water sources of Bemos and Benemauk and in a few service connections and public taps throughout Dili township. This observation could be attributed to the inefficiency of the water treatment facilities, notably the coagulating and filtering process. The high turbidity level noted in the distribution area is due to the inadequate treatment of the water produced. The levels seemed to increase in the service area mainly due to the lack of maintenance work in the distribution network and the numerous pipe leaks creating contaminated ground water to infiltrate into the pipes. On the other hand, the sampling results in dry season indicate that it has no significant fluctuation comparison with rainy season. Rather, it shows clearly that its turbidity is quite gentle. According to an operator of Lahane WTP, no coagulant (ALUM; aluminum sulfate powder) is required for usual treatment from early July to the end of October. During the period, it is satisfied with only simple filtration for removal of turbid. It means that the turbidity value is kept on low and stable. It is said that the same situation for Bemos and Benamauk WTP.

All other parameters measured are within the limits set by the WHO Standards for Drinking Water, also *the Guidelines*, except for the sample collected in Church Motael. In the analysis, the water sample exhibited high conductivity values, TDS, salinity and coliform count. The result appeared to be an isolated case, which could be possibly due to the contamination of the water coming from the pipe damage. A reconfirmation test from this area maybe required once the leakage repair in the reticulation is completed. Regretfully, it is no opportunity to visit again during the Phase-II Study.

The groundwater sources in Dili; such as in Comoro and Kuluhun boreholes showed acceptable water characteristics for the physical, chemical and even though microbiological properties. The quality features of those boreholes are quite stable throughout the year. In fact, whenever samples from boreholes are tested, there is no coliform appeared at all. The groundwater of Dili complies with most health guidelines reviewed. Unfortunately, the Bidau boreholes could not examine because the pumps were spoiled and had not been used for a long time. The result showed that utilization of groundwater as a source may require simple chlorination as a form of treatment. With regard to corrosive property investigation, samples from Comoro D and Kuluhun B were examined with the Langelier's Index (hereinafter LI) calculation. A handy method of LI calculation was announced by E. Nordell. The Index is calculated using the parameters of total solids, water temperature, calcium-hardness and alkalinity (*E.Nordell*, 1951). According to the results, the LI indicates +0.1 for Kuluhun and +0.3 for Comoro. It asserts that each ground water has no corrosive nature due to the gound waters containing temperate hardness and alkalinity. If capability of ground water cultivation can meet the future water demand and the water quality were unchanged eternally, the water sources from boreholes would become the major water source of Dili water supply. It is necessary to monitor continuously the water qualities for physico-chemical and bacteriological fields, respectively.

Aside from the high turbidity values for the raw surface water sources in rainy season, it is remarkably alarming to note the presence of total and faecal coliform in the water. This condition indicates that the surface water sources are highly contaminated with wastewater (human or animal excreta are possible sources). To minimize bacteriological pollution of the water supply in Dili, it is recommended to completely restrict the entire tributary watershed from human entry and the presence of domestic animals.

After the Phase-I Study, a monthly monitoring of water quality for specified sampling points has been carried out by the office of Water and Sanitation Service (WSS), East Timor Transitional Administration (ETTA), as part of routine scheme of the laboratory. Those data are surely useful for water quality control of East Timor. The detailed information of the water quality investigations on the samples collected in Dili is shown in **Table A.6-1**.

A.5.2 Atauro Water

Five water samples were collected in the island of Atauro from the water source into the intake and down to three different points of the distribution area. The detailed information of the water quality investigations on the samples collected in Atauro is shown in **Table A.6-2**. The physical and chemical characteristics for the parameters measured are within the limit set by *the Guidelines*. An examination of sulfate (SO_4^{2-}) that has just launched since phase-II Study, shows somewhat high concentration value from both AT-4 and AT-5 samples. These samples are different origins from Eklai and Tulai water sources. According to an interview from a local operator, the names of water sources are Eruta and Erseribau that are indicated quite different characters of water quality comparing with distribution area of Villa town. The result is, however, not exert serious cathartic action. While, the bacteriological analysis show the serious contamination of coliforms for all collected samples. This observation constitutes to contamination of the water, primarily due to the existing condition of the water distribution pipes and studded reservoirs.

Rehabilitation of the pipelines and chlorination of the water at reservoir just before supply to the residents will help improve the water quality in terms of the coliforms contamination. Besides, an appropriate maintenance of water supply facilities is indispensable simultaneously.

A.5.3 Manatuto Water

The water supply system in Manatuto is generally in a desperate state due to the damages of the transmission mains that transmit water from the main source to center of the town. During the phase-I Study, samples were collected from sources such as shallow wells, hand pumps and the surface water source that the residents collect from nearby river. The current situation of water supply in Manatuto is still in great difficulty.

The detailed information of the water quality investigations on the samples collected in Manatuto is shown in **Table A.6-3**. The results of the analysis showed that all the water samples collected from Manatuto groundwater sources exhibited high values of conductivity, TDS, alkalinity and hardness indicating that the water is relatively hard and

possibly contaminated with seawater. In addition, high nitrate (NO_3) contaminations are detected from several wells. An increase of nitrate levels has been observed owing to the intensification farming and sewage disposal. It seems that nitrogen nutrition originated from chemical fertilizer is influenceable. It is likely that leaching of nitrates to groundwater occurs in case of superabundant use of such fertilizers (*EPU Technical Report No.1*, 2000). During the survey, it was noted that all the handpump wells where the water samples were collected are in close proximity to the sea and a vast rice paddy.

The microbiological analysis of the samples showed a grave situation of coliform and general bacteria in the existing portable water. There is high possibility of wastewater contamination on the groundwater sources because most of the wells investigated are shallow without protection. The risk of contamination is very high in as much as the groundwater abstraction is mainly occurring from the water level aquifer where polluted water is possible. Moreover, the town of Manatuto is not equipped with municipal sewerage system. It is therefore, concluded that abstraction of groundwater as a source of water supply in Manatuto should be discouraged, especially for shallow wells and for wells drilled in close proximity to the sea.

On the other hand, the water sample collected from the infiltration gallery of Laclo River that is constructed by JICA's Quick Project showed an admirable water quality both physico-chemical and bacteriological aspects. Even though it rains in the upstream of Laclo River, the filtration facility can reduce the turbidity to permissible level. After completion of this urgent project, most residents of Manatuto can enjoy the piped water satisfactorily.

A.5.4 Baucau Water

The detailed information of the water quality investigations on the samples collected in Baucau is shown in **Table A.6-4**. Although the results of the water quality analysis for all the water samples in Baucau showed an acceptable physical and chemical characteristics, the value of hardness may seem high compared with the other samples analyzed from other districts. The high concentration of alkalinity and hardness could be possibly due to the geological limestone formation prevailing in the area. In addition, total hardness is nearly equal to calcium (Ca) hardness. It is arisen from the geographical features.

The water quality of Baucau is extremely equilibrium all the year around. Wherever samples may be collected in the same distribution area, the result is led in very similar to one another. The water source of Baucau has one of the best qualities in East Timor. The bacteriological properties regretfully indicated the presence of coliforms and general bacteria in the water because of no disinfection treated. The level of contamination is a very little to be considered since majority of the people in Baucau depends on the public water supply system. Therefore, it is desirable to treat the water by chlorination.

A.5.5 Los Palos Water

The detailed information of the water quality investigations on the samples collected in Los Palos is shown in **Table A.6-5**. The result of the water quality analysis for the samples collected in Los Palos indicated the same high values of alkalinity, hardness and conductivity as in Baucau. Basically, the results suggest that the water is relatively hard

and may contain substances causing alkalinity such as calcium bicarbonates, which are also the cause of temporary hardness in water. This condition can be attributed to the geological limestone formation prevailing in the area.

Generally, all other parameters measured are within acceptable limits in terms of its physical and chemical characteristics. However, turbidity examination is shown relatively high value even in dry season. It means that the distribution facilities would be made damage by turbid particles. The bacteriological properties indicated the sizable contamination of total coliform comparison with Baucau's results. Considering that in close proximity to the spring source are numerous human habitations and there is free loitering of domestic animals in the area, contamination of the water is inevitable. On the other hand, the result of another spring nearby Papapa intake that is using by Korean PKF indicates almost same physico-chemical characteristics as an existing source. However, the result of coliform count for the water is much less than the existing one due to a well-protected intake facility. The coliform pollution of the water source can be minimize by any of the following:

- Fence off the area where the water source is located.
- Restrict human entry and the presence of domestic animals in the intake area and if possible in the entire tributary watershed.
- Water treatment should be done by filtration and chlorination.

A.5.6 Viqueque Water

The detailed information of the water quality investigations on the samples collected in Viqueque is shown in **Table A.6-6**. The water quality of any parameter is greatly steadiness such as Baucau's investigation. The result of the water quality analysis for the samples collected in Viqueque indicated high values of alkalinity, hardness and conductivity. Total hardness of the water is composed of well-balanced calcium and magnesium with a ratio of 2:1. Originally, the results suggest that the water is relatively hard and may contain substances causing alkalinity such as calcium and magnesium bicarbonates, which are also the cause of temporary hardness in water. This condition can be attributed to the geological limestone formation prevailing in the area.

Another chemical characteristic that was found remarkable in the study area is the fluoride content of the water. A fluoride concentration of approximately 1.0 mg/L in drinking water effectively reduces dental caries without harmful effects on health. Some fluorosis may occur when the fluoride level exceeds the recommended limits (*Standard Method*, 1995). Although the values recorded are not alarming and within the range as prescribed by *the Guidelines*, the concentration, which is well above the rest of East Timor water samples maybe objectionable to the water consumers. It is recommended that continuous monitoring for fluoride level in drinking water is required.

The bacteriological analysis also indicated the presence of coliform and general bacteria in the water samples collected. This condition can be addressed to by the restriction of human and animal entry into the tributary watershed area or by water treatment such as effectiveness disinfection at the break pressure tank.

A.5.7 Same Water

The results of the physical and chemical analysis of the water samples collected from Same indicated no remarkable bad characteristics. In other word, all water sources in Same have really a moderate hardness and relatively low level of turbidity through the year. Rest of all physico-chemical parameters measured is within the limit set by *the Guidelines*. However, the bacteriological examinations indicated serious coliform contamination at any time. This suggests that the bacterial contamination of the water is possible from the water sources, also the existing condition of the pipelines and the tanks. Simple chlorination of the water and rehabilitation of the pipelines could improve the current characteristics of the water in Same in terms of bacteriological properties. The detailed information of the water quality investigations on the samples collected in Same is shown in **Table A.6-7**.

A.5.8 Ainaro Water

The detailed information of the water quality investigations on the samples collected in Ainaro is shown in **Table A.6-8**. The water quality analysis conducted for the water samples collected in Ainaro showed favorable results in all parameters measured for the physical and chemical properties all year around. The raw water has always low temperature about 20 °C. Due to the water source of Ainaro is from surface water, there is no doubt that the water with high turbidity may flow out in case of rainy weather. The bacteriological examinations of the water samples showed a highly contaminated by numerous coliforms. The existing state of the slow sand filtration (hereinafter SSF) facilities and the condition of the distribution pipelines could lead to the contamination of the water. Moreover, the existing aqueduct from intake to water treatment plant was crumbled its concrete cover in some places. It is very simple to be suffered substantial contamination. However, if chlorination is carried out in the water treatment process, bacterial properties of the water will likely improve to be drinkable.

A.5.9 Aileu Water

The detailed information of the water quality investigations on the samples collected in Aileu is shown in **Table A.6-9**. The result of the physical and chemical analysis for the water samples collected from Aileu indicated acceptable values, except for the raw water source from the Mantane River that is abandoned presently with some troubles for pumping facilities. This river, which is the site of the infiltration gallery, exhibited high turbidity result during the rainy season. The quality of the water production from the infiltration gallery could not be assessed due to the existing state of damage to the facilities. From a standpoint of long-term development strategy, it is worthwhile to note that the water quality from this source needs to be monitored once it becomes operational.

In the Phase-II Study, a sample was taken from one of the intake, namely, Naufaisaran. Water quality of this sample showed ultra-soft water characteristics. It is uncommon thing among the East Timor water sources. Other water sources from spring and stream except Mantane River also have remarkably low level of alkalinity and hardness.

On the other hand, the bacteriological analysis for all the samples showed the nasty pollution by coliforms and general bacteria irrespective of seasons. This condition

suggests that the water from the sources down into the distribution area is not free from bacterial contamination. This phenomenon could be attributed to the absence of water treatment of which chlorination will be sufficient.

A.5.10 Maubisse Water

The detailed information of the water quality investigations on the samples collected in Maubisse is shown in **Table A.6-10**. The analysis carried out for the water samples collected from Maubisse indicated acceptable physical and chemical characteristics all year around. In addition, the water quality is suitable for drinking form physico-chemical points of view. However, the bacteriological analysis showed many coliforms in the water. This condition clearly indicates that the water from the source is contaminated with wastewater (human or animal excreta). The bacterial contamination noted in the distribution could be due to the absence of any form of treatment of which chlorination maybe sufficient. Due to a lack of appropriate maintenance and management for the Posadas reservoir from Bucana intake where locates on the top of a small hill, a sample from resort hotel was indicated the worst result of all samples.

Due to the presence of human habitation nearby the water sources, it is therefore recommended that to minimize the risks of coliform contamination the following are necessary:

- Fence off the area where the springs are located.
- Restrict human entry and the presence of domestic animals in the intake area and if possible in the entire tributary watershed.

A.5.11 Gleno Water

The detailed information of the water quality investigations on the samples collected in Gleno is shown in **Table A.6-11**. The results of the physical and chemical analysis of the water samples collected from Gleno suggest no remarkable bad characteristics regardless of the season. All the physico-chemical parameters measured are within the limit set by *the Guidelines*. However, the bacteriological examinations indicated the presence of coliform and general bacteria. This suggests that the bacterial contamination of the water is possible from the existing condition of the pipelines. The SSF facilities in Gleno need to be maintained, since this could contribute to the improvement of the water quality. The filtration system does not operate currently but functions well as turbid removal. Collecting samples in dry season, it has already started raining in the district. The existing Mota Kiik source, the turbidity has settled as blow 2.0 NTU. On the other hand, turbidity of Mota Boot source showed over 20.0 NTU at the same sampling. It is found out that the turbidity of Mota Boot is always greater than the turbidity of Mota Kiik by three times water quality monitoring since the phase-I Study.

Chlorination of the water at the SSF and rehabilitation of the pipelines will help improve the water quality in terms of the bacteriological characteristics.

A.5.12 Ermera Water

The detailed information of the water quality investigations on the samples collected in Ermera is shown in **Table A.6-12**. The results of the physical and chemical analysis of the water samples collected from Ermera indicated no remarkable bad characteristics through the year. All the parameters measured are within the limit set by *the Guidelines*. The bacteriological examinations indicated the presence of coliform and general bacteria. However, coliform contamination level is relatively low comparison with other towns.

This suggests that the microbial contamination of the water is possible due to the existing condition of the pipelines. Simple chlorination of the water and rehabilitation of the pipelines could substantially improve the present characteristics of the water in Ermera in terms of bacteriological properties.

A.5.13 Liquica Water

The detailed information of the water quality investigations on the samples collected in Liquica is shown in **Table A.6-13**. The results of the physical and chemical analysis of the water samples collected from Liquica indicated high turbidity values in the sampling points where the source comes from surface water in rainy season. This could mean that the surface water sources in Liquica are erosion prone in which the water becomes turbid after rainfall. All other values showed acceptable water quality in the parameters measured. The waters come from particular water sources, namely, Daulo, Enaloa, Laclo and Emilaloa intakes, high concentrations of sulfate (SO_4^{2-}) could be confirmed. Moreover, total hardness shows high concentration value for all surface water sources. The results are, also, not exert serious cathartic symptom as well as Atauro's results.

The bacteriological examination of the water showed remarkably serious coliform count in all the samples collected regardless of the seasons. In as much as most of the samples collected are from surface water sources, there is a high possibility of bacterial contamination. This phenomenon suggests that utilization of the existing water sources in Liquica will require treatment with appropriate disinfection.

There are some boreholes in the center of the town. According to a report from other study group, the ground water of Liquica must be included corrosive substances such as hydrogen sulfide (H_2S). Unfortunately, no sulfide examination performs with existing lab equipment and reagents.

A.5.14 Suai Water

The detailed information of the water quality investigations on the samples collected in Suai is shown in **Table A6-14**. The result of the water quality analysis for the samples collected in Suai indicated one of the highest values of alkalinity, hardness and conductivity. Basically, the results suggest that the water is relatively hard and may contain substances causing alkalinity such as calcium and magnesium bicarbonates, which are also the cause of temporary hardness in water. This condition can be attributed to the geological limestone formation prevailing in the area.

In rainy season, another remarkable characteristic of the water in Suai that may be aesthetically objectionable to the water consumers is the high turbidity value in some of the samples collected particularly from the Sta. Rosa Reservoir, market and Debos area.

This condition is primarily due to the absence of maintenance works in the facilities over a long period of time. During sampling, siltation and deposits of other sediments were noted in the reservoir and the pipelines. Therefore, the turbid characteristic recorded in the water is rather due to the lack of maintenance than source-oriented as can be seen in the low turbidity of the source.

No matter what any season, the bacteriological examinations of the water samples indicated the presence of many coliforms including feacal coliforms. This suggests that the bacterial contamination of the water is possible due to the existing condition of the intake facility and the pipelines. Simple chlorination of the water, regular maintenance of the facilities and rehabilitation of the pipelines could improve the present characteristics of the water in Suai in terms of bacteriological properties.

The samples collected in phase-II Study, a sample was fetched from an existing borehole (Borehole-1). The result comes into the same as other sampling point concerning physical and chemical characteristics. However, there is no coliform observed like existing boreholes of Dili. If capability of ground water is sufficient to satisfy the water demand of the area, it is highly recommended to develop.

A.5.15 Maliana Water

The detailed information of the water quality investigations on the samples collected in Maliana is shown in **Table A6-15**. The results of the physical and chemical analysis of the water samples collected from Maliana indicated no remarkable bad characteristics, except for the high turbidity value in the water intake. All other parameters measured are within the limit set by the Guidelines.

The bacteriological examinations during the rainy season indicated the presence of coliform and general bacteria. This suggests that the bacterial contamination of the water is possible due to the existing condition of the pipelines. Simple chlorination of the water and rehabilitation of the pipelines could improve the present characteristics of the water in Maliana in terms of bacteriological properties. At the recent phase-II Study, all collected samples were examined for quantative coliform count. A conclusion based on the results, all samples have some feacal coliforms except Mugis public tap. Mugis public tap is located nearby the Ritabou reservoir from Colegio spring. There are three pipes outlet without faucet made during Indonesian era for neighbor community water supply.

Sample from Mota Bulobu is one of intake called Irrigation Canal. At the sampling, the river flows whitish brown waters with high turbidity, which is over 200 NTU. It seems to contain silt sand like clay. Previously, the SSF facilities were operated using the water. It is considered that turbidity removal is more laborious than other water sources of Maliana.

A.5.16 References

E. Nordell, (1951), *Water Treatment for Industrial and Other Uses, pp.233*

World Health Organization, (1998), *Guidelines for drinking water quality. Health criteria and other supporting information Volume 2.*

Environmental Protection Unit, United Nations Transitional Administration in East Timor (2000), ***Technical Report No.1, Groundwater Quality Issues in Manatutu.***

Andrew D. Eaton, Lenore S. Clesceri and Arnold E. Greenberg, (1995), *Standard Methods for the Examination of Water and Wastewater, 19th Edition*

Table A.6-1 Water Quality Data Sheet of Dili (1)

District: Dili

Town: Dili (1/2)

Sampled and tested by: Alvaro Godinho, Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-1	Bemos WTP, raw water	13-Mar-00	15-Mar-00	8.1	25.1	141.5	67.4	0.1	44.0	49.0	54.0	NT	ND	1.2	ND	10.3	0.14	ND	NT	NT	+++	+++
DL-2	Bemos WTP, Disinfected W																					
DL-3	Bemos WTP, treated water	13-Mar-00	15-Mar-00	8.2	25.7	151.3	72.1	0.1	27.1	69.6	103	NT	0.2	0.2	0.119	0.16	0.19	0.2	NT	2.5	-	-
DL-4	Manleuana	13-Mar-00	15-Mar-00	8.1	25.1	153.7	73.3	0.1	21.2	NT	NT	NT	ND	NT	NT	NT	0.15	NT	NT	ND	-	-
DL-5	Bairo Pite	13-Mar-00	15-Mar-00	8.0	25.9	149.2	71.1	0.1	8.7	NT	NT	NT	0.3	NT	NT	NT	0.20	NT	NT	ND	-	-
DL-6	Lahane WTP, raw water	13-Mar-00	15-Mar-00	8.1	25.9	187.6	89.7	0.1	20.9	84.8	90.0	NT	0.2	0.3	0.005	0.03	0.26	0.4	NT	NT	+++	+++
DL-7	Lahane Barat	13-Mar-00	15-Mar-00	8.1	26.4	188.2	90.0	0.1	3.3	NT	NT	NT	3.0	NT	NT	NT	0.24	NT	NT	0.4	-	-
DL-8	Santa Cruz	13-Mar-00	15-Mar-00	8.1	29.3	187.1	89.4	0.1	4.0	NT	NT	NT	ND	NT	NT	NT	0.22	NT	NT	ND	+	+
DL-9	Church Motael	13-Mar-00	15-Mar-00	7.3	30.0	872	427	0.4	0.3	386	322	NT	1.4	ND	0.012	0.01	0.70	0.6	NT	ND	++	+
DL-10	Benamauk WTP, raw water	13-Mar-00	15-Mar-00	8.2	25.9	172.5	82.4	0.1	37.8	82.0	75.0	NT	0.6	0.7	ND	4.7	0.24	0.2	NT	NT	+++	+++
DL-11	Benamauk WTP, filtered water	13-Mar-00	15-Mar-00	8.2	25.7	172.0	82.2	0.1	22.9	NT	NT	NT	0.5	NT	NT	NT	0.24	NT	NT	ND	±	±
DL-12	Saburaka Laran	13-Mar-00	15-Mar-00	8.1	26.1	172.3	82.3	0.1	22.7	NT	NT	NT	0.4	NT	NT	NT	0.22	NT	NT	ND	-	-
DL-13	Church Becora	13-Mar-00	15-Mar-00	8.0	27.7	180.1	86.1	0.1	32.4	NT	NT	NT	ND	NT	NT	NT	0.25	NT	NT	1.5	-	-
DL-14	Parliament House No.37	13-Mar-00	15-Mar-00	7.5	27.5	211	100.9	0.1	20.4	93.2	90.0	NT	ND	0.6	0.004	0.03	0.22	0.2	NT	ND	+	±
DL-15	Matadolu, RW																					
DL-16	Comoro A, BH	13-Mar-00	15-Mar-00	7.3	26.8	353	169.8	0.2	0.2	NT	NT	NT	0.1	NT	NT	NT	0.33	NT	NT	NT	±	-
DL-17*	Dili Mosque	13-Mar-00	15-Mar-00	7.5	29.9	347	167.3	0.2	0.6	172	166	NT	0.5	0.3	0.011	ND	0.24	ND	NT	NT	-	±

District: Dili
Town: Dili (2/2)

Sampled and tested by: Alvaro Godinho, Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(°C)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-18	Comoro B, BH																					
DL-19*	Pantai Clapa H.No.5	13-Mar-00	15-Mar-00	7.3	27.8	348	167.4	0.2	0.2	NT	NT	NT	ND	NT	NT	NT	0.32	NT	NT	NT	-	-
DL-20	Comoro D, BH	13-Mar-00	15-Mar-00	7.4	27.1	357	171.9	0.2	0.3	184	180	NT	0.4	0.5	0.007	ND	0.21	0.2	NT	NT	±	-
DL-21	Kampung Baru H.No.12A	13-Mar-00	15-Mar-00	7.5	27.3	360	173.3	0.2	0.2	NT	NT	NT	ND	NT	NT	NT	0.30	NT	NT	1.5	-	-
DL-22	Kuluhun A, BH	13-Mar-00	15-Mar-00	<6.8	27.7	350	168.4	0.2	1.5	NT	NT	NT	ND	NT	NT	NT	0.30	NT	NT	NT	-	±
DL-23	Kuluhun B, BH	13-Mar-00	15-Mar-00	<6.8	28.0	406	195.7	0.2	0.2	180	195	NT	0.1	1.9	0.008	0.03	0.28	0.7	NT	NT	-	-
DL-24*	Motael H No.23	13-Mar-00	15-Mar-00	7.3	29.8	348	167.4	0.2	1.6	NT	NT	NT	ND	NT	NT	NT	0.38	NT	NT	ND	±	-
DL-25*	Motael H No.D85	13-Mar-00	15-Mar-00	7.3	29.8	350	168.5	0.2	0.2	NT	NT	NT	0.2	NT	NT	NT	0.36	NT	NT	ND	-	-

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of DL-17, 19, 24 and DL-25 would be converted the different palces after this sampling.

Table A.6-1 Water Quality Data Sheet of Dili (2)

District: Dili

Town: Dili (1/2)

Sampled and tested by: Alvaro Godinho and X. Wang, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(°C)	(ƒ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-1	Bemos WTP, raw water	18-Apr-00	19-Apr-00	8.1	26.8	186.1	88.9	0.1	9.4	83.0	85.0	NT	ND	0.1	0.002	0.08	ND	0.2	NT	NT	++	+++
DL-2	Bemos WTP, Disinfected W																					
DL-3	Bemos WTP, treated water	18-Apr-00	19-Apr-00	8.0	26.4	194.4	93.4	0.1	10.7	91.0	78.0	NT	ND	0.3	0.003	0.07	ND	0.2	NT	0.1	-	-
DL-4	Manleuana	18-Apr-00	19-Apr-00	8.0	27.9	153.5	73.2	0.1	13.4	126	82.0	NT	ND	0.1	0.002	0.08	0.06	0.2	NT	ND	-	+
DL-5	Bairo Pite																					
DL-6	Lahane WTP, raw water	18-Apr-00	19-Apr-00	8.0	25.7	202.0	96.6	0.1	8.6	97.6	106	NT	ND	0.3	0.003	0.05	0.07	0.1	NT	NT	++	++
DL-7	Lahane Barat	18-Apr-00	19-Apr-00	8.1	25.7	203.0	97.1	0.1	2.6	104	101	NT	ND	0.3	0.004	0.03	0.50	0.1	NT	ND	-	-
DL-8	Santa Cruz	12-May-00	13-May-00	7.9	27.9	197.7	95.0	0.1	11.9	NT	NT	NT	ND	0.3	0.002	0.00	0.20	0.1	NT	NT	+	+
DL-9*	Church Motael	12-May-00	13-May-00	8.0	30.0	897	439	0.4	0.3	415	NT	NT	2.1	0.1	0.022	0.03	0.52	0.2	NT	NT	+	++
DL-10	Benamauk WTP, raw water	7-Jun-00	8-Jun-00	8.0	25.6	192.8	92.2	0.1	7.2	134	97.0	NT	ND	0.2	0.002	0.04	0.16	0.3	NT	NT	++	++
DL-11	Benamauk WTP, treated water	18-Apr-00	19-Apr-00	8.0	25.4	197.6	94.5	0.1	7.1	170	92.0	NT	ND	0.3	0.002	0.40	ND	0.2	NT	0.6	±	±
DL-12	Sabureka Laran																					
DL-13	Church Becora																					
DL-14	Parliament House No.37	18-Apr-00	19-Apr-00	7.7	27.9	402	193.8	0.2	2.3	NT	NT	NT	ND	2.3	0.001	0.02	0.19	-	NT	NT	±	±
DL-15	Matadolu, RW																					
DL-16	Comoro A, BH	14-Jun-00	15-Jun-00	6.9	26.5	355	170.8	0.2	0.4	75.0	NT	NT	ND	0.6	0.002	0.01	0.34	0.1	NT	NT	-	-
DL-17	Comoro Delta																					

District: Dili

Town: Dili (2/2)

Sampled and tested by: Alvaro Godinho and X. Wang, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(°C)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-18	Comoro B,BH																					
DL-19	Pantai Clapa H.No.6	6-Jun-00	7-Jun-00	7.7	28.8	345	165.9	0.2	0.3	NT	NT	NT	0.1	0.3	0.003	0.01	0.13	NT	NT	NT	-	-
DL-20	Comoro D, BH	14-Jun-00	15-Jun-00	7.4	26.5	359	173.1	0.2	0.3	183	NT	NT	ND	0.6	0.008	0.01	0.20	0.2	NT	NT	-	-
DL-21	Kampung Baru, H.No.12A	6-Jun-00	7-Jun-00	7.7	27.3	361	173.7	0.2	0.5	NT	NT	NT	3.4	0.4	0.003	ND	ND	0.5	NT	NT	-	-
DL-22	Kuluhun A, BH	12-May-00	13-May-00	<6.8	27.7	397	191.3	0.2	0.3	NT	NT	NT	0.2	3.0	0.005	0.01	ND	0.3	NT	NT	-	-
DL-23	Kuluhun B, BH	14-Jun-00	15-Jun-00	7.8	29.2	425	205.0	0.2	0.8	182	NT	NT	ND	1.8	0.009	0.04	0.30	0.8	NT	NT	-	-
DL-24	Cacoli, laboratory																					
DL-25	Bemos intake																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample point of DL-9 would be converted the different palces after this sampling.

Table A.6-1 Water Quality Data Sheet of Dili (3)

District: Dili

Town: Dili (1/2)

Sampled and tested by: Alvaro Godinho and X. Wang, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-1	Bemos WTP, raw water	24-Jul-00	24-Jul-00	>8.2	24.0	229	109.8	0.1	1.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	+	+
DL-2	Bemos WTP, Disinfected W	24-Jul-00	24-Jul-00	>8.2	24.3	229	109.6	0.1	2.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	±	±
DL-3	Bemos WTP, treated water	24-Jul-00	24-Jul-00	7.6	24.1	230	110.2	0.1	1.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1.5	-	-
DL-4	Manleuana	27-Jul-00	27-Jul-00	>8.2	24.0	226	108.4	0.1	1.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.1	-	-
DL-5	Bairo Pite	27-Jul-00	27-Jul-00	8.0	24.3	227	108.8	0.1	1.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.6	-	-
DL-6	Lahane WTP, raw water	6-Jul-00	7-Jul-00	>8.2	23.9	250	119.9	0.1	0.7	150	NT	NT	0.1	0.1	0.003	0.01	ND	0.3	NT	ND	++	++
DL-7	Lahane Barat	6-Jul-00	7-Jul-00	>8.2	24.3	248	119.1	0.1	2.6	128	NT	NT	0.3	0.1	0.001	0.02	ND	0.2	NT	0.3	-	-
DL-8	Santa Cruz	6-Jul-00	7-Jul-00	>8.2	27.9	252	120.7	0.1	0.6	121	NT	NT	0.4	0.1	0.007	0.05	ND	0.1	NT	ND	+	+
DL-9	Motael H No. 23	27-Jul-00	27-Jul-00	7.4	30.0	899	440	0.4	1.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	+	+
DL-10	Benamauk WTP, raw water	27-Jul-00	27-Jul-00	>8.2	25.4	254	121.6	0.1	2.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	+	+
DL-11	Benamauk WTP, treated water	28-Jul-00	28-Jul-00	>8.2	24.1	262	125.6	0.1	3.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	++	+
DL-12	Saburaka Laran	28-Jul-00	28-Jul-00	>8.2	29.4	261	125.0	0.1	1.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	++	++
DL-13	Church Becora																					
DL-14	Parliament House No.37	6-Jul-00	7-Jul-00	6.8	27.9	412	199.0	0.2	0.5	NT	NT	NT	0.6	2.2	0.001	0.01	ND	0.1	NT	ND	±	-
DL-15	Matadolu, RW	27-Jul-00	27-Jul-00	>8.2	26.5	274	131.4	0.1	2.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	++	++
DL-16	Comoro A, BH	30-Jun-00	30-Jun-00	7.6	26.5	346	166.6	0.2	1.8	162	NT	NT	0.0	ND	0.001	0.01	0.31	0.2	NT	ND	-	-
DL-17	Comoro Delta	25-Jul-00	25-Jul-00	7.0	26.8	358	172.3	0.2	0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT

District: Dili
Town: Dili (2/2)

Sampled and tested by: Alvaro Godinho and X. Wang, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-18	Comoro B,BH	30-Jun-00	30-Jun-00	7.6	27.0	354	170.0	0.2	0.7	170	NT	NT	ND	0.3	0.003	0.03	0.37	0.3	NT	3.0	-	-
DL-19	Pantai Clapa H.No.6	27-Jul-00	27-Jul-00	7.4	26.2	359	172.8	0.2	0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	-	-
DL-20	Comoro D, BH	30-Juni-00	30-Juni-00	7.6	26.8	344	165.5	0.2	0.6	170	NT	NT	Nil	ND	0.001	0.01	0.28	0.3	NT	Nil	-	-
DL-21	Kampung Baru, H.No.12A																					
DL-22	Kuluhun A, BH	28-Jul-00	28-Jul-00	6.8	27.8	367	176.9	0.2	2.6	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
DL-23	Kuluhun B, BH	28-Jul-00	28-Jul-00	6.8	28.9	408	196.7	0.2	5.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
DL-24	Cacoli, laboratory																					
DL-25	Bemos intake																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-1 Water Quality Data Sheet of Dili (4)

District: Dili

Town: Dili (1/2)

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-1	Bemos WTP, raw water	11-Aug-00	11-Aug-00	8.2	22.6	228	109.3	0.1	1.6	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	+	+
DL-2	Bemos WTP, Disinfected W	11-Aug-00	11-Aug-00	8.2	23.4	230	110.0	0.1	1.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	-	-
DL-3	Bemos WTP, treated water	11-Aug-00	11-Aug-00	7.2	22.1	232	111.2	0.1	1.8	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.3	-	-
DL-4	Manleuana	11-Aug-00	11-Aug-00	8.2	22.6	230	110.1	0.1	0.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.1	-	-
DL-5	Bairo Pite	11-Aug-00	11-Aug-00	7.8	26.1	235	112.5	0.1	0.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.6	-	-
DL-6	Lahane WTP, raw water	15-Aug-00	15-Aug-00	8.2	24.0	287	137.8	0.1	1.7	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	++	++
DL-7	Lahane Barat	15-Aug-00	15-Aug-00	8.2	NT	NT	NT	NT	1.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.8	-	-
DL-8	Santa Cruz	15-Aug-00	15-Aug-00	8.2	27.6	290	139.4	0.1	0.7	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<0.1	-	-
DL-9	Motael H No. 23	22-Aug-00	22-Aug-00	7.2	31.6	899	440	0.4	0.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	+++	±
DL-10	Benamauk WTP, raw water	1-Sep-00	1-Sep-00	8.2	27.9	279	133.8	0.1	1.4	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	++	++
DL-11	Benamauk WTP, treated water	1-Sep-00	1-Sep-00	8.2	26.9	279	133.9	0.1	1.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.2	-	-
DL-12	Saburaka Laran	1-Sep-00	1-Sep-00	8.2	29.6	284	136.6	0.1	2.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.2	-	-
DL-13	Church Becora	31-Aug-00	31-Aug-00	7.2	31.5	354	170.3	0.2	28.4	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	++	+
DL-14	Parliament House No.37	15-Aug-00	15-Aug-00	<6.8	28.1	398	191.9	0.2	1.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	-	-
DL-15	Matadolu, RW	11-Aug-00	11-Aug-00	7.9	27.7	132	132.4	0.1	1.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	++	++
DL-16	Comoro A, BH	22-Aug-00	22-Aug-00	7.4	27.0	348	167.1	0.2	0.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	-	-
DL-17	Comoro Delta	22-Aug-00	22-Aug-00	7.3	26.9	347	167.1	0.2	0.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	-	-

District: Dili
Town: Dili (2/2)

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-18	Comoro B,BH	22-Aug-00	22-Aug-00	7.3	26.9	364	175.5	0.2	0.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	3.0	-	-
DL-19	Pantai Clapa H.No.6	22-Aug-00	22-Aug-00	7.2	27.2	346	166.8	0.2	0.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	-	-
DL-20	Comoro D, BH	22-Aug-00	22-Aug-00	7.8	27.2	344	165.6	0.2	1.7	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
DL-21	Kampung Baru, H.No.12A																					
DL-22	Kuluhun A, BH	31-Aug-00	31-Aug-00	6.8	28.3	363	174.8	0.2	2.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
DL-23	Kuluhun B, BH	31-Aug-00	31-Aug-00	6.8	29.4	397	191.5	0.2	4.8	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
DL-24	Cacoli, laboratory	23-Aug-00	23-Aug-00	8.2	26.9	285	136.8	0.1	0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
DL-25	Bemos intake																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-1 Water Quality Data Sheet of Dili (5)

District: Dili

Town: Dili (1/2)

Sampled and tested by: Mario Soares and X. Wang WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-1	Bemos WTP, raw water																					
DL-2	Bemos WTP, Disinfected W																					
DL-3	Bemos WTP, treated water																					
DL-4	Manleuana	8-Sep-00	8-Sep-00	8.2	24.4	251	120.4	0.1	1.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.1	-	-
DL-5	Bairo Pite	8-Sep-00	8-Sep-00	8.2	26.6	253	121.4	0.1	1.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.1	-	-
DL-6	Lahane WTP, raw water																					
DL-7	Lahane Barat	15-Sep-00	15-Sep-00	8.2	26.5	307	147.5	0.1	0.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.2	-	-
DL-8	Santa Cruz	15-Sep-00	15-Sep-00	8.2	27.7	313	150.7	0.1	0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.2	-	-
DL-9	Motael H No. 23																					
DL-10	Benamauk intake																					
DL-11	Benamauk WTP, treated water																					
DL-12	Saburaka Laran	15-Sep-00	15-Sep-00	8.2	28.2	295	141.8	0.1	0.9	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.1	-	-
DL-13	Church Becora																					
DL-14	Parliament House No.37	15-Sep-00	15-Sep-00	6.8	28.5	399	192.6	1.2	1.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	-	-
DL-15	Matadolu, RW	8-Sep-00	8-Sep-00	8.2	27.2	294	141.5	0.1	1.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	++	++
DL-16	Comoro A, BH	7-Sep-00	7-Sep-00	7.4	26.8	355	171.0	0.2	0.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
DL-17	Comoro Delta	7-Sep-00	7-Sep-00	7.3	27.1	353	170.2	0.2	0.4	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	-	-

District: Dili
Town: Dili (2/2)

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μ ℧/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-18	Comoro B,BH	7-Sep-00	7-Sep-00	7.6	27.4	366	176.4	0.2	0.6	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	4.0	-	-
DL-19	Pantai Clapa H.No.6	7-Sep-00	7-Sep-00	7.4	27.8	352	169.4	0.2	0.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	+	+
DL-20	Comoro D, BH	7-Sep-00	7-Sep-00	7.6	26.5	355	171.2	0.2	0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
DL-21	Kampung Baru, H.No.12A	7-Sep-00	7-Sep-00	7.8	27.5	355	170.9	0.2	0.4	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
DL-22	Kuluhun A, BH																					
DL-23	Kuluhun B, BH	15-Sep-00	15-Sep-00	6.8	27.5	404	195.0	0.2	0.4	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	-	-
DL-24	Cacoli, laboratory	25-Sep-00	25-Sep-00	8.2	29.2	420	203.0	0.2	1.2	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
DL-25	Bemos intake																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-1 Water Quality Data Sheet of Dili (6)

District: Dili

Town: Dili (1/2)

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(ƒ ß/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-1	Bemos WTP, raw water	12-Oct-00	12-Oct-00	8.7	24.3	268	128.4	0.1	1.8	126	127	NT	ND	0.1	0.012	ND	0.42	0.1	23	NT	TNC	3
DL-2	Bemos WTP, Disinfected W	12-Oct-00	12/13-Oct-00	8.7	25.2	267	127.9	0.1	1.4	NT	NT	NT	ND	NT	NT	NT	0.17	NT	NT	ND	0	0
DL-3	Bemos WTP, treated water	12-Oct-00	12/13-Oct-00	8.7	24.6	267	128.4	0.1	1.3	NT	NT	NT	ND	NT	NT	NT	0.48	NT	NT	ND	3	0
DL-4	Manleuana	12-Oct-00	12/13-Oct-00	8.6	25.7	269	129.0	0.1	0.9	124	127	NT	ND	0.10	0.014	0.02	ND	ND	23	ND	0	0
DL-5	Bairo Pite	12-Oct-00	12/13-Oct-00	8.5	28.8	270	129.4	0.1	0.7	140	122	NT	1.2	0.10	0.005	0.01	0.22	0.1	NT	ND	0	0
DL-6	Lahane WTP, raw water	12-Oct-00	12/13-Oct-00	8.6	26.8	322	154.9	0.2	1.2	159	146	NT	ND	0.10	0.006	ND	0.31	0.4	20	NT	55	0
DL-7	Lahane Barat	12-Oct-00	12/13-Oct-00	8.7	28.2	322	155.0	0.2	0.3	158	149	NT	ND	0.20	0.060	ND	0.30	0.3	NT	1.0	0	0
DL-8	Santa Cruz	18-Oct-00	18-Oct-00	8.7	30.1	324	155.9	0.3	1.1	NT	NT	NT	1.2	0.10	0.047	0.01	0.38	NT	NT	ND	66	0
DL-9	Motael H No. 23	13-Oct-00	13/14-Oct-00	7.4	34.7	354	170.5	0.2	0.2	159	163	NT	ND	0.30	0.015	0.01	0.45	0.4	33	NT	TNC	0
DL-10	Benamauk intake	18-Oct-00	18-Oct-00	8.8	24.8	308	148.0	0.1	2.7	145	136	NT	1.2	0.10	0.007	0.01	0.37	0.3	NT	NT	TNC	38
DL-11	Benamauk WTP, treated water																					
DL-12	Saburaka Laran	13-Oct-00	13/14-Oct-00	8.6	27.4	304	146.3	0.1	1.0	147	226	NT	ND	ND	0.009	ND	0.47	0.5	20	NT	TNC	0
DL-13	Church Becora	13-Oct-00	13/14-Oct-00	7.4	29.5	376	181.0	0.2	0.6	155	208	NT	ND	NT	NT	NT	NT	NT	NT	NT	10	0
DL-14	Parliament House No.37	13-Oct-00	13/14-Oct-00	7.1	28.9	398	192.1	0.2	0.2	157	161	NT	ND	1.70	0.010	ND	0.51	0.5	NT	NT	40	0
DL-15	Matadolu, RW	12-Oct-00	12-Oct-00	8.6	28.5	308	147.9	0.1	0.7	150	134	NT	0.5	0.20	0.004	0.01	0.42	0.0	NT	NT	TNC	51
DL-16	Comoro A, BH	12-Oct-00	12-Oct-00	7.6	29.4	345	166.1	0,2	0,3	NT	NT	NT	ND	NT	NT	NT	0.47	NT	31	NT	0	0
DL-17	Comoro Delta	12-Oct-00	12-Oct-00	8.4	27.6	346	166.8	0.2	0.8	159	157	NT	0.2	0.30	0.009	0.01	0.39	0.1	NT	ND	0	0

District: Dili

Town: Dili (2/2)

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
DL-18	Comoro B,BH	12-Oct-00	12-Oct-00	7.6	30.5	374	180.1	0.2	0.2	NT	NT	NT	0.1	NT	NT	NT	0.36	NT	34	4.0	0	0
DL-19	Pantai Clepa H.No.6	12-Oct-00	12-Oct-00	7.5	28.1	349	168.3	0.2	0.2	164	165	NT	ND	0,3	0.008	0.02	0.42	0.0	NT	ND	0	0
DL-20	Comoro D, BH	13-Oct-00	13/14-Oct-00	7.5	28.2	362	174.5	0.2	0.8	160	169	NT	ND	0.30	0.012	ND	0.52	0.4	34	NT	0	0
DL-21	Kampung Baru, H.No.A5	18-Oct-00	13/14-Oct-00	7.5	27.9	359	172.7	0.2	0.4	163	167	NT	ND	0.50	0.008	0.01	2.09	0.4	NT	NT	0	0
DL-22	Kuluhun A, BH	13-Oct-00	13/14-Oct-00	7.2	27.6	376	181.1	0.2	0.4	156	161	NT	ND	1.90	0.003	ND	0.49	0.5	30	NT	0	0
DL-23	Kuluhun B, BH	13-Oct-00	13/14-Oct-00	7.1	28.3	400	192.7	0.2	0.4	159	160	NT	ND	1.60	0.014	ND	0.45	0.4	NT	NT	0	0
DL-24	Caicoli, laboratory	18-Oct-00	18-Oct-00	8.5	28.9	393	189.5	0.2	0.9	174	173	119	ND	ND	0.020	0.03	0.37	NT	NT	NT	0	0
DL-25	Bemos intake	1-Nov-00	3-Nov-00	8.6	22.0	257	123.2	0.1	1.1	124	123	NT	0.30	0.1	0.004	0.02	0.28	0.2	23	NT	315	86

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-2 Water Quality Data Sheet of Atauro (1)

District: Dili

Town: Atauro

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
AT-1	Mota Eklai, intake																					
AT-2*	Tanki Berau, Makadade	24-Mar-00	25-Mar-00	8.2	28.1	362	174.4	0.2	0.7	182	165.6	NT	ND	1.0	0.005	0.00	0.29	0.1	NT	NT	+	+
AT-3	Tulai intake, Galileia	24-Mar-00	25-Mar-00	8.0	28.9	272	130.5	0.1	5.7	117	85.2	NT	0.1	0.9	0.005	0.05	0.38	0.0	NT	NT	N/A	N/A
AT-4	Kampung Baru	24-Mar-00	25-Mar-00	8.2	40.8	279	134.1	N/A	13.6	NT	NT	NT	ND	NT	NT	NT	0.38	NT	NT	NT	++	++
AT-5	Elti Karkea	24-Mar-00	25-Mar-00	8.2	29.0	652	317	0.3	3.2	192	236.0	NT	0.4	0.0	0.003	0.23	0.57	0.0	NT	NT	++	+++
AT-6	Church Villa	24-Mar-00	25-Mar-00	8.2	26.7	613	298	0.3	2.0	NT	NT	NT	ND	NT	NT	NT	0.57	NT	NT	NT	++	++

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-2 Water Quality Data Sheet of Atauro (2)

District: Dili

Town: Atauro

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
AT-1	Mota Eklai, intake	27-Oct-00	28-Oct-00	7.6	30.8	701	341	0.3	0.4	274	194	NT	ND	0.7	0.001	0.01	0.55	0.1	36	NT	TNC	120
AT-2	Tulai intake, Hatusou	27-Oct-00	28-Oct-00	8.0	26.7	280	134	0.1	3.4	114	84	NT	0.3	0.3	0.005	0.13	0.33	0.1	4	NT	TNC	430
AT-3	Tulai intake, Galileia	27-Oct-00	28-Oct-00	8.0	26.4	274	132	0.1	4.1	108	86	NT	ND	1.2	0.005	0.03	0.35	0.1	2	NT	355	30
AT-4	Kampung Baru	27-Oct-00	28-Oct-00	8.6	32.5	638	310	0.3	0.7	213	214	172	0.4	0.2	0.008	0.02	0.51	ND	115	NT	TNC	160
AT-5	Efti Karkea	27-Oct-00	28-Oct-00	8.6	33.0	628	305	0.3	1.3	210	208	166	ND	0.1	0.005	0.08	0.52	0.1	115	NT	380	95
AT-6	Church Villa	27-Oct-00	28-Oct-00	8.3	35.5	281	135	NT	17.0	118	90	63	ND	0.7	0.005	0.13	0.47	ND	3	NT	TNC	375

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-3 Water Quality Data Sheet of Manatuto (1)

District: Manatuto

Town: Manatuto

Sampled and tested by: Alvaro Godinho, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μ ℧/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
MT-1*	Manatuto, raw water	17-Mar-00	18-Mar-00	7.8	28.0	548	266	0.3	1.6	196	269	NT	0.3	0.0	0.009	0.01	0.47	0.1	NT	NT	N/A	N/A
MT-2*	Umasao	17-Mar-00	18-Mar-00	7.3	28.7	1184	584	0.6	0.6	NT	NT	NT	ND	NT	NT	NT	0.61	NT	NT	NT	++	+++
MT-3*	Nonsorao	17-Mar-00	18-Mar-00	7.3	30.1	1639	817	0.8	1.0	422	618	NT	ND	1.8	0.010	0.03	0.94	0.1	NT	NT	+	++
MT-4*	Ma Abat	17-Mar-00	18-Mar-00	7.3	29.5	1237	611	0.6	0.3	NT	NT	NT	ND	NT	NT	NT	0.60	NT	NT	NT	++	+++
MT-5*	Aiteas	17-Mar-00	18-Mar-00	7.1	29.1	1036	509	0.5	0.7	NT	NT	NT	0.1	NT	NT	NT	0.38	NT	NT	NT	++	++
MT-6*	Nunu Tehen	17-Mar-00	18-Mar-00	7.2	29.9	3530	1818	1.8	0.2	494	1146	NT	0.5	65.0	0.029	0.02	0.83	0.1	NT	NT	+	+
MT-7*	Nakukuren	17-Mar-00	18-Mar-00	7.2	30.3	1214	599	0.6	3.5	NT	NT	NT	ND	NT	NT	NT	0.61	NT	NT	NT	+	+
MT-8*	Sala Mata	17-Mar-00	18-Mar-00	6.8	29.5	1755	877	0.9	7.0	NT	NT	NT	ND	NT	NT	NT	0.65	NT	NT	NT	++	++
MT-9*	Natar Laran	17-Mar-00	18-Mar-00	7.3	28.7	1184	584	0.6	5.1	NT	NT	NT	ND	NT	NT	NT	0.52	NT	NT	NT	+	++

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of MT-1 to MT-9 would be converted the different palces after this sampling.

Table A.6-3 Water Quality Data Sheet of Manatuto (2)

District: Manatuto

Town: Manatuto

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(°C)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
MT-1	Pumping Station, Infiltration Gallery																					
MT-2	After Reservoir Tank																					
MT-3	UN Office																					
MT-4	Nonsorao	9-May-00	10-May-00	7.3	29.0	1272	628	0.6	4.5	435	NT	NT	1.0	9.4	0.003	0.01	0.92	NT	NT	NT	+	+++
MT-5	Aiteas, ACF House	9-May-00	10-May-00	7.0	29.0	1192	588	0.6	3.5	NT	NT	NT	0.9	0.5	ND	0.16	0.56	NT	NT	NT	±	-
MT-6	Nunu Tohen	9-May-00	10-May-00	7.3	28.0	3980	207	2.1	0.3	NT	NT	NT	0.4	10	0.007	0.01	0.92	ND	NT	NT	+	±
MT-7	Natar Laran	9-May-00	10-May-00	7.1	28.0	1194	589	0.6	2.8	NT	NT	NT	0.5	0.1	0.001	0.04	0.60	0.1	NT	NT	±	-
MT-8	Ailili-1	8-Jun-00	9-Jun-00	7.1	NT	5640	2970	3.0	0.3	NT	NT	NT	ND	255	0.03	0.03	0.53	0.7	NT	NT	+	+
MT-9	Sau, Market	8-Jun-00	9-Jun-00	7.5	NT	4370	2280	2.3	0.9	NT	NT	NT	0.1	111	0.03	0.05	0.84	0.3	NT	NT	±	+
MT-10	Ailili-2	8-Jun-00	9-Jun-00	7.8	NT	3940	2040	2.1	3.4	NT	NT	NT	ND	49	0.04	0.01	0.99	0.2	NT	NT	++	+++

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-3 Water Quality Data Sheet of Manatuto (3)

District: Manatuto

Town: Manatuto

Sampled and tested by: X. Wang, Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
MT-1	Pumping Station, Infiltration Gallery	19-Oct-00	20-Oct-00	7.7	30.5	569	376	0.3	0.2	208	372	NT	ND	ND	0.008	ND	0.52	0.5	ND	NT	17	0
MT-2	After Reservoir Tank	19-Oct-00	20-Oct-00	8.1	31.1	587	285	0.3	26.6	206	272	NT	ND	0.5	0.009	ND	0.84	0.7	130	NT	0	0
MT-3	UN Office	19-Oct-00	20-Oct-00	7.3	29.9	2200	1100	1.1	2.6	452	682	NT	1.5	0.5	0.011	0.47	1.01	1.6	ND	NT	5	0
MT-4	Nonsorao	19-Oct-00	20-Oct-00	7.4	30.6	190	1910	1.0	1.4	392	676	NT	ND	2.0	0.007	ND	1.26	0.4	ND	NT	25	15
MT-5	Aiteas, ACF House	19-Oct-00	20-Oct-00	7.4	30.6	2640	1342	1.4	1.0	456	960	NT	ND	9.0	0.017	ND	1.19	0.5	ND	NT	TNC	595
MT-6	Nunu Tehen	19-Oct-00	20-Oct-00	7.1	31.4	4280	2230	2.3	1.1	476	1248	NT	0.3	28.8	0.008	0.01	1.18	0.9	ND	NT	485	380
MT-7	Natar Laran	19-Oct-00	20-Oct-00	7.2	31.0	1406	697	0.7	6.6	424	700	NT	ND	2.0	0.003	ND	0.83	0.4	375	NT	TNC	195
MT-8	Ailili-1	19-Oct-00	20-Oct-00	7.1	31.5	4210	2190	2.2	0.3	388	1340	NT	0.2	76.0	0.057	0.08	1.08	0.8	25	NT	0	0
MT-9	Sau, Market	19-Oct-00	20-Oct-00	7.2	30.1	3280	1688	1.7	2.0	556	1000	NT	0.5	2.5	0.050	ND	1.21	0.7	ND	NT	TNC	TNC
MT-10	Ailili-2	19-Oct-00	20-Oct-00	7.2	31.1	2340	1183	1.2	7.2	528	984	NT	0.3	0.1	0.340	1.00	1.07	1.1	ND	NT	5	0

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-4 Water Quality Data Sheet of Baucau (1)

District: Baucau

Town: Baucau

Sampled and tested by: Alvaro Godinho, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
BC-1	SMPK Misi, Baucau	20-Mar-00	21-Mar-00	7.5	27.4	406	195.7	0.2	0.5	NT	NT	NT	0.3	NT	NT	NT	ND	NT	NT	NT	+	+
BC-2	Reservoir 2	20-Mar-00	21-Mar-00	8.0	26.1	396	191.2	0.2	0.2	193	195	NT	0.6	1.4	0.004	0.01	0.01	0.2	NT	NT	-	±
BC-3	Water Authority Office	20-Mar-00	21-Mar-00	7.7	27.9	410	198.0	0.2	0.5	212	216	NT	0.6	1.3	0.034	0.01	0.06	ND	NT	NT	+	±
BC-4	Uma Lima	20-Mar-00	21-Mar-00	7.7	27.3	411	198.3	0.2	2.0	NT	NT	NT	0.8	NT	NT	NT	0.03	NT	NT	NT	++	++
BC-5	Kathederal, Baucau	20-Mar-00	21-Mar-00	7.4	27.0	411	198.4	0.2	0.2	NT	NT	NT	0.5	NT	NT	NT	0.09	NT	NT	NT	-	±
BC-6	Abudae	20-Mar-00	21-Mar-00	7.4	27.2	410	198.0	0.2	0.7	NT	NT	NT	0.6	NT	NT	NT	0.02	NT	NT	NT	+	+
BC-7	Maternidade	20-Mar-00	21-Mar-00	7.4	29.5	410	197.7	0.2	0.7	NT	NT	NT	0.5	NT	NT	NT	0.09	NT	NT	NT	+	+
BC-8	Teulale Senior Schola	20-Mar-00	21-Mar-00	7.7	36.4	415	200.0	N/A	0.3	214	217	NT	0.6	1.3	0.005	ND	0.05	0.2	NT	NT	±	±
BC-9	Lamegia	20-Mar-00	21-Mar-00	7.5	27.3	410	198.1	0.2	0.5	NT	NT	NT	0.8	NT	NT	NT	0.04	NT	NT	NT	±	+
BC-10	Central	20-Mar-00	21-Mar-00	7.7	29.3	413	199.4	0.2	0.4	NT	NT	NT	0.7	NT	NT	NT	ND	NT	NT	NT	±	±

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-4 Water Quality Data Sheet of Baucau (2)

District: Baucau

Town: Baucau

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
BC-1	SMPK Misi, Baucau	5-May-00	6-May-00	7.6	27.6	415	200.0	0.2	0.5	NT	NT	NT	ND	1.3	0.002	0.02	1.06	0.5	NT	NT	±	±
BC-2	Reservoir 2	5-May-00	6-May-00	7.8	27.5	414	199.9	0.2	0.5	277	NT	NT	ND	1.3	0.166	0.01	ND	0.2	NT	NT	+	±
BC-3	Water Authority Office	5-May-00	6-May-00	8.0	26.9	416	198.0	0.2	0.2	268	NT	NT	ND	1.3	0.002	0.03	ND	0.3	NT	NT	+	++
BC-4	Uma Lima	5-May-00	6-May-00	7.8	27.4	414	199.9	0.2	0.2	NT	NT	NT	ND	1.5	0.003	ND	0.11	NT	NT	NT	++	+
BC-5	Kathederal, Baucau	5-May-00	6-May-00	7.7	26.2	415	200.0	0.2	1.0	NT	NT	NT	ND	1.5	0.007	0.01	0.26	NT	NT	NT	+	-
BC-6	Abudae	5-May-00	6-May-00	7.5	27.7	414	199.9	0.2	0.2	NT	NT	NT	0.1	1.5	0.004	0.02	0.00	NT	NT	NT	+	-
BC-7	Maternidade	5-May-00	6-May-00	7.4	27.0	443	214.0	0.2	0.7	NT	NT	NT	ND	0.1	0.002	0.02	0.18	NT	NT	NT	±	-
BC-8	Teulale Senior Schola	5-May-00	6-May-00	7.5	26.8	414	199.9	0.2	0.7	278	NT	NT	ND	1.5	0.002	ND	0.15	0.2	NT	NT	NT	NT
BC-9	Lamegia	5-May-00	6-May-00	7.6	27.6	406	195.9	0.2	0.3	NT	NT	NT	ND	1.4	0.002	0.00	ND	NT	NT	NT	-	-
BC-10	Central	5-May-00	6-May-00	7.4	27.3	407	195.8	0.2	0.4	NT	NT	NT	ND	1.40	0.002	0.09	ND	NT	NT	NT	-	±

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-4 Water Quality Data Sheet of Baucau (3)

District: Baucau

Town: Baucau

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(°C)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
BC-1	SMPK Misi, Baucau	23-Oct-00	24-Oct-00	7.7	28.5	419	202	0.2	0.5	222	216	213	0.3	NT	NT	NT	0.25	ND	2	NT	150	72
BC-2	Reservoir 2	23-Oct-00	24-Oct-00	8.2	30.8	419	202	0.2	0.4	NT	NT	NT	0.1	1.0	0.035	0.02	0.23	ND	1	NT	0	0
BC-3	Water Authority Office	23-Oct-00	24-Oct-00	7.9	27.9	421	203	0.2	0.2	226	220	218	0.2	1.0	0.012	0.03	0.22	ND	1	NT	46	26
BC-4	Uma Lima	23-Oct-00	24-Oct-00	8.0	28.4	411	198	0.2	0.2	NT	NT	NT	0.2	1.0	0.004	0.02	0.22	ND	1	NT	42	16
BC-5	Kathederal, Baucau	23-Oct-00	24-Oct-00	7.7	26.9	422	204	0.2	0.3	220	210	209	1.3	1.1	0.006	0.05	0.31	ND	1	NT	34	12
BC-6	Abudae	23-Oct-00	24-Oct-00	7.7	27.1	421	203	0.2	1.0	NT	NT	NT	ND	NT	NT	NT	0.27	ND	1	NT	48	24
BC-7	Maternidade	23-Oct-00	24-Oct-00	7.7	29.7	422	204	0.2	0.2	NT	NT	NT	ND	1.1	0.008	0.03	0.28	ND	ND	NT	22	20
BC-8	Teufale Senior Schola	23-Oct-00	24-Oct-00	7.7	33.2	424	205	0.2	0.3	223	204	204	0.2	1.0	0.004	0.03	0.29	ND	1	NT	24	16
BC-9	Lamegia	23-Oct-00	24-Oct-00	8.0	27.3	418	202	0.2	0.0	NT	NT	NT	ND	0.9	0.005	0.02	0.21	ND	1	NT	30	18
BC-10	Central																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-5 Water Quality Data Sheet of Los Palos (1)

District: Lautem

Town: Los Palos

Tested by: Alvaro Godinho, technician, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
LP-1	Papapa, intake	23-Mar-00	24-Mar-00	7.1	26.1	518	251	0.2	1.7	258	264	NT	0.1	0.6	0.012	ND	0.10	0.1	NT	NT	±	+
LP-2	KOR BATT, Spring																					
LP-3	Kauto, Old pump house	23-Mar-00	24-Mar-00	6.8	26.0	523	253	0.3	1.4	NT	NT	NT	ND	NT	NT	NT	0.16	NT	NT	NT	+	+++
LP-4	Perekiki																					
LP-5	Kartini-1																					
LP-6	Sawarika																					
LP-7	Motarlori	23-Mar-00	24-Mar-00	7.0	26.5	522	253	0.2	1.0	NT	NT	NT	ND	NT	NT	NT	0.17	NT	1	NT	+++	+++
LP-8	Natura, shallow well																					
LP-9	Central 2	23-Mar-00	24-Mar-00	7.1	26.8	534	259	0.3	1.0	NT	NT	273	ND	NT	NT	NT	0.21	NT	2	NT	++	++
LP-10	Central 3	23-Mar-00	24-Mar-00	7.0	27.5	537	260	0.3	1.5	290	297	NT	ND	0.9	0.010	ND	0.25	0.1	NT	NT	NT	NT

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-5 Water Quality Data Sheet of Los Palos (2)

District: Lautem

Town: Los Palos

Tested by: Alvaro Godinho, technician, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(°C)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
LP-1	Papapa, intake	8-May-00	9-May-00	7.1	26.0	532	258	0.3	2.1	289	NT	NT	0.4	0.8	0.007	0.02	0.12	ND	NT	NT	±	+
LP-2	KOR BATT, Spring																					
LP-3	Kauto, Old pump house	8-May-00	9-May-00	6.8	26.0	517	250	0.2	2.0	NT	NT	NT	0.2	0.4	0.002	0.02	0.19	NT	NT	NT	+	+++
LP-4	Perekiki																					
LP-5	Kartini-1																					
LP-6	Sawarika																					
LP-7	Motarlori	8-May-00	9-May-00	7.0	26.0	516	250	0.2	1.5	288	NT	NT	0.5	0.4	0.002	0.02	0.12	0.1	1.0	NT	+++	+++
LP-8	Natura, shallow well																					
LP-9	Central 2	8-May-00	9-May-00	7.1	NT	526	255	0.3	12.3	286	NT	NT	0.30	0.6	0.003	0.02	0.17	0.3	2.0	NT	++	++
LP-10	Central 3	8-May-00	9-May-00	7.0	26.0	518	251	0.2	10.9	NT	NT	NT	0.3	0.5	0.003	0.00	0.10	0.3	NT	NT	NT	NT

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-5 Water Quality Data Sheet of Los Palos (3)

District: Lautem

Town: Los Palos

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	E.Coli
		sample	test		(°C)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
LP-1	Papapa, intake	30-Oct-00	1-Nov-00	7.5	28.7	539	261	0.3	1.4	280	288	NT	ND	0.9	0.011	ND	0.12	ND	1.0	NT	170	0
LP-2	KOR BATT, Spring	30-Oct-00	1-Nov-00	7.4	26.8	546	264	0.3	0.4	281	222	NT	1.0	1.3	0.006	ND	0.15	ND	ND	NT	10	0
LP-3	Kauto, Old pump house	30-Oct-00	1-Nov-00	7.4	30.0	544	264	0.3	1.6	NT	NT	NT	ND	NT	0.009	NT	0.11	NT	NT	NT	225	0
LP-4	Perekiki	30-Oct-00	1-Nov-00	7.5	27.0	545	264	0.3	3.5	280	282	277	ND	0.9	0.005	ND	ND	0.3	1.0	NT	100	0
LP-5	Kartini-1	30-Oct-00	1-Nov-00	7.4	27.6	547	265	0.3	4.4	NT	NT	NT	0.6	NT	ND	NT	0.07	NT	NT	NT	145	0
LP-6	Sawarika	30-Oct-00	1-Nov-00	7.3	30.3	554	269	0.3	1.5	281	285	274	1.1	1.0	0.003	ND	0.18	ND	ND	NT	130	0
LP-7	Motarlori	30-Oct-00	1-Nov-00	7.4	27.8	545	264	0.3	2.3	NT	NT	NT	ND	0.8	0.004	ND	ND	ND	1.0	NT	115	5
LP-8	Natura, shallow well	30-Oct-00	1-Nov-00	7.6	25.7	440	212	0.2	1.6	NT	219	NT	1.4	0.4	0.007	ND	ND	ND	ND	NT	TNC	130
LP-9	Central 2	31-Oct-00	1-Nov-00	7.5	25.9	541	262	0.3	6.5	280	283	273	ND	0.9	0.009	0.03	0.08	ND	2.0	NT	85	35
LP-10	Central 3	31-Oct-00	1-Nov-00	7.5	26.6	541	262	0.3	4.3	NT	NT	NT	0.3	NT	0.008	NT	0.12	NT	NT	NT	220	5

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-6 Water Quality Data Sheet of Viqueque (1)

District: Viqueque

Town: Viqueque

Sampled and tested by: Alvaro Godinho, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
VQ-1	Loi Huna, intake	22-Mar-00	24-Mar-00	>8.2	26.7	503	244	0.2	1.1	209	227	NT	0.3	0.1	0.004	0.01	1.19	0.3	NT	NT	+++	+++
VQ-2	Break Pressure Tank	22-Mar-00	24-Mar-00	7.4	27.2	560	272	0.3	0.5	NT	NT	NT	0.3	NT	NT	NT	1.21	NT	NT	NT	±	+
VQ-3	RSUD Viqueque, Hospital	22-Mar-00	24-Mar-00																			
VQ-4	Beloi 1,PT	22-Mar-00	24-Mar-00	7.9	28.7	556	269	0.3	0.2	NT	NT	NT	0.1	NT	NT	NT	1.30	NT	NT	NT	+	+
VQ-5*	Boramatan 2	22-Mar-00	24-Mar-00	7.5	29.9	551	267	0.3	0.3	NT	NT	NT	0.3	NT	NT	NT	1.21	NT	NT	NT	±	±
VQ-6	Beobe Area	22-Mar-00	24-Mar-00																			
VQ-7*	Beloi 2	22-Mar-00	24-Mar-00	7.5	30.7	558	270	0.3	0.6	288	334	NT	0.2	ND	0.010	0.00	1.25	0.1	NT	NT	-	++
VQ-8	Aulatar, PT	22-Mar-00	24-Mar-00	7.5	28.6	557	270	0.3	0.3	285	298	NT	0.2	ND	0.037	0.01	1.26	0.3	NT	NT	++	++
VQ-9	Carabaro H.No.261	22-Mar-00	24-Mar-00	7.6	29.1	556	269	0.3	1.5	NT	NT	NT	ND	NT	NT	NT	1.22	NT	NT	NT	-	+
VQ-10*	Kabira, Boramatan 1	22-Mar-00	24-Mar-00	7.5	30.0	556	270	0.3	1.7	NT	NT	NT	0.1	NT	NT	NT	1.31	NT	NT	NT	±	±

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of VQ-5,6 and VQ-10 would be converted the different palces after this sampling.

Table A.6-6 Water Quality Data Sheet of Viqueque (2)

District: Viqueque

Town: Viqueque

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
VQ-1	Loi Huno, intake	4-May-00	5-May-00	8.2	20.5	457	221	0.2	1.1	239	NT	NT	0.2	ND	0.001	0.01	1.07	0.2	NT	NT	+++	+++
VQ-2	Break Pressure Tank	4-May-00	5-May-00	7.4	27.9	551	267	0.3	0.5	265	NT	NT	ND	ND	0.003	ND	0.98	NT	NT	NT	-	±
VQ-3	RSUD Viqueque	4-May-00	5-May-00	7.7	28.1	559	253	0.3	0.3	NT	NT	NT	ND	ND	0.003	0.01	1.12	NT	NT	NT	++	+
VQ-4	Beloi 1,PT	4-May-00	5-May-00	7.8	27.9	548	265	0.3	0.2	NT	NT	NT	ND	0.1	0.003	0.01	1.02	NT	NT	NT	+	+
VQ-5	Boramatan 3	4-May-00	5-May-00	7.6	27.8	568	276	0.3	0.3	NT	NT	NT	ND	0.1	0.002	0.00	1.16	NT	NT	NT	+	±
VQ-6*	Beobe Area	4-May-00	5-May-00	7.7	27.9	533	268	0.3	0.5	NT	NT	NT	ND	0.1	0.003	0.01	1.18	NT	NT	NT	-	±
VQ-7	Beloi 3	4-May-00	5-May-00	7.6	26.3	544	269	0.3	0.6	NT	NT	NT	ND	0.1	0.002	0.00	1.10	NT	NT	NT	++	++
VQ-8	Aulatar, PT	4-May-00	5-May-00	7.5	27.1	552	268	0.3	0.3	331	NT	NT	ND	ND	0.002	0.01	1.24	NT	NT	NT	±	+
VQ-9	Carabaro H.No.261	4-May-00	5-May-00	7.6	26.5	548	265	0.3	1.5	372	NT	NT	ND	0.1	0.003	0.01	1.08	0.2	NT	NT	±	±
VQ-10	Kabira, Boramatan 2	4-May-00	5-May-00	7.4	27.5	545	264	0.3	1.7	NT	NT	NT	ND	ND	0.003	0.02	1.28	0.2	NT	NT	±	±

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of VQ-6 would be converted the different palces after this sampling.

Table A.6-6 Water Quality Data Sheet of Viqueque (3)

District: Viqueque

Town: Viqueque

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	E.Coli
		sample	test		(°C)	(ƒ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
VQ-1	Loi Huno, intake	21-Nov-00	22-Nov-00	8.1	27.1	557	270	0.3	0.2	282	298	NT	ND	ND	0.006	0.01	1.38	0.4	30	NT	TNC	TNC
VQ-2	Break Pressure Tank																					
VQ-3	RSUD Viqueque	2-Nov-00	3-Nov-00	8.0	31.8	561	272	0.3	0.3	NT	NT	NT	ND	NT	NT	NT	1.26	NT	NT	NT	75	0
VQ-4	Beloi 1,PT	2-Nov-00	3-Nov-00	8.2	30.6	556	269	0.3	0.3	288	278	184	ND	ND	0.006	0.01	1.10	0.3	29	NT	160	12
VQ-5	Boramatan 3	2-Nov-00	3-Nov-00	7.9	34.9	563	273	0.3	2.1	NT	NT	NT	ND	NT	NT	NT	0.91	NT	NT	NT	TNC	76
VQ-6	Bahafou PT	2-Nov-00	3-Nov-00	8.0	32.1	560	272	0.3	0.7	250	304	201	ND	ND	0.007	ND	1.14	0.3	30	NT	190	28
VQ-7	Beloi 3	2-Nov-00	3-Nov-00	8.0	30.8	560	271	0.3	0.5	292	296	200	ND	ND	0.005	0.01	1.31	0.1	30	NT	95	38
VQ-8	Aulatar, PT	2-Nov-00	3-Nov-00	7.9	31.4	560	271	0.3	0.5	288	290	198	0.1	ND	0.005	0.01	0.85	0.2	29	NT	60	32
VQ-9	Carabaro H.No.261	2-Nov-00	3-Nov-00	7.8	31.0	565	274	0.3	0.3	278	276	198	ND	0.1	0.005	0.01	1.17	0.2	29	NT	110	4
VQ-10	Kabira, Boramatan 2	2-Nov-00	3-Nov-00	7.8	32.4	566	274	0.3	2.0	NT	NT	NT	ND	NT	NT	NT	1.21	NT	NT	NT	120	6

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-7 Water Quality Data Sheet of Same (1)

District: Manufahi

Town: Same

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(°C)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
SM-1	Carbulau, intake 1	27-Mar-00	29-Mar-00	7.9	18.9	257	123.4	0.1	0.2	131	135	NT	ND	0.1	0.007	ND	0.28	0.1	NT	NT	+	+
SM-2	Mibuteluli, intake 2	27-Mar-00	29-Mar-00	7.2	21.7	262	126.0	0.1	0.3	139	139	NT	ND	0.1	0.006	ND	0.11	ND	NT	NT	+	+
SM-3	Break Pressure Tank, Market	27-Mar-00	29-Mar-00	7.9	21.9	346	166.4	0.2	0.4	NT	NT	NT	ND	NT	NT	NT	0.11	NT	NT	NT	+	+
SM-4	Kamilaran, PT	27-Mar-00	29-Mar-00	7.6	23.2	267	128.2	0.1	0.5	NT	NT	NT	ND	NT	NT	NT	0.13	NT	NT	NT	+	+
SM-5	Babulu	27-Mar-00	29-Mar-00	7.7	23.1	347	166.9	0.2	1.0	186	185	NT	ND	0.1	0.007	0.01	0.14	0.1	NT	NT	++	+
SM-6	Raimerak	27-Mar-00	29-Mar-00	7.9	26.0	345	166.0	0.2	2.3	NT	NT	NT	ND	NT	NT	NT	0.13	NT	NT	NT	++	++
SM-7*	Rai Upun	27-Mar-00	29-Mar-00	7.8	23.1	347	167.0	0.2	0.5	NT	NT	NT	ND	NT	NT	NT	0.14	NT	NT	NT	++	+
SM-8*	Nenu Aha	27-Mar-00	29-Mar-00	7.9	20.2	260	124.8	0.1	0.3	NT	NT	NT	ND	NT	NT	NT	0.39	NT	NT	NT	++	+

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of SM-7 and SM-8 would be abolished after this sampling.

Table A.6-7 Water Quality Data Sheet of Same (2)

District: Manufahi

Town: Same

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
SM-1	Carbulau, intake 1	15-May-00	16-May-00	7.7	17.6	261	126.6	0.1	0.2	128	NT	NT	0.4	0.1	0.002	0.02	0.16	ND	NT	NT	+	+++
SM-2	Mibuteluli, intake 2	15-May-00	16-May-00	7.1	20.9	265	124.0	0.1	0.3	183	NT	NT	ND	0.2	0.015	ND	0.09	0.1	NT	NT	+	+
SM-3	Break Pressure Tank, Market	15-May-00	16-May-00	7.8	22.0	318	159.6	0.1	0.3	NT	NT	NT	0.4	ND	0.003	0.04	ND	ND	NT	NT	+	++
SM-4	Kamilaran, PT	15-May-00	16-May-00	7.4	21.5	268	130.0	0.2	0.6	NT	NT	NT	0.1	0.1	0.006	0.01	ND	0.1	NT	NT	NT	NT
SM-5*	Babulu	15-May-00	16-May-00	7.6	25.1	330	161.5	0.1	1.0	190	NT	NT	0.0	ND	0.003	0.03	ND	ND	NT	NT	++	+++
SM-6*	Raimerak	15-May-00	16-May-00	7.5	22.1	346	167.0	0.2	1.2	292	NT	NT	0.3	0.2	0.001	0.02	ND	ND	NT	NT	++	+++

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of SM-5 and SM-6 would be converted the different palces after this sampling.

Table A.6-7 Water Quality Data Sheet of Same (3)

District: Manufahi

Town: Same

Sampled and tested by: Mario Soares, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(°C)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
SM-1	Carbulau, intake 1	2-Oct-00	4-Oct-00	7.8	18.7	294	141.3	0.1	0.2	139	165	NT	0.8	0.1	0.014	ND	0.42	0.5	27	NT	6	4
SM-2	Mibuteluli, intake 2	2-Oct-00	4-Oct-00	7.8	20.7	317	152.4	0.1	0.4	142	214	NT	0.6	0.1	0.005	ND	ND	0.3	7	NT	TNC	17
SM-3	Break Pressure Tank, Market	2-Oct-00	4-Oct-00	8.2	23.2	315	151.3	0.1	0.3	NT	NT	NT	ND	0.1	0.008	NT	NT	NT	NT	NT	TNC	TNC
SM-4	Kamilaran, PT	2-Oct-00	4-Oct-00	7.8	22.8	329	158.3	0.2	0.5	166	NT	NT	ND	0.1	0.013	NT	NT	NT	6	NT	TNC	TNC
SM-5	SAVE HAVEN, CIVPOL	3-Oct-00	4-Oct-00	7.8	25.7	330	158.9	0.2	5.1	NT	176	NT	ND	0.1	0.006	0.02	NT	0.2	NT	NT	TNC	TNC
SM-6	UNTAET Office	3-Oct-00	4-Oct-00	8.0	28.1	316	151.8	0.1	1.0	NT	167	NT	1.3	ND	0.010	0.01	NT	0.3	NT	NT	TNC	10
SM-7	Kotalala Intake 3	2-Oct-00	4-Oct-00	7.4	21.5	332	159.6	0.2	0.9	NT	198	NT	ND	0.1	0.004	0.01	0.06	ND	NT	NT	TNC	13
SM-8	Borlala	2-Oct-00	4-Oct-00	8.0	22.2	299	143.5	0.1	0.3	NT	NT	NT	0.4	0.1	0.015	0.01	NT	0.6	NT	NT	110	4
SM-9	Hatunifa Reservoir	2-Oct-00	4-Oct-00	7.8	21.3	299	143.6	0.1	0.5	NT	NT	NT	ND	0.1	0.004	NT	NT	NT	NT	NT	50	5
SM-10	Clinic OIKOS	3-Oct-00	4-Oct-00	8.0	23.3	317	152.6	0.1	0.8	NT	NT	NT	ND	0.1	0.004	NT	NT	NT	NT	NT	TNC	4

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-7 Water Quality Data Sheet of Same (4)

District: Manufahi

Town: Same

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
SM-1	Carbulau, intake 1	6-Nov-00	7-Nov-00	8.2	18.8	301	144.6	0.1	0.2	138	153	NT	0.3	ND	0.004	ND	0.48	0.3	29	NT	75	0
SM-2	Mibuteluli, intake 2	6-Nov-00	7-Nov-00	8.0	20.9	311	149.4	0.1	0.9	164	162	NT	ND	ND	0.005	ND	0.33	0.5	14	NT	TNC	414
SM-3	Break Pressure Tank, Market	6-Nov-00	7-Nov-00	8.3	24.8	315	151.6	0.1	0.3	NT	NT	NT	ND	NT	NT	NT	0.31	NT	NT	NT	160	18
SM-4	Kamilaran, PT	6-Nov-00	7-Nov-00	8.2	24.7	328	157.9	0.2	6.3	168	170	150	ND	ND	0.005	0.01	0.34	0.3	14	NT	TNC	TNC
SM-5	SAVE HAVEN, CIVPOL	6-Nov-00	7-Nov-00	7.8	28.5	335	161.1	0.2	5.6	NT	176	151	ND	NT	NT	NT	0.39	NT	NT	NT	TNC	TNC
SM-6	UNTAET Office	6-Nov-00	7-Nov-00	8.1	32.5	322	154.7	0.2	0.2	NT	167	147	ND	ND	0.005	0.03	0.30	0.3	15	NT	60	8
SM-7	Kotalala Intake 3	6-Nov-00	7-Nov-00	7.7	21.6	346	166.4	0.2	0.2	179	179	NT	0.5	0.1	0.004	ND	0.36	0.2	12	NT	265	108
SM-8	Borlala	6-Nov-00	7-Nov-00	8.1	26.2	303	145.6	0.1	0.2	NT	154	120	0.5	ND	0.004	ND	0.68	0.3	29	NT	420	30
SM-9	Hatunifa Reservoir	6-Nov-00	7-Nov-00	8.1	23.8	300	144.1	0.1	0.3	NT	NT	NT	0.5	NT	NT	NT	0.49	NT	NT	NT	420	12
SM-10	Clinic OIKOS	6-Nov-00	7-Nov-00	8.1	26.2	320	154.0	0.2	0.1	160	165	145	1.5	ND	0.004	ND	0.29	0.3	14	NT	128	0

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-8 Water Quality Data Sheet of Ainaro (1)

District: Ainaro

Town: Ainaro

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
AN-1	Nugufu, raw water Ainaro	28-Mar-00	29-Mar-00	8.2	17.5	313	150.6	0.1	3.0	160	161	NT	ND	0.1	0.005	0.01	0.18	ND	NT	NT	++	±
AN-2	Misão	28-Mar-00	29-Mar-00	8.2	20.8	313	150.4	0.1	4.0	NT	NT	NT	ND	NT	NT	NT	0.05	NT	NT	NT	++	+
AN-3	Malimeta	28-Mar-00	29-Mar-00	8.2	20.6	314	150.8	0.1	6.2	NT	NT	NT	ND	NT	NT	NT	0.19	NT	NT	NT	+	+
AN-4	Masjid	28-Mar-00	29-Mar-00	8.2	24.4	316	152.2	0.1	2.8	167	175	NT	ND	0.1	0.007	0.02	0.14	ND	NT	NT	+	+
AN-5	Central Market	28-Mar-00	29-Mar-00	8.2	22.8	315	151.6	0.1	4.1	NT	NT	NT	ND	NT	NT	NT	0.22	NT	NT	NT	+	+
AN-6	SMU Negeri, Ainaro	28-Mar-00	29-Mar-00	8.2	20.3	313	150.7	0.1	163	NT	NT	NT	ND	NT	NT	NT	0.19	NT	NT	NT	++	++
AN-7	Maulore, former UN Office	28-Mar-00	29-Mar-00	8.2	29.0	319	153.3	0.1	4.2	164	174	NT	1.1	0.1	0.006	0.05	0.15	ND	NT	NT	+	+
AN-8	Maulore	28-Mar-00	29-Mar-00	8.2	27.5	318	153.0	0.1	3.2	NT	NT	NT	ND	NT	NT	NT	0.15	NT	NT	NT	+	+

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-8 Water Quality Data Sheet of Ainaro (2)

District: Ainaro

Town: Ainaro

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(°C)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
AN-1	Nugufu, raw water Ainaro	22-May-00	23-May-00	8.2	17.0	314	151.3	0.1	3.8	163	NT	NT	ND	0.1	0.004	0.01	0.20	0.1	NT	NT	+	+
AN-2	Misão	22-May-00	23-May-00	8.2	21.4	316	153.0	0.1	7.8	163	NT	NT	0.4	0.1	ND	NT	0.18	NT	NT	NT	+	+
AN-3	Malimeta	22-May-00	23-May-00	8.2	21.1	314	151.1	0.1	10.7	NT	NT	NT	0.7	0.1	0.004	0.02	0.17	ND	NT	NT	+	+
AN-4	Masjid	22-May-00	23-May-00	8.1	24.4	316	151.9	0.1	4.5	NT	NT	NT	ND	0.1	0.004	NT	1.44	NT	NT	NT	+	+
AN-5	Central Market	22-May-00	23-May-00	8.2	20.8	316	152.2	0.1	11.4	NT	NT	NT	0.1	0.2	0.002	NT	0.94	NT	NT	NT	+	+
AN-6	SMU Negeri, Ainaro	22-May-00	23-May-00	8.2	21.2	316	152.0	0.1	7.4	174	NT	NT	0.1	0.2	0.001	NT	0.13	NT	NT	NT	++	++
AN-7	Maulore, former UN Office																					
AN-8	Maulore	22-May-00	23-May-00	8.2	23.3	324	155.7	0.2	3.6	NT	NT	NT	ND	0.1	0.001	NT	0.90	NT	NT	NT	+	+

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-8 Water Quality Data Sheet of Ainaro (3)

District: Ainaro

Town: Ainaro

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(ƒ ℧/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
AN-1	Nugufu, intake	8-Nov-00	9-Nov-00	8.6	18.9	319	153.4	0.2	0.5	159	163	NT	1.8	0.1	0.004	ND	0.23	0.4	17	NT	130	18
AN-2	Misão	8-Nov-00	9-Nov-00	8.6	21.3	316	152.2	0.1	1.7	NT	166	NT	0.8	NT	NT	NT	0.16	NT	NT	NT	210	38
AN-3	Malimeta	8-Nov-00	9-Nov-00	8.6	22.8	315	151.6	0.1	2.0	156	165	122	0.1	0.1	0.003	0.01	0.21	0.3	18	NT	275	16
AN-4	Masjid	8-Nov-00	9-Nov-00	8.5	26.8	315	151.7	0.1	1.0	NT	164	NT	0.9	NT	NT	NT	0.17	NT	NT	NT	210	18
AN-5	Central Market	8-Nov-00	9-Nov-00	8.6	26.8	322	155.1	0.2	1.1	162	166	122	ND	0.2	0.004	0.01	0.23	0.4	18	NT	210	8
AN-6	SMU Negeri, Ainaro	8-Nov-00	9-Nov-00	8.6	23.5	316	152.1	0.1	1.4	162	165	121	ND	0.1	0.003	0.01	0.17	0.2	18	NT	TNC	18
AN-7	Maulore, former UN Office	8-Nov-00	9-Nov-00	8.5	23.7	316	152.2	0.1	1.2	NT	166	NT	0.5	NT	NT	NT	0.15	NT	NT	NT	150	28
AN-8	Maulore	8-Nov-00	9-Nov-00	8.5	26.0	306	147.3	0.1	4.0	152	157	114	0.3	0.4	0.004	0.04	0.08	0.4	18	NT	TNC	120

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-9 Water Quality Data Sheet of Aileu (1)

District: Aileu

Town: Aileu

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Syudy Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
AL-1	Mantane River intake, RW	18-Mar-00	20-Mar-00	8.1	24.3	220	105.2	0.1	42.6	101.6	104.8	NT	ND	0.1	0.008	0.29	0.19	0.1	NT	NT	+++	+++
AL-2	Sloi Kraik, RW																					
AL-3	Hularema, RW																					
AL-4	Naufaisaran, RW																					
AL-5	Tanki Malere A	18-Mar-00	20-Mar-00	7.8	22.0	157.0	74.9	0.1	3.6	NT	NT	NT	0.4	NT	NT	NT	0.21	NT	NT	NT	++	++
AL-6	Malere Area	18-Mar-00	20-Mar-00	6.9	22.8	86.0	40.7	ND	1.2	38.1	26.8	NT	0.8	ND	0.007	0.02	0.18	0.2	NT	NT	+	++
AL-7	Aileu Market	18-Mar-00	20-Mar-00	6.8	23.4	84.7	40.1	ND	1.2	NT	NT	NT	0.4	NT	NT	NT	0.16	NT	NT	NT	+	+
AL-8	Uma Hitu	18-Mar-00	20-Mar-00	6.8	23.5	88.1	41.7	ND	1.4	NT	NT	NT	ND	NT	NT	NT	0.20	NT	NT	NT	+	+
AL-9	Modo Laran	18-Mar-00	20-Mar-00	6.8	25.4	151.6	72.3	0.1	2.5	NT	NT	NT	0.1	NT	NT	NT	0.20	NT	NT	NT	++	++
AL-10	Nenas Laran	18-Mar-00	20-Mar-00	7.2	24.9	150.7	71.9	0.1	3.0	NT	NT	NT	0.5	NT	NT	NT	0.20	NT	NT	NT	++	++

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-9 Water Quality Data Sheet of Aileu (2)

District: Aileu

Town: Aileu

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(°C)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
AL-1	Mantane River intake, RW	27-Apr-00	28-Apr-00	8.1	25.4	221	106.1	0.1	2.9	106	105	NT	0.0	0.1	0.006	0.26	0.15	0.1	NT	NT	+++	+++
AL-2	Sloi Kraik, RW																					
AL-3	Hularema, RW																					
AL-4	Naufaisaran, RW																					
AL-5	Tanki Malere A	27-Apr-00	28-Apr-00	7.8	22.3	156.0	75.5	0.1	3.5	59.0	NT	NT	0.5	0.3	0.007	0.02	0.18	0.2	NT	NT	++	+++
AL-6	Malere Area	27-Apr-00	28-Apr-00	6.9	23.4	85.9	40.5	0.0	1.2	176	26.8	NT	0.7	ND	0.006	0.02	0.16	0.2	NT	NT	++	++
AL-7	Aileu Market	27-Apr-00	28-Apr-00	6.8	23.0	84.5	40.0	0.0	1.2	47.0	NT	NT	0.3	0.2	0.005	ND	0.17	0.2	NT	NT	+	++
AL-8	Uma Hitu	27-Apr-00	28-Apr-00	6.8	23.6	88.0	40.8	0.0	1.4	37.6	NT	NT	ND	ND	0.005	0.02	0.20	0.1	NT	NT	+	+
AL-9	Modo Laran	27-Apr-00	28-Apr-00	6.7	25.6	150.5	70.9	0.1	2.4	37.8	NT	NT	0.1	0.1	0.004	0.02	0.19	0.2	NT	NT	++	+++
AL-10	Nenas Laran	27-Apr-00	28-Apr-00	7.4	24.8	151.6	70.9	0.1	3.0	123	NT	NT	0.4	0.0	0.006	0.02	0.21	0.2	NT	NT	++	++

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-9 Water Quality Data Sheet of Aileu (3)

District: Aileu

Town: Aileu

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
AL-1	Mantane River intake, RW	25-Oct-00	25-Oct-00	8.6	28.9	257	123.5	0.1	2.9	130	125	107	ND	0.1	0.050	0.11	0.19	0.6	25	NT	470	155
AL-2	Sloi Kraik, RW	20-Oct-00	25-Oct-00	8.2	28.1	126.7	60.3	0.1	1.5	64	50	28	1.2	ND	0.195	0.20	1.51	0.5	12	NT	376	210
AL-3	Hularema, RW	21-Oct-00	25-Oct-00	8.0	27.8	125.7	59.8	0.1	6.5	59	50	24	0.9	0.3	0.009	0.08	0.12	0.3	18	NT	275	70
AL-4	Naufaisaran, RW	24-Oct-00	25-Oct-00	7.4	27.8	47.4	22.2	0.0	0.6	28	16	7	1.1	ND	0.020	ND	0.12	0.2	1	NT	90	0
AL-5	Tanki Malere A	25-Oct-00	25-Oct-00	8.2	23.2	168.4	80.4	0.1	1.1	75	80	47	0.5	0.1	NT	NT	1.43	NT	NT	NT	112	10
AL-6	Malere Area	25-Oct-00	25-Oct-00	8.0	25.2	142.4	67.9	0.1	0.9	NT	NT	NT	0.2	ND	0.164	0.08	0.17	0.5	14	NT	235	5
AL-7	RSU Aileu	25-Oct-00	25-Oct-00	8.2	25.8	144.8	69.0	0.1	1.1	77	59	43	0.1	0.1	0.226	0.12	ND	0.4	13	NT	260	0
AL-8	Uma Hitu	25-Oct-00	25-Oct-00	7.9	26.6	140.6	67.0	0.1	2.2	71	52	32	ND	0.2	0.321	0.07	0.19	0.6	13	NT	270	0
AL-9	Companya Lima	25-Oct-00	25-Oct-00	7.8	25.2	138.7	66.1	0.1	0.9	NT	NT	NT	0.8	0.1	NT	NT	0.09	NT	NT	NT	265	5
AL-10	Nanas Laran	25-Oct-00	25-Oct-00	8.1	25.3	152.9	72.9	0.1	0.8	78	60	35	0.8	0.1	0.076	0.09	0.54	0.4	16	NT	250	10

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-10 Water Quality Data Sheet of Maubisse (1)

District: Ainaro

Town: Maubisse

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
MB-1	Erulun intake	18-Mar-00	20-Mar-00	7.7	19.5	282	135.3	0.1	0.3	152	146	NT	ND	0.9	0.007	0.02	0.27	0.2	NT	NT	±	+
MB-2	Raikoak Ulun intake																					
MB-3	Bucana intake																					
MB-4	Kompanya Area 2	18-Mar-00	20-Mar-00	7.7	20.2	286	137.2	0.1	0.2	NT	NT	NT	ND	NT	NT	NT	0.24	NT	NT	NT	±	±
MB-5	Hopital Area	18-Mar-00	20-Mar-00	7.6	20.0	291	140.0	0.1	8.0	NT	NT	NT	ND	NT	NT	NT	0.20	NT	NT	NT	++	++
MB-6	Central Market	18-Mar-00	20-Mar-00	7.6	20.4	301	144.5	0.1	2.0	168	159	NT	0.1	0.4	0.007	0.01	0.23	0.3	NT	NT	++	++
MB-7*	Kompanya Area 1	18-Mar-00	20-Mar-00	7.7	19.8	285	137.0	0.1	0.6	NT	NT	NT	ND	NT	NT	NT	0.20	NT	NT	NT	-	+
MB-8	Posadas de Timor																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of MB-7 would be converted the different palces after this sampling.

Table A.6-10 Water Quality Data Sheet of Maubisse (2)

District: Ainaro

Town: Maubisse

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(ƒ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
MB-1	Erulun intake	23-May-00	24-May-00	7.8	19.4	273	131.2	0.1	0.3	147	NT	NT	0.3	0.9	0.001	0.01	0.21	0.1	NT	NT	±	+
MB-2	Raikoak Ulun intake																					
MB-3	Bucana intake																					
MB-4	Kompanya Area 2	23-May-00	24-May-00	7.7	19.6	276	139.0	0.1	0.4	NT	NT	NT	0.4	0.4	0.001	0.01	0.09	0.2	NT	NT	±	+
MB-5	Hopital Area	23-May-00	24-May-00	7.6	10.9	283	136.0	0.1	1.0	NT	NT	NT	0.4	0.9	0.002	ND	0.00	0.1	NT	NT	++	++
MB-6*	Central Market	23-May-00	24-May-00	7.5	21.9	296	142.0	0.1	0.8	147	NT	NT	0.6	0.1	0.003	ND	0.17	0.1	NT	NT	++	++
MB-7*	Kompanya Area 3	23-May-00	24-May-00	7.6	20.0	280	134.0	0.1	0.4	NT	NT	NT	0.8	1.0	0.001	ND	0.08	0.2	NT	NT	±	+
MB-8	Posadas de Timor																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of MB-6 and MB-7 would be converted the different palces after this sampling.

Table A.6-10 Water Quality Data Sheet of Maubisse (3)

District: Ainaro

Town: Maubisse

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(°C)	(ƒ ß/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
MB-1	Erulun intake	20-Oct-00	21-Oct-00	8.1	19.6	281	135.1	0.1	0.5	142	140	NT	0.3	0.5	0.005	ND	0.48	0.3	1	NT	120	10
MB-2	Raikoak Ulun intake	20-Oct-00	21-Oct-00	7.9	19.0	453	219	0.2	1.1	242	228	NT	0.5	ND	0.006	0.03	0.19	0.5	2	NT	55	2
MB-3	Bucana intake	8-Nov-00	12-Nov-00	8.5	29.1	326	156.6	0.2	43.8	170	174	NT	ND	0.3	0.007	0.40	ND	0.4	2	NT	475	105
MB-4	Kompanya Area 2	20-Oct-00	21-Oct-00	8.0	28.8	290	139.5	0.1	0.3	144	137	118	ND	0.6	0.026	NT	1.80	NT	NT	NT	85	0
MB-5	Hopital Area	20-Oct-00	21-Oct-00	8.0	23.7	293	140.8	0.1	1.0	147	140	114	0.3	0.7	NT	NT	0.27	NT	NT	NT	TNC	4
MB-6	Balai Pertemuan	20-Oct-00	21-Oct-00	8.1	22.3	320	153.8	0.2	0.6	168	158	133	0.9	0.1	0.011	0.01	0.26	0.3	2	NT	100	40
MB-7	Lepotutu Tanki	20-Oct-00	21-Oct-00	8.2	24.0	447	216	0.2	10.1	241	228	NT	0.4	ND	0.006	0.06	0.65	0.4	2	NT	340	160
MB-8	Posadas de Timor	20-Oct-00	21-Oct-00	8.5	21.9	543	263	0.3	16.6	236	221	213	0.4	0.10	0.011	NT	1.06	NT	5	NT	TNC	TNC

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-11 Water Quality Data Sheet of Gleno (1)

District: Ermera

Town: Gleno

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(°C)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
GL-1	Mota Boot intake, not use	21-Mar-00	22-Mar-00	8.1	22.3	190.1	90.9	0.1	9.5	NT	NT	NT	ND	NT	NT	NT	0.29	NT	NT	NT	++	+
GL-2	Mota Kiik intake, Existing	21-Mar-00	22-Mar-00	8.1	21.2	175.0	83.6	0.1	2.1	95.0	85.6	NT	0.1	0.1	0.005	0.01	0.39	0.1	NT	NT	+	++
GL-3	Reservoir, Riheu	21-Mar-00	22-Mar-00	8.0	23.0	175.4	83.8	0.1	1.9	88.0	83.6	NT	ND	0.1	0.005	0.01	0.30	0.2	NT	NT	+	++
GL-4	Perumnas Lama	21-Mar-00	22-Mar-00	7.9	26.3	319	153.4	0.1	1.5	160	161	NT	ND	ND	0.004	0.01	0.33	0.2	NT	NT	+	++
GL-5	DA office, Gleno																					
GL-6	AMI Hospital, Riheu																					
GL-7	Meijid	21-Mar-00	22-Mar-00	8.2	23.1	175.2	83.7	0.1	2.7	NT	NT	NT	ND	NT	NT	NT	0.35	NT	NT	NT	+	++

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-11 Water Quality Data Sheet of Gleno (2)

District: Ermera

Town: Gleno

Sampled and tested by: X.Wang, Alvaro Godinho, OWS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
GL-1	Mota Boot intake, not use	3-Jul-00	4-Jul-00	8.2	20.6	239	114.4	0.1	6.3	140	NT	NT	0.1	ND	0.197	0.01	1.20	0.4	NT	NT	+++	+++
GL-2	Mota Kiik intake, Existing	3-Jul-00	4-Jul-00	8.2	20.0	197	94.3	0.1	1.9	125	NT	NT	0.2	ND	0.027	0.02	0.07	0.1	NT	NT	±	++
GL-3	Reservoir, Riheu	3-Jul-00	4-Jul-00	8.2	22.2	198	94.4	0.1	4.1	114	NT	NT	0.1	0.2	0.005	0.01	0.07	ND	NT	NT	±	++
GL-4	Perumnas Lama	3-Jul-00	4-Jul-00	8.0	23.8	265	127.2	0.1	4.3	133	NT	NT	ND	0.2	0.001	0.01	0.05	0.1	NT	NT	+	++
GL-5	DA office, Gleno	3-Jul-00	4-Jul-00	8.0	24.4	194	92.9	0.1	5.0	220	NT	NT	ND	nd	0.003	0.02	0.06	0.2	NT	NT	+	++
GL-6	AMI Hospital, Riheu																					
GL-7*	Meijid																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of GL-7 would be abolished after this sampling

Table A.6-11 Water Quality Data Sheet of Gleno (3)

District: Ermera

Town: Gleno

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(ƒ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
GL-1	Mota Boot intake, not use	10-Nov-00	10-Nov-00	8.4	21.8	232	111.1	0.1	21.8	74.8	87.6	NT	ND	0.4	0.010	0.17	0.02	0.4	32	NT	TNC	TNC
GL-2	Mota Kiik intake, Existing	10-Nov-00	10-Nov-00	8.4	21.1	244	117.2	0.1	1.8	92.8	100	NT	0.2	0.2	0.005	0.01	0.09	0.2	24	NT	225	18
GL-3	Reservoir, Riheu	10-Nov-00	10-Nov-00	8.3	24.6	258	123.6	0.1	0.8	NT	94.8	NT	ND	NT	NT	NT	0.10	NT	NT	NT	18	5
GL-4	Perumnas Lama																					
GL-5	DA office, Gleno	10-Nov-00	10-Nov-00	8.3	29.7	237	113.5	0.1	0.8	NT	97.6	82.0	0.1	0.2	0.005	0.01	0.05	0.2	24	NT	104	25
GL-6	AMI Hospital, Riheu	10-Nov-00	10-Nov-00	8.2	27.6	258	123.7	0.1	1.6	93.6	95.6	84.4	0.4	0.2	0.005	0.02	0.82	0.1	24	NT	60	15

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-12 Water Quality Data Sheet of Ermera (1)

District: Ermera

Town: Ermera

Sampled and tested by: Mario Soares, WSS laboratory and T. ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
ER-1	Ersoi intake, Poepum	21-Mar-00	22-Mar-00	7.1	20.2	229	109.7	0.1	0.6	122	119	NT	ND	0.4	0.005	ND	0.42	ND	NT	NT	+	++
ER-2	SMUK Katolik MIssion	21-Mar-00	22-Mar-00	7.3	24.1	232	110.9	0.1	0.3	NT	NT	NT	ND	NT	NT	NT	0.33	NT	NT	NT	±	+
ER-3	Reservoir, Mota Buro	21-Mar-00	22-Mar-00	7.5	21.1	371	178.6	0.2	0.3	NT	NT	NT	ND	NT	NT	NT	0.28	NT	NT	NT	±	-
ER-4	Poetete, private tap	21-Mar-00	22-Mar-00	8.2	23.8	369	177.7	0.2	0.4	208	201	NT	0.1	0.1	0.004	ND	0.31	0.4	NT	NT	+	+
ER-5	DA Office, Ermera	21-Mar-00	22-Mar-00	7.8	24.9	373	179.9	0.2	0.3	NT	NT	NT	ND	NT	NT	NT	0.27	NT	NT	NT	+	±
ER-6	Mota Buro intake																					
ER-7	Misão 1	21-Mar-00	22-Mar-00	7.6	22.2	228	109.4	0.1	0.6	NT	NT	NT	0.1	NT	NT	NT	0.35	NT	NT	NT	+	-
ER-8	Misão 2	21-Mar-00	22-Mar-00	7.6	24.1	230	110.2	0.1	0.8	119	114	NT	0.1	0.3	0.006	0.01	0.31	0.1	NT	NT	+	±

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of ER-7 and ER-8 would be abolished after this sampling

Table A.6-12 Water Quality Data Sheet of Ermera (2)

District: Ermera

Town: Ermera

Sampled and tested by: X.Wang, Alvaro Godinho, OWS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
ER-1	Ersoi intake, Poepum	3-Jul-00	4-Jul-00	7.2	21.0	218.0	104.5	0.1	0.45	121	NT	NT	0.3	0.3	0.060	0.01	0.13	0.1	NT	NT	-	-
ER-2	SMUK Katolik MIssion	3-Jul-00	4-Jul-00	7.6	22.0	226.0	108.4	0.1	0.45	130	NT	NT	0.4	0.3	0.001	0.01	0.23	0.2	NT	NT	++	±
ER-3	Reservoir, Mota Buro	3-Jul-00	4-Jul-00	8.2	22.9	218.0	104.5	0.1	0.49	131	NT	NT	0.3	0.2	0.013	0.01	ND	0.1	NT	NT	++	++
ER-4	Poetete, private tap	3-Jul-00	4-Jul-00	6.8	24.9	251.0	120.2	0.1	0.29	130	NT	NT	ND	0.2	0.002	0.01	0.10	0.2	NT	NT	+	+
ER-5	DA Office, Ermera	3-Jul-00	4-Jul-00	7.8	24.7	367.0	176.9	0.1	0.25	131	NT	NT	0.2	0.1	0.002	0.01	0.12	0.1	NT	NT	-	±
ER-6	Mota Buro intake																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-12 Water Quality Data Sheet of Ermera (3)

District: Ermera

Town: Ermera

Sampled and tested by: Mario Soares, WSS laboratory and T. ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
ER-1	Ersoi intake, Poepum	10-Nov-00	10-Nov-00	7.8	20.2	282	135.5	0.1	0.3	115	103	NT	ND	0.1	0.005	0.01	0.05	ND	1	NT	15	0
ER-2	SMUK Katolik MIssion	10-Nov-00	10-Nov-00	8.0	22.7	262	127.6	0.1	0.3	NT	101	77.2	0.6	0.1	0.005	ND	0.08	0.2	1	NT	15	0
ER-3	Reservoir, Mota Buro	10-Nov-00	10-Nov-00	8.0	22.3	446	216	0.2	0.4	NT	193	NT	0.3	NT	NT	NT	0.06	NT	1	NT	60	10
ER-4	Kantor Desa, Poetete	10-Nov-00	10-Nov-00	7.4	26.5	361	173.9	0.2	0.2	155	142	124	ND	0.1	0.004	0.01	0.22	0.1	16	NT	110	0
ER-5	DA Office, Ermera																					
ER-6	Mota Buro intake	10-Nov-00	10-Nov-00	8.0	21.0	385	185.4	0.2	0.3	200	196	NT	ND	0.5	0.004	0.01	0.59	0.1	1	NT	35	6

Legend:
ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-13 Water Quality Data Sheet of Liquica (1)

District: Liquica

Town: Liquica

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(℃)	(μ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
LQ-1*	Kaimeo St. Cruz	15-Mar-00	16-Mar-00	8.1	35.2	607	295	N/A	6.3	NT	NT	NT	ND	NT	NT	NT	0.57	NT	NT	NT	+++	+++
LQ-2*	Kamale Laran 1	15-Mar-00	16-Mar-00	8.2	29.9	377	181.7	0.2	0.9	NT	NT	NT	ND	NT	NT	NT	0.43	NT	NT	NT	+++	++
LQ-3*	Kamale Laran 2	15-Mar-00	16-Mar-00	8.2	27.9	377	181.8	0.2	1.3	185	173	NT	0.3	0.1	0.005	ND	0.43	0.3	NT	NT	+++	++
LQ-4*	Mutiara	15-Mar-00	16-Mar-00	8.2	28.6	594	288	0.3	4.4	NT	NT	NT	0.0	NT	NT	NT	0.61	NT	NT	NT	+++	+++
LQ-5	Laclo intake																					
LQ-6	Tanki Mean 1, N	15-Mar-00	16-Mar-00	>8.2	30.8	581	282	0.3	4.4	221	218	NT	ND	0.1	0.076	0.01	0.55	0.2	NT	NT	+++	+++
LQ-7	Tanki Mean 2, N	15-Mar-00	16-Mar-00	>8.2	28.3	585	284	0.3	9.7	NT	NT	NT	ND	NT	NT	NT	0.56	NT	NT	NT	+++	+++
LQ-8	Leopa, Abo's house																					
LQ-9	Maumeta																					
LQ-10	Oxafam office																					
LQ-11	PBT, from Emilaloa intake																					
LQ-12	Lauhata																					
LQ-13	Lelabo 1	15-Mar-00	16-Mar-00	>8.2	26.7	354	170.7	0.2	2.3	170	160	NT	ND	0.1	0.003	0.01	0.46	0.2	NT	NT	+++	++
LQ-14	Lelabo 2	15-Mar-00	16-Mar-00	>8.2	35.1	342	164.6	N/A	2.0	NT	NT	NT	ND	NT	NT	NT	0.45	NT	NT	NT	++	++
LQ-15	Kamale Mutu, Private wel																					
LQ-16	Sedimentation Tank, Serlema																					
LQ-17	BPT, from Enaloa intake																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of No. LQ-1,2,3 and LQ-4 would be converted the different palces after this sampling.

Table A.6-13 Water Quality Data Sheet of Liquica (2)

District: Liquica

Town: Liquica

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	$R.Cl_2$	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
LQ-1	Daulo intake																					
LQ-2	Enaloa intake																					
LQ-3	Narlolo intake																					
LQ-4	Lilabu intake																					
LQ-5	Laclo intake																					
LQ-6	Tanki Mean 1, N	28-Sep-00	28-Sep-00	8.2	28.0	643	315	0.3	0.6	NT	NT	NT	0.4	ND	ND	ND	0.04	0.3	NT	NT	+++	+++
LQ-7	Tanki Mean 2, N	28-Sep-00	28-Sep-00	8.2	27.9	636	309	0.3	0.7	262	301	NT	0.3	0.1	ND	0.01	0.22	0.2	117	NT	+++	+++
LQ-8	Leopa, Abo's house	28-Sep-00	28-Sep-00	8.2	28.2	633	307	0.3	0.6	NT	NT	NT	0.4	0.1	0.001	0.02	0.11	0.1	NT	NT	+++	+++
LQ-9	Maumeta	28-Sep-00	28-Sep-00	8.2	34.5	597	290	0.3	0.5	179	480	NT	0.5	ND	0.002	0.01	0.30	0.1	142	NT	++	++
LQ-10	Oxafam office	28-Sep-00	28-Sep-00	8.2	31.1	619	300	0.3	1.2	NT	NT	NT	ND	ND	ND	ND	0.14	0.5	NT	NT	+++	+++
LQ-11	PBT, from Emilaloa intake	28-Sep-00	28-Sep-00	8.0	31.2	780	381	0.4	2.0	254	404	NT	0.4	ND	ND	0.09	0.30	0.1	170	NT	+++	++
LQ-12	Lauhata	28-Sep-00	28-Sep-00	8.0	30.5	716	344	0.3	1.3	NT	NT	NT	0.1	ND	ND	0.05	ND	ND	NT	NT	+++	+++
LQ-13	Lelabo 1	28-Sep-00	28-Sep-00	8.2	33.8	660	321	0.3	0.4	311	319	NT	0.3	0.1	ND	0.01	0.51	0.1	49	NT	+++	++
LQ-14	Lelabo 2																					
LQ-15	Kamale Mutu, Private wel	28-Sep-00	28-Sep-00	7.6	27.2	719	350	0.3	1.0	NT	NT	NT	0.4	0.3	ND	0.04	0.32	0.1	NT	NT	+++	+++
LQ-16	Sedimentation Tank, Seriema																					
LQ-17	BPT, from Enaloa intake																					

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-13 Water Quality Data Sheet of Liquica (3)

District: Liquica

Town: Liquica

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
LQ-1	Daulo intake	2-Nov-00	4-Nov-00	8.7	21.5	581	282	0.3	0.6	196	300	NT	ND	ND	0.015	0.01	0.27	0.5	195	NT	TNC	90
LQ-2	Enaloa intake	2-Nov-00	4-Nov-00	8.3	21.7	642	312	0.3	1.8	248	336	NT	ND	ND	0.004	0.03	0.24	0.6	155	NT	TNC	16
LQ-3	Narlolo intake	3-Nov-00	4-Nov-00	8.3	21.2	695	338	0.3	1.2	334	344	NT	0.2	0.1	0.004	ND	0.69	0.7	36	NT	TNC	70
LQ-4	Lilabu intake	3-Nov-00	4-Nov-00	8.5	20.9	637	310	0.3	0.5	316	302	NT	0.1	ND	0.005	0.01	0.50	0.3	50	NT	TNC	456
LQ-5	Laclo intake	3-Nov-00	4-Nov-00	8.5	21.8	522	253	0.3	0.8	214	276	NT	ND	0.1	0.007	0.01	0.29	0.5	195	NT	TNC	70
LQ-6	Metagou intake	13-Nov-00	14-Nov-00	8.7	28.0	1413	701	0.7	3.4	113	108	NT	3.7	0.3	0.004	0.01	0.07	0.2	2	NT	345	36
LQ-7	Tanki Mean 1, N	16-Oct-00	17-Oct-00	8.6	28.3	647	315	0.3	2.9	NT	NT	NT	0.05	ND	0.004	ND	0.51	NT	NT	NT	180	38
LQ-8	Tanki Mean 2, N	16-Oct-00	17-Oct-00	8.7	28.6	647	315	0.3	1.7	246	370	NT	0.02	ND	0.012	0.03	0.95	0.3	130	NT	60	45
LQ-9	DA Office	16-Oct-00	17-Oct-00	8.2	31.9	636	309	0.3	5.6	NT	NT	NT	0.02	ND	0.004	0.02	0.67	NT	NT	NT	275	88
LQ-10	Maumeta	16-Oct-00	17-Oct-00	8.5	31.4	633	308	0.3	14.9	214	330	NT	0.02	ND	0.013	0.02	0.77	0.5	155	NT	45	10
LQ-11	Oxafam office	16-Oct-00	17-Oct-00	8.7	32.2	597	290	0.3	4.7	NT	NT	NT	0.07	ND	0.003	0.04	0.89	NT	NT	NT	0	0
LQ-12	PBT, from Emilaloa intake	16-Oct-00	17-Oct-00	8.0	38.4	691	336	N/A	2.8	274	352	NT	0.06	0.1	0.006	0.02	0.35	0.5	140	NT	55	30
LQ-13	Lauhata	16-Oct-00	17-Oct-00	7.8	31.1	809	395	0.4	2.7	NT	NT	NT	0.01	0.1	0.003	0.07	0.79	NT	NT	NT	75	10
LQ-14	Lelabo 1	16-Oct-00	17-Oct-00	8.5	33.6	643	212	0.3	0.3	305	334	NT	0.02	ND	0.004	0.05	0.53	0.1	NT	NT	75	50
LQ-15	Lelabo 2	16-Oct-00	17-Oct-00	8.7	NT	616	299	0.3	0.7	NT	NT	NT	0.02	0.1	0.005	0.02	0.66	NT	55	NT	TNC	115
LQ-16	Kamale Mutu, Private wel	16-Oct-00	17-Oct-00	7.7	28.0	696	339	0.3	1.7	242	332	NT	ND	0.1	0.004	0.02	0.38	0.4	135	NT	TNC	68
LQ-17	Sedimentation Tank, Serlema	17-Oct-00	17-Oct-00	8.5	26.5	649	315	0.3	1.2	NT	NT	NT	0.03	0.1	0.014	0.01	1.26	NT	NT	NT	495	45
LQ-18	BPT, from Enaloa intake	17-Oct-00	17-Oct-00	8.4	28.3	675	328	0.3	1.4	NT	NT	NT	ND	0.1	0.010	0.02	1.76	NT	NT	NT	230	40

Legend:
ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-14 Water Quality Data Sheet of Suai (1)

District: Cova Lima

Town: Suai

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
SU-1	Americo, intake	30-Mar-00	1-Apr-00	>8.2	26.9	534	259	0.3	3.8	304	218	NT	0.1	ND	0.001	0.01	0.33	0.1	NT	NT	+	++
SU-2*	St. Rosa, reservoir	30-Mar-00	1-Apr-00	8.2	27.0	499	241	0.2	18.5	NT	NT	NT	0.5	NT	NT	NT	0.29	NT	NT	NT	+	+
SU-3*	Hospital, Suai	30-Mar-00	1-Apr-00	8.2	27.4	556	270	0.3	0.7	NT	NT	NT	0.3	NT	NT	NT	0.34	NT	NT	NT	±	++
SU-4*	SDK St. Maria	30-Mar-00	1-Apr-00	7.8	30.7	823	402	0.4	1.2	360	260	NT	0.4	ND	0.004	0.01	0.50	0.2	NT	NT	±	+
SU-5	Market, PT	30-Mar-00	1-Apr-00	>8.2	32.1	501	242	0.2	14.8	NT	NT	NT	0.8	NT	NT	NT	0.27	NT	NT	NT	++	++
SU-6*	Ahinarai	30-Mar-00	1-Apr-00	7.7	30.1	821	401	0.4	0.8	NT	NT	NT	0.1	NT	NT	NT	0.44	NT	NT	NT	±	±
SU-7*	Reservoir from pump	30-Mar-00	1-Apr-00	7.6	30.7	822	402	0.4	1.3	NT	NT	NT	0.8	NT	NT	NT	0.46	NT	NT	NT	+	±
SU-8*	Debos	30-Mar-00	1-Apr-00	8.2	28.4	503	243	0.2	14.7	278	201	NT	0.1	ND	0.002	0.04	0.25	0.1	NT	NT	++	++
SU-9																						

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

*Sample points of SU-2,3,4,6,7 and SU-8 would be converted the different palces after this sampling.

Table A.6-14 Water Quality Data Sheet of Suai (2)

District: Cova Lima

Town: Suai

Sampled and tested by: Alvaro Godinho, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
SU-1	Americo, intake	17-Jul-00	19-Jul-00	>8.2	21.4	585	284	0.3	0.4	NT	NT	NT	ND	ND	ND	ND	0.28	ND	NT	NT	+++	+++
SU-2	Mata Air	17-Jul-00	19-Jul-00	7.8	25.8	1587	790	0.8	2.0	NT	NT	NT	0.2	ND	0.013	ND	ND	ND	NT	NT	+++	+++
SU-3	Pump station	17-Jul-00	19-Jul-00	7.4	28.4	849	415	0.4	1.1	NT	NT	NT	0.2	ND	0.002	0.01	0.20	ND	NT	NT	-	-
SU-4	Fatunian, PT	17-Jul-00	19-Jul-00	>8.2	24.8	601	292	0.3	0.6	NT	NT	NT	ND	ND	0.001	0.02	ND	ND	NT	NT	+++	+++
SU-5	Market, PT	17-Jul-00	19-Jul-00	8.0	26.4	599	291	0.3	0.5	NT	NT	NT	ND	0.1	0.001	ND	ND	ND	NT	NT	++	++
SU-6	Busa Kutun, PT	17-Jul-00	19-Jul-00	>8.2	26.4	607	295	0.3	1.0	NT	NT	NT	ND	0.1	0.001	ND	0.26	ND	NT	NT	+++	+++
SU-7	Leegore, PT	17-Jul-00	19-Jul-00	>8.2	24.4	578	281	0.3	0.4	NT	NT	NT	4.9	ND	0.001	ND	ND	ND	NT	NT	+++	+++
SU-8	Borefole 1 or 2																					
SU-9	Spring intake, Zumalai	17-Jul-00	19-Jul-00	7.0	27.0	850	416	0.4	0.4	NT	NT	NT	ND	ND	0.002	0.01	ND	ND	NT	NT	++++	++++

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-14 Water Quality Data Sheet of Suai (3)

District: Cova Lima

Town: Suai

Sampled and tested by: Mario Soares, WSS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(°C)	(ƒ S/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
SU-1	Americo, intake	13-Nov-00	15-Nov-00	8.5	25.1	644	313	0.3	0.4	308	220	NT	ND	ND	0.004	ND	0.41	0.5	27	NT	435	56
SU-2	Mata Air	13-Nov-00	15-Nov-00	8.0	30.2	696	339	0.3	0.4	604	344	206	ND	ND	0.007	0.03	0.61	0.5	165	NT	35	22
SU-3	Pump station	13-Nov-00	15-Nov-00	7.9	26.2	820	401	0.4	0.6	NT	266	NT	0.2	NT	NT	NT	0.45	NT	NT	NT	130	12
SU-4	Fatunian, PT	13-Nov-00	15-Nov-00	8.6	30.0	696	339	0.3	0.6	368	266	NT	0.5	0.7	0.004	ND	0.39	0.3	28	NT	495	112
SU-5	Market, PT	13-Nov-00	15-Nov-00	8.1	29.0	798	390	0.4	0.6	NT	270	186	0.4	NT	NT	NT	0.44	NT	NT	NT	285	70
SU-6	Busa Kutun, PT	13-Nov-00	15-Nov-00	8.5	30.2	696	339	0.3	1.1	NT	268	NT	0.5	NT	NT	NT	0.28	NT	NT	NT	525	134
SU-7	Leegore, PT	13-Nov-00	15-Nov-00	8.3	30.4	768	375	0.4	9.9	NT	250	192	0.7	ND	0.007	0.01	0.41	0.3	52	NT	TNC	98
SU-8	Borefole 1 or 2	13-Nov-00	15-Nov-00	7.6	29.9	832	407	0.4	0.7	360	264	NT	0.4	0.5	0.006	0.01	0.33	0.4	100	NT	0	0
SU-9	Spring intake, Zumalai	13-Nov-00	15-Nov-00	7.5	27.9	775	378	0.4	0.4	312	302	NT	0.6	ND	0.004	0.01	0.46	0.2	150	NT	40	8
SU-10	DA Office, Suai	13-Nov-00	15-Nov-00	8.1	30.1	814	398	0.4	0.5	438	316	NT	0.6	0.1	0.005	0.01	0.71	0.3	29	NT	60	12

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.6-15 Water Quality Data Sheet of Maliana (1)

District: Bobonaro

Town: Maliana

Tested by: Alvaro Godinho, WSS laboratory and T.ISHIHARA, JICA Study Team

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
ML-1	Tvri, reservoir	31-Mar-00	1-Apr-00	8.1	23.9	298	143.1	0.1	3.3	157	162	NT	ND	ND	0.004	0.01	0.09	0.2	NT	NT	+	+
ML-2	Santa Cruz, reservoir	31-Mar-00	1-Apr-00	>8.2	27.3	396	191.1	0.2	1.7	219	139	NT	ND	0.1	0.005	0.00	0.20	0.3	NT	NT	+	±
ML-3	PKF, reservoir	31-Mar-00	1-Apr-00	6.8	27.5	445	215	0.2	3.0	NT	NT	NT	0.3	NT	NT	NT	0.34	NT	NT	NT	-	-
ML-4	Bulobu, intake irrigation canal	31-Mar-00	1-Apr-00	8.2	26.7	409	197.5	0.2	67.1	216	149	NT	ND	ND	0.003	ND	0.45	ND	NT	NT	+	±
ML-5	Mugis, public tap	31-Mar-00	1-Apr-00	>8.2	29.0	393	189.5	0.2	1.7	NT	NT	NT	0.3	NT	NT	NT	0.20	NT	NT	NT	+	+
ML-6	UNTAET Office	31-Mar-00	1-Apr-00	8.1	28.4	300	144.0	0.1	2.7	NT	NT	NT	ND	NT	NT	NT	0.12	NT	NT	NT	+	+
ML-7	Church, Maliana	31-Mar-00	1-Apr-00	8.1	27.9	300	144.1	0.1	3.2	NT	NT	NT	0.2	NT	NT	NT	0.11	NT	NT	NT	±	+
ML-8	Public tap from Colega spring	31-Mar-00	1-Apr-00	7.7	29.1	621	302	0.3	0.4	329	323	NT	0.2	0.9	0.006	0.00	0.10	0.4	NT	NT	+	+

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-15 Water Quality Data Sheet of Maliana (2)

District: Bobonaro

Town: Maliana

Tested by: Alvaro Godinho, technician, OWS laboratory

No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	G.Bac
		sample	test		(°C)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
ML-1	Tvri, reservoir	29-May-00	31-May-00	8.1	23.8	297	142	0.1	3.2	217	NT	NT	1.6	ND	ND	ND	ND	0.1	NT	NT	+	±
ML-2	Santa Cruz, reservoir	29-May-00	31-May-00	8.2	26.5	394	190	0.2	1.7	NT	NT	NT	1.8	ND	0.010	0.01	ND	0.1	NT	NT	+	±
ML-3	PKF, reservoir	29-May-00	31-May-00	6.9	26.8	446	215	0.2	3.0	NT	NT	NT	1.5	ND	0.001	0.01	ND	0.1	NT	NT	-	-
ML-4	Bulobu, intake irrigation canal	29-May-00	31-May-00	8.1	26.4	408	196	0.2	65.8	167	NT	NT	1.8	ND	0.001	0.01	ND	ND	NT	NT	++	±
ML-5	Mugis, public tap	29-May-00	31-May-00	8.0	27.5	394	190	0.2	1.7	NT	NT	NT	1.7	ND	0.001	0.01	ND	0.1	NT	NT	±	+
ML-6	UNTAET Office	29-May-00	31-May-00	8.0	26.5	304	145	0.1	2.7	NT	NT	NT	1.9	ND	0.001	0.01	ND	0.1	NT	NT	+	+
ML-7	Church, Maliana	29-May-00	31-May-00	8.1	26.6	304	144	0.1	3.2	212	NT	NT	2.0	ND	0.002	0.00	ND	0.1	NT	NT	±	+
ML-8	Public tap from Colega spring	29-May-00	31-May-00	7.6	25.0	623	303	0.3	0.4	NT	NT	NT	ND	0.5	0.005	0.01	ND	0.1	NT	NT	+	+

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; -: 0-3 ±: 3-10 +: 10-20 ++: 20-30 +++: more than 30

Table A.6-15 Water Quality Data Sheet of Maliana (3)

District: Bobonaro

Town: Maliana

Sampled and tested by: Mario Soares, WSS laboratory and T.ISHIHARA, JICA Water Supply Team

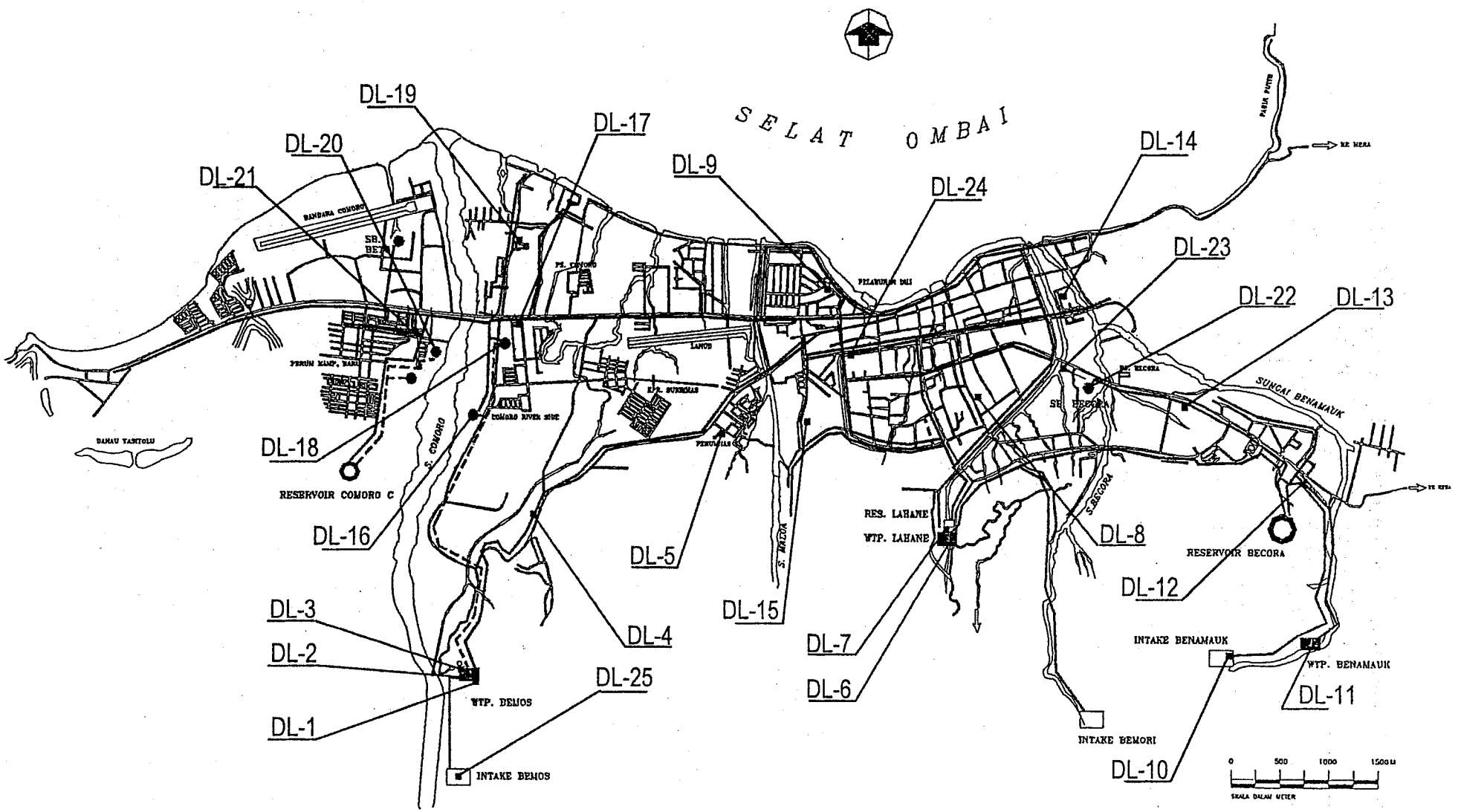
No.	Sampling Point	Date		pH	Temp.	Cond.	TDS	Salinity	Turbid.	Alkali.	Hdns.	Ca-Hdns	NH_3-N	NO_3-N	NO_2-N	Fe	Fluoride	Mn	SO_4^{2-}	R.Cl_2	T.Coli	E.Coli
		sample	test		(℃)	(μS/cm)	(mg/L)	(‰)	(NTU)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	CFU	CFU
Timor Loro sa'e Guidelines				6.5-8.5	NS	NS	1000	NS	5.0	NS	200	NS	1.5	10	1	0.3	1.5	0.5	250	5	0	0
ML-1	Tvri, reservoir	16-Nov-00	17-Nov-00	8.5	25.3	334	160.9	0.2	6.7	156	150	NT	0.5	0.1	0.015	0.06	0.33	0.5	8	NT	420	84
ML-2	Santa Cruz, reservoir	16-Nov-00	17-Nov-00	8.7	26.9	460	222	0.2	1.5	210	152	NT	ND	ND	0.012	0.01	0.37	0.4	1	NT	160	52
ML-3	PKF, reservoir	16-Nov-00	17-Nov-00																			
ML-4	Bulobu, intake irrigation canal	16-Nov-00	17-Nov-00	8.6	26.3	503	244	0.2	236	200	148	108	0.4	0.6	0.020	0.81	0.21	ND	53	NT	140	45
ML-5	Mugis, public tap	16-Nov-00	17-Nov-00	7.5	27.2	664	323	0.3	0.6	282	278	254	0.6	0.6	0.005	0.01	0.51	0.3	41	NT	20	0
ML-6	UNTAET Office	16-Nov-00	17-Nov-00	8.6	26.9	357	172.1	0.2	5.2	NT	156	120	ND	0.2	0.007	0.07	0.33	0.5	4	NT	432	72
ML-7	Church, Maliana	16-Nov-00	17-Nov-00	8.3	26.9	354	170.6	0.2	4.8	NT	166	NT	0.1	NT	NT	NT	0.24	NT	NT	NT	425	72
ML-8	Public tap from Colegio spring	16-Nov-00	17-Nov-00	7.7	26.9	676	329	0.3	0.4	NT	326	246	0.1	NT	NT	NT	0.22	NT	NT	NT	TNC	54
ML-9	Colegio spring, intake	16-Nov-00	17-Nov-00	7.6	26.8	677	330	0.3	0.4	332	314	NT	1.5	0.7	0.004	0.02	0.23	0.4	36	NT	TNC	30

Legend:

ND: not detectable NT: not tested NS: not set CFU: colony formed unit; TNC: too numerous to count

Table A.7 Results of The Water Quality Analysis of Schools in Dili, Aileu and Lautem District

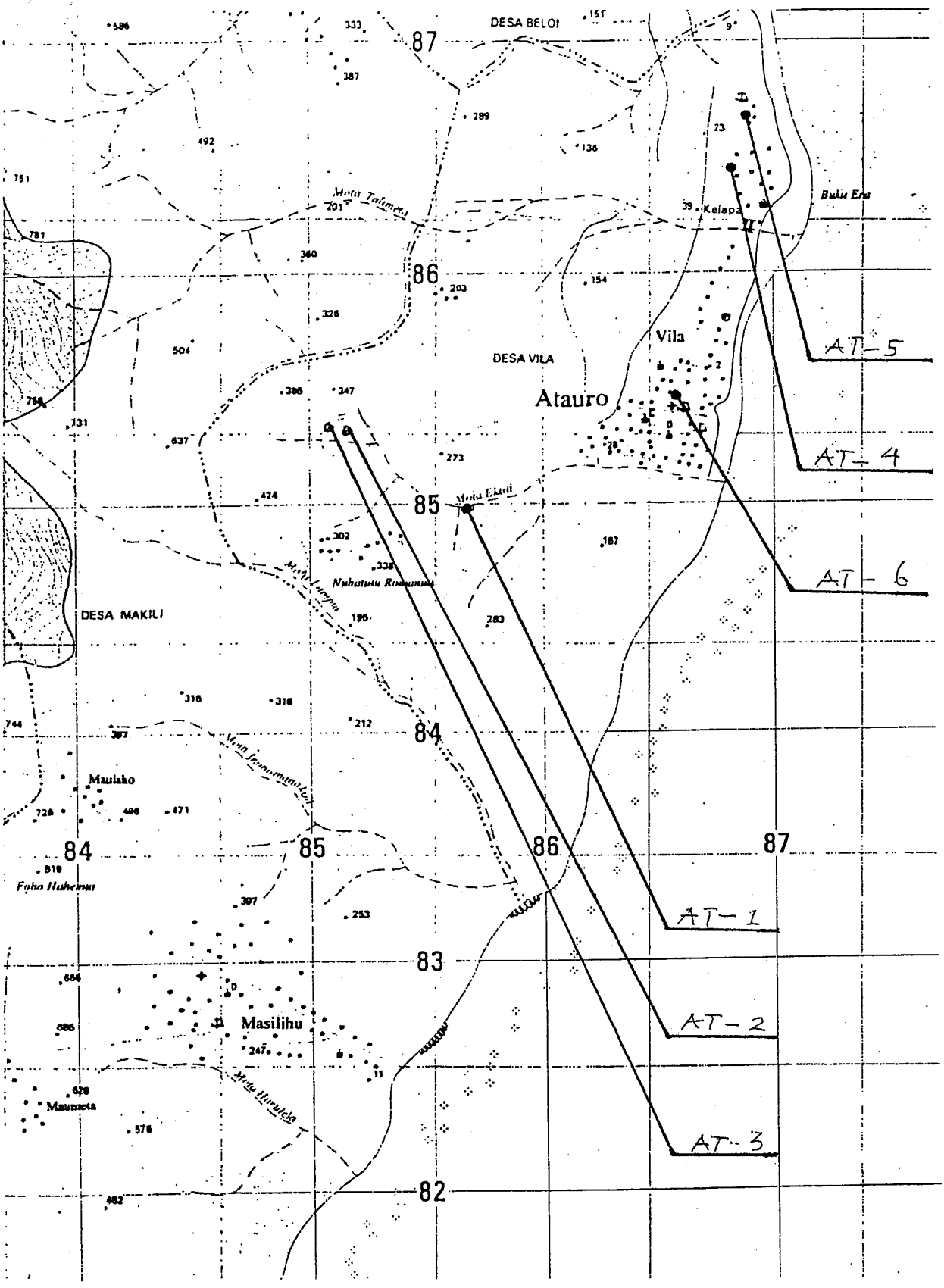
No.	Name of Sampling Point	pH	$R.Cl_2$ (mg/L)	Cond. (μS/cm)	TDS (mg/L)	Salinity (‰)	Temp. (℃)	T.Coli CFU	Remarks
1	Escola Misão No.6 Balide	8.0	-	207	99.2	0.1	26.6	-	Tank
2	SDK 05 Madelena Massau								No water
3	SDLB Taibessi	7.6	-	329	158.3	0.2	31.4	±	Tank
4	SDN 05 Aituri Laran	8.2	-	262	125.5	0.1	32.5	++	No water in school: tap water near here
5	SDN Kecil Mota Ulun	8.0	-	256	122.8	0.1	25.6	++	Tank
6	SDN 07 Camea	8.2	-	205	98.1	0.1	28.1	+	No water in school, tap water near here
7	SDK 07 Mota Ulun								No water
8	SDN 10 Camea Raihun	>8.2	-	2,480	1259	1.3	37.3	++	Tank, but always open a concrete lid
9	SDN 04 Bairo Pite	7.0	-	751	366	0.4	29.1	-	Borehole, but pump was removed
10	SDN 06 Fatuhada	7.3	-	347	167.0	0.2	27.8	-	Tap water
11	SDN 14 Ai Mutin	7.5	-	347	167.0	0.2	28.7	-	Tap water
12	SDN 07 Comoro	7.5	-	363	175.0	0.2	30.4	-	Tap water
13	SD Tasi Tolu								No water
14	SDN 08 Kampung Marinir	7.3	-	448	216	0.2	28.3	+	Well with Dragon Pump
15	SDN 03 Bebonuk	7.4	-	349	167.8	0.2	26.9	-	Tap water, behind a schoolhouse
16	SDN 05 Manleuana								No water, but one tank
17	SDN 13 Fatumeta	8.2	-	175.1	83.6	0.1	27.2	±	Tank
18	SDK 02 Ailok Laran								No water, whole the area has no tap water
19	SDN 15 Tuana Laran								No water, handpump was spoiled
20	SDN 09 Vila Verde								No water, there are 2 wells but no pump
21	SDN 02 Farol								No water, pipe broken
22	SDK St. Comoro	7.0	-	362	174.5	0.2	28.1	-	Tap water from Comoro Reservoir
23	SD Ailelehun	<6.8	-	2,220	1118	1.1	24.8	++	Water from a marsh in the small valley
24	SD 2 Metinaro								No water, nobody, shut down?
25	SD Benunuk								No water, school was shut down
26	SD 1 Metinaro								No water, school was shut down
27	Temporary School, Subuli	6.8	-	733	357	0.4	29.4	+	No water, Dragon Pump near the school
28	SDN 06 Hera	8.2	-	813	397	0.4	29.5	±	Dug well, pump and tank installed by Oxfam
29	SDN 08 Akanunu								No water, school was shut down
30	Church, Akanunu	8.1	-	242	116.0	0.1	27.8	++	Pipeline from the river
31	SDN Kaicoli Rumbia	7.0	-	553	268	0.3	28.6	-	Handpump well
32	SDN 01 Colmea								No water, spoiled well
33	SDN 01 Nularan	7.2	-	520	252	0.2	28.5	±	No water, Fuji Kawamoto handpump next door
34	SDN 03 Bidau Dili Timur	7.0	-	518	251	0.2	28.5	±	Well with Dragon Pump, good condition
35	SDN 09 Bidau Massau	6.8	-	381	183.6	0.2	28.2	-	No water, Ikada handpump next door
36	SDK Hati Kudus	8.0	1.5	180.1	86.1	0.1	27.7	-	No water, only bishop's house has tap water
37	SDN 04 Bemori	8.0	-	195.5	93.5	0.1	27.7	±	No water, sample is from a house next door
38	TK Paulus VI Bemori								No water, broken pipeline
39	SDN 12 Hudi Laran	7.4	-	543	263	0.3	27.7	-	No water, BCS handpump 30M from the school
40	SDK Kristal	7.6	-	219	104.7	0.1	30.4	-	No water, pipe broken, sample is from next door
41	SDN 11 Fayol								No water, no well
42	SDK 01 Dare	7.4	-	72.7	34.3	0.0	26.0	++	Piped water from the mountain
43	SDN 11 Balibar	7.8	-	177.1	84.6	0.1	25.4	++	No water, pipeline and tap under a precipice
44	TK Balibar	<6.8	-	56.1	26.3	0.0	23.5	++	No water, one old tank, public tap 50M away
45	SDN 01 Laulara								No water, one old tank
46	SDN 12 Darlau	6.8	-	56.8	26.7	0.0	23.0	+	No water, public tap 30M away
47	SDN Asu Mau	6.9	-	129.0	56.5	0.0	23.4	+	No water, sample is from a house near school
48	SDK Asu Mau	7.7	-	56.5	26.5	0.0	23.8	+	Toilet facility with water tank by the school
49	SD 08 Roluli								No access, because a landslide is obstructing
50	SD Aicuros								No access, because a landslide is obstructing
51	SDN 01 Fahisoi	6.8	-	32.1	14.9	0.0	24.0	±	No water, Open-air tank near school
52	SDN 02 Namulesu								No water in this area
53	SDN 03 Bereleu	7.3	-	424	205	N/A	35.1	-	No water, pipeline with 5 faucets in the town
54	SDN 02 Fatuk Hun								No water, some houses use the rain water tank
55	SDN 09 Rairema	7.3	-	414	199.7	0.2	21.3	+	Spring reservoir, never dry up throughout the year
56	SDN 11 Sucu Liurai								No water, broken pipeline
57	SDN 03 Mantane	8.2	-	452	218	0.2	26.3	++	Temporary schoolhouse
58	SDN 01 Aileu								Water supply abd toilet facilities, but no water
59	SDK Fuiloro (Don Bosco School)	7.5	-	587	285	0.3	27.7	±	Tube well
60	SDN Kecil Assalaino	7.4	-	537	260	0.3	27.8	+	No water, sample from the neighborhood
61	SDN 17 Iralafai	7.2	-	514	249	0.3	27.6	±	No water, sample from the neighborhood



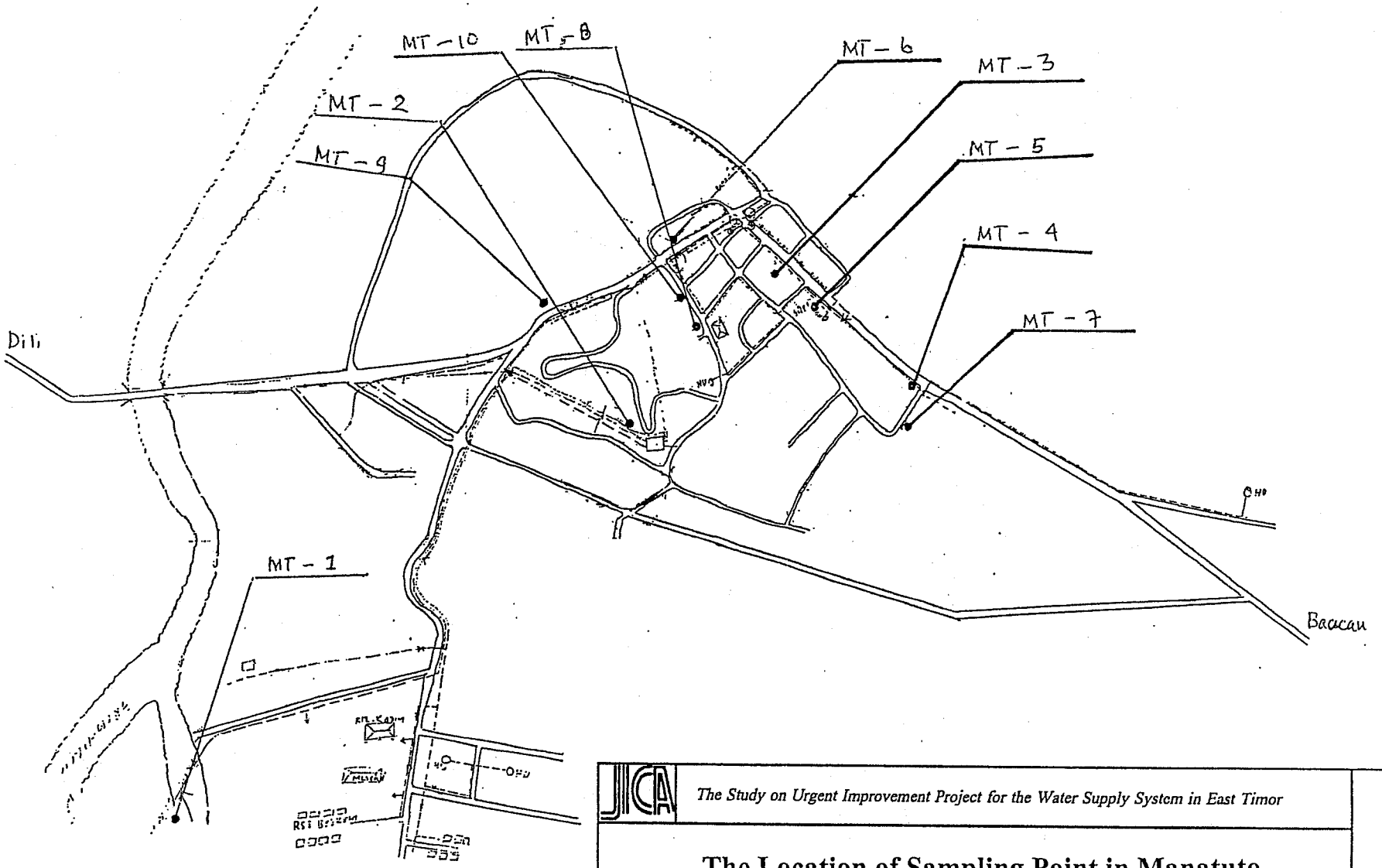
The Study on Urgent Improvement Project for the Water Supply System in East Timor

The Location of Sampling Point in Dili

Figure A.1



JICA	*The Study on Urgent Improvement Project for the Water Supply System in East Timor*	Figure A.2
The Location of Sampling Point in Atauro		

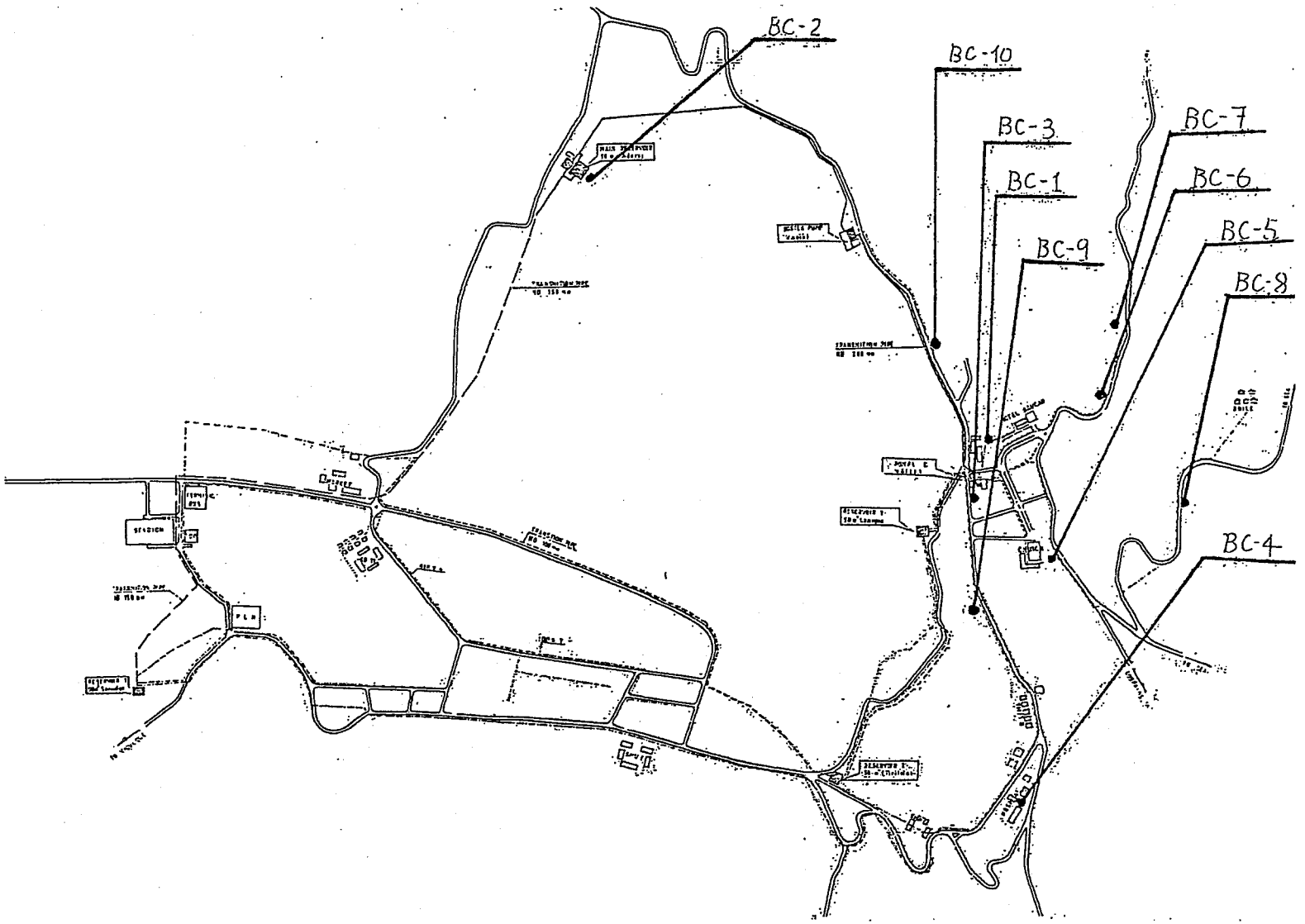


JICA

The Study on Urgent Improvement Project for the Water Supply System in East Timor

The Location of Sampling Point in Manatuto

Figure A.3



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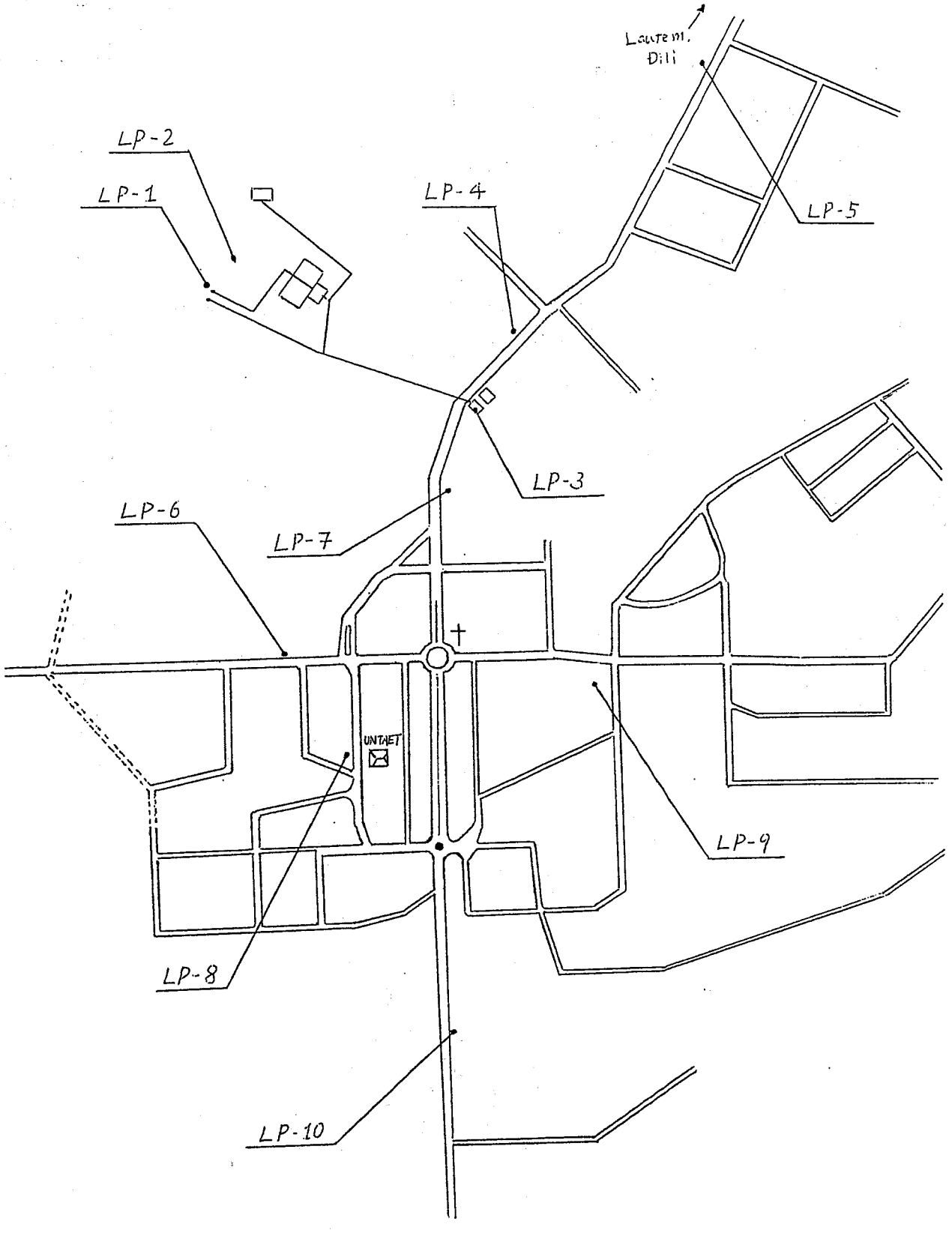
The Location of Sampling Point in Baucau

Figure A.4



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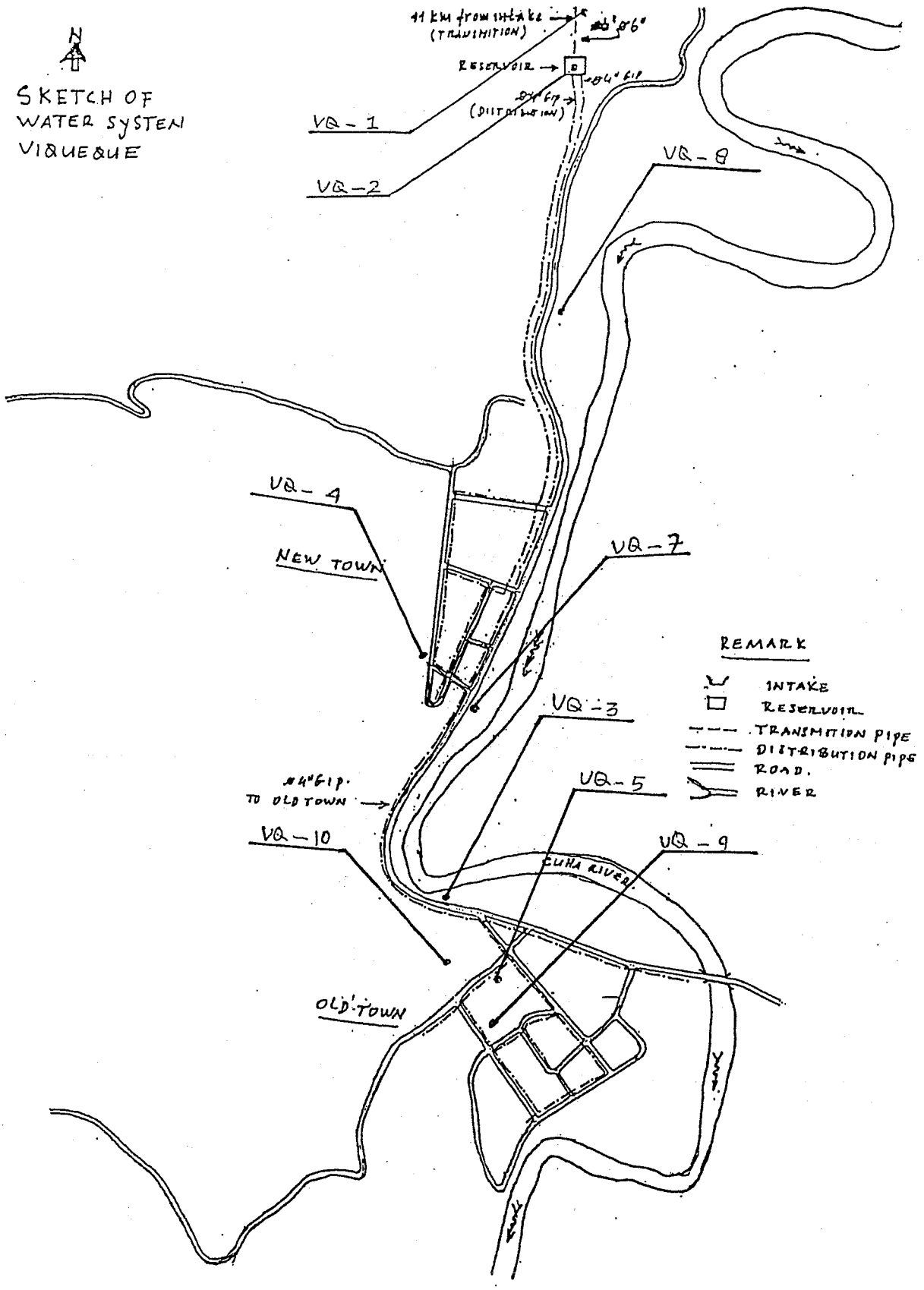
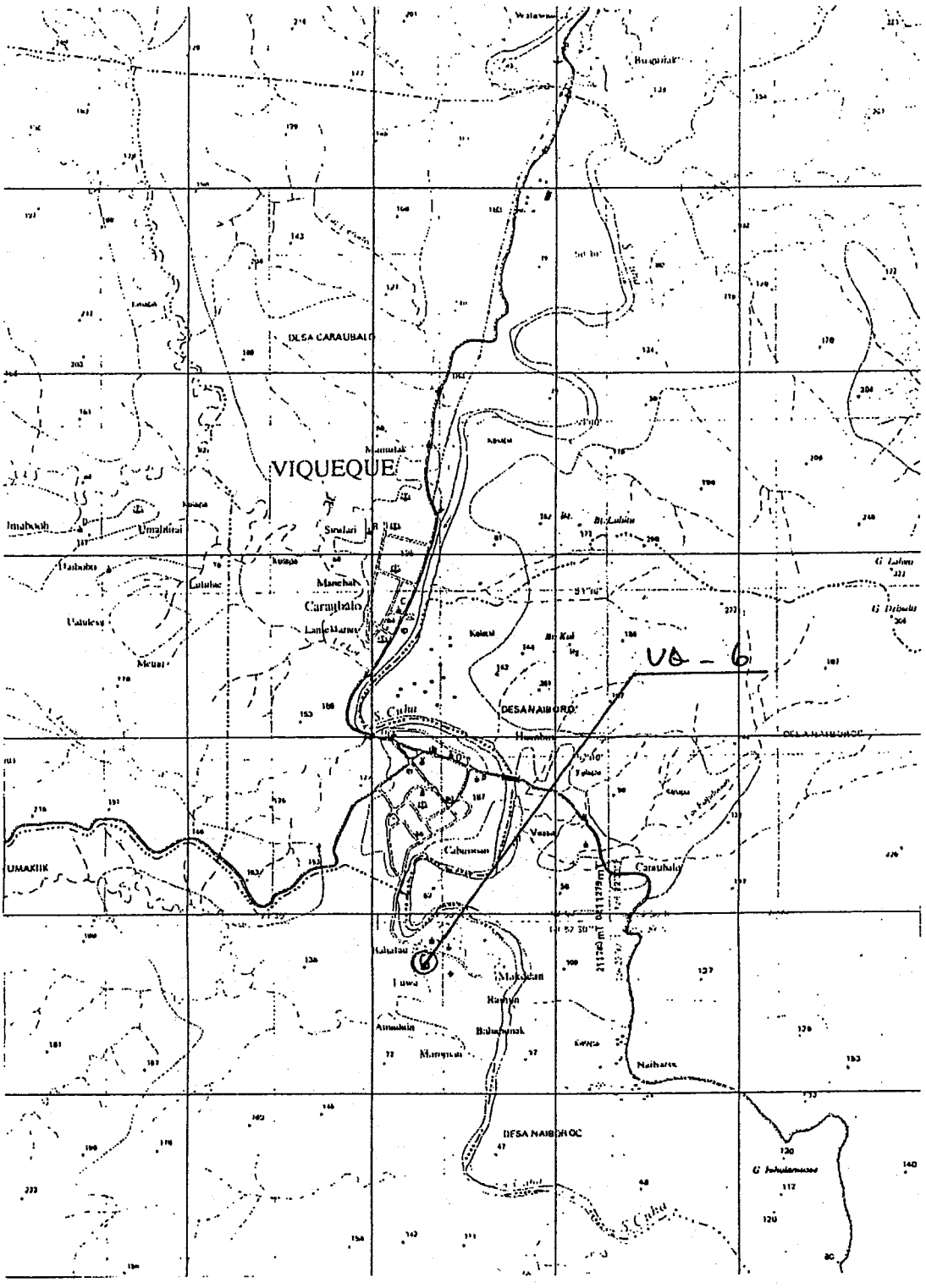
The Location of Sampling Point in Los Palos

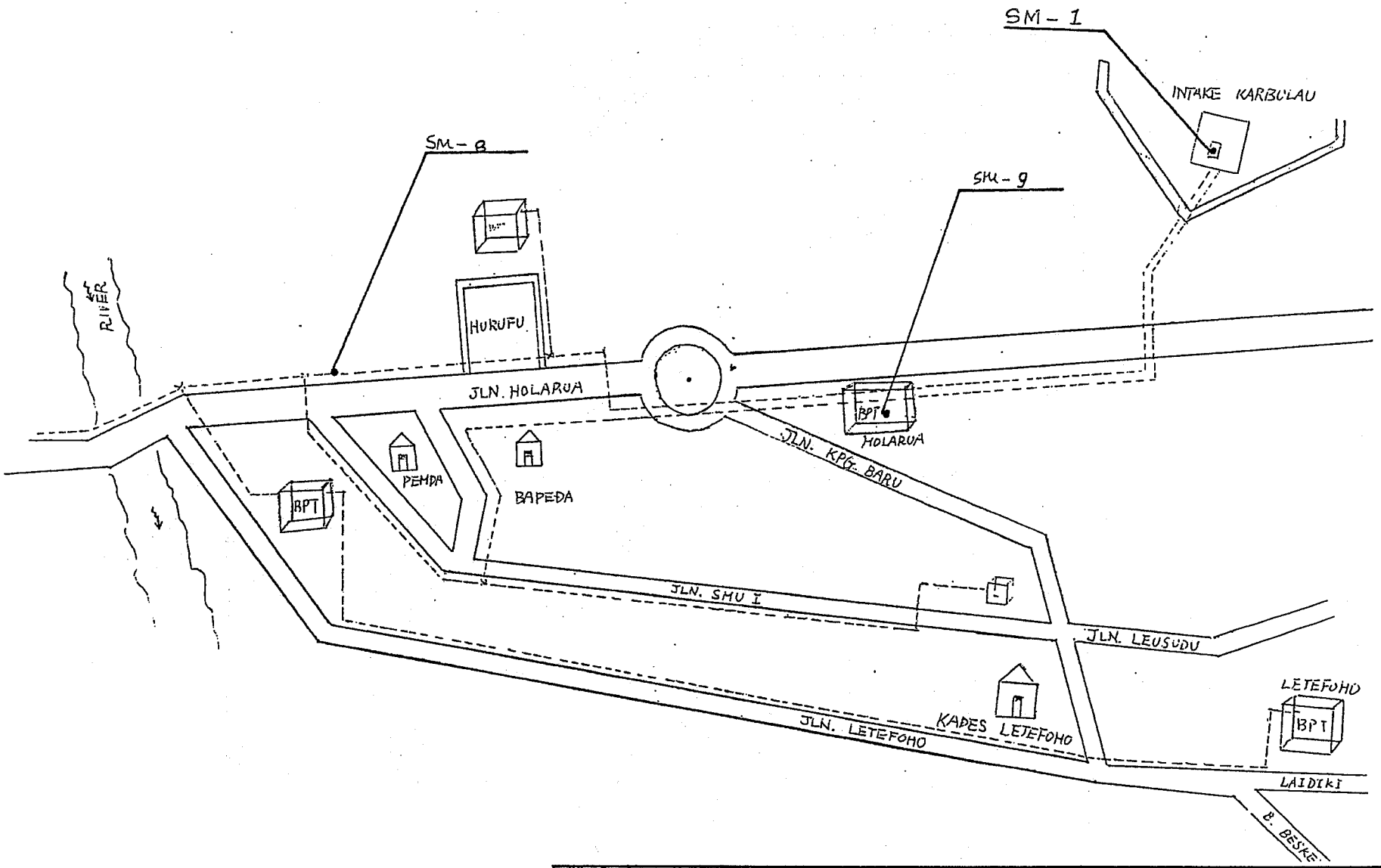
Figure A.5



JICA	*The Study on Urgent Improvement Project for the Water Supply System in East Timor*	Figure A.6-1
	The Location of Sampling Point in Viqueque (1)	



JICA	*The Study on Urgent Improvement Project for the Water Supply System in East Timor*	**Figure**
	The Location of Sampling Point in Viqueque (2)	**A.6-2**



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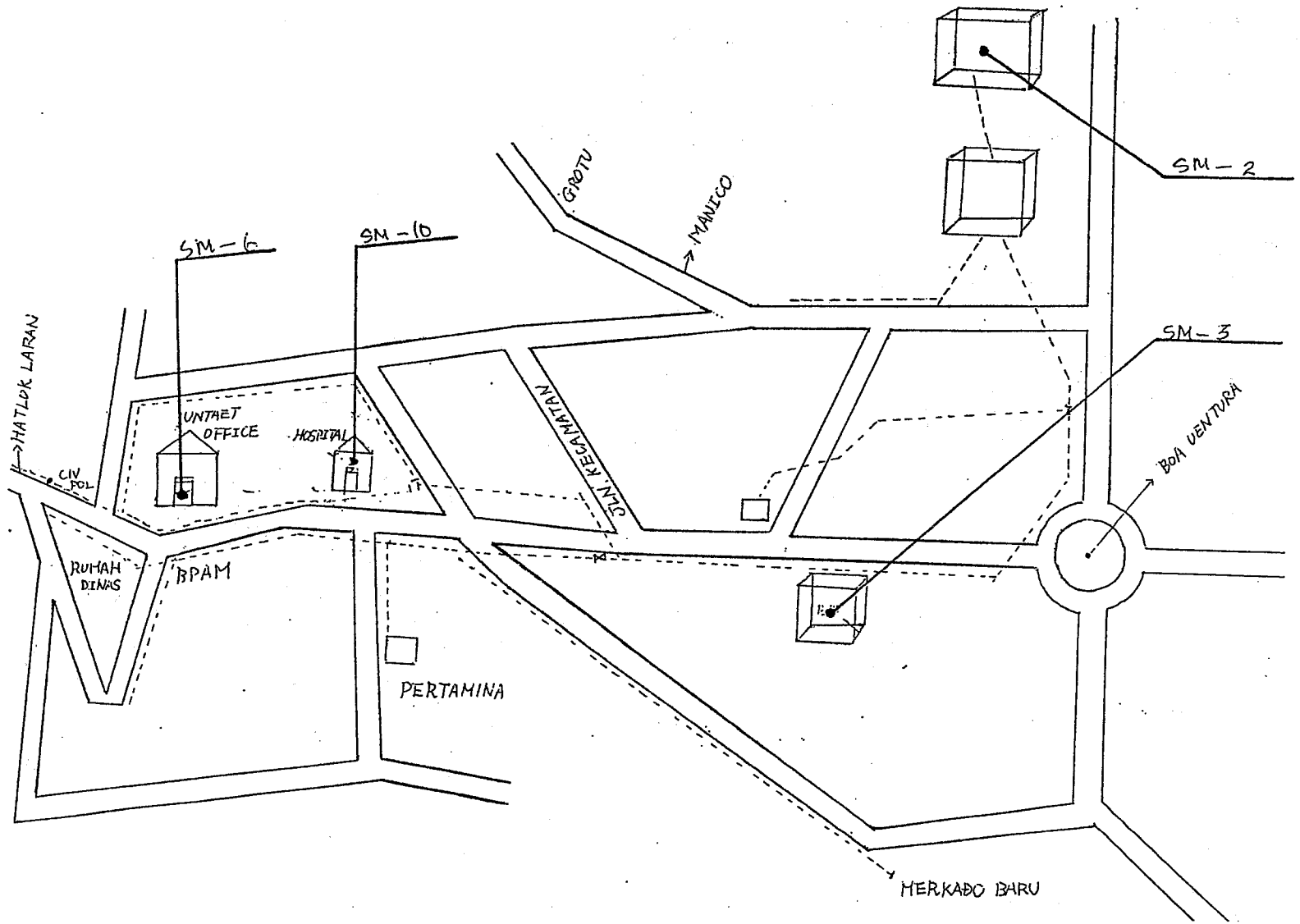
The Location of Sampling Point in Same (1)

Figure A.7-1



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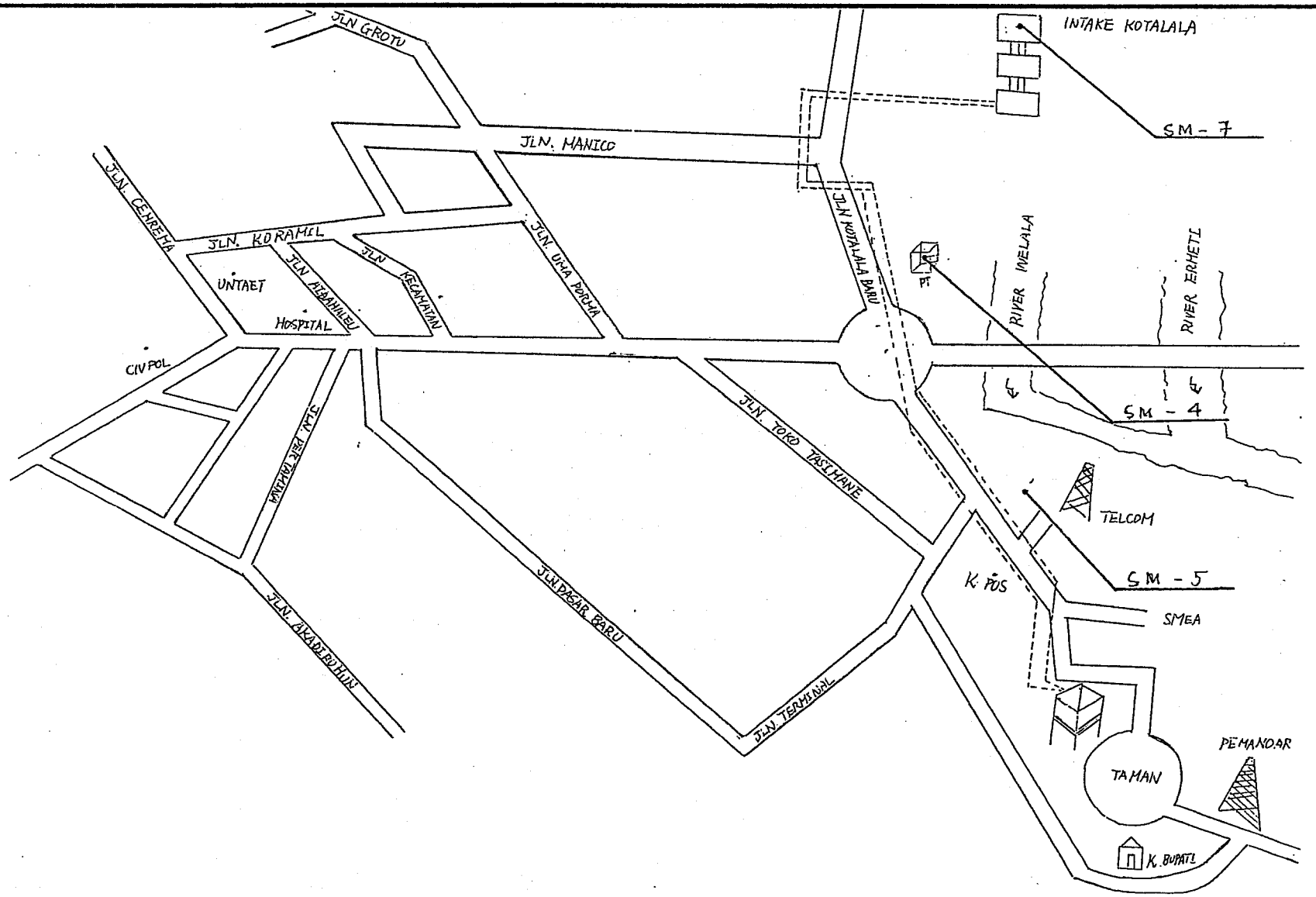
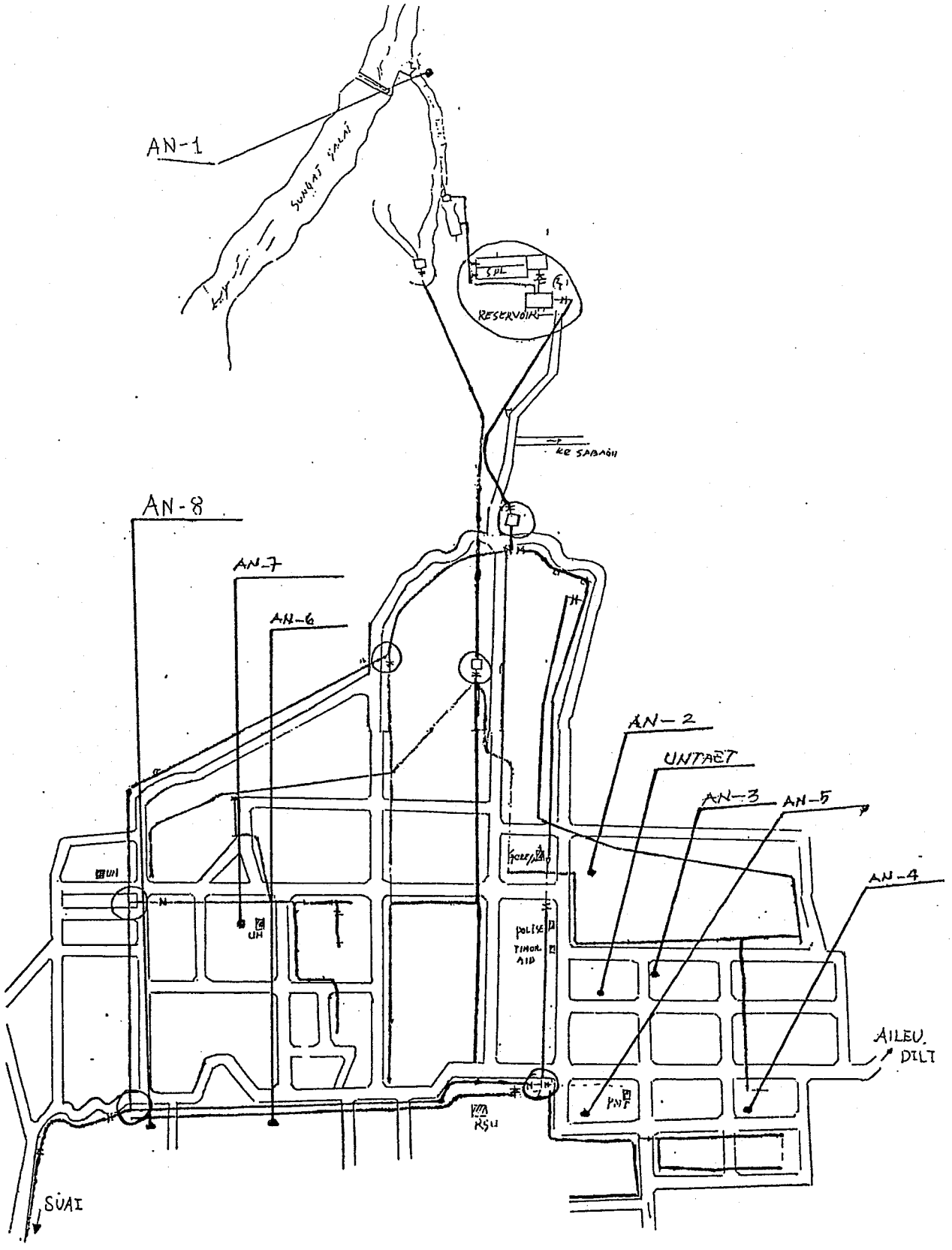
The Location of Sampling Point in Same (2)

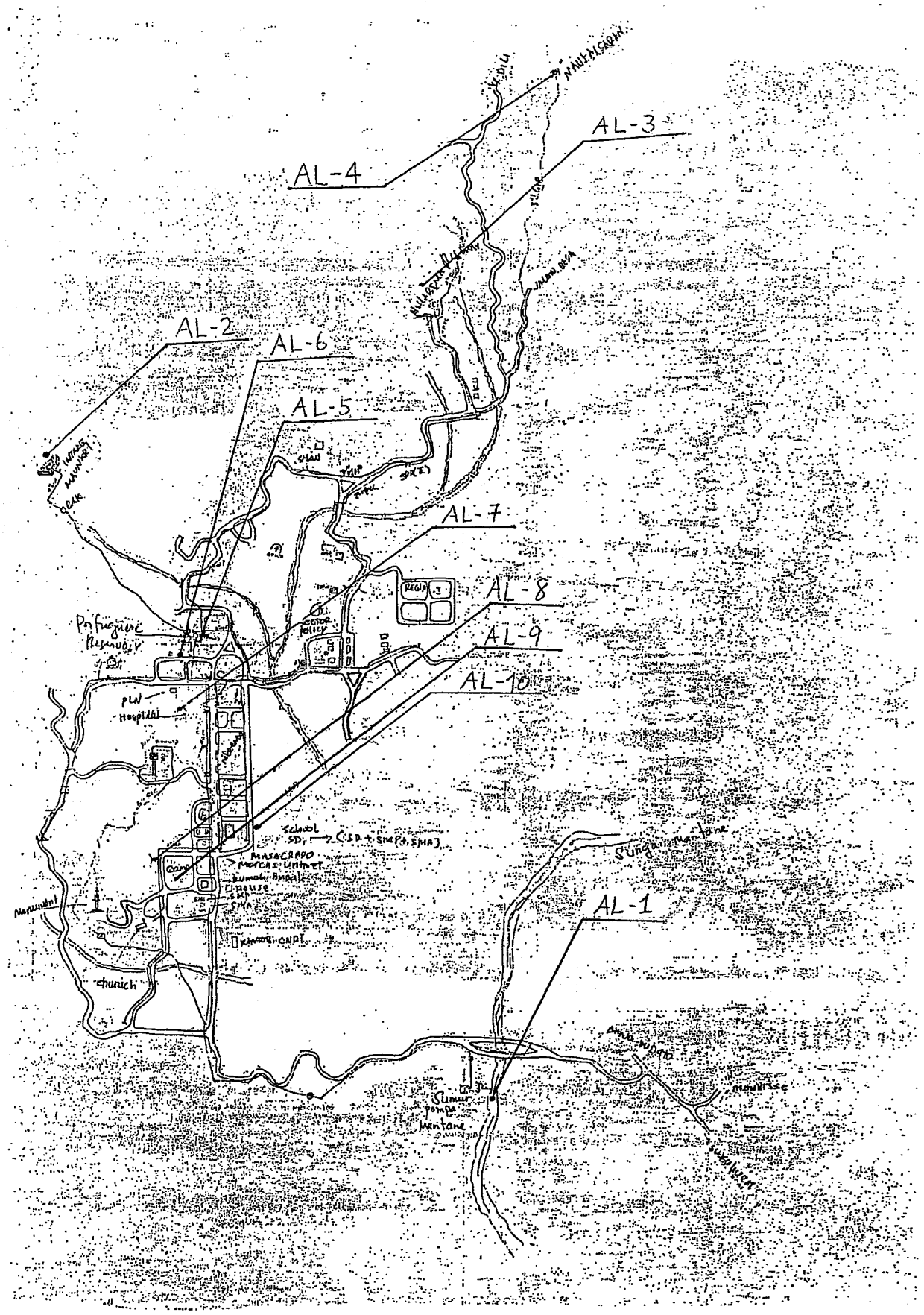
Figure A.7-2



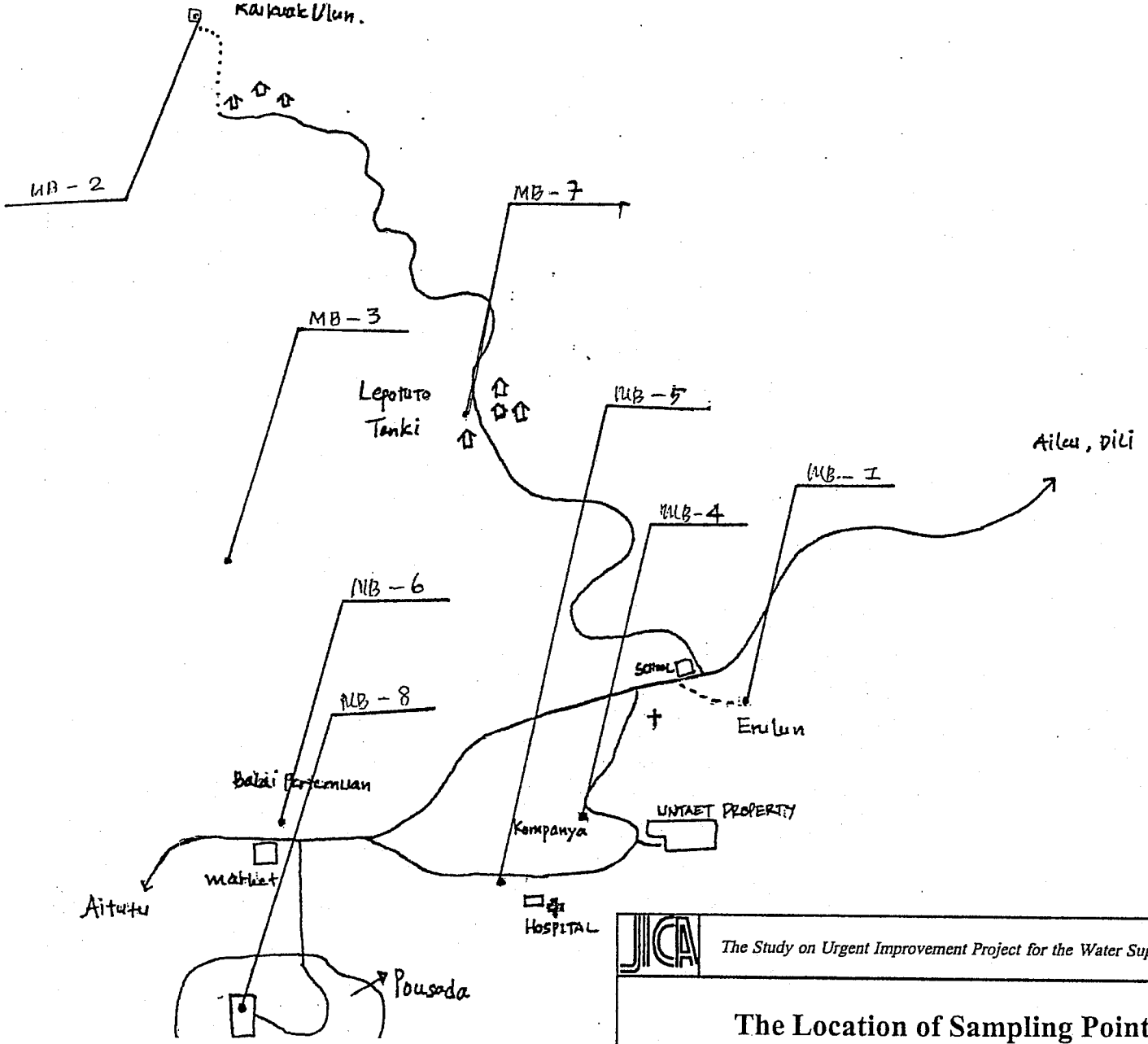
JICA	*The Study on Urgent Improvement Project for the Water Supply System in East Timor*	**Figure A.7-3**
	The Location of Sampling Point in Same (3)	



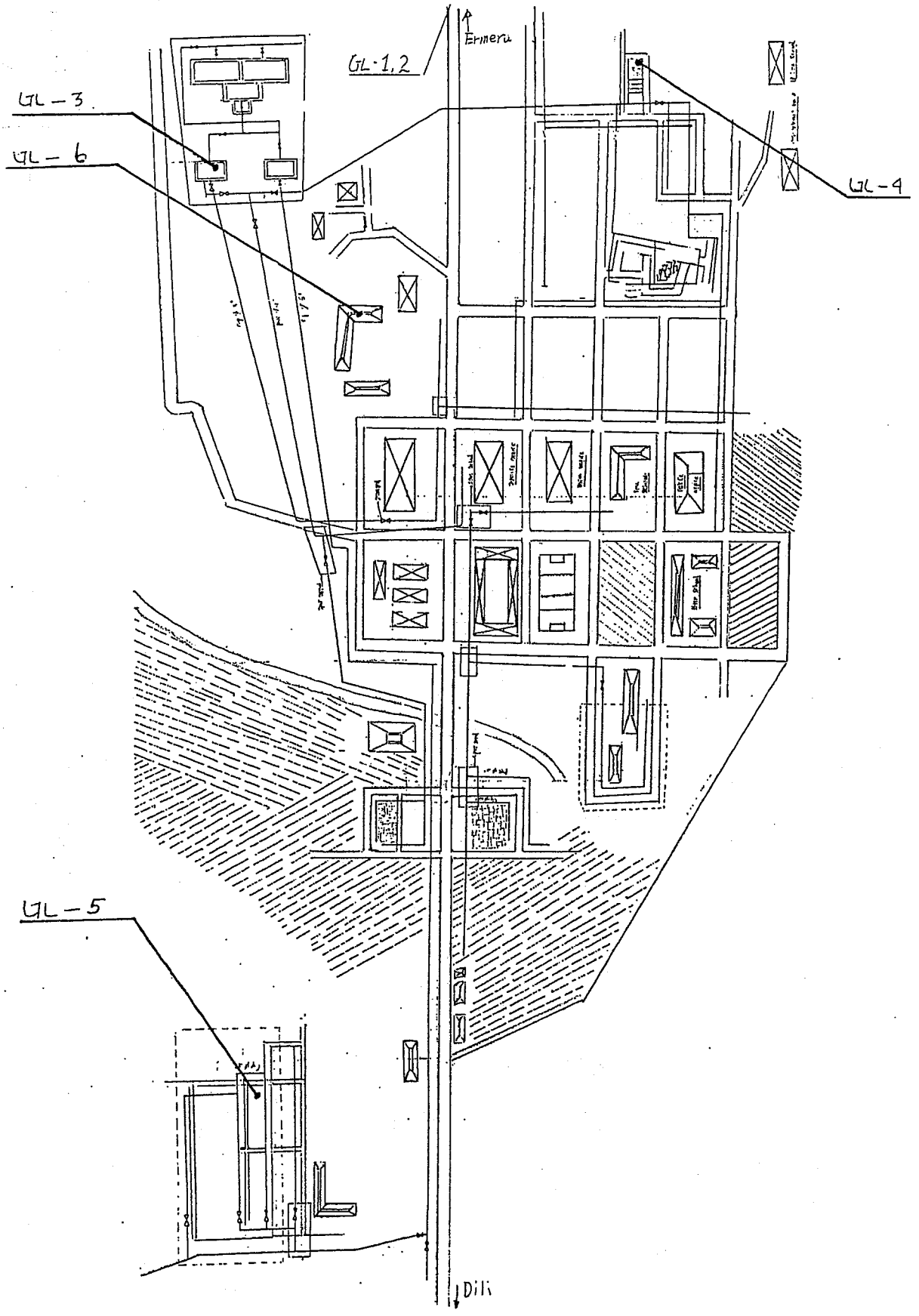
JICA	*The Study on Urgent Improvement Project for the Water Supply System in East Timor*	**Figure**
	The Location of Sampling Point in Ainaro	**A.8**



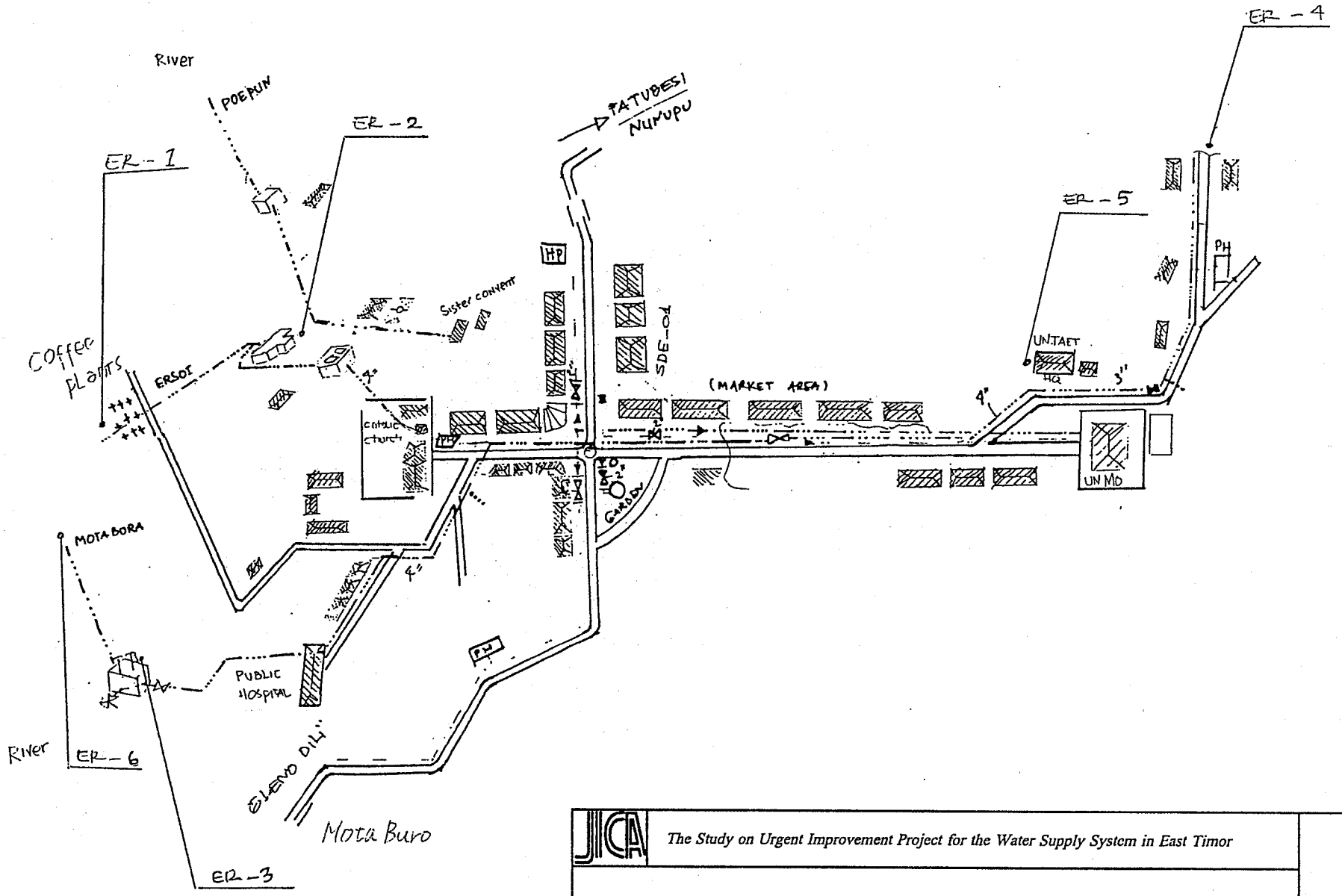
JICA	*The Study on Urgent Improvement Project for the Water Supply System in East Timor*	**Figure A.9**
	The Location of Sampling Point in Aileu	



JICA	The Study on Urgent Improvement Project for the Water Supply System in East Timor	Figure A.10
	The Location of Sampling Point in Maubisse	



JICA	*The Study on Urgent Improvement Project for the Water Supply System in East Timor*	**Figure**
	The Location of Sampling Point in Gleno	**A.11**

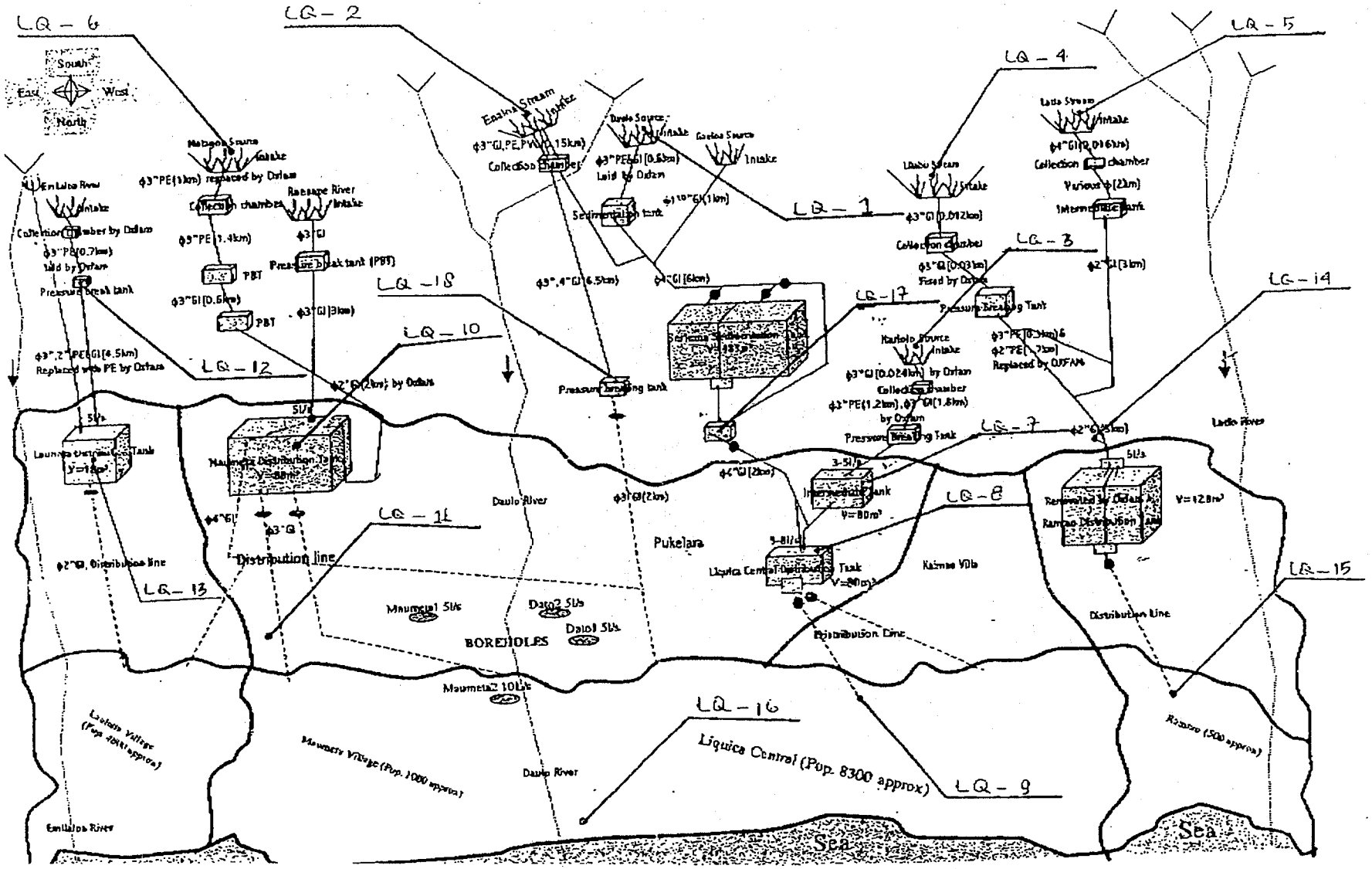


JICA

The Study on Urgent Improvement Project for the Water Supply System in East Timor

The Location of Sampling Point in Ermera

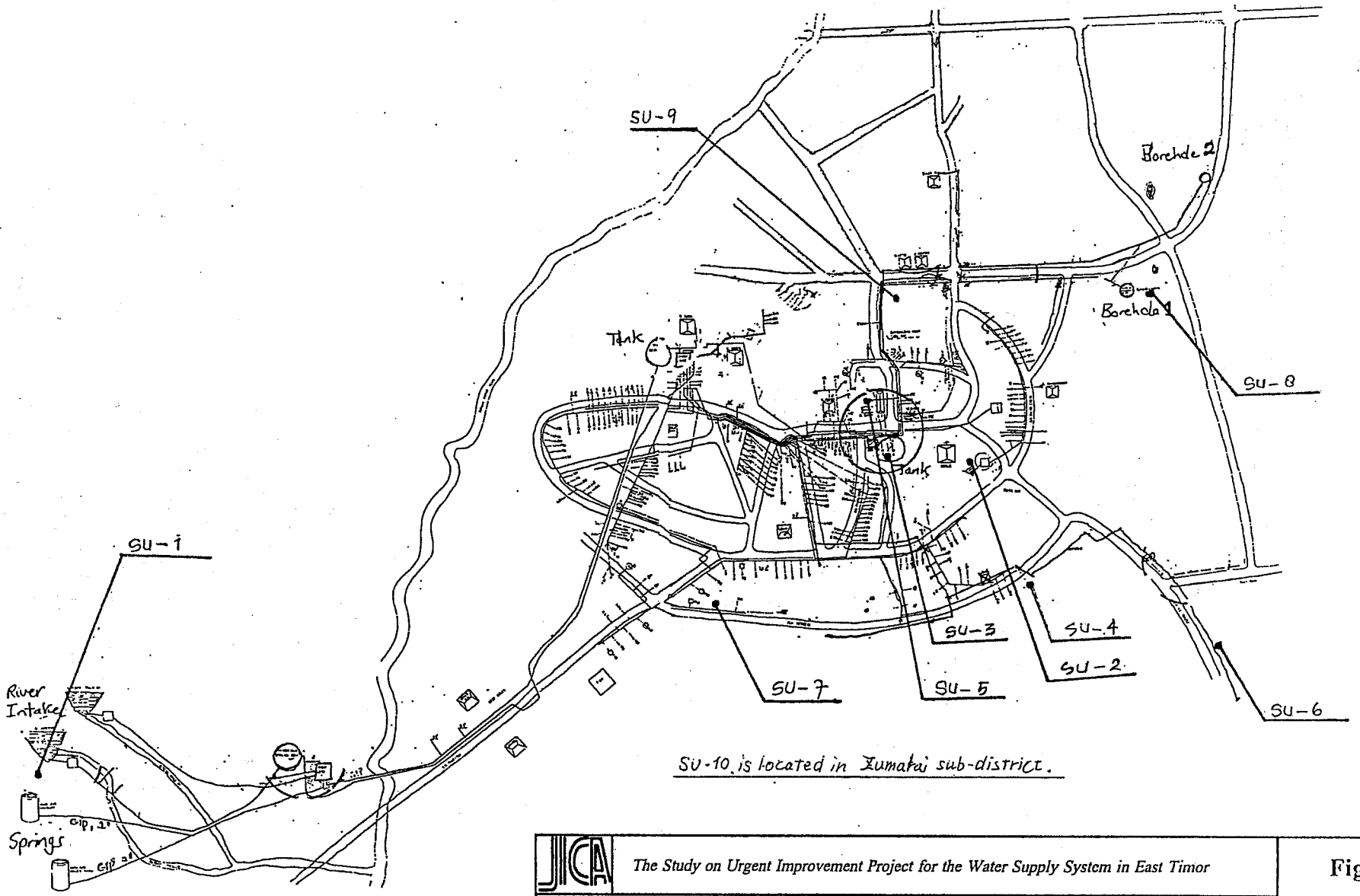
Figure A.12



The Study on Urgent Improvement Project for the Water Supply System in East Timor

The Location of Sampling Point in Liquica

Figure A.13

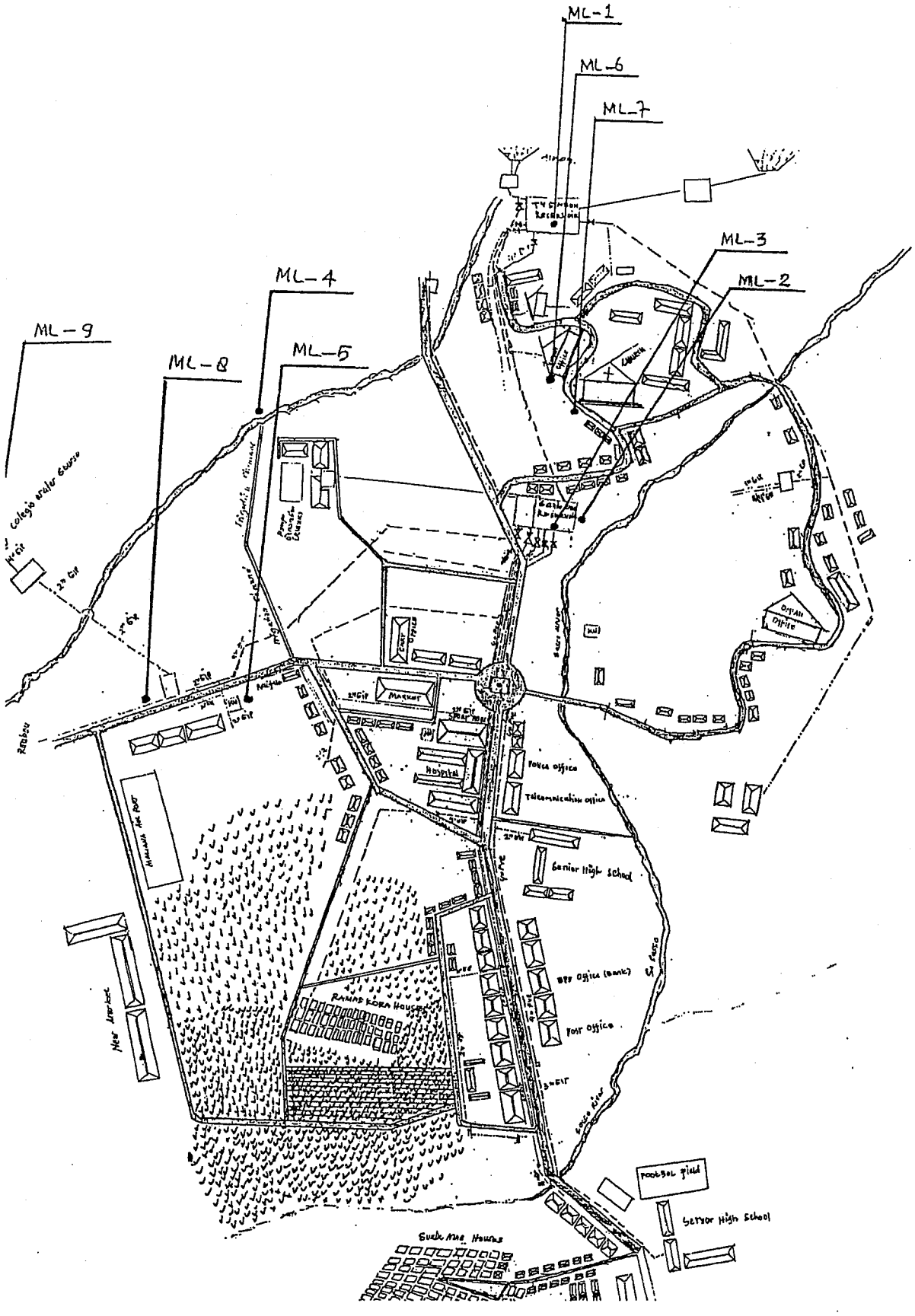


JICA

The Study on Urgent Improvement Project for the Water Supply System in East Timor

The Location of Sampling Point in Suai

Figure A.14



JICA	*The Study on Urgent Improvement Project for the Water Supply System in East Timor*	Figure A.15
	The Location of Sampling Point in Maliana	