

Final report

July 2021

## Viet Nam: Water Sector Investment Program - Tranche 2

Buon Ma Thuot and Three Adjacent Districts Water Supply Project - Dak  
Lak province

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## **Final report**

### **SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT**

## **L2961 – VIE: WATER SUPPLY FOR BUON MA THUOT CITY AND THREE ADJACENT DISTRICTS OF EA KAR, BUON DON AND Krong Nang**

Prepared by Dak Lac Water Supply Company for the Buon Me Thuat People Committee and the Asian Development Bank.

### CURRENCY EQUIVALENTS

Currency unit	(Up to Dec 2020)	
\$1.00	–	Viet Nam Dong (VND)
	=	VND 23,275

### UNITS OF MEASUREMENT

ha	–	Hectare
kg	–	Kilogram
km	–	Kilometre
m	–	Meter
t	–	Ton
m <sup>2</sup>		Square meter
m <sup>3</sup>		Cubic meter
m <sup>3</sup> /d		Cubic meter per day
m <sup>3</sup> /s		Cubic meter per second
mm		millimetre

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## **ABBREVIATION**

ADB	Asian Development Bank
AP	Affected People
PMU	Project management unit
CCGQKNTM	Grievance redress mechanism
DAKWACO	Dak Lak water supply and construction investment one-member limited company
DTTS	Ethnic minority
HH	Household
EMP	Environmental management plan
SEMP	Site environment management plan
RP	Resettlement plan
D.N.	Day-night
QCVN	Technical regulation
CMC	Construction monitoring consultant
EMC	Environmental monitoring consultant
WTP	Water treatment plant
VUWSDP	Vietnam Urban water supply development project
WB	World Bank
TA	Technical Assistance

## EXECUTIVE SUMMARY

1. This semi-annual report about water supply project environmental safety implementation policy status was prepared by PMU of Dak Lak water supply joint stock company in the second semi-annual 2020 with the assistance from Eptisa supervision Consultant Contractor (41456-033) (under DL-CS01 contract) This report covers the implementation progress of environmental safeguard and occupational safety activities from July to December 30, 2020.
2. PMU of Dak Lak water supply joint stock company had 06 packages including 05 construction packages and 01 supervision and institutional strengthening package.
  - i. DLCW01 package: Supply and Install of the raw water intake and transmission pipeline 35.000m<sup>3</sup>/day.
  - ii. DLCW02 package: Water treatment plant with capacity 35.000m<sup>3</sup>/day and treatment water transmission pipeline t booster pumping station.
  - iii. DLCW-03 package: Booster pumping station, treated water transmission pipelines to Buon Ma Thuot city water supplying network.
  - iv. DLCW-04 package: Construction of Buon Ma Thuot treated water transmission and distribution pipelines.
  - v. DLCW-05 package: Raw water intake + pumping station + transmission pipelines, water treatment plant, water treatment plant, treatment water transmission pipeline and distribution network for three districts of Ea Kar, Buon Don and Krong Nang.
  - vi. DL-CS-01 package: Construction supervision and institutional strengthening in non-revenue water management (41456-033) that implemented by Eptisa company. Environment + Gender + Resettlement safety policy implementation assistance consultant is under this package.
3. The civil work of the 05 construction packages was started from period of October-November 2017, in which 4 packages (DLCW-01, DLCW02, DLCW03 & DLCW05) of the project commenced on 16 Nov 2017, except for DLCW04 commenced on 10 Oct 2017. The project has been in compliance with policies of the Government and of the ADB on environmental protection and occupational safety. The approved reports include: Environmental Protection Commitments (EPC), Initial Environmental Examination (IEE) and Updated Environmental Management Plans (uEMP), two environmental monitoring reports in 2018.
4. The Contractor Environmental Management Plan (CEMP) of 5 packages (DLCW01, DLCW02, DLCW03, DLCW04, DLCW05) have been prepared by Contractor. PMU also approved all Environmental Protection Commitments of Construction Contractor before undertaking of the Project. 100% of Contractor had commitment about implementation of all mitigation measures that mentioned in uEMP

/CEMP and submitted to DPC before implementation of all packages' construction. For environment quality, Eptisa supervision Consultant signed contract with Natural Resource and Environment Observation Centre to take monitoring samples in the construction sites.

5. In general, the Contractor's implementation of Environmental Safeguard and Occupational Safety under the Project has been compliant with the project requirements. The Contractor has also implemented the environmental impact mitigation measures under the approved CEMP. The project has been mostly compliant with national regulations and policies of the Donor on environmental aspect and occupational safety.



## **1. Project overview, General safeguard matters**

### **1.1 Project Overview**

1. According to the letter 240/BKHDT-KTDN dated 14 January 2011 by The Ministry of Planning and investment to ADB director, Dak Lak is one of 12 provinces including Hai Phong, Da Nang, Thua Thien Hue, Bac Giang, Thai Nguyen, Thanh Hoa, Nghe An, Quang Tri, Dak Lak, Quang Nam, Lam Dong and Binh Dinh taking part in stage 02 of water section development program.

2. On 15 February 2011 the ADB letter was sent to the MPI on “Multi-tranche Financing Facility “Water Sector Investment Program” Second Tranche (2011) – Periodic Financing Request 2 (PRF2)” to agree the list of participating provinces in PRF2, namely Hai Phong, Da Nang, Thua Thien Hue, Bac Giang, Thai Nguyen, Nghi Son, Nghe An, Quang Tri, Dak Lak (public and private) Quang Nam, Lam Dong and Binh Duong, with total estimated investment capital of \$540 million.

3. On 8 February 2011, Ministry of Planning and Investment submitted to the Prime Minister letter No 5044/BKHDT-KTDN re “Approval of sub- projects participating the Viet Nam Water Sector Investment Program, ADB Loan” (Program). The Program for 2011 – 2012 financial year is expected to be conducted in 12 provinces including Hai Phong, Da Nang, Thua Thien Hue, Bac Giang, Thai Nguyen, Thanh Hoa, Nghe An, Quang Tri, Quang Nam, Dak Lak, Lam Dong and Binh Duong.

4. The Prime Minister issued letter No 1530/TTg-QHQT dated 5 September 2011 re “Approval list of project components under Program for Viet Nam Water Sector Investment in 2011 – 2012”.

5. Water supply project for Buon Ma Thuot and three adjacent districts of Ea Kar, Buon Don and Krong Nang was officially commenced from 19 Oct 2017; all project components were classified as class B in environment aspects.

#### **1.1.1 Project’s objectives and works**

##### **Project Objective:**

6. The development objective of the Project is to improve water supply for domestic, industrial and service- commercial use in Buon Ma Thuot City and three district towns having the same names as their districts of Ea Kar, Buon Don and Krong Nang.

7. The Project implementation will bring specific success as follows: ensure quality of clean water supplied to local residents, increase customers from construction of new-piped water supply system and expansion of piped water supply.

8. The overall objective of the Project is to increase water supply coverage for residents in Buon Ma Thuot City and its adjacent areas within the Project service area. That will create favorable conditions for improvements of living conditions and health of

residents; for socio-economic, industrial and tourism development of Buon Ma Thuot city and project towns, Dak Lak province and Central Highland region.

9. The specific objective of the Project is to improve access to safe and reliable piped water supply in Buon Ma Thuot city and meet the forecast water demands to 2020 of 13 yards and 8 communes of the City and to meet the demand of safe and reliable piped water supply in three district towns of Ea Kar, Buon Don and Krong Nang to 2020.

10. Project Works: water supply for Buon Ma Thuot city and three adjacent districts of Ea Kar Buon Don and Krong Nang includes subprojects as below:

### 1.1.2 Water supply system in Buon Ma Thuot city

11. Raw water facilities: construct a water intake and design capacity of 35,000 m<sup>3</sup>/day raw water pumping station. Install a mid-voltage power line from the electricity grid to the raw water pumping station, transformer sub-station and low voltage line and backup generator. Install a 06km long HDPE DN700 raw water pipeline from the raw water pumping station to the water treatment plant (WTP) which is located on Tan Lap hill.

12. Water treatment: the proposed design capacity of 35,000 m<sup>3</sup>/day WTP will be constructed on Tan Lap hill, Krong Ana District. The treatment process is conventional including: coagulation, flocculation, sedimentation, rapid sand filtration and disinfection. Install a mid-voltage power line from the national grid to the WTP area, transformer substation, and low-voltage power line. This WTP includes Chemical houses, Sludge settling pond, Laboratory to construct and equip a testing laboratory at the WTP site to control water quality in the WTP, a Supervisory Control and Data Acquisition System (SCADA) at the WTP to monitor and control WTP operation, transmission pipelines from the WTP to the water storage reservoir with booster pumping station and transmission pipelines of treated water to Hoa Phu, Hoa Xuan, Hoa Khanh and Ea Kao communes in the South of the city.

13. Booster pumping station: construct a booster pumping station (capacity 32,000 m<sup>3</sup>/day) and a 5,000 m<sup>3</sup> storage reservoir to pump water to the transmission and distribution pipelines. These will be located in the Hamlet 11, Ea Tam ward.

14. Transmission and distribution network: install totally 130 km transmission mains and distribution pipelines, 80 km DN50-90 service lines and 22,000 service connections.

**Table 01: SUMMARIZATION OF ALL WATER SUPPLY ITEMS IN BUON MA THUOT CITY**

No.	Item	Capacity
A	<b>DLCW-01 PACKAGE</b>	35,000 m <sup>3</sup> /day

1	Raw water intake and pumping station	
2	DN700 raw water pipeline	
<b>B</b>	<b>DLCW02 PACKAGE</b>	35,000 m <sup>3</sup> /day
<b>1</b>	<b>Water treatment plant, treated transmission pipeline into booster pumping station</b>	
1	Water treatment plant	
2	SCADA	
3	Treated transmission pipeline into booster pumping station	
<b>C</b>	<b>DLCW03 PACKAGE</b>	32,000 m <sup>3</sup> /day and a 5,000 m <sup>3</sup> storage reservoir to pump water to the transmission and distribution pipelines
1	Booster pumping station	
2	22 Kv electricity wire	
3	Treated water transmission pipelines into network	
4	2L – Pipeline crossing stream	
<b>D</b>	<b>DLCW04 PACKAGE</b>	130 km transmission mains and distribution pipelines, 80 km DN 50-90 service lines and 22,000 service connections

### 1.1.3 Water supply system in three adjacent towns

15. Ea Kar: Construct a 2,500 m<sup>3</sup>/day WTP on the small Chu Cuc hill. Raw water will be supplied from the Ea Kar dam. Total length of transmission, distribution pipelines and service connection are 44 km. Installation of 3,300 service connections.

16. Buon Don: Construct a 1,000 m<sup>3</sup>/day WTP in Ea Wer. Raw water will be supplied from Serepok hydro-electric dam. Total length of transmission, distribution pipelines and service connection are 22 km. Installation of 1,400 service connections.

17. Krong Nang: Construct a 1,600 m<sup>3</sup>/day WTP in Ho Sen park area. Raw water will be supplied from the Dong Ho Lake. Total length of transmission, distribution pipelines and service connection are 34 km. Installation of 2,300 service connections.

18. Summary of land map and water supply capacity in Buon Ma Thuot city and three adjacent districts of project are in figure 1.1.

#### 1.1.3.1 Ea Kar town

Stage	Capacity
Phase I	2,500 m <sup>3</sup> /day
Water resource	Water in Ea Kar lake Offside intake close of Ea Kar dam; Pumped through raw water main to WTP

Treatment and network	<p>WTP is on bottom of Chu Cuc hill.</p> <p>Water treatment scheme: surface water treatment technology: coagulation, flocculation, lamella sedimentation, rapid filtration, disinfection.</p> <p>Conditioned pumped on the hill and treated reservoir is on top of hill</p> <p>Backwash water from reservoir</p>
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#### 1.1.3.2 Buon Don town

Stage	Content
Stage	Capacity
Phase I	1. 000 m <sup>3</sup> /day
Water resource development	Surface water source is from hydroelectric lake Serepok 04 Offside intake, submersible pumps into WTP
Water treatment	<p>Location: Ea Wer ward</p> <p>Treatment scheme: coagulation, flocculation, lamella sedimentation, rapid filtration, disinfection, in storage reservoir. Backwash pump. Treated water pumped to distribution network by booster pumps adjusted by inverter, backwash water treatment by a sludge lagoon.</p>
Network	Treated water pumped to distribution network by booster pumps adjusted by inverter.

#### 1.1.3.3 Krong Nang town

Stage	Capacity
Phase I	1.600 m <sup>3</sup> /day
Resource development	Surface water applied from Dong Ho Lake. Raw water intake works, submersible pumps to pump water to WTP.
Water treatment	<p>The WTP will be located at the Lotus Lake Park.</p> <p>Water treatment profile: surface water treatment scheme: coagulation, flocculation, lamella sedimentation, rapid filtration, disinfection in storage reservoir, backwash by pump and air blow, treated water pumped to distribution network under control of an inverter, backwash water treatment by a sludge lagoon.</p>
Network	Treated water pumping will be controlled by inverter

19. Location of each component of the projects and details of each package' items are presented in the figure 1, 2,3,4 as below:

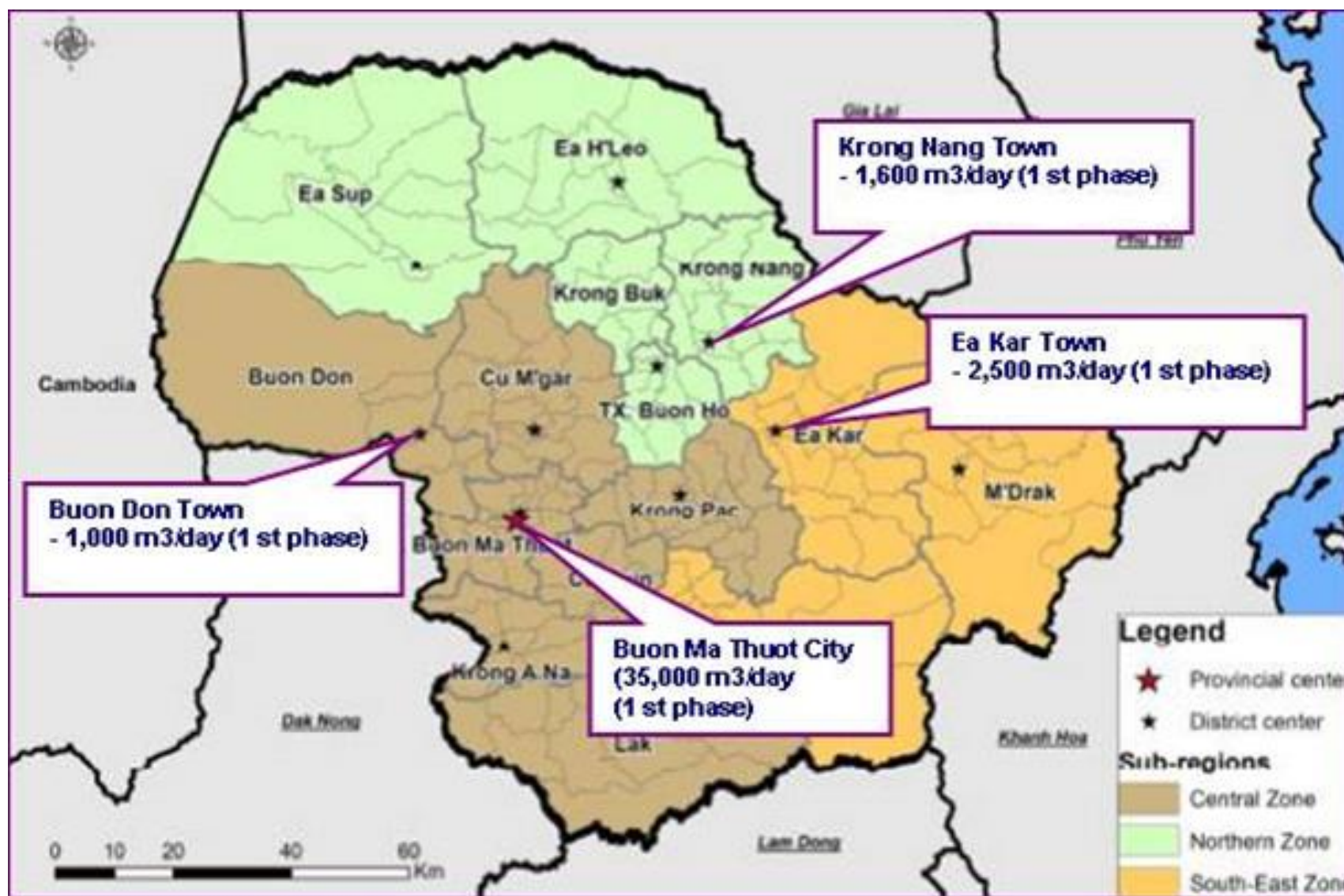
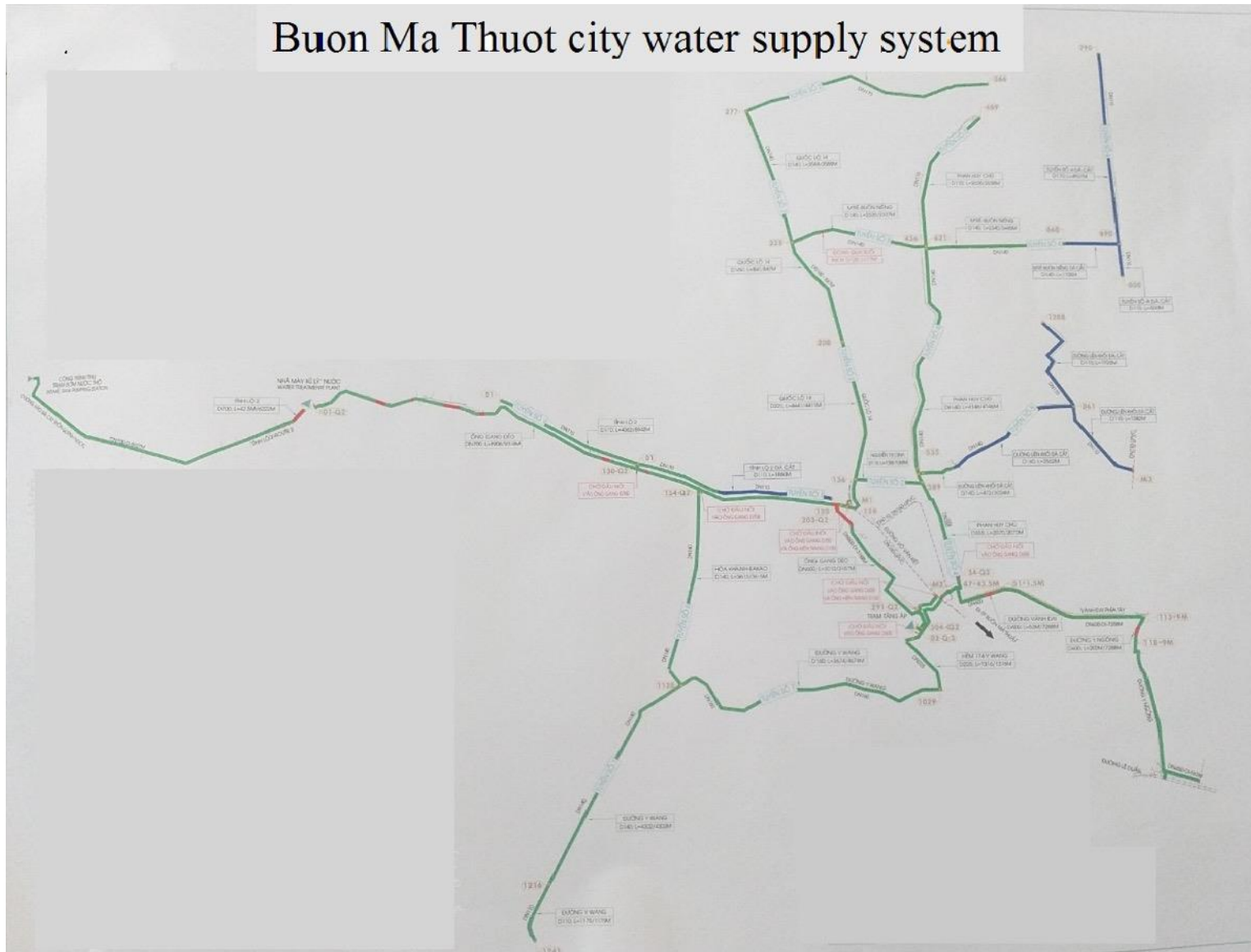


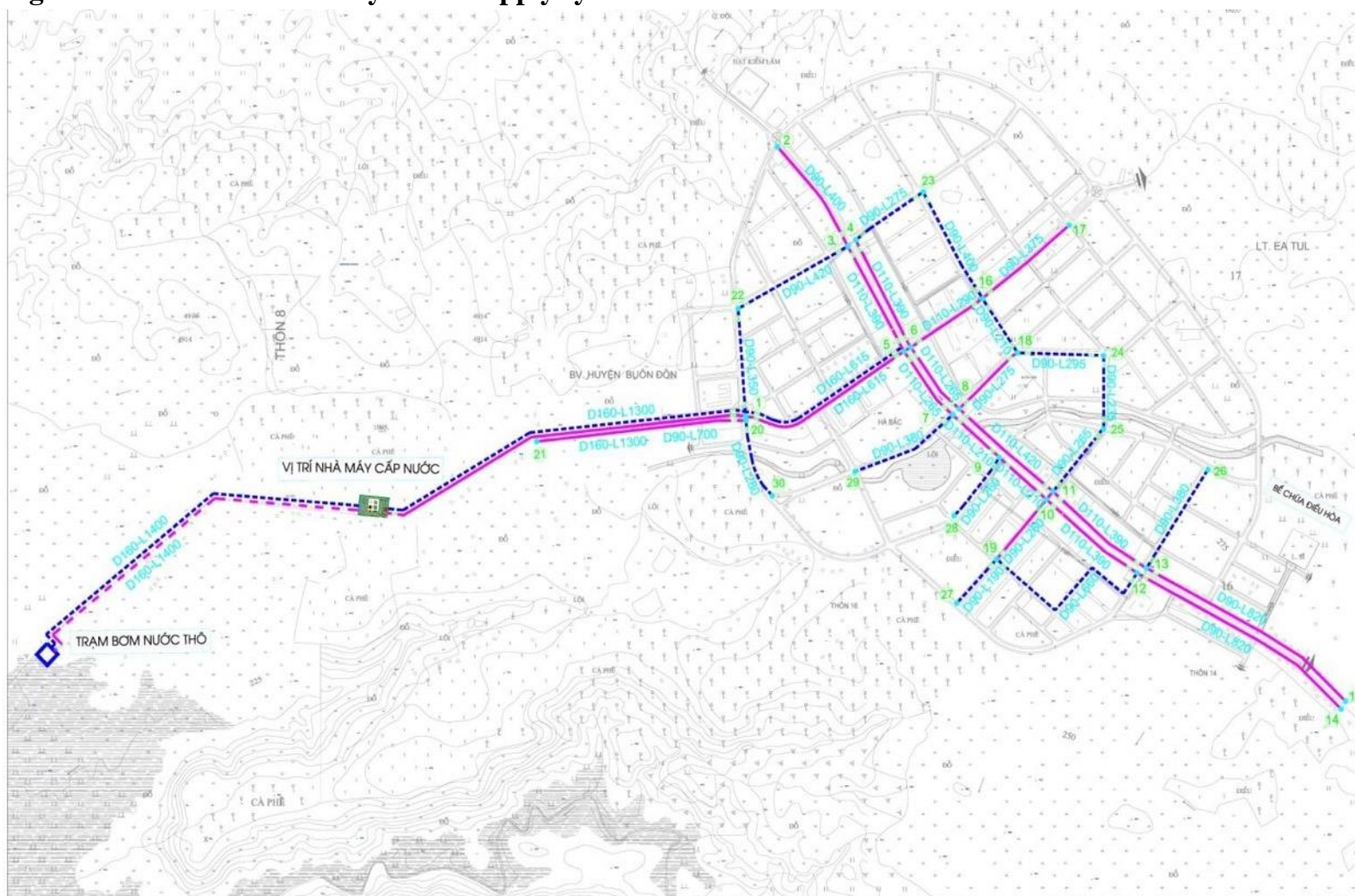
Figure 1: Land map of project package



## Buon Ma Thuot city water supply system



**Figure 2: Buon Ma Thuot city water supply system**



**Figure 3: Buon Don district water supply system**

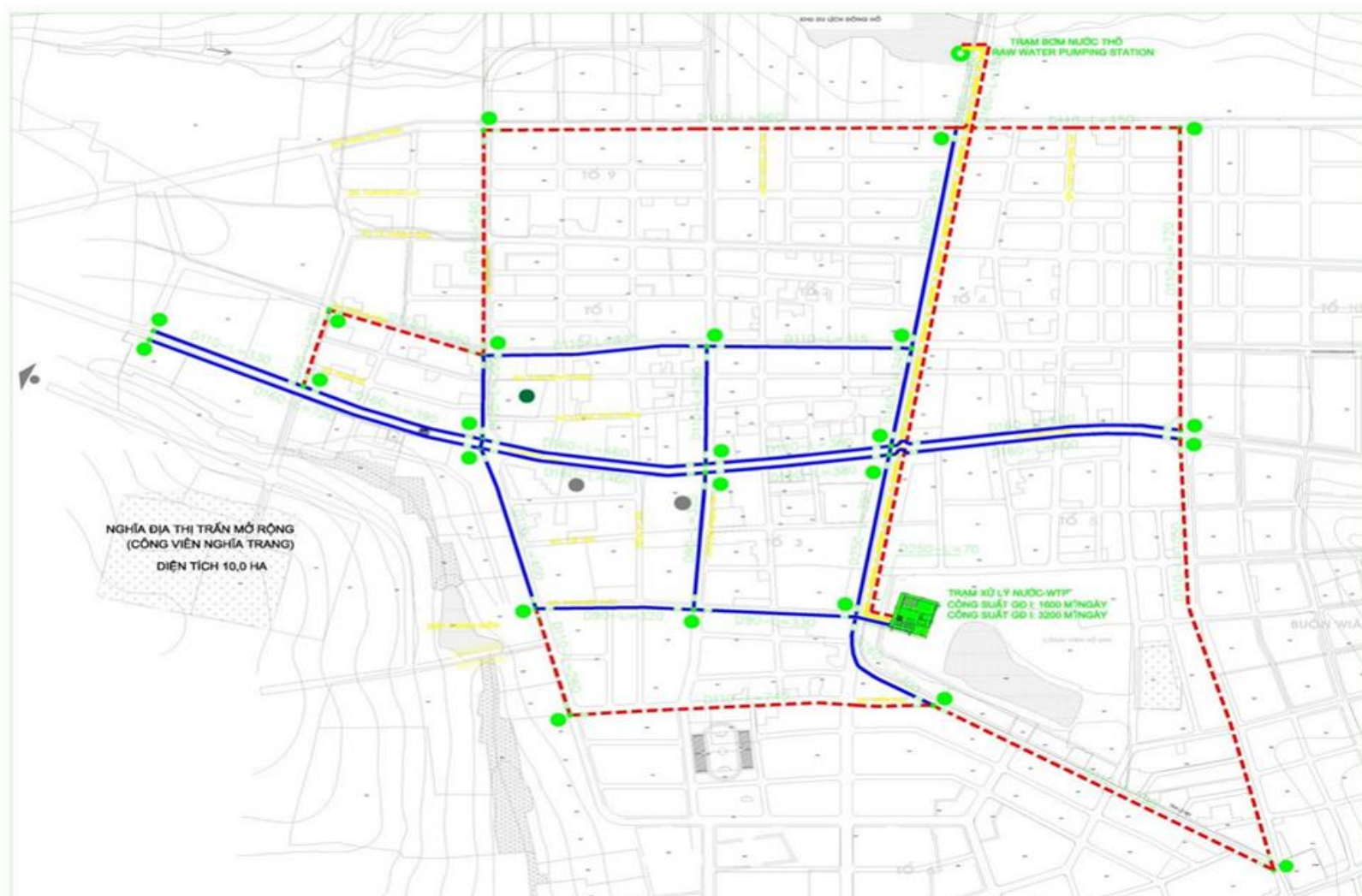


Figure 4: Krong Nang district water supply system



## 1.2 Project Progress

### 1.2.1 Contractor and packages

20. The project has 05 packages. All packages, contractors and periods of each package is summarized in below table:

**Table 2: Information summary of all construction packages**

Package	Contractor	Contract			Progress (up to 30 Dec 2020)
		Signed contract date	Commence-ment date	Adjustment	
DLCW01: supply and install raw water intake and transmission pipelines with capacity 35.000m <sup>3</sup> /day	Water supply and sewerage construction and investment JSC. (WASECO)	10/08/2017	16/11/2017 (403/TB-BQLDA)	Extended from 435 days to 562 days	100 %
DLCW-02: WTP with capacity 35.000m <sup>3</sup> /day and transmission pipeline to booster pumping station.	Dai Phu Thinh Co. Ltd.	10/08/2017	16/11/2017 (404/TB-BQLDA)	Extended from 460 days to 640 days	100 %
DLCW-03: booster pumping station and transmission pipeline to network	JV of Europe Pump & Dai Phu Thinh Co. Ltd	31/07/2017	16/11/2017 (405/TB-BQLDA)	Extended from 435 days to 623 days	100 %
DLCW-04: Construct transmission and distribution pipelines in Buon Ma Thuot city.	JV of Ha Huy Co. JSC and Ha Noi water electricity installation and construction Co. JSC. (HAWEICCO)	11/08/2017	10/10/2017 (344/TB-BQLDA)	Extended from 520 days to 659 days	100 %
DLCW-05: Intake, raw water pumping station, transmission pipelines, WTP, treated transmission pipelines and distribution network of three districts Ea Kar, Buon Don and Krong Nang	Vietnam water and environment Investment Corporation – JSC	15/08/2017	16/11/2017 (401/TB-BQLDA)	Extended from 540 days to 721 days	100 %
DL-CS01: Construction supervision & Institutional strengthening in no-revenue water management (41456-033)	Joint Venture of EPTISA SERVICIOS DE INGENIERIA S.L. and CEN joint stock company (as called Eptisa Contractor)	08 Nov 2016		extended from 30 months to 39 months	

(Source: Quarterly Project Progress Report, October 2020)

**Construction activities during the reporting period:**

21. Construction activities have completed for all 5 packages DLCW01, 02, 03 & 04, no activities were taken in Buon Me Thuot City during this reporting report. The construction of intake and water treatment stations under package DLCW05 were implemented in Ea Kar, Buon Don and Krong Nang Districts, Dak Lak Province.

**Construction activities during the next reporting period:** No construction activities, all construction was completed.

22. Some key safeguard information and activities carried out during the reporting period are summarized in Table 4.

**Table 4: Project Overview, Snapshot of Project Progress**

Project Number and Title:	<b>WATER SUPPLY FOR BUON MA THUOT CITY AND THREE ADJACENT DISTRICTS OF EA KAR, BUON DON AND KRONG NANG</b> ADB No.2961-VIE	
Safeguards classification	Environment	Category B
	Involuntary Resettlement	Category B
	Indigenous Peoples	Category C
Reporting period:	Second semi-annual monitoring 2020 – (report No 06)	
Last report date:	December 2020	
Key sub-project activities:	<b>Contract awarding:</b> Appx.24,59 million USD	
	<b>Main construction activities</b>	
	The Project includes 05 construction packages. The project as of 30 of December 2019 is given as below:	
	<i>Item</i>	<i>Construction progress</i>
	DLCW01 Package	100 %
	DLCW02 Package	100 %
	DLCW03 Package	100 %
	DLCW04 Package	100 %
	DLCW05 Package	100 %

	Contract award and ground-breaking on August, 2017 and construction began from October and November 2017.
Main environmental activities during the reporting period	<p>IEE, EMP, uEMP, EPP (environmental protection plan), SEMP</p> <p>i) 04 EPPs for 04 water supplying structures were approved by Buon Ma Thuot CPC and 03 DPC in project areas in 2016. The details are: EPP was approved by Buon Ma Thuot CPC on 14 Jun 2016; Buon Don DPC on 13 May 2016; Ea Kar DPC on 17 May 2016 and Krong Nang DPC on 04 May 2016.</p> <p>ii) 01 IEE for the whole project was approved by ADB in 2012</p> <p>iii) 01 updated environment management plan was approved by ADB in December 2016.</p> <p>iv) Updated environment management plan was integrated as one part in bid documents in 2017.</p> <p>v) 05 construction contractors of 05 packages prepared 05 CEMP and submitted for PMU after contract signature and before Notice to Proceed.</p> <p>vi) 05 SEMRs for the years of 2018, 2019 &amp; 2020 were submitted and approved by ADB</p> <p>vii) EMC, CMC conduct inspections and spot checks in monitoring performance of the Contractors on implementation of activities/mitigation measures on environmental protection and occupational safety at site during construction in accordance with the approved CEMPs, uEMPs / EPPs.</p> <p>viii) Review results of air quality monitoring conducted by Dak Lak Environmental Monitoring Center in the second semi-annual of 2020</p> <p>ix) affected people consultations were conducted in July 2020.</p>
Assistance PMU to prepare reports	Environmental monitoring + contract management + construction monitoring by joint venture of Eptisa to support PMU in preparation of reports to submit to ADB twice a year.

### 1.3 Environmental monitoring Plans and implementation arrangements

23. Dak Lak Construction Investment Water Supply One Member Limited Company (DAKWACO) who is the project owner (PO) and sub-executing agency (EA);<sup>2</sup> a designated project management unit (PMU) to support DAKWACO who will implement the subproject components and the EMP; and 3) a Construction Supervision Consultant 1 (CSC) who will assist to update EMP to ensure EMP meets the final subproject designs. The ADB is responsible for monitoring to ensure subproject meets the environmental safeguards of the SPS (2009).

23. The EA (DAKWACO) has the ultimate responsibility for implementation of the entire subproject, including finance and administration, technical and procurement

<sup>1</sup>CSC contract expected to include construction supervision.

matters, monitoring and evaluation, and environmental safeguards compliance. The DAKWACO will operate the completed water supply system (WS).

24. The Department of Natural Resources and Environment (DoNRE) is the provincial agency which oversees environmental management of Dak Lak. The DoNRE with District staff provides direction and support for environmental protection-related matters including application of the Law on Environmental protection (LEP 2014), and on use of the environmental policy and standards that are in place protect the environment (see Table 4).

25. Dak Lak water supply construction and investment project management unit (PMU) signed contract with Eptisa (thereby consultant) on 8 November 2016 to provide consultant service (construction supervision and environment– society – gender + ethnic minority safeguard policy implementation monitoring). Consultant will be a team including international and national consultant to implement tasks in 30 months in which construction supervision consultant engineers will work full time and environment monitoring, society and ethnic minority consultants will work part-time.

26. The relationship among parties: all participants related to the project including the DAKWACO/PMU, design consultant, CSC and construction contractors must incorporate firmly with each other to ensure that the project in compliance with design, current state standards. Eptisa Consultant supports PMU to monitor the implementation of all Project contractors, in which construction supervision consultant undertook the full-time monitoring of all problems related to construction + environment at the sites; environment monitoring consultant supervised once per three months during construction stages and support PMU to prepare the reports and submit to ADB.

27. The supervision results of implementing mitigation measures by construction contractors have been updated in general periodic progress report of project prepared by Eptisa consultant. First semi-annual 2019 environment monitoring report made by environment monitoring consultant (EMC) under Eptisa will include results of sampling programs by third party (monitoring center of natural resource and environment of Dak Lak DONRE) and supervision of implementation of all mitigation measurement based on environment management plan committed by construction contractors.

**Table 5: Project Implementation Organization**

No	Agencies	Responsibilities of environmental management implementation	Current compliance status
1	PMU	<p>To support DAKWACO who will implement the subproject components and the EMP</p> <p>will be responsible for the detailed engineering and preparation of construction plans, and construction monitoring with support from the CSC.</p> <p>It will be responsible for overseeing the overall procurement process as well as for the overall financial monitoring of the project. Taking responsibilities for updating of the</p>	<p>Partially complied.</p> <ul style="list-style-type: none"> <li>- Detailed engineering design and construction plans, construction monitoring</li> <li>- Updating EMP; include uEMP on construction contractors' contracts</li> <li>- Disclosure project information</li> </ul>

No	Agencies	Responsibilities of environmental management implementation	Current compliance status
		environmental monitoring plan (uEMP), management, monitoring, supervision and preparation of environmental monitoring reports to submit ADB every 6 months.	<ul style="list-style-type: none"> <li>- Continuing public consultation, responding to complaints from communities/stakeholders affected by subproject implementation</li> <li>- Implementing of the uEMP</li> <li>- Delay in preparation and submission of SEMRs to ADB</li> </ul>
	Construction supervision Consultant (Eptisa)	Provide consultant service team in 30 months in which construction supervision engineers will work full time and environment, social and gender will work part time.	<p>Partially complied.</p> <p>Provide engineering consultants and CMC fulltime on sites-</p> <p>Environmental, social and gender consultants were mobilized part time for supervision and assistance when necessary</p> <p>An environmental sampling program was undertaken in July 2020.</p> <p>Delay in preparation and submission of SEMRs to ADB</p>
	Environmental monitoring consultant (EMC) under Eptisa	<p>Assistance PMU to do:</p> <ul style="list-style-type: none"> <li>(i) Update the EMP reports.</li> <li>(ii) Review the design document + contract + CEMP to assure the mitigation measures on environmental impact that mentioned in uEMP to be integrated in bid document and detail of implementation commitment in CEMP.</li> <li>(iii) Assistance PMU in selection of authorized agencies, which of taking periodical environment observation samples to evaluate the impacts of construction activities on surrounding environment.</li> </ul>	<p>Partially complied.</p> <p>uEMP was approved by ADB in December 2016.</p> <p>Completion of semi-annual monitoring reports for 2018, 2019 &amp; 2020. A delay of submission of SEMRs to ADB due to the ineffective cooperation among the CSC.</p>

No	Agencies	Responsibilities of environmental management implementation	Current compliance status
		<p>(iv) Field visiting around construction sites in sub-project areas to check, remind contractors to do the environment safety policies; listen and record of local and community opinions that living surrounding the construction sites.</p> <p>(v) Taking part in project internal monitoring groups; meet all relevant parties regularly; consultancy with local authority community. Support PMU and contractor to implement of detailed requirements in uEMP.</p>	<p>Field visiting with public consultation at the construction sites was conducted in Jul 2020</p> <p>Reviewing the quarterly monitoring reports by construction supervision consultant and on behalf of PMU to draft the second semi-annual 2020 environment monitoring report for PMU to submit ADB.</p>

28. PMU and Consultation organization flowchart is presented in the figure 5 as below:

#### CONSULTANT ORGANIZATION CHART

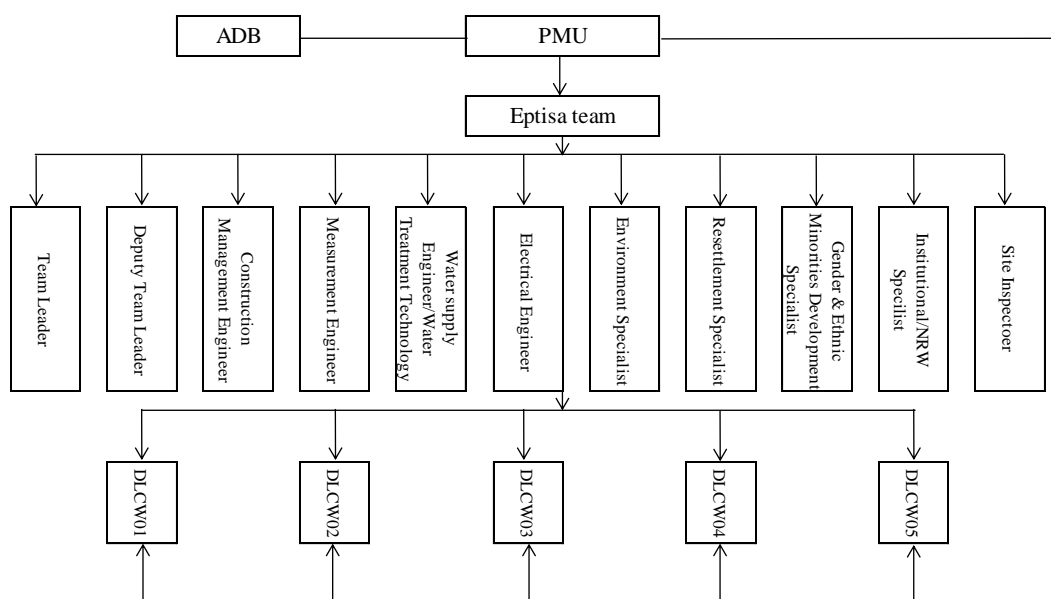


Figure 5: PMU and Consultation organization flowchart

#### 1.4 Updated EMPs, Incorporation of Safeguards Requirements into Project Contractual Arrangements

29. An EMP report was updated, submitted and approved by ADB on December 2016.

30. All safeguard requirement setting forth in the Loan Covenant and uEMP (safeguard requirement, mitigation measures, environmental management plan) were integrated into bidding documents and economic contracts with construction contracts.



31. All construction contractors submitted CEMP for PMU and sent commitments about implementation of all mitigation measures that mentioned in uEMP/CEMP to DPC before construction.

32. 05 semi-annual monitoring reports for 2018, 2019 & 2020 on the implementation of mitigation measures required in uEMP/CEMPs that were approved by ADB. The summary of the preparation and approval of CEMP is shown in the following table

**Table 5. Summary of the preparation of Site-specific Environmental Management Plans (CEMP)**

No.	Name of Packages	Date of submission and approval of CEMPs
1	DLCW01	Submitted on 17/01/2017 Approved on 13/02/2017 by PMU
2	DLCW02	Submitted on 26/05/2017. Approved on 26/9/2017 by PMU
3	DLCW03	Submitted on 5/4/2017 Approved on 10/4/2017 by PMU
4	DLCW04	Approved on 29/5/2017 by PMU
5	DLCW05	Approved on 10 January 2018 by PMU

## **2. Environmental Monitoring Implementation Results**

### **2.1 Status of EMP implementation (mitigation measures)**

33. PMU assigned a technician ( Mr Nguyen Dinh Viet) and construction supervision consultants to check site regularly. An EMC (Ms Vu Hoang Hoa) under Eptisa checked the construction sites every 3-month. The EMC with construction supervision consultants in charge of monitoring of environmental safeguard policy implementation of all construction contractors. Every three months, sample monitoring unit is rent to take site monitoring samples. Monthly, PMU, construction contractors and Eptisa Supervision Consultant organized meetings to discuss about environmental and safety issues needing to be resolved (if having).

34. During construction, contractors are requested to implement all requirements of updated environment management plan that mentioned in bidding documents, contractor's environment management plans (CEMP). By supervision results, contractors are followed environment hygiene assurance, labor safety or changed after reminding. Summary of supervision results of environment safety policy compliance activities, implementation of mitigation measurements in initial environmental examination/updated EMP will be shown in table 6.

**Table 6: Compliance with EMP Requirements**

EMAP requirements	Compliance status (Yes, No, Partly)	Remark – reason of non-compliance	Further action
<i>Construction Phase of DLCW05</i>			
Worker camp operation	Yes  - Hire adequate housing and waste disposal facilities including pit latrines and garbage bins, adequate drainage.  - solid waste collection by commune's garbage collection groups (in the 3 districts and by BMT Urenco of BMT PC) and maintains a clean worker camps  - Workers have been registered with local authorities  - AIDS education to workers.	N/a	N/a
Training & capacity	Yes  - EMC under Eptisa implemented training and building capacity directly for DAKWACO / PMU (Environmental staff), CSC and contractors at the sites within Quarter 03 2018	N/a	N/a
Contractor's information disclosure	Yes  - Monthly/regular inform to local commune authority the project's implementation date.  - Construction contractors have put the starting and ending date and hotline phone number on the instruction board at project site	N/a	N/a



<b>EMAP requirements</b>	<b>Compliance status (Yes, No, Partly)</b>	<b>Remark – reason of non-compliance</b>	<b>Further action</b>
Tree and vegetation removal, and site restoration sub-plan	<p>Yes</p> <ul style="list-style-type: none"> <li>- Agreement with local farm company on how to minimize damage to trees and vegetation.</li> <li>- Restrict tree and vegetation removal to within designated RoWs.</li> <li>- Install protective physical barriers around trees that do not need to be removed.</li> <li>- All RoWs to be re-vegetated and landscaped after construction completed.</li> </ul>	N/a	N/a
Civil works	<p>Yes</p> <ul style="list-style-type: none"> <li>- All construction sites are located away plantation, &amp; agricultural areas as much as possible.</li> <li>- No unnecessary cutting of trees.</li> <li>- All construction fluids such as oils, and fuels stored and handled well away plantation areas.</li> <li>- No waste of any kind is to be discarded on land or in plantations.</li> <li>- Package DLCW02: Land compensation at the pile 225 was delayed, construction of pipeline was slow</li> </ul>	N/a	N/a
Civil works for intakes	<p>Yes</p> <ul style="list-style-type: none"> <li>- Iron sheet fencing, silt curtains is placed between all earthworks and surface waters in Srepok river. The protective berm was done for All existing irrigation canals.</li> <li>- Erosion channels is built around aggregate stockpile areas to contain rain-induced erosion.</li> <li>- Earthworks conducted during dry periods.</li> <li>- All construction fluids such as oils,</li> </ul>	N/a	N/a

<b>EMAP requirements</b>	<b>Compliance status (Yes, No, Partly)</b>	<b>Remark – reason of non-compliance</b>	<b>Further action</b>
	<p>and fuels are stored and handled well away from surface waters.</p> <p>- No waste of any kind is to be thrown in surface waters. No washing or repair of machinery near surface waters.</p> <p>- Pit latrines to be located well away from all surface waters.</p>		
Cultural chance finds	<p>Yes</p> <p>- All civil works located away from all cultural property and values including cemeteries and pagodas.</p> <p>- No report of finds of valued relics and cultural values during construction</p>	N/a	N/a
Construction materials acquisition, transport, and storage sub-plan	<p>Yes</p> <p>-No accident and grievance that related to temporal material storage action; slow period in transportation period due to action of temporal material storage areas from local residents; all company/organization.</p> <p>- No complain related to the pollution issues, injury, increased traffic, disrupted access during construction</p>	N/a	N/a
Excavation spoil management sub-plan	<p>Yes</p> <p>- Almost of excavated soil is reused to backfill construction land.</p> <p>- The excess excavated soil has been used for leveling or transported to landfill as the contractors has signed the contract with the service unit for collection, transport, and treatment of excess soil.</p>	N/a	N/a
Construction Drainage sub-plan	<p>Yes</p> <p>- Have adequate short-term drainage to prevent ponding and flooding on construction sites.</p>	N/a	N/a

EMAP requirements	Compliance status (Yes, No, Partly)	Remark – reason of non-compliance	Further action
Solid and liquid construction waste sub-plan	<p>Yes</p> <ul style="list-style-type: none"> <li>- Construction contractors have signed contracts with service units of Buon Me Thuot city and districts to collect, transport and transport solid waste and hazardous waste out of the site in accordance with Government regulations.</li> <li>- All waste created from construction activities and worker force is covered, daily/3 time a week collected, transport, recycling, and disposal by Buon Me Thuot URENCO or commune group as contractors have contracted with commune on waste collection;</li> <li>- Construction sites have large garbage bins ensures construction sites are as clean as possible...</li> <li>- Hazardous waste such as used oils, gasoline, paint, stored above ground in closed, well labeled in good condition well away from construction activity areas, all surface water, water supplies, and sensitive receptors.</li> </ul>	N/a	N/a
Noise and dust	<p>Yes</p> <ul style="list-style-type: none"> <li>- Regularly apply wetting agents to exposed soil and construction roads especially in high density areas.</li> <li>- Cover or keep moist all stockpiles of construction aggregates, and all truckloads of aggregates</li> <li>- Minimize time that excavations and exposed soil are left open/exposed.</li> <li>- Maintain registries equipment in proper working order or turned off when not in use.</li> </ul>	N/a	N/a
Utility and power disruption sub-plan	<p>Yes</p> <ul style="list-style-type: none"> <li>- No loss or disruption of utilities and services such as water supply and electricity during construction</li> </ul>	N/a	N/a

<b>EMAP requirements</b>	<b>Compliance status (Yes, No, Partly)</b>	<b>Remark – reason of non-compliance</b>	<b>Further action</b>
Erosion sub-plan	Yes - No land erosion	N/a	N/a
Worker and public safety sub-plan	Partially - Fencing, protective barriers, speed limit sign provided around all construction sites or on all roads used by construction vehicles. - Standing water suitable for disease vector breeding is filled in. - Arrange at least 02 officers (flags) at each affected road end, from eight o'clock to five o'clock in the afternoon and during overtime with flags and signs. - Access locks are provided with alternative safety access ways. - Do not have to pause work due to a work-related accident; - There are no complaints from local people regarding the construction workers' actions.	Raw water pumping stations in Krong Nang District was not locked. Unauthorized people could access inside the pumping room causing risks of safety to people and system operation. No security guards were found in the treatment stations in Krong Nang, Ea Kar and Buon Don Districts	The contractor of DLCW05 should implement the following corrective actions: - Provide adequately personnel to protect the pumping and treatment stations Deadline: in Jan 2021 The PMU/CSC is responsible for supervising the implementation of these corrective actions
Construction and local vehicle traffic sub-plan	Yes - No traffic accidents or complaints from neighboring communities related to construction activities; - There are signs boards of construction works and limit speed on the construction site - Construction activities did not cause traffic congestion ..	N/a	N/a
Environmental monitoring <i>Sampling to observe environmental parameters 3 months / time</i>	Yes - Supervision contractors under Eptisa followed report writing guideline, but the on-site information must update. Monitoring noise and air quality at construction sites of water treatment plant and booster pumping station for Buon Ma Thuot city, water treatment of Ea Kar, Krong Ana and Buon Don	N/a	N/a

EMAP requirements	Compliance status (Yes, No, Partly)	Remark – reason of non-compliance	Further action
<i>in construction period</i>	districts, along water transmission pipelines sites in Buon Me Thuot city.		

## 2.2 Issue for further action

**Table 7: Issues for Further Action**

Issue	Required Action	Responsibility and Timing (implementation/supervision)	Resolution
<b>Old Issues from Previous Reports</b>			
Inadequate PPE during working	Provide adequate PPE (helmet, shoes, gloves) to the workers and request them to use the PPE while working.  - Build a strong 1.5m high fence surrounding every site above 3 m to prevent the accidents from working at height	Done, Construction activities have been completed	
Delay in submission of SEMRs to ADB	CSC should mobilize the environmental specialist to prepare and submit the SEMRs in time	Not done yet Implementation: The CSC Supervision: the PMU Deadline: June 2020	The PMU should send official letters requesting the CSC mobilizing environmental specialist to complete the pending SEMRs
<b>New Issues from This Report</b>			
Inadequate personnel for security matter	Provide adequately personnel to protect the pumping and treatment stations	Implementation: The contractor of DLCW05 Supervision: the CSC/PMU Deadline: Jan 2021	
Delay in submission of SEMRs to ADB	The PMU should send official letters requesting the CSC mobilizing environmental specialist to complete the pending SEMRs	Implementation: The CSC Supervision: the PMU Deadline: Jan 2021	

	CSC should mobilize the environmental specialist to prepare and submit the SEMRs in time		
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### 3. Health and Safety

**Table 8: Health and Safety Issues**

Issue	Required Action	Responsibility and Timing	Resolution
<b>Old Issues from Previous Reports</b>			
Inadequate PPE during working	Provide adequate PPE (helmet, shoes, gloves) to the workers and request them to use the PPE while working.	Done, Construction activities have been completed	
<b>New Issued from this report</b>			
Inadequate personnel for security matter	Provide adequately personnel to protect the pumping and treatment stations	Implementation: The contractor of DLCW05 Supervision: the CSC/PMU Deadline: Jan 2021	

### 4. Environment Effects Monitoring

35. From the official commencement date of project, based on actual construction progress, Eptisa rent Dak Lak environment monitoring center (Villas 667) to implement periodical environment monitoring at the places with construction activities of DLCW05. Environment analysis sample were taken in July 2020. Detailed environmental monitoring locations and monitoring results can be seen in the tables 9, 10, 11, 12 as below.

36. Environment monitoring samples, locations were selected on actual construction activities and project's uEMP. The detail of environment monitoring sample taking positions of all packages will be shown in table 9.

37. All monitoring parameter are selected on initial environment examination (IEE) report's requirements, updated environment management plan (uEMP) and actual construction activities.

**Table 9: Environment sampling program in July 2020.**

N o.	Pack age	Sam ple	Sample position	Address	Coordinate X, Y	Weather	Time
1	DLC W05	KK1	Pipeline in Ea Kar District	Ea Kar town, Ea Kar District	X=0443807 Y=1387983	Sunny	1/7/2020
3	DLC W05	KK2	Clean water treatment plan in Ea Kar	Cur Cuc Hill, Ea Kar District	X=0493877 Y=1416341	Sunny	1/7/2020

**38. Evaluation of environment quality results (see the details in appendix B) in the second six months of 2020**

- Because of construction in daytime, observation results are compared with noise standards of normal place in daytime. The results show that measured noise level around construction areas is not higher than the permitted limit regulated in QCVN 26:2010/BTNMT on national technical regulation on noise.
- Similarly, vibration level of excavators, rollers in construction areas (against QCVN 27:2010/BTNMT - on national technical regulation on vibration) and other related data of emission concentration like NO<sub>2</sub>, SO<sub>2</sub>, CO is lower than permitted level of pollution concentration that measured average in one hour, regulated in QCVN 05:2013/BTNMT - on national technical regulation on surrounding air quality.
- Thus, the environmental quality monitoring results in the first semi-annual year of 2020 show that the project construction activities have not affected environment surrounding project areas.

## 5. Information Disclosure, Community Consultancy and grievance redress

### 5.1 Public consultation

39. All community consultancy and project information disclosure presented to authority and locals in project areas by the PMU and construction contractor regularly. Detail of community and information disclosure is implemented by the PMU as below:

- During the second semi-annual of project implementation in 2020, the PMU hosted monthly project meetings with multi-sector supervision team. The supervision team includes representatives of the PMU, Eptisa consultants and contractor to host meetings with purposes to summary announcement of results and construction progress; resolve all arising matters (if having) with locals and local authority in project areas
- o Construction work execution plan and some mitigation measures to minimize impacts during construction phase which need to focus on during this period.
- o Construction contractors, Engineering contractors explain about pending problems related to construction implementation; answer all questions of PMU, local representatives lived nearly project areas (water supply plants and raw/clean water pipeline)
- o Discuss activities to improve pending problems in the first six months of 2020 and implement effectively corrective actions
- Visit site of construction areas
- o In 01 & 02 of July 2020, EMC under CSC (Eptisa) surveyed actual construction at the site and discussion with locals in project areas to record and answers all responses to be better in project implementation.

40. No information or document in term of environment safeguard was disclosed during the reporting period. Summary of activities for information disclosure, community consultancy that undertook by representatives of Dak Lak PMU and contractors will be presented in Table 13

**Table 13: Summary of activities for information disclosure, community consultancy and all relevant parties to the Project.**

No	Activity	Responsible party	Time
1	Project meetings with relevant parties (Combination with environmental safety policy).	PMU, contractors, CSC, representatives of local authorities.	Monthly and when requested by PMU or local authorities (detail will be shown in consultant report by Eptisa)



2	Meeting with local people living nearby/within the project areas	PMU environmental officers and EMC under Eptisa	01 & 02 of July 2020
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Result summary of community consultancy will be shown in Table 14

**Table 14: Result summary of community consultancy**

Issues	Compliance status (Yes/No/Partly)	Comment or reason of non-compliance	Issues for further action
July 2020			
Package DLCW01:	No construction activities	N/a	N/a
Package DLCW02:	No construction activities	N/a	N/a
Package DLCW-03:	No construction activities	N/a	N/a
Package DLCW-04:	No construction activities	N/a	N/a
Package DLCW05: No Complaint from local residents.	-Yes, good contact with locals, all issues have been solved immediately -Local residents want PMU to expand clean water distribution network	N/a	N/a

## 5.2 Grievance Redress mechanism

- Project information as well as contact numbers is posted publicly with local authorities and in consultancy meetings so that people can respond and complain if necessary.
- In the second semi-annual of 2020, no complaints significantly on the Environmental safeguard or Occupational Safety was recorded.

**Table 15: Summary of Grievance Redress**

Type of Grievance	Details (Date, person, address, contact details, etc.)	Required Responsibility and Timing	Action, and Resolution
<b>Old Issues from Previous Reports</b>			
No			
<b>New Issues from This Report</b>			
No			

## 6. Conclusion

41. The DAKWACO/PMU, Eptisa Consultant and construction contractors during the reporting report, in general, follow ADB safeguard policies and commitments in environment management plans/contractors' environment management plans of the uEMP as well as the Government regulations. However, there are some issues needing to be addressed in the coming months as follows:

- Inadequate personnel to protect the works already completed construction.
- Delay in the preparation and submission of SEMRs to ADB

42. The responsibilities and timeframe of implementing and supervising the implementation of the corrective actions to address the issues mentioned above are presented in Table 7.

### A. Lesson learned from EMP implementation and monitoring

43. The lessons learned are likely to come from the differences between ADB's projects and government projects such as corporation of EMP into construction and monitoring contracture arrangements; focal staffs in charge of environmental issues in the PMU, CSC and Contractors, such as:

- Clear assignment of the roles and responsibilities of stakeholders in the EMP implementation and monitoring is an important factor in compliance with EMP implementation.
- For the contractor: the arrangement of full-time personnel in charge of safety, environment and funding for EMP implementation will help in implementing the EMP well.
- PMU's experience and capacity is also a prerequisite for effective implementation of this project EMP implementation.

### B. Conclusion and recommendation.

44. Overall, PMU has complied with the requirements for social and environmental safeguard according to ADB's policy and GovV's requirements, including: (i) All quarterly reports including implementation of the Environmental Management Plan were submitted to ADB; (iii) PMU assigned environmental staff; integrated environmental requirement in bidding document and contract with contractor; (iii) approved CEMP of contractors; (iv) monitored EMP implementation; (v) GRM of the project was disseminated in communes, districts in project area; (vii) PMU periodically or irregularly supervises the contractor's activities on the construction, etc.

45. The CSC has completed the environmental management and monitoring roles with no serious complaints related to environmental issues. The CSCs had been (i) regularly monitoring the EMP implementation of contractors according to HSE checklists; (ii) usually visited construction sites, in case an environmental or safety issues were detected; (iii) recorded and required corrective action; and (iv) submitted monthly report on environmental monitoring for each package to PMU.

46. The contractors have implemented the environmental protection measures complied with EMP requirement. The construction activities have not affected traffic in the project area.

The noise and dust levels have been lower than those levels in the Viet Nam standards. The construction equipment and vehicles are full of operating licenses and have emission level that is within the allowable limit. There is no grievance from local people about social and environmental issues and resettlement.

47. Public consultation was also carried out throughout the construction period with main subjects as follows: Local people wish that the project will be completed as soon as possible to the households can use the clean water for daily life. Majority of the contractors have shown that implementation of the contractors' mitigation measures has been quite good. The PMU, CSCs was requested the Contractors to solve these issues timely and reasonable during the construction phase. There is no pending issue.

48. All construction activities of all packages haven't cause impact/effects on around environment. All contractors implemented labor safety and environment hygiene in compliance with project requirements that mentioned in uEMP/CEMP and correct noncompliance issues after reminding in the first stage of project implementation.

49. There was no grievance from community.

**Appendix A:** *Detail of packages' divisions:*

➤ **Package DLCW-01**

- Intake structure construction: offshore manmade lagoon water intake type, masonry structure, water intake estimated for 02 phases 70,000 m<sup>3</sup>/day, length of water intake lagoon is 127.22, width is 4.36m.
- Raw pumping station construction: designed capacity for the first phase is 35,000 m<sup>3</sup>/day, second phase is 70,000 m<sup>3</sup>/day;
- Pumping station type: half on land haft submerge structure, submerged part is RC, on land part which is bricked with RC heat-insulation tile roof, contains 05 pumping unit separators of each one sized 4.65x2.1m. In the phase 01 there are 03 submerged pumping units Q=730 m<sup>3</sup>/h, H=70m.
- Raw water pipeline dimension is DN700-DI, total pipe length 6.222 km. Material is ductile iron pipe and fitting products.

➤ **Package DLCW02:**

Construct the phase I WTP with capacity of 35,000 m<sup>3</sup>/day including major items:

- WTP system, administration house, chemical house, pumping station:
- Reservoir 3,300 m<sup>3</sup>: built by RC, haft emerged haft submerged with dimension is 30x30m, submerged part height is 2.05m, emerged part height is 2.2m divided into 02 compartments which is 750m<sup>3</sup> per each one, treated water compartment volume is 2,550m<sup>3</sup>.
- Backwash washing water tank: by RC, dimension 15.85x16.6m, high 3.7m; separated into 02 compartments with 02 submerged pumping units Q=50m<sup>3</sup>/h, H=15m placed inside.
- Sludge drying bed: masonry, 02 separated tanks; dimension per each tank is 38.6x14.6m, high 2.8m.
- Garage: steel frame, iron roof, area 14.4x4.6m.
- Transformer unit capacity 500 KVA, placed on RC foundation dimension 4.5x3.1m.
- Fence - guard booth: Major gate is 8.42m, sub-gate is 2.1m, fence length is 576,6m; guard booth built by brick and RC, heating insulation iron tile size 3.3x3.3m.
- Material of the treated water pipeline to the booster:
- Ductile iron pipe DN700 PN16 (connecting Tee) long L= 8,798 m.
- Ductile iron pipe DN700 PN16 (connecting Tee) long L= 3.163 m.
- Steel pipe DN700 wall thickness 10mm long L=239m.

➤ **Package DLCW03:**

Building the booster pumping station with details as below:

- Reservoir 4,500 m<sup>3</sup>;
- Booster pumping station combined chemical house capacity 25,000 m<sup>3</sup>.
- Substation capacity 1,000 KVA, backup generator capacity 1,256 KVA;
- Fence, guard booth.
- Treated water pipeline to distribution net.
- Ductile iron pipe DN700 PN16 (connecting K) long L= 5.230 m.

- Ductile iron pipe DN700 PN16 (connecting Tee) long = 2.005 m.
- Ductile iron pipe DN450 PN16 (connecting Tee) long L= 563 m.
- Steel pipes DN600 wall thickness 8mm, long L=69m.
- HDPE pipe DN280 PN12, 5 L=27m long

➤ **Package DLCW04**

Supply and install treated water transmission and distribution HDPE pipeline 61,527m long totally, divided into 07 lines as below:

- Line 01: Provincial road (PR) No. 02 (node 130-Q2 to node 51, node 01 to node 120), DN110-HDPE pipeline length is 5,920m and DN140-HDPE pipeline is 22m, pressure capacity is minimum PN 10.
- Line 02: PR2 (node 203-Q2 to node 136); National Road (NR)14 (node 136 to node 277); Road to Dray H'Ling Hydropower Station (from node 277 to node 366); path 545 (node 136 to node 530) Pipe dimensions are DN225-HDPE long 4,411m; DN160- HDPE long 847m; DN140-HDPE long 2,588m and DN110-HDPE long 39m. Minimum pressure capacity is PN10.
- Line 03: Roads of Buon M'rê-Buon Niêng (node 225 to node 453); Phan Huy Chu Street (node 453 to node 489) pipe dimension is DN110-HDPE long 2,638m and DN140-HDPE long: 2,320m. Minimum pressure capacity is PN10.
- Line 04: Phan Huy Chu Street (node 34-Q3 to node 621); Roads of Buon M're-Buôn Nieng (node 621 to node 690); inter-commune roads of Hoa Xuan and Hoa Phu (node 690 to node 790 and node 790 to node 800) pipe dimension is DN110-HDPE long 5,437m Minimum pressure capacity PN10; DN140-HDPE long 7,591m and DN355-HDPE long 2,070m Minimum pressure capacity PN16.
- Line 05: Inter-blocks' road (node 535 to node 861, node 861 to node 893 and node 861 to node 913) pipe dimension is DN110-HDPE long 3,507m Minimum pressure capacity PN10 and DN140-HDPE long 3,024m Minimum pressure capacity is PN10.
- Line 06: inter-commune roads of Hoa Khanh and Ea Kao (node 154-Q2 to node 1128) pipe dimension is DN140-HDPE. Total line length is 3,615m. Minimum pressure capacity PN10.
- Line 07: Y Wang Street (node 15-Q3 to node 1269); path 03- Vo Van Kiet Street (node 233-Q2 to node 1241) pipe dimensions are DN110-HDPE long 1,175m. Minimum pressure capacity PN10; DN140-HDPE long 4,302m, Minimum pressure capacity is PN10; DN160-HDPE long 5,127m. Minimum pressure capacity is PN16; DN225-HDPE long 1.316m. Minimum pressure capacity is PN16.

➤ **Package DLCW05:**

*Building water supply system to Ea Kar town capacity 2,500m<sup>3</sup>/day including major structures:*

- Raw water intake structure is offshored 98,5m, pier leading to pumping station is concreted, wide 1,6m, area size is 3.5x3.5m, 02 submerged pumping units  $Q=105\text{m}^3/\text{h}$ ,  $H=55\text{m}$ . Raw water pipeline DN225-HDPE long 3,012m with pressure capacity PN16.
- Treatment system: RC vertical sludge drying includes 04 tanks with per each capacity is 4.8x4.8m and 7.6m high. One RC rapid sand filter compartment includes 04 tanks with per each capacity is 2.4x2.375m and 5.0m high.
- Reservoir  $580\text{ m}^3$ : RC, half emerge half submerge, area 13.2x13.2m, merged part is 1.35m high, emerged part is 2.1m high divided into 02 compartments: washed water compartment capacity  $75\text{m}^3$  and treated water compartment capacity  $505\text{ m}^3$ .
- 02 level pumping station and backwashing structures: bricked, RC frame, half emerged half submerged structures dimension is 4.2x9.9m. Emerged part is 4.2x16.5m, contained 02 horizontal axis centrifugal pumping units  $Q=75\text{m}^3/\text{h}$ ,  $H=35\text{m}$ . 01 pumping unit  $Q=107\text{ m}^3/\text{h}$ ,  $H=15\text{m}$ ; 01 ventilation  $Q=4,5\text{m}^3/\text{h}$ ,  $H=5\text{m}$ ; 01 dewatering pump  $Q=2\text{m}^3/\text{h}$ ,  $H=10\text{m}$  for leaking water.
- Chemical house chlorine: 01 story, bricked, RC frame with heating insulation iron tile, area 4.2x16.5m; Space of Chlorine container 4.2x3.3m includes 05 chlorine tanks 50kg, 02 controllers of vacuum, 01 automatic transform device, 02 clorators, 02 ejectors 0-1 kg/g; Chemical house area is 4.4x13.2m, contained the equipment: 02 alum stirring machines 0.55kw-100v/p, 02 determiners 100l/h-40m, 02 soda stirring machines 0.55kW-100 v/p, 02 determined pumpers 50l/h-40m.
- Sludge drying bed: masonry, 02 containers, each one is 14.55x8.0m, 2.6m high
- Administration house: 02 stories, bricked, reinforced frame with heating insulation tile, area 12.9x11.7m.
- Guard booth and fence: guard booth is bricked, reinforced roof with insulation tile 3.3x3.3m
- Technical pipeline
- Electrical station: substation 250kV.
- Treated water pipeline dimension is from DN90-HDPE to DN280-HDPE, total length is 12.939km. Pipeline design.

*Building water supply system capacity is  $1,600\text{m}^3/\text{day}$  in Krong Nang town including major items:*

- Electrodynamics system;
- Lighting system;
- Treated water distribution pipelines.



*Build water supply system  $1,000\text{m}^3/\text{day}$  in Buon Don District with major items as below:*

- Building WTP including major structures: raw water intake, pumping stations, combination of treatment system, second level pumping station, treated water reservoir, chemical house, sludge container, administration house, garage, guard booth, store.

- Electrodynamics system;
- Lighting system;
- Treated water distribution pipeline



**Appendix B: Sampling results in July 2020**

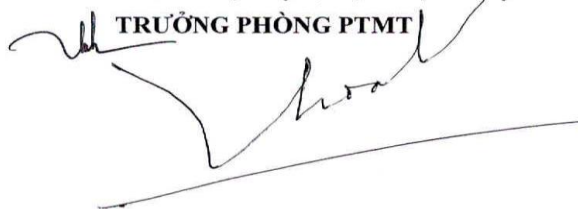
SỞ TÀI NGUYÊN VÀ MÔI TRƯỜNG TỈNH ĐẮK LẮK <b>TRUNG TÂM QUAN TRẮC TÀI NGUYÊN VÀ MÔI TRƯỜNG</b> Địa chỉ: 38 Nguyễn Chí Thanh, Tp. Buôn Ma Thuột, tỉnh Đắk Lắk. Điện thoại: 0262.3815 137 Email: qtmtdaklak@gmail.com		  <b>VILAS 667</b>
Số: 239A/TTQT	<b>PHIẾU KẾT QUẢ THỬ NGHIỆM</b>	Ngày: 10/7/2020

- Tên Khách hàng:** Công ty Eptisa Servicios de Ingenieria S.L
- Địa chỉ:** 339 Tôn Đức Thắng, P. Tân An, Tp. Buôn Ma Thuột, tỉnh Đắk Lắk
- Loại mẫu:** Không khí
- Số lượng:** 03 mẫu
- Tình trạng mẫu:** Mẫu do phòng Quan trắc môi trường đo đạc và thu mẫu tại trạm Ea Kar
- Ngày nhận mẫu:** 01/7/2020

TT	Thông số	Đơn vị	Kết quả		Phương pháp
			KK1	KK2	
1	Nhiệt độ	t°	30,2	29,3	QCVN 46:2012/BTNMT
2	Tốc độ gió	m/s	0,6 – 1,3	0,7 – 1,6	
3	Tiếng ồn – Leq	dBA	65,4	66,0	TCVN 7878-2:2010
4	Gia tốc rung	m/s <sup>2</sup>	0,02	0,02	TCVN 6963:2001
5	Bụi	mg/m <sup>3</sup>	0,06	0,09	TCVN 5067:1995
6	NO <sub>2</sub>	mg/m <sup>3</sup>	0,067	0,083	TCVN 6137:2009
7	SO <sub>2</sub>	mg/m <sup>3</sup>	0,078	0,091	TCVN 5971:1995
8	CO	mg/m <sup>3</sup>	< 3,5	< 3,5	HD.04.04/TTQTĐL

**Ghi chú:**

- Toàn bộ các thông số quan trắc môi trường được Bộ Tài nguyên và Môi trường cấp Giấy chứng nhận đủ điều kiện hoạt động dịch vụ quan trắc môi trường, mã số Vmcerts 046;
- (★) Thông số thử nghiệm được công nhận VILAS, mã số 667;
- (<): Kết quả nhỏ hơn giới hạn định lượng của phương pháp thử.
- + **KK1:** Mẫu được lấy tại vị trí trạm bơm nước thô Ea Kar;
- + **KK2:** Mẫu được lấy tại vị trí trạm xử lý Ea Kar.

  
**TRƯỞNG PHÒNG PTMT**  
**Dương Đăng Khoa**

**KT. GIÁM ĐỐC**  
**PHÓ GIÁM ĐỐC**  
  
**Bùi Minh Hoàng**

1. Kết quả thử nghiệm chỉ có giá trị trên mẫu thử hoặc tại thời điểm đo đạc lấy mẫu.  
 2. Thông tin về mẫu được ghi theo yêu cầu của khách hàng.  
 3. Thời gian lưu mẫu: 05 ngày kể từ ngày trả kết quả (ngoại trừ mẫu không khí).  
 4. Kết quả này không được trích sao một phần hay toàn bộ, nếu không được sự đồng ý của Trung tâm Quan trắc Tài nguyên và Môi trường Đắk Lắk.  
 BM.05/QT.06/TTQTĐL \* 20/8/2019 NLP 03 Trang 1/1