Initial Environmental Examination

Stage of the document: Final
Project number: 49026-003
June 2017

VIE: Basic Infrastructure for Inclusive Growth in Nghe An, Ha Tinh, Quang Binh and Quang Tri Provinces Sector Project-Water Supply System for 7 Communes in Loc Ha District and 2 Communes in Can Loc District, Ha Tinh Province

Prepared by Planning and Investment Department of Ha Tinh province for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of 12 June 2017)

Currency unit	–	Viet Nam Dong (D)
D1.00	=	$0.000044
$1.00	=	Đ 22,680

ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
CEMP	Contractor's Environmental Management Plan
CPC	Commune People's Committee
CSC	Construction Supervision Consultant
DARD	Department of Agriculture and Rural Development
DONRE	Department of Natural Resources and Environment
DPC	District People's Committee
DPI	Department of Planning and Investment
ECT	Emergency Control Team
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
EPP	Environmental Protection Plan
ESO	Environmental Safeguards Staff
ESP	Environmental Safeguard Specialist
HWMC	Ha Tinh Water Supply Management Company
IEE	Initial Environmental Examination
LEP	Law on Environmental Protection
lpd	Liters / person / day
MPI	Ministry of Planning and Investment
MPN	Most Probable Number of viable cells of a pathogen - a measure of water quality
ODA	Overseas Development Assistance
PPC	Provincial People's Committee
PPE	Personal Protective Equipment
PMU	Project Management Unit
PPTA	Project Preparatory Technical Assistant
ROW	Right of Way
SPS	Safeguard Policy Statement
The PPTA	The Project Preparatory Technical Assistant Consultants

The Project	Basic Infrastructure for Inclusive Growth in Nghe An, Ha Tinh, Quang Binh and Quang Tri Provinces Sector Project
The Subproject	Water Supply System for 7 Communes in Loc Ha District and 2 Communes in Can Loc District, Ha Tinh Province
UXO	Unexploded ordnance
WTP	Water Treatment Plant

WEIGHTS AND MEASURES

Km^2 (square kilometer)	–	unit of length
m^3 (cubic meter)	–	A measure of volume

Note:

(i) In this report, "$" refers to US dollars.

The initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

I. EXECUTIVE SUMMARY

1. The proposed Basic Infrastructure for Inclusive Growth in Nghe An, Ha Tinh, Quang Binh and Quang Tri Provinces Sector Project (BIIG 2) will invest in implementation of the north central coastal provinces sub-region socio-economic development plan. The Project responds to the Government of Vietnam's strategy of targeting the use of concessional ODA investment into poorer provinces using economic sub-regions as a means of identifying interconnectivity and synergies between provinces to accelerate economic growth in provinces that have previously lagged in terms of economic growth.

2. The expected impact will be achieved by accelerating the socio-economic development of the four North Central Provinces in accordance with the Provincial Socio-Economic Development Plans. The expected outcome will be enhanced opportunities for increased inclusive economic growth.

3. The project has three outputs being (i) Improved connectivity within value chains and their supporting infrastructure, (ii) Improved business development infrastructure and (iii) Strengthened Sub-regional infrastructure planning and management.

A. Subproject Summary

4. The subproject is entitled "Water Supply System for 7 Communes in Loc Ha District and 2 Communes in Can Loc District, Ha Tinh Province" and is a representative subproject of Ha Tinh province. The subproject will develop two water supply networks in Loc Ha and Can Loc Districts of North-east Ha Tinh province. The “southern network” will connect from the end of the existing Ha Tinh City water supply scheme and deliver an estimated 2,500m^3/day to a total of 4,587 households in three communes of Thach Chau, Mai Phu, Thach My, Loc Ha district by 2030. The water requirement is reported to be surplus to currently planned supply demand in Ha Tinh City[1].

5. The “northern network” will develop a water source from the Cu Lay reservoir and supply 7,100m^3 per day to a total of 10,984 households in a total of 6 communes by 2030.

6. In total 15,572 households are expected to be connected by 2030 with up to 9,500m^3/day supplied. The assets and operation of both schemes are assigned to the Ha Tinh Water Supply Joint Stock Co Ltd that currently manages nine water supply schemes[2] for the PPC.

7. The subproject scope was changed after the interim workshop on the 17th January 2017 when the PPTA was asked to include two additional communes (Thuan Thien and Tung Loc communes of Can Loc district) to the northern network requiring further engineering design inputs, field investigations and safeguard assessments.

8. Its objectives are to improve public hygiene, improve the appearance of the rural area, and to improve the health status and living conditions of people living in the commune.

[1] It is strongly suggested that ADB seek formal confirmation of this fact as if there is future demand for this water in effect the subproject network is simply moving existing benefits from one location to another and possibly bringing these further forward As such the net benefit stream quantified is significantly over represented.

[2] The Ha Tinh WS JSC manages 9 water supply schemes in semi-urban, urban, township and municipal areas across Ha Tinh province.

9. The water supply to the 9 communes will be taken from 2 sources: (i) the Cu Lay reservoir in Thuan Thien commune, Can Loc district for 4 the communes of Loc Ha district: Hong Loc, Binh Loc, Phu Luu and Ich Hau and 2 communes of Can Loc district: Thuan Thien and Tung Loc; (ii) the existing water supply system of Ha Tinh city for 3 the communes of Thach My, Thach Chau and Mai Phu. In the 6 remaining communes of Loc Ha district, 3 communes are now using tap water from a water supply system sourced from the Upper Khe Hao Reservoir. The proposed subproject, which includes a Water Treatment Plant (WTP), will be constructed and has the following design information:

Table 1 - Key Design Information for the Subproject

Key Indicators	Total	Southern network	Northern network
Number of beneficiaries provided with clean 24 hour water (2030)	60,414	16,594	43,820
Number of households served	15,572	4,587	10,984
Forecast Demand	9,600 m³/day	2,500 m³/day	7,100 m³/day
Construction works:			
			Intake on the Cu Lay reservoir
Treatment works and clean water tank at the right bank Cu Lay reservoir			4000m^3
Clean water tank and booster station at Thach Ha		1200 m^3	
Gravity water supply delivery mains	465km	162km	303km
Construction period	18 months		
Total construction cost	$7.73 million	$2.14 million	$5.59 million
Unit cost per household connection	$496	$466	$509
Management entity	Ha Tinh Water Supply Joint Stock Company		

10. The subproject, classified as Environment Category B, is judged to have limited potential adverse environmental impacts, particularly in relation to pipeline construction, water treatment plant (WTP) and access road construction. The unavoidable construction impacts are temporary and can be mitigated through suitable mitigation measures.

11. This Initial Environmental Assessment complies with the laws, decrees and circulars, the national technical standards and national technical standards of Vietnam and the Asian Development Bank (ADB) safeguard policy.

B. Environmental impacts and mitigation

12. The project has very limited impacts on the natural environment, ecological resources and cultural assets. Most of the likely impacts are common for construction activities such as dust, noise, traffic disruptions, and waste generation. These can be prevented or minimized by standard mitigation measures.

13. During operation of the WTP, it is necessary to ensure that the management of chemical treatment plant and new sludge tanks under the design meet the GOV discharge standards and water source protection management, hygiene condition of the WTP in accordance to Circular No.50/2015/TT-BYT[3].

14. The EMP for the subproject includes mitigation measures and monitoring processes to manage and assess the expected and unexpected impacts of this project. The EMP also specifies responsibilities for implementation, and capacity development and training requirements of HWMC for subproject management in the operation phase and the appointed PMU to monitor the implementation of the EMP. The implementation of the EMP will require assistance from an environmental specialist (ESP), and a construction supervision consultant (CSC).

C. Information Disclosure, Public Consultation, and Grievance Redress

15. According to Vietnamese law, for a water supply facility with a capacity less than 50,000 m^3/day (surface water source), it is not necessary to prepare an Environmental Impact Assessment Report (EIA) including public consultation but in accordance with the ADB Safeguard Policy Statement, for category B subprojects, it is necessary to conduct public consultation. As such, consultation on design and construction options of the subproject, including technology processes for the WTP, water supply alternatives, etc. is essential as a part of actual survey in project preparation. Public information and consultation activities were carried out as part of a baseline survey of local environmental conditions along the projects sites. Meeting with Loc Ha District People Committee (DPC) took place on 19 December 2016. A public meeting was held in 7 Commune People Committees (CPCs) on 19 and 20 December 2016. The consultation meeting with local authorities took place on 31 March 2017.

16. During the consultation on environmental matters, local leaders and members of some households were given an introduction to the project, anticipated environmental impacts and mitigation measurements, the project implementation schedule and relevant environmental issues. Overall, there was no opposition raised with respect to the proposed subproject except some concerns on the forest clearance at Hong Loc protection forest for the construction of the WTP (See Annex 6 for more details)

17. A three-step grievance redress mechanism will be established for the subproject, common to social as well as environmental safeguards to handle environmental impacts and land occupation. As a guideline, any complaints about any subproject's activity will be solved through negotiation to get agreement. Complaints will be submitted toward 3 levels of entities: First through CPC, then the DPC and finally through PPC. If an agreement was not reach, then they will be law court as the final method. HWMC will bear all administrative and legal cost arising in such complaint solving processes in the operation phase.

D. Institutional arrangements

18. Ha Tinh DPI will establish an Official Development Assistance (ODA) Project Management Unit (PMU) and assign relevant staff to support the preparation of the subproject in the PPTA period. One member of the PMU will be assigned as the Environmental Safeguards Officer (ESO). During implementation the Environmental specialist (ESP) for

[3] Circular No.50/2015/TT-BYT dated 11 December 2015 of the Ministry of Health, providing for the inspection of drinking water and domestic water's sanitation and quality

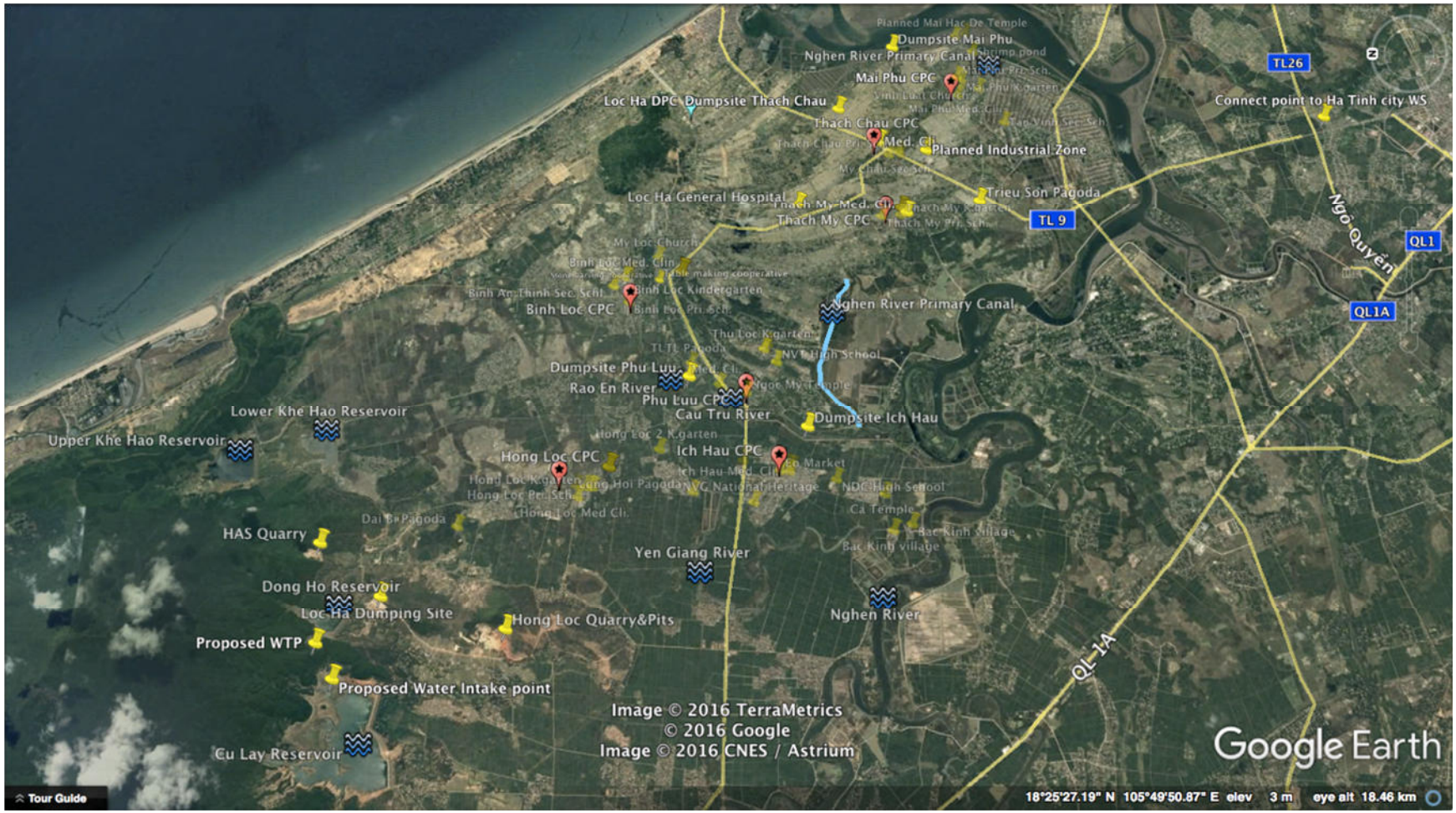
subproject implementation will organize a formal training course and on-the-job training in roles and responsibilities for EMP implementation for relevant PMU staff, Construction Supervision (CSC), communities, contractors; and support for establishment and operation of the subproject environment management system in construction phase. The ESP will also support PMU's capacity building by reviewing and evaluating the capacity for environmental protection of the PMU and HWMC – subproject management organization in the operation phase.

19. To ensure that environmental protection and mitigation measures are included in the civil works contracts, the EMP will be included in the bidding documents and civil works contracts. Any omission of environmental management costs will create high risks for implementing mitigation measures during the construction phase due to lack of resources and capacity, thus the environmental protection cost and responsibilities need to be clear from the beginning and costs of undertaking these taken into consideration in bid preparation. Bid documents will also specify that contractors shall engage capable and trained staff to take responsibility for the environmental management and safety issues at the working level and to monitor the effectiveness and review mitigation measures as the subproject proceeds.

E. Conclusion

20. The IEE concludes that the feasibility study of the subproject combined with available information is sufficient to identify the scope of potential environmental impacts and formulate mitigation measures for the subproject. Providing that significant changes to the subproject description do not occur at the detailed design phase, and that new sensitive environmental, or cultural resources are not encountered, further detailed environmental impact assessment (EIA) is not required. In case of any change in the subproject design, the ESP will update EMP before detail design finalization.

Figure 1 – General Map of Loc Ha District and Subproject Area



II. BACKGROUND

A. Objectives of the Subproject

1. The Basic Infrastructure for Inclusive Growth in Nghe An, Ha Tinh, Quang Binh and Quang Tri Provinces Sector Project

21. The subproject objectives will be achieved through construction of the water supply system, providing greater access to clean water, especially for people in the 7 subproject communes of Loc Ha district and 2 subproject communes of Can Loc district, as the area currently has inadequate clean water supplies and unsuitable groundwater is the main water supply source of local people.

22. The subproject is initially categorized as 'B' for environmental safeguards, and this IEE is required according to the ADB Safeguards Policy Statement (SPS) of 2009. The objectives and scope of this IEE are to (i) assess the existing environmental conditions in the vicinity Loc Ha district; (ii) identify potential environmental impacts from the proposed water supply system subproject; (iii) evaluate and determine the significance of the impacts; (iv) develop an environmental management plan (EMP) detailing mitigation measures, monitoring activities, reporting requirements, institutional responsibilities and cost estimates to address adverse environmental impacts; and (v) carry out public consultations to document any issues/ concerns that stakeholders may have on the subproject and to ensure that such concerns are addressed in the subproject design and mitigation measures.

III. POLICY AND LEGAL FRAMEWORK

23. The subproject shall comply with requirements of ADB SPS 2009 and the GOV's Guidelines on Implementation of the Law on Environmental Protection 2014. Decree No. 18/2015/ND-CP has detailed information on environmental protection assessment, environmental impact assessment and environmental protection plans. However certain activities commonly associated with infrastructure subprojects such as quarry operations, extraction of gravel, etc., will also require permission from the relevant provincial level authorities.

A. ASIAN DEVELOPMENT BANK SPS requirement

24. The ADB safeguard policy statement (SPS) 2009 imposes safeguard requirements for all projects. The SPS 2009 clarifies the rationale, scope and contents of the environmental assessment. It emphasizes environmental and social sustainability in progress of economic growth and poverty reduction in Asia and the Pacific, with the following aims:

- Avoid adverse impacts of projects on the environment and affected people, where possible;
- Minimize/mitigate and/or compensate for adverse impacts on environment and affected people when avoidance is not possible; and
- Help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks

25. For environmental safeguards, the subproject is initially categorized as 'B'. A subproject, which would be classified as category A on environmental safeguards would be ineligible as a BIIG 2 subproject.

B. Legal and Administrative Framework for Environmental Protection in Vietnam

26. The subproject has to comply with the environmental legal framework of Vietnam, which is outlined in this section. The main components of the framework, if not, the more applicable ones are shown here.

1. Laws

- Law No. 55/2014/QH13 of 23 June 2014 by the National Assembly on environment protection
- Law No. 17/2012/QH13 of 21 June 2012 by the National Assembly on water resources
- Law No. 20/2008/QH12 of 13 November 2008 by the National Assembly on biodiversity
- Law No. 68/2006/QH11 of 29 June 2006 by the National Assembly on standards and technical regulations

2. Decrees and Regulations

- Decree No. 18/2015/ND-CP dated February 14, 2015 on environmental protection planning, strategic environmental assessment, environmental impact assessment and environmental protection plans.
- Circular No. 27/2015/TT-BTNMT dated May 29, 2015 on strategic environmental assessment, environmental impact assessment and environmental protection plans.

- Circular No. 50/2015/TT-BYT dated 11 December 2015 of the Ministry of Health providing for the inspection of drinking water and domestic water's sanitation and quality.
- National Technical Regulations on air and noise quality
    - QCVN 05: 2013/BTNMT on ambient air quality
    - QCVN 26: 2010/BTNMT on noise
    - QCVN 27: 2010/BTNMT on vibration
- National Technical Regulations on water quality
    - QCVN 01: 2009/BYT on drinking water quality
    - QCVN 02: 2009/BYT on domestic water quality
    - QCVN 08: 2008/BTNMT on surface water quality
    - QCVN 09: 2008/BTNMT on underground water quality
    - QCVN 14: 2008/BTNMT on domestic wastewater

3. Other legislation applicable to the subproject are the following

- Law No. 50/2014/QH13 of 18 June 2014 by the National Assembly on construction
- Circular No. 22/2010/TT-BXD of 03 December 2010 by the Ministry of Construction on labor safety in work construction
- Law No. 10/2012/QH13 of 18 June 2012 by the National Assembly on labor code.
- Circular No. 24/2013/TT-BNNPTNT provisions on replacement afforestation
- Circular No. 26/2015/TT-BNNPTNT amending Circular No. 24/2013/TT-BNNPTNT forest replacement upon
- Directive 02/CT-TTg dated 24 January 2014 of the Prime Minister to take directions on reforestation replacing areas, which have been used for other purposes.
- Decision No. 17/2015/QD-TTg regulation on protection forest management

C. Requirements for Subproject Categorization and Approval

27. Subproject selection and screening ensures that only subprojects ranked as Category B or C to follow ADB SPS 2009 will be included in the list of eligible subprojects for possible funding under the proposed Project. It is anticipated that all eligible subprojects will fall into Category B, whereby some adverse environmental impacts are expected additional subprojects will be screened by carrying out initial site visits to view local conditions, identify potential negative impacts, and complete Rapid Environmental Assessment (REA) Checklists. With regard to the requirements of Decree No. 18/2015/ND-CP, an Environmental Assessment Report is required for all development projects, either an Environmental Impact Assessment Report (EIAR) or an Environmental Protection Plan (EPP). In common with projects classified as Category B under the ADB SPS, smaller projects with some but limited adverse impacts will be subject to a lesser level of assessment in the form of an EPP. EPPs are required to be submitted for appraisal at the time of Subproject Investment Report preparation.

28. An IEE/EPP needs to be prepared if a subproject is classified as environmental category B following ADB SPS 2009. The IEE needs to include an environmental management plan

(EMP). The PMU will select an appropriate national consulting firm to prepare the IEE/EPP with support from PMU/LIC environment specialist and update the representative IEE/EMP prepared by the PPTA Consultants if needed to reflect any change in the subproject detail design. The IEE/EPP should include the subproject scope, baseline information, materials to be used construction techniques, impact assessment, mitigation and environmental monitoring, and a minute of public consultation. The content and format of the IEE report should satisfy the requirements of both ADB and the Government of Viet Nam (EPP). Adequate public consultation needs to be carried out to share and get feedback on the initial findings of the IEE.

29. Review of IEE/EPPs: On completion, IEE/EPP reports will be reviewed initially by the PMU and if satisfactory, IEE/EPP reports will be forwarded to relevant PPC for approval. The environmental assessment and review procedures for IEE/EPP are as follows:

(i) PMU reviews IEE/EPP reports;
(ii) If found satisfactory, the PMU will forward to relevant PPC for approval and submit the IEE/EPP for each subproject to ADB for review, endorsement and uploading on the ADB website.

IV. PROJECT DESCRIPTION

A. The need for the subproject

30. The proposed water supply scheme is the water supply system for 7 of the 13 communes of Loc Ha district and 2 communes of Can Loc district to deliver 9,500 m^3/day to supply 15,572 households[4]. The subproject will include a new water supply system for the 4 communes of Loc Ha district: Hong Loc, Binh Loc, Phu Luu, Ich Hau and 2 communes of Can Loc district: Thuan Thien and Tung Loc and a booster station to allow the 3 communes of Loc Ha district: Thach My, Thach Chau and My Phu to connect to the distribution system of the existing water supply system of Ha Tinh city.

31. Several communes of Loc Ha and Can Loc districts are now served by separated Water Supply Networks. Tan Loc, An Loc and Thinh Loc communes, Loc Ha district are now using piped water with water source is Khe Hao Reservoir. Ho Do commune, Loc Ha district is already using water from the Ha Tinh City water supply network. All the 9 communes of the subproject are now using a combination of ground water, which has become polluted, or rain water which is inadequate for year round daily supply.

32. Investment in construction of water supply systems is now an urgent need, in order to solve the shortage of clean water for people living in the coastal area of Loc Ha district as well as local agencies, offices and schools; to ensure all-year-round water for households in 9 communes; and to improve sanitation and health.

33. On completion the system will provide water for about 60,414 local people and staff in offices, schools, and health centers, even in dry seasons. The general location of the proposed Water Treatment Plant (WTP) for 6 communes, which will be constructed in Thuan Thien commune, Can Loc district, is shown in figure 2. Water sources for the other 3 communes come from the existing water supply system of Ha Tinh city.

B. Subproject Components

1. Northern Network

34. The “northern network” sources water from Cu Lây reservoir (total reservoir capacity of 13 million cubic meters that currently supplies irrigation) to supply water to Hồng Lộc, Ích Hậu, Phù Lưu and Bình Lộc communes, Loc Ha district and Thuần Thiện and Tùng Lộc, communes in Can Loc district. The reservoir is located 4.6km from above communes at a higher elevation and will require the following components:

(i) Design capacity: 7,100 m^3/ 24 hours.

(ii) Intake gate and piping system for the pump station with a capacity of 318m^3/h, located in the left side of the dam inside the lake base

(iii) Water treatment works includes: Mixing tank, vertical sedimentation tank combined with whirling reaction prevention, filtering tank, chemical house, etc. with reinforced concrete structure.

(iv) Clean water tank: Total volume is W = 1350 m^3.

[4] The Subproject Details Outline

(v) Management area: Management and operation house, chemical house and warehouses:

(vi) Water intake system.

(vii) Build power supply and constructional road

(viii) Gravity based distribution network.

35. The Subproject will invest in a new water supply scheme to supply 7,000m^3 per day (2.55million m^3 per annum to 6 communes that do not currently have access to safe and clean water. The project will support a (i) new intake from the Cu Lay Reservoir in Can Loc District, to an adjacent water treatment plan comprising of Clarifiers (2), water storage tanks (3), operators house, backwash pumps (3), sludge tank and a 241km distribution network pipeline, and (ii) rehabilitate an existing water transfer canal from Cao Cau pump station on the Nghen River to the CU Lay Main irrigation north –south canal at a junction 7.4km from the Nghen river. A daily water demand of 7,000m^3 per day is estimated as the likely demand requirement for 2030 and has been adopted for the design standard.

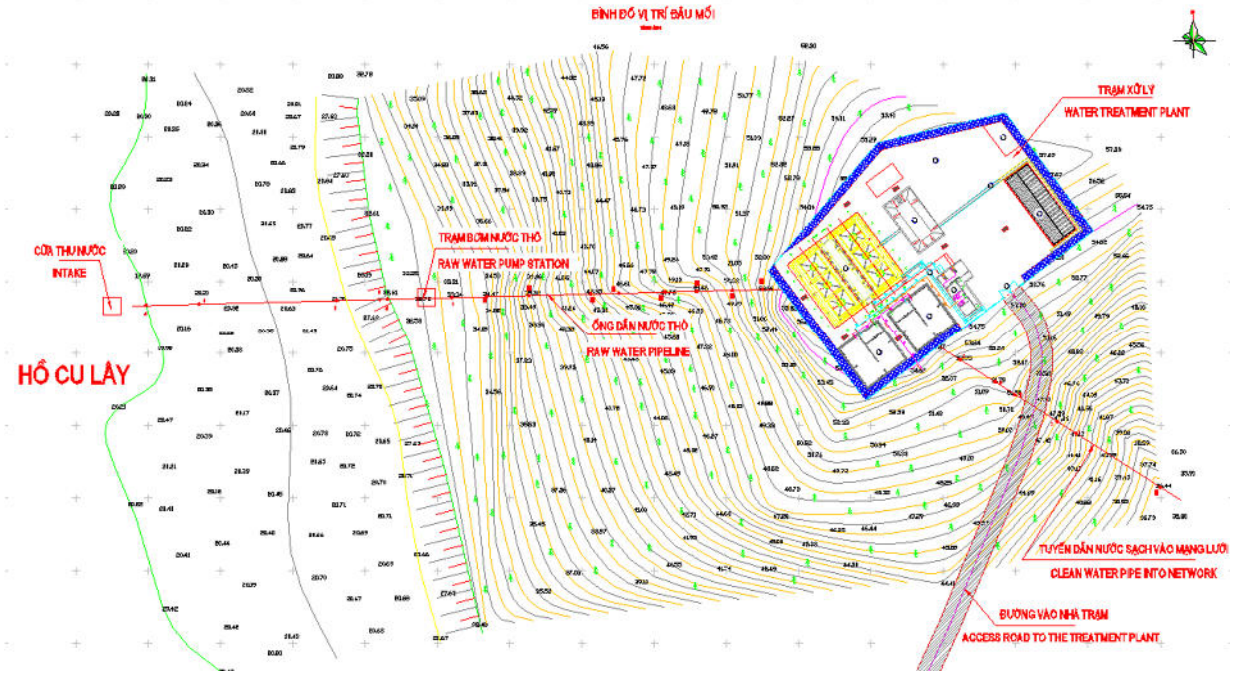
36. The water source is the Cu Lay reservoir, constructed in 1972 and located in Thuan Thien commune, Can Loc district and is used to supply irrigation water for rice, aquacultural and other crops. The reservoir serves a command area that is not clearly defined, due to differences in historical command areas and effective irrigated areas, and the fact that some of the area receives supplementary water from pumping stations along the nearby Nghen river. The irrigation system is managed by the Northern Ha Tinh Irrigation One Member Limited Liability Company.

37. Based on information provided by the Irrigation Department of Ha Tinh available water does not suffice to serve the combined demand for irrigation and the needs of the water supply projects year round, with a shortfall in July and August and the system will be dependent on water pumped from the Nghen river, via a pump station. The proposed pump station, at Cau Cao on the Nghen river, was installed during 2001 to 2002 and feeds water via a series of canals to join a canal that runs south of the Cu Lay reservoir. It has sufficient capacity to meet the extra demand for the proposed water supply. The Nghen River, as a source has a mean annual flow in excess of 33,000 m^3/hr. The river is man made with water derived from two tidal spillways on the La River, receiving inflows twice a day as tides influence water levels in the river. Further inflow is derived from the Gia, Hue and My rivers and numerous streams. The Nghen river flows within an existing stream bed with significantly increased water flows. A salinity barrier has been constructed downstream, preventing salinity intrusion due to tidal movement and lifting river levels upstream. There are however losses in the canal system, and the rehabilitation of 1.5km of canals is to be included in the scope of the subproject.

At the treatment plant, water will be drawn via a 200m long dynamic suction pipe made of steel using two horizontal centrifugal pumps to the treatment plant. The treatment plant consists of a vertical clarifier tank - using rapid filter with capacity of 7,000m^3/day, 3 clean water tanks with a capacity of 450m^3 each, a single storey operation house, a single storey management house, a sludge tank, drying bed, perimeter wall and gate. A layout of the treatment plant facility is shown in

38. Figure 2 below.

Figure 2: Layout of the treatment plant for the Northern Network

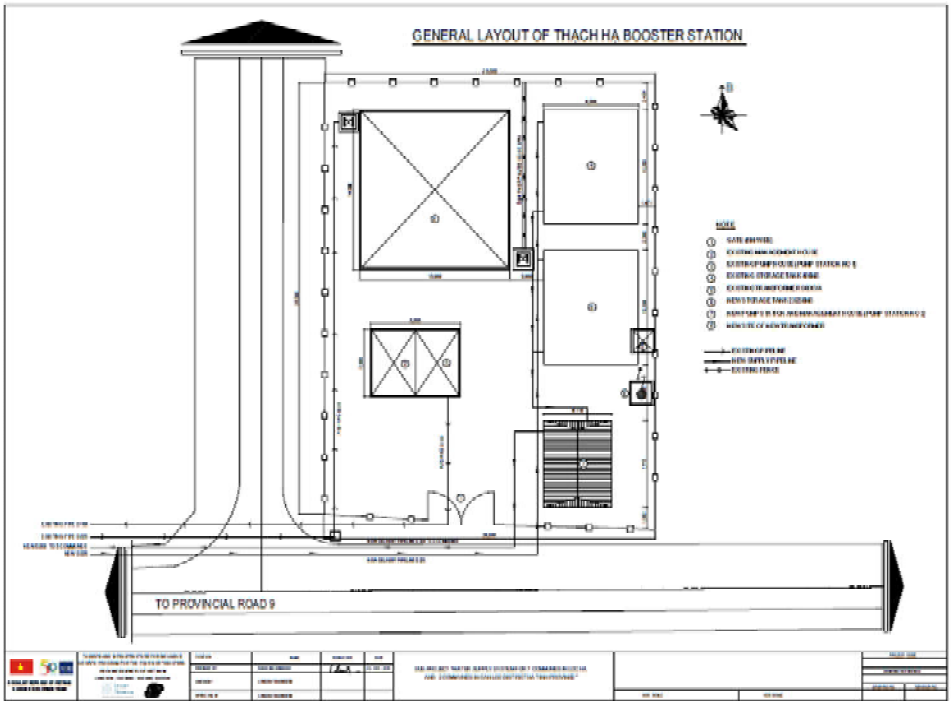


2. Southern Network

39. The Subproject will extend the Ha Tinh city water supply to the communes of Mai Phụ, Thạch Châu and Thạch Mỹ communes by installing 3 additional horizontal pumps each with a capacity of 140m^3/hr, to water storage tanks and through a treatment plant at the existing Thach Ha pumping station from where it is to be fed into a 162 km pipeline network. A daily water demand of 1,659m^3 per day is estimated and a design capacity of 2,500 m^3/day has been adopted.

40. While testing of water samples established that the quality of water in the system meets the allowed standards under QCVN 02:2009/BYT, the treatment plant will provide for additional chlorine dosing to ensure safety of the water, as chlorine levels decline along the existing network. An existing water tank and two new tanks will be connected to a new mainline loop with a flow rate of 73.4l/s. The tanks will be interconnected to enable movement of supply in response to down time or operational repairs and maintenance periods. A layout of the booster station is provided in Figure 3 below.

Figure 3: Layout of the booster station for the Southern Network



C. Cost estimate

41. A construction cost estimate has been prepared based on the feasibility study outline designs and a bill of quantities (BOQ). The unit costs are the current rates published by the province.

Table 2: Southern Network cost estimate (Đ)

Cost items	Base cost	Tax	Total (Đ)	Total ($)
Construction costs	**35,055,842,172**	**3,535,475,847**	**38,591,318,019**	**1,726,681**
Pipeline				
Pipeline	30,645,598,606	3,064,559,861	33,710,158,466	1,508,284
Household connection system	*2,690,246,727*	*298,916,303*	*2,989,163,030*	133,743
Clean water tanks n=2	1,365,538,762	136,553,876	1,502,092,638	67,208
Management house, booster station	354,458,077	35,445,808	389,903,885	17,445
Equipment costs (incl pumps)	**118,208,182**	**11,820,818**	**130,029,000**	**5,818**
Management costs	**446,147,655**	**44,614,766**	**490,762,421**	**21,958**

Construction investment consultation costs	**2,928,315,701**	**292,831,570**	**3,221,147,271**	**144,123**
Other costs	**1,289,735,174**	**124,587,313**	**1,414,322,487**	**63,281**
Cost of construction supervision	**392,555,321**	**39,255,532**	**431,810,853**	**19,320**
General costs (temporary hut for workers, etc.)	1,385,033,718	138,503,372	1,523,537,090	68,167
Cost of design verification (Circular 75/2014/TT-BTC)	35,027,797	3,502,780	38,530,577	1,724
Cost of estimate verification (Circular 75/2014/TT-BTC)	33,849,921	3,384,992	37,234,913	1,666
Cost of examination and approval of final account	43,862,041	0	43,862,041	1,963
Independent audit	61,167,674	6,116,767	67,284,441	3,010
Works insurance	105,167,527	10,516,753	115,684,279	5,176
Management and operation training cost	18,181,818	1,818,182	20,000,000	895
Peripheral electricity costs	**136,363,636**	**13,636,364**	**150,000,000**	**6,711**
Compensation cost for land clearance	**121,264,128**	**12,126,413**	**133,390,541**	**5,968**
Contingency cost	**4,048,843,197**	**404,884,320**	**4,453,727,517**	**199,272**
TOTAL	**44,537,275,166**	**4,449,341,312**	**48,986,616,478**	**2,191,795**
ROUNDING			**48,986,616,000**	**2,192,000**
Total Net of Connections				**2,058,257**

Source PPTA Consultants Note: includes general costs (temporary hut for workers, etc.), design verification, examination and approval of final account, independent audit, works insurance, training cost.

Table 3: Northern Network Cost Estimate (Đ)

Cost items	Base cost	Tax	Total	Total (US$)
Construction costs	**94,778,595,953**	**9,546,202,946**	**104,324,798,899**	**4,667,776**
Pipeline				
Pipeline	*63,070,347,236*	*6,307,034,724*	*69,377,381,959*	*3,104,133*
Household connection system	*6,150,901,604*	*683,433,512*	*6,834,335,116*	*305,787*
Clean water tank	3,653,260,582	365,326,058	4,018,586,640	179,803
Clarifying tank	10,454,302,377	1,045,430,238	11,499,732,615	514,529
Sludge tank	194,760,880	19,476,088	214,236,968	9,586
Ground levelling	457,862,695	45,786,270	503,648,965	22,535
Gate, surrounding wall	1,292,578,206	129,257,821	1,421,836,027	63,617
Internal power	348,299,980	34,829,998	383,129,978	17,142
Construction road	584,354,094	58,435,409	642,789,503	28,760
Operation house	984,236,424	98,423,642	1,082,660,066	48,441
Management house	946,498,399	94,649,840	1,041,148,239	46,584
Raw water pump station (intake tank)	1,186,648,021	118,664,802	1,305,312,823	58,403
Cau Cao pumping station canal upgrade	5,454,545,455	545,454,545	6,000,000,000	268,456
Equipment costs	**472,832,727**	**47,283,273**	**520,116,000**	**23,271**
Management costs	**1,208,169,121**	**120,816,912**	**1,328,986,033**	**59,462**
Construction investment consultation costs	**6,762,026,375**	**676,202,638**	**7,438,229,013**	**332,807**
Cost of construction supervision	**1,061,330,717**	**106,133,072**	**1,167,463,789**	**52,236**
Other costs	**4,317,820,633**	**419,904,210**	**4,737,724,843**	**211,979**
General costs (temporary hut for workers, etc.)	3,535,570,367	353,557,037	3,889,127,404	174,010
Cost of design verification (Circular 75/2014/TT-BTC)	94,702,773	9,470,277	104,173,050	4,661
Cost of estimate verification (Circular 75/2014/TT-BTC)	91,518,212	9,151,821	100,670,033	4,504
Cost of examination and approval of final account	118,778,532	0	118,778,532	5,314
Independent audit	165,642,234	16,564,223	182,206,458	8,152
Works insurance	284,335,788	28,433,579	312,769,367	13,994
Management and operation training cost	27,272,727	2,727,273	30,000,000	1,342
Peripheral electricity costs	**318,181,818**	**31,818,182**	**350,000,000**	**15,660**
Compensation cost for land clearance	**485,056,512**	**48,505,651**	**533,562,163**	**23,873**
Contingency cost	**10,940,401,386**	**1,094,040,139**	**12,034,441,524**	**538,454**
TOTAL	**120,344,415,242**	**12,022,563,671**	**132,366,978,913**	**5,922,460**
ROUNDING			**132,366,979,000**	**6,000,000**
Net of connection costs				**5,694,213**

Source PPTA Consultants Note: includes general costs (temporary hut for workers, etc.), design verification, examination and approval of final account, independent audit, works insurance, training cost.

V. DESCRIPTION OF THE ENVIRONMENT

A. NATURAL CONDITIONS

1. Topography, Geology, and Soils

42. The 9 communes that form the subproject area are located in the northeast of Ha Tinh province, about 18km from Ha Tinh city along PR9 and PR22-12. The area borders with the East Sea in the east, Can Loc district in the west, Thach Ha district and Ha Tinh city in the south and Nghi Xuan district in the north. The communes are all located in a coastal area on a river plain that supports a high population density, often resulting in poor living conditions. Current environmental conditions are poor as the area supports many livestock enterprises (39), and light manufacturing industries (44) as well as a planned 5ha industrial area

43. Loc Ha is a poor costal district, located Northeast of Ha Tinh province. The East Sea bound the district to the East, Can Loc district to the West, Nghi Xuan district to the North, Thach Ha district and Ha Tinh city to the South. Loc Ha, established in 2007, is separated from 7 communes of Can Loc district and 6 communes of Thach Ha district.

44. The subproject is located in the narrow coastal plain so the area is generally flat, with elevations ranging from 10.0m to 50.0m and the lowest point is 2.5m. The highest point is Bang Son Mountain (Ru Bong) with a height of 230m, located near Loc Ha DPC.

45. The total land natural area of Loc Ha is 11,830.85 ha. In general, soils in Loc Ha are acidic soils and saline soils, affected by saline intrusions through the Nghen River system or through underground fissures. The soil has poor quality and local people usually cultivate only one crop per year.[5]

Figure 4: Subproject Location

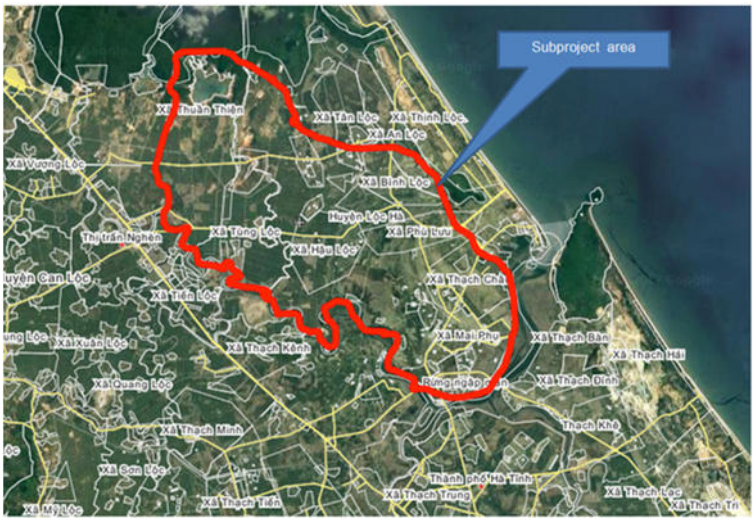
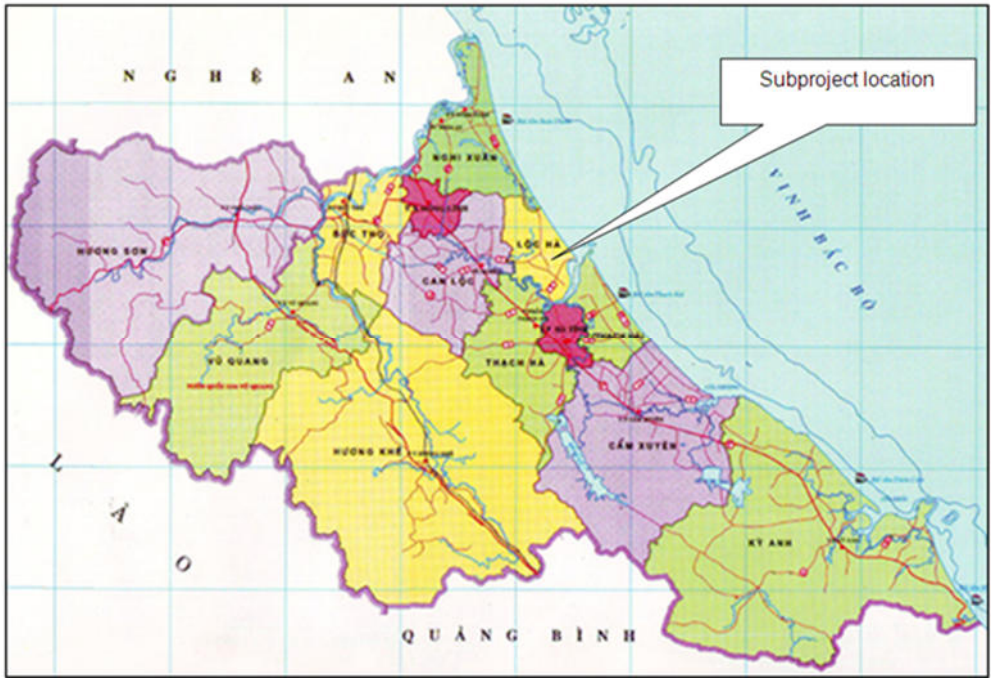


Figure 5: Subproject Location on map of Ha Tinh Province

[5] Status of Environment report (SOE) of Ha Tinh province 2015 prepared by Environmental Protection Agency under Ha Tinh DONRE


Subproject location
N G H Ệ A N
VINH BẮC BỘ
NGHI XUÂN
HƯƠNG SƠN
ĐỨC THỌ
LỘC HÀ
CAN LỘC
VŨ QUANG
THẠCH HÀ
HƯƠNG KHÊ
CẨM XUYÊN
KỲ ANH
L A O
QUẢNG BÌNH

2. Weather, natural disaster and climate change

46. The subproject area is characterized by a tropical monsoon climate common to the coastal Northern Central region of Vietnam. The annual climate has a distinct rainy season with a predominantly cold and wet northeasterly wind and a dry season with a predominantly dry southwesterly wind. The rainy season is brief, lasting from September to November. Storms, high winds and intense rainfall can occur in the subproject area with maximum wind speed reaching 40m/s. The average rainfall is 2,688 mm but 75-80% of the total rainfall is distributed in the rainy season. This climate condition causes droughts and floods annually in the subproject area.

47. The meteorology-hydrology data of Ha Tinh Centre indicates that there are on average 4-5 storms annually in the subproject area with heavy rainfall. However, relatively few storms have occurred in the subproject in the recent years although a catastrophic storm did happen in September 2013 which caused 216 houses to lose their roofs; 203 houses to be flooded; 14.25 km of canal to be broken and inundation 250 ha of rice field, 110 ha of sweet potato, 120 ha of vegetables and 707 ha of land used for salt production.

48. The temperature varies a lot, between a maximum of 40^0C in July and a minimum in of 6.8^0C in January.

49. As a central coastal province with a coastline of 137 km, Ha Tinh is one of the most vulnerable provinces to the impacts of climate change. More intensive and frequent tropical cyclones, floods and heavy rains, in line with rising of sea-wave energy have resulted in increased coastal erosion.

3. Hydrology

50. There are several branches of the Nghen River including the Yen Giang River in Ich Hau commune; the Cau Tru River in Phu Luu commune; and the Rao En River in Binh Loc commune. The Nghen River has a total length of about 70 km from Trung Luong commune, Hong Linh town, flowing through Ich Hau, Mai Phu and Thach Chau communes of the subproject area right before joining the Ha Vang River and then entering to the sea at Cua Sot estuary.

B. ECOLOGICAL ENVIRONMENT

51. A forest area of known as the Hong Loc protection forest surrounds Cu Lay Reservoir, the water source for 6 subproject communes. The total area of the Hong Loc protection forest is 10,000 ha, is mainly pine forest and its main function is maintaining the landscape and protecting environment. The WTP is located on top of a hill, under zone 123 of Hong Loc protection forest and in the administrative area of Thuan Thien commune, Can Loc district. The booster station connects to the Ha Tinh Water Supply Plant is located at the roadside of PR9, and is surrounding by irrigated rice fields.

Figure 6 – The Cu Lay Reservoir and proposed booster station connecting with the Ha Tinh city water supply system

Location of proposed WTP - Cu Lay Reservoir in the area of Hong Loc protection forest

Proposed site for the booster unit to connect to the two Ha Tinh city WS plant

C. SOCIO-ECONOMIC CONTEXT

1. Administrative areas and population

52. The total population in the nine target communes is 60,414 people in 15,572 households. All of them are Kinh people

Table 4 – Population and ethnicity in the subproject area.

Name of communes	Number of villages	Population	Number of households
Hong Loc	7	7543	2223
Binh Loc	6	4784	1253
Ich Hau	5	6930	2023
Phu Luu	8	5529	1581
Thach My	8	6068	1759
Thach Chau	11	5577	1592
Mai Phu	7	5207	1463
Tung Loc	12	8664	2165
Thuan Thien	10	8751	2058
Total	74	59,053	16,117

Source: Ha Tinh Statistic Yearbook, 2015

2. Economic development and income

53. Agriculture production is still dominant income source in the communes. Main crops are paddy, sweet potato, groundnut, vegetable and fruits. Livestock is considered as one of main income sources of the target communes. Main agricultural products in target communes as followings

Table 5 – Main agricultural products in target communes, 2015

Indicators		Hong Loc	Binh Loc	Ich Hau	Phu Luu	Thach My	Thach Chau	Mai Phu	Tung Loc	Thuan Thien
LAND USE										
Total area	ha	2,119.14	435.31	917.26	842.38	1032.3	744.34	574.36	881	2772.75
Agricultural production land	ha	859.55	333.95	510.91	552.65	629.76	423.75	261.92	591	892.33
Forestry land	ha	744.49	0	0	0	28.67	6.43	8.06	28	1312.5
Land for aquaculture	ha	15.53	0.36	28.56	22.47	71.63	15.06	5.59	34	20.1
AGRICULTURAL PRODUCTION										
Total production of cereals	Ton	4384	1292	5607	3199	1977	780	568	5450	5273.6
Food (cereal) income per capita	kg/person	581	270	809	579	326	140	109	607	610
Main agricultural products										
Paddy										
+ Planted Areas	ha	801	277	1002	601	458	279	139	950	1024
+ Production	Ton	4384	1292	5587	3146	1906	648	489	5450	5273.6
Maize										
+ Planted Areas	ha	0	17	10	21	32	62	32		8
+ Production	Ton	0	0	20.69	52.67	71.1	132.04	79.2		28
Groundnut										
+ Planted Areas	ha	111	78	8	82	212	262	106		75
+ Production	Ton	233	196	17	196	478	767	250		213.2
Sweet potato										
+ Planted Areas	ha	65	11	6	42	24	67	18	5	15
+ Production	Ton	355	62	38	153	123	305	78	na	97.5
Orange										
+ Planted Areas	ha	1.87	1.16	4.71	2.12	2.14	2.77	1.06		
+ Production	Ton	12.2	6.48	15.95	14.57	11.33	9.87	5.31		
Livestock										
Buffaloes	head	141	217	769	407	211	18	58	400	540
Cow	head	1628	512	673	895	1066	1685	598	2137	2915
Pig	head	1392	1057	674	817	3055	251	313	6032	6750

Poultry	head	25,270	15,510	20,810	16,530	29,170	21,940	11,140	30,530	85,300

Source: Loc Ha District Statistic Yearbook, 2015 and annual report 2015 of Tung Loc and Thuan Thien communes

54. Table 5 presents poverty incidence in the 9 target communes. Among the 7 communes, Hong Loc and Mai Phu's poverty rates are 11.74 and 14.94 respectively and are still much higher than the 5 other communes. Hong Loc commune is one of the two communes under P135 of the district[6]. In Mai Phu commune, the number of households below poverty line increased in 2015- 2016 because the commune was seriously affected by the environmental disaster associated with the Formosa Steel Plant located in the Vung Ang industrial Zone of Ha Tinh.

Table 6 – Incidence of poverty in target communes

Administrative Unit	2011	2012	2013	2014	2015[7]	2015[8]	2016
Whole district	17.04	14.55	11.4	8.83	7.01	11.11	9.51
Hong Loc	19.5	17.39	15.14	12.47	9.13	12.95	11.74
Binh Loc	20.6	16.21	14.27	11.48	9.33	9.77	8.81
Ich Hau	9.2	8.33	7.1	4.64	4.69	6.82	4.94
Phu Luu	20.2	14.22	12.44	11.33	7.72	9.33	8.84
Thach My	12.0	11.06	9.91	7.0	4.97	8.05	4.97
Thach Chau	4.7	3.8	3.83	3.55	3.55	6.61	4.91
Mai Phu	14.1	12.52	10.98	9.05	8.33	15.78	14.94
Tung Loc	na	na	na	na	na	na	7.2
Thuan Thien	na	na	na	na	na	na	14.9

Source: Division of Labor, Invalid and Social Affairs of Loc Ha and Can Loc Districts, 2016

3. Public health

55. With regard to disease related to water quality, sore eyes, typhoid, diarrhea, cholera and gynaecological diseases were listed as originated from water quality. Table 6 presents the survey results on the serious health problems experienced in the previous year by economic status.

[6] Two out of 13 communes of Loc Ha district are eligible for P135 included Hong Loc and Tan Loc communes
[7] Income-based poverty criteria
[8] Multi-dimension based poverty criteria

Table 7 – House experiencing health problems in the last year by economic status

Waterborne diseases	Number of respondent				
	Total	Female headed HH	poor	near poor	non poor
In dry season					
Sore eyes	5	1	2	0	3
Typhoid	0	0	0	0	0
Diarrhea	0	0	0	0	0
Cholera	0	0	0	0	0
Gynaecological disease	2	0	0	0	2
In rainy season					
Sore eyes	5	1	2	0	3
Typhoid	0	0	0	0	0
Diarrhea	0	0	0	0	0
Cholera	0	0	0	0	0
Gynaecological disease	2	0	0	0	2

Source: PPTA Consultants- BIIG socio- economic baseline household survey 2016

4. Historical, cultural and religious presence

56. The subproject area possesses some areas of cultural, historical and religious significance as follows:

- Kim Dung pagoda, a provincial historical site, located in Bang Son Mount (Ru Bong), 1 km from Loc Ha DPC in Thach Kim commune
- Bien Son temple, a national historical/ cultural site, located in near Hong Loc commune center.
- Dai Bi pagoda in Hong Loc commune.
- Long Hoi pagoda, provincial historical site, located in Hong Loc commune.
- Nguyen Van Giai National Heritage, located beside Pr7 in Ich Hau commune.
- Ca Temple, national historical site, located in Bac Kinh village, Ich Hau commune.
- Truc Lam Thanh Luong pagoda, located near Rao En River, Phu Luu commune.
- Ngoc My temple, near Phu Luu CPC, Phu Luu commune
- Le Khoi temple, located at the riverbank of Nghen River, Mai Phu commune.
- Mai Hac De temple, near Nghen River, Mai Phu commune.
- Trieu Son pagoda, provincial historical site, near Pr9 in Mai Phu commune.

57. The Christian community in the subproject area is quite big, accounting for a significant proportion of the total population with some catholic churches in the subproject area including My Loc church in Binh Loc commune; Vinh Luat church in Mai Phu commune.

D. SURFACE WATER RESOURCES

58. The Nghen River is the biggest surface water resource in the subproject area. This river has high salinity caused by salt water intrusion and is polluted by human activities. There are several reservoirs, situated around Huong Tich mountain - Hong Linh range, in the administrative area of Loc Ha and Can Loc districts. From the National Road No.1 to the coastal line, they are Khe Truc, Duong Dynasty, Cu Lay, Dong Ho and Khe Hao, of which, the Khe Hao

reservoirs (including upper and lower Khe Hao) are located in Tan Loc and Thinh Loc communes, Loc Ha district and the other reservoirs are under administrative area of Can Loc district.

59. Cu Lay reservoir, one of the water sources for the subproject, is located in Thuan Thien commune, Can Loc district. The reservoir has a capacity of 13 million cubic meters and has the capacity to serve an irrigation command area of 1,200 ha but currently is used to irrigate only 680 ha of rice and 38 ha of vegetables for Thuan Thien and Tung Loc communes, Can Loc district. The irrigation capacity will reduce by 50ha when it is established as a drinking water source on completion of the subproject. The irrigation water for these two communes will be compensated by the Nghen River primary system, which is now under construction. Upon completion, this system will provide adequate irrigation water for several communes of Hong Linh town, Can Loc and Loc Ha districts, including Thuan Thien and Tung Loc communes. The reservoir has been approved as the water source for the subproject by Decision No. 1995/UBND-XD of Ha Tinh Provincial People's Committee in 11 May 2016.

60. The current capacity of the Ha Tinh City Water Supply Plant is 2,500 m^3 /day-night. The water source of the plant is Boc Nguyen reservoir (24 million cubic meter capacity) about 14 km to the south of the booster point. Official Document No. 123/CV-CT.QLDA of Ha Tinh Provincial People's Committee - Ha Tinh Water Supply, JSC in 23 May 2016, has approved this water source as the water source for Mai Phu, Thach Chau and Thach My communes of the subproject.

E. WATER QUALITY

61. Ha Tinh Irrigation Construction Consulting, JSC carried out surface water quality testing for Cu Lay reservoir on 06 September 2016 and treated tap water from the Ha Tinh water supply system on 29 August 2016.

62. Based on the test results, the quality of water of Cu Lay reservoir in general met the requirement as raw water for Water supply system for domestic use as stated in QCVN 02:2009BYT[9]. On the iron (Fe) level exceeds the standard, by 1.24 times..

Table 8 - Test result of Cu Lay reservoir water source[10]

No.	Indicators	Unit	Analysis result	Analyzing method	QCVN 02:2009/BYT
			NM		GH I
1	Color[b]	Pt-co	6.25	TCVN 6185:2008	15
2	Smell, taste	-	No strange smell or taste	TCVN 2653:1978	No strange smell or taste
3	Turbidity	NTU	2.6	TCVN 6184:1996	5
4	pH[ab]	-	7.62	TCVN 6492:2011	6.0-8.5
5	Hardness (calculated according to $CaCO_3$)[ab]	mg/l	27.74	TCVN 6224:1996	350
6	Pecmanganat[b]	mg/l	1.16	SMEWW 5220C,D:2012	4
7	Cl^{-}[ab]	mg/l	4.72	TCVN 6194:1996	300
8	Fe[ab]	mg/l	0.62	TCVN 6177:1996	0.5

[9] QCVN 02:2009/BYT National Technical Standard on Quality of Water for Domestic Use
[10] Water sampled at Cu Lay Reservoir as surface water source.

No.	Indicators	Unit	Analysis result	Analyzing method	QCVN 02:2009/BYT
			NM		GH I
9	As[b]	mg/l	<0.002	TCVN 6626:2000	0.01
10	NH_4^{+ab}	mg/l	<0.01	SMEWW 4500 NH3.B&F:2012	3
11	F^{-b}	mg/l	0.76	TCVN 6494-1:2011	1.5
12	E.Coli[*]	Bacteria /100ml	<3	TCVN6187-2:1996	0
13	Coliform[b]		40		50
14	Fecal coliform[*]		<3		0

63. The analysis results of treated water from Ha Tinh Water Plant show that all indicators, including for iron concentration, are within acceptable limits of the national technical standards on quality of tap water as stated in QCVN 02:2009BYT[11].

Table 9 - Test result of tap water from Ha Tinh Water Plant

No.	Indicators	Unit	Analysis result	Analyzing method	QCVN 02:2009/BYT
			NSH		GH I
1	Color[b]	Pt-co	<5	TCVN 6185:2008	15
2	Smell, taste	-	No strange smell or taste	TCVN 2653:1978	No strange smell or taste
3	Turbidity	NTU	0.01	TCVN 6184:1996	5
4	pH[ab]	-	6.94	TCVN 6492:2011	6.0-8.5
5	Hardness (calculated according to $CaCO_3$)[ab]	mg/l	35.5	TCVN 6224:1996	350
6	Pecmanganat$_b$	mg/l	1.33	TCVN 6186:1996	4
7	Cl^{-ab}	mg/l	5.39	TCVN 6194:1996	300
8	Fe[ab]	mg/l	0.152	TCVN 6177:1996	0.5
9	As[b]	mg/l	<0.002	TCVN 6626:2000	0.01
10	NH_4^{+ab}	mg/l	<0.01	SMEWW 4500 NH3.B&F:2012	3
11	F^{-b}	mg/l	0.78	TCVN 6494-1:2011	1.5
12	E.Coli[*]	Bacteria /100ml	<3	TCVN6187-2:1996	0
13	Coliform[b]		<3		50
14	Fecal coliform[*]		<3		0

- (-): No regulation available
- This results is applicable on the analysed sample only
- Indicators with (a) mark: recognized by Vilas 755
- Indicators with (b) mark: recognized by Vincents 034
- Indicators with (*) mark: carried out by subcontractor
- Names of sample and customer are as required by the customer
- After the time of sample saving, the Analysis Department is not responsible for any claim relating to this analysis.

[11] QCVN 02:2009/BYT National Technical Standard on Quality of Water for Domestic Use

VI. IMPACT, ALTERNATIVE AND MITIGATION MEASURES

A. Area of influence of the subproject

64. The area of influence of the subproject includes the water intake area, the WTP area, the area served by the pipe distribution network and the area along the raw water transmission pipe connecting the Cu Lay reservoir to the WTP and the clean water transmission pipe connecting the booster station to the distribution system. It includes several villages of 7 subproject communes and Ho Do commune, Loc Ha district; 2 subproject communes of Thuan Thien and Tung Loc, Can Loc district; and Thach Ha commune, Ha Tinh city.

B. The expected benefits

65. The benefits of the subproject are improved public health by ensuring full time reliable access to clean water for most of the local people in 7 communes of Loc Ha district and 2 communes of Can Loc district. The water will be safe for drinking and cooking, reducing the incidence of water related disease, which in turn improves the quality of life for beneficiaries, reducing the need to purchase safe water, and reduces productive time lost to illness.

66. Many households in the region seek other water sources by themselves for the purposes of catering and drinking. Commonly, households with good economic conditions have constructed water tank systems to collect rainwater for drinking purposes and underground water for other domestic use. Some poor households have invested portable filter systems to treat groundwater for use as drinking water.

C. Alternative; Design and Location Consideration

67. Other water sources that could be considered for the subproject are:

(i) The Nghen River: the river plays a role in controlling salt-water intrusion, drainage of floodwaters and the supply of water for 12,000 of irrigated agricultural land and land used for aquaculture. Along two sides of the river are cultivation areas and the water quality is affected with high salinity and pollution by human activities. Use of the river water as a source would therefore incur high costs for treatment to bring quality to an acceptable standard for domestic supply, and compete with existing uses;

(ii) The Khe Hao Reservoirs: The Khe Hao reservoirs consist of separate upper and lower reservoirs. The total storage capacity the two reservoirs are 4.43 million cubic meters, and are located in Tan Loc and Thinh Loc communes. The lower Khe Hao reservoir only provides irrigation water for several communes of Loc Ha district while upper Khe Hao reservoir provides water for lower Khe Hao and domestic water for Thach Bang, Thach Kim and Thinh Loc communes, Loc Ha district.

(iii) The Dong Ho Reservoir: Dong Ho is a small reservoir with capacity of 1.27 million cubic meters and it provides water for irrigation purpose only for Hong Loc commune. It is not used as a source because of its limited size.

(iv) Groundwater sources: Groundwater in the region is mainly from shallow water veins, absorbed from surface reserves such as rain, lakes, wastewater, etc. This water source is currently used by 90% of local people for domestic use (washing), and exploited via dug and drilled wells in the households. This water source is

seriously polluted and infected with alum, seawater and ammonium. Groundwater reserves are abundant in the rainy season but exhausted in dry season. Deeper ground reserves in the area, while less prone to pollution or seasonal fluctuation, suffer from a high manganese content, testing of a drilled well in Hong Loc commune by Ha Tinh Irrigation Construction Consulting, JSC on 17 September 2016 showed that the water has polluted with Manganese. (See Appendix 5 for more details.) [12].

68. Based on a review of existing data, the Cu Lay Reservoir and Ha Tinh City Water Plant have been selected as the water sources for the subproject (Source 1). The Cu Lay Reservoir located in Thuan Thien commune, Can Loc district is about 5 km from the nearest subproject commune center of Hong Loc. The reservoir has been selected to provide domestic water for Hong Loc, Binh Loc, Ich Hau and Phu Luu communes, Loc Ha district and Thuan Thien, Tung Loc communes, Can Loc district

69. The Ha Tinh City Water Plant has been selected as the water source for Thach Chau, Thach My and Mai Phu communes (Source 2). A water tank and a pump will be installed at the existing booster station in Thach Ha commune, Ha Tinh city. This booster station currently operating to pump water supply from Ha Tinh City Water Plant to Ho Do commune, Loc Ha district.

D. Pre-construction activities

70. The preconstruction activities under the two sources are site clearance along the raw water pipeline, WTP of the Source 1 and distribution networks. A Resettlement and Ethnic Minority Development Plan (REMDP) has been prepared to cover compensation and assistance based on ADB SPS.

E. Potential Impacts and Mitigation Measures in the construction phase

1. Loss of trees and impact to fauna

71. **Impacts:** Construction work will involve some removal of trees along 150-meter access road and 4,100 m^2 of proposed WTP itself in the Zone 123 of Hong Loc protection forest. The trees are mainly pine trees, with other species that have generated naturally. Except pine trees, the other species are well represented in wooded areas, strips of riparian vegetation and forests in the area and as such do not present a unique habitat. In total, 1,865 pine trees will be removed. The subproject will also affect 245 eucalyptus, 268 melaleucas. The impact area in Hong Loc protection forest is about 0.5 ha over 1,084 ha of zone 123 and 10,000 ha in general of the forest. The impact will take place over 12 months of construction time.

72. Mitigation measures: 41-million Dong compensation for the change from forestland use will be paid to the Ha Tinh reforestation budget. This is the unit price for 1 ha reforestation. This 1 ha area will be defined and Ha Tinh PMU will be responsible to supervise and monitor the reforestation progress. Other trees owned by local residents that will be removed, will be compensated under the provisions of the REMDP. To reduce the impact on further trees and vegetation, the DARD offices of Loc Ha and Can Loc districts will be informed about the number of tree to be cut down, construction time and schedule. The contractor will not use or permit the use of fuel wood for construction activities or for cooking and water heating in worker's camps.

[12] The subproject Feasibility Study

The contractor will prohibit staff from collecting fuel wood from nearby forests and will not buy or use wood from illegal sources. The PMU assisted by the ESP and CSC will strictly supervise and monitor the protection of trees and other vegetation.

2. Generation of surplus soil

73. **Impacts:** Soil from excavation activities, which could not be reused as fill soil, could have significant impacts such as soil erosion when placed on slopes, as well as release of silt.

74. **Mitigation measures:** Most of the excavated soil will be reused as filling soil to cover the pipe system. Thus, large amounts of excavated soil from pipeline construction will not need to be discarded. The remaining surplus that could not be reused will be used as a base material for the WTP site, for access road construction if suited for the purpose, or provided to local people for use on public or private land, as they desire. Any further surplus soil will be transferred to designated disposal sites, as agreed with the CSC and local authorities.

3. Generation of construction waste

75. **Impacts:** Solid waste that will be generated from construction mainly includes waste from workers' camps, debris, and packaging of materials and equipment cement cover, oil containers, crates and cardboard. Some may be contaminated with hazardous or semi hazardous substances. Domestic waste from workers camps may include organic waste, as well as plastic and other packaging and semi toxic items such as used batteries. Other waste will be generated at workshops, storage sites, refueling sites and depots. This is a minor impact, as the main construction site is the proposed WTP, small access road.

76. **Mitigation measures:** Contractors will be required to (i) compost organic waste produced at workers sites and (ii) install rubbish bins at work sites and in worker's camps to allow efficient collection of waste and transport the solid waste to a disposal site approved by the CSC.

4. Impact from noise, dust and vibration generated by the construction activities

77. **Impacts:** Earthworks and rock crushing activities will be the main sources of dust. Construction machines and vehicles will generate gaseous emissions (NOx SOx, CO, CO_2, etc.) when they are in operation. These gaseous emissions and dust could cause health problems for residents who live near the construction site and along the transportation route and along the distribution pipeline network. The impact is considered as minor as the WTP and access road will be constructed at in the forest area area, about 5 km from the nearest commune center. The installation of distribution network will be done mainly by manual work.

78. **Mitigation measures:** The contractors should not locate any noisy machines near residential areas and will work with the CPCs, with the representative of ESP and PMU, to identify suitable materials transportation routes. During the dry period, the roads and patches near residential areas, especially the sensitive receivers like schools of all grades, kindergartens, Loc Ha hospital, Nguyen Van Giai National Heritage, pagodas and churches should be sprayed with water regularly to suppress dust generated PMU and CSC will responsible to monitor these mitigation measures.

5. Impact on local traffic

79. **Impacts:** Distribution pipelines installation is likely to cause hindrance in traffic flow along Pr9, Road 22-12 and other communal roads of the 9 communes if not mitigated properly especially in the area of schools, kindergartens and markets. Pupils will get difficulties on their way to schools and local people will get difficulties on their way to the market. On the other hand, material transportation activities from quarries and borrow pits to the construction sites. The impact duration will be short, during the distribution pipelines installation in 12 months construction phase.

80. **Mitigation measures:** To minimize the disturbance to local people, the contractor will inform 9 CPCs the construction schedule for distribution pipelines in advance and will also coordinate with local traffic authorities to implement appropriate traffic diversion schemes (if needed) to avoid inconvenience due to pipelines installation, setup clear traffic signal boards and traffic advisory signs at the market and school areas.

6. Safety of construction workers

81. **Impacts:** Workers are at risk of accidents associated with construction, particularly power connect to the nearby transmission line for the electricity substations of the WTP and the booster station.

82. **Mitigation measures:** The contractors will (i) conduct training for workers on safety, including roles and responsibilities, safe site practices and environmental hygiene (ii) institute site and camp rules such as wearing proper safety apparel such as safety boots, helmets, protective clothes, gloves and ear protection, (iii) ensure all excavation sites are fenced with sign boards and perimeter markers; (iv) liaison with the power company to ensure that qualified technicians are on site to ensure that safety procedures are followed and (v) allocate responsibility to supervisor staff to ensure that all safety rules are followed by all staff at all times. The project will take note of opinions and complaints from local people and authorities on safety.

F. Potential Impacts and Mitigation Measures in the Operation Phase

1. Risks of Water Shortages

83. **Impacts**. The feasibility study has project demand to the year 2030 and examined water availability from the Ha Tinh city supply for the southern network and the Cu Lay reservoir and Nghen river for the northern network.

84. In the case of the southern network, any shortfall potential impacts will include public health risks and water quality risks as the system will deteriorate when the pipes, tanks and treatment systems are not carrying water. However, the PPTA received written confirmation from the Ha Tinh Water Supply Joint Stock Company on the capacity of a new main line that will be used to provide a secure water supply through to 2030, including advice that the only users outside the subproject area of water from the new mainline would be a group to the north east of the subproject area, requiring 10 to 11 l/s.

85. In the Northern network, shortages in the Cu Lay reservoir are prevented by the use of water pumped from the Nghen river as a buffer source. The capacity of the Nghen river was assessed. The Nghen river receives water from artificial channels diverting flows from the

nearby La River, receiving inflows twice a day as tides influence water levels in the river. Further inflow is derived from the Gia, Hue and My rivers and numerous streams. The Nghen river flows within an existing stream bed with significantly increased water flows and freshwater reserves are further protected by a salinity barrier that has been constructed downstream, preventing salinity intrusion due to tidal movement and lifting river levels at the Cao Cau pump station.

2. Risk of water source pollution and broken pipes

86. **Impacts:** The water source of Cu Lay Reservoir could be vulnerable to pollution from animal waste

87. **Mitigation measures:** HWMC will install fences surround the water intake location to avoid cattle trespassing and install warning board at the intake location as well as some main points along the distribution pipeline system.

3. Risk of pipe breakage

88. **Impacts:** Breakages in the treated water pipeline can lead to pollution of the water supplied to the distribution network and wastage of water.

89. **Mitigation measures:** HWMC will inspect the water intake, pipeline system regularly and fix any system failure in time to ensure adequate water supply and quality.

4. Risk of accidents during WTP operation process

90. **Impacts:** Chemicals used in the WTP, especially chlorine could be leaked and impact on the health of operation workers. Electric shocks could occur with workers working at the electricity substation. Other work accidents could happen if workers are not trained properly and do not follow the safe working procedures.

Mitigation measures: The WTP must be equipped with a fire control system and protective gear for workers. Workers should be trained in the principles of safe working, emergency steps and proper handling and storage of chemicals. Among the chemicals, chlorine, supplied in powder or tablet form, is the most toxic and therefore requires safe storage and handling. The operating procedures of the plant should include an inspection and maintenance schedule for all chemical storage and treatment equipment. Containers of chlorine tablets or powder must be kept in a dry place and stored separately from non-hazardous materials.

VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. The purpose of information disclosure, consultation and participation

91. Public Consultation and Disclosure. Public consultation shall include discussions with members of project beneficiary groups, affected persons and commune officials, as a part of IEE preparation, in order to ascertain any concerns that may need to be addressed. In accordance to Circular No. 27/2015/TT-BTNMT, preparation of an EIA, entailing including public consultation is not required as the capacity of the subproject is only 7,100 m^3/day in comparison with the threshold for the EIA requirement being 50,000 m^3/day. As per ADB's SPS (2009), for category B subproject however, it is necessary to conduct public consultation, including the following aspects:

(i) A summary of the proposed works under the subproject;

(ii) A summary of subproject objectives and likely positive and negative environmental impacts, covering the impacts in design, construction and operation phases for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders;

(iii) Invitation for feedback in respect of any areas of concern that the public may have, and suggested means of implementation; Summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples;

(iv) Acceptability of the proposed works to the public; and

(v) Request for information on the known occurrence of unexploded ordinance in the area where the scheme components will be built and facilitating participation of affected people during project implementation.

B. Method of consultation and participation

92. The method of information dissemination and consultation and participation includes the rapid assessment methodology and stakeholders participation and consultation using the following techniques:

- An in-depth interview (live-interview): organizing dialogues, meetings and discussions with local authorities, including interview via phone for additional information. At the commune level, the participants are usually deputy chairman and land administrative staff of the CPC.
- Obtaining information on the questionnaire (integrated with the social survey)
- Public consultation meeting at the CPC with the participant of affected households; representatives of commune, district and provincial level.

C. Consultation process

93. The PPTA in collaboration with the local authorities held consultation. These were conducted as part of the baseline survey on local environmental conditions along the pipeline corridor and the location of the WTP.

94. The main content of the consultation meeting was to announce the main information of the Water Supply System for 9 communes in Loc Ha and Can Loc districts; the adverse environment impacts, proposed mitigation measures to be applied during the construction phase and operation phase. The participants also expressed their views as well as other opinions related to the Subproject and other issues.

D. The result of information disclosure and public consultation

95. During consultations, there was clear enthusiasm for the project and no opposition provided. All the respondents showed support for the subproject and stated that they with construction to commence as soon as possible. They also mentioned that clean water supply system is their utmost need at the moment.

96. The public consultation meeting was carried out as part of a baseline survey of local environmental conditions along the projects sites. Meeting with local authorities of Ha Tinh Province and Loc Ha district took place on 16 and 19 December 2016. Public meetings with local people in 7 communes were held in CPCs on 19 and 20 December 2016. Additional meeting with Ha Tinh DARD, Forest Ranger, Hong Loc Protection Forest and Management Board related to forest clearance in Hong Loc protection forest and mitigation measures has been held in 31 March 2017.

97. The IEE, including Environmental Management Plan (EMP) will be translated into Vietnamese and will be made available at the office of the People's Committees of the 9 subproject communes.

VIII. GRIEVANCE REDRESS MECHANISM

A. Purpose of the mechanism

98. During the preparation of the subproject, information is disseminated to local people on the scope of the subproject, and environmental and social impacts. Negative impacts of an environmental or social nature, or resettlement impacts, may occur during the construction and operational phases. Any comments/ suggestions of local people will be solved quickly, transparently in accordance with protected the law, particularly for people affected by the subproject. This grievance redress mechanism is classified by level and responsibilities of involved parties.

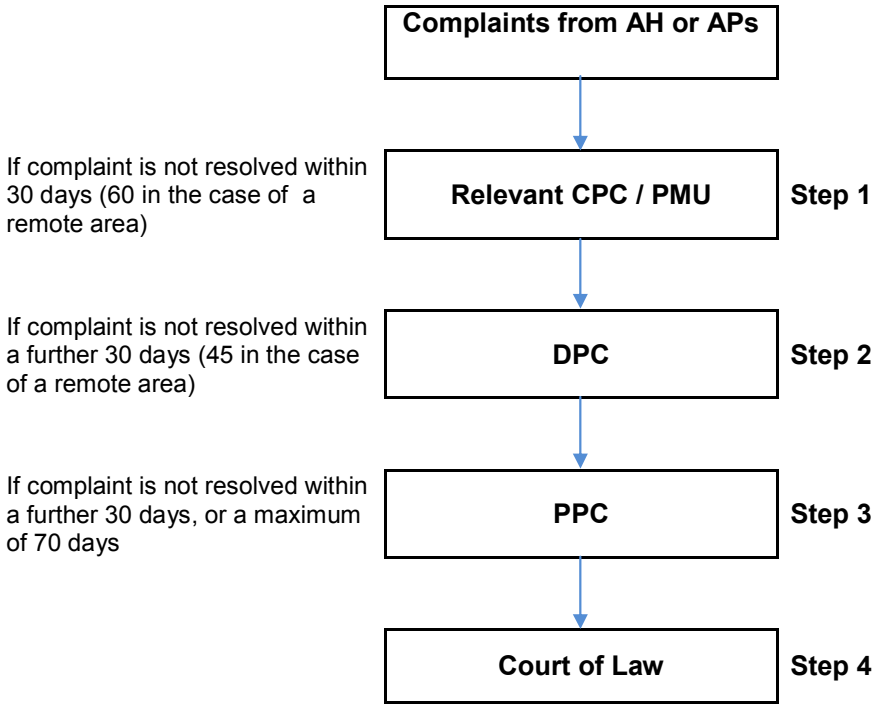
B. Grievance redress process

***Stage 1*:** If a household or individual has any complaint he/she can submit a complaint in written or verbal form to the representative of the CPC-community monitoring board (usually the Deputy Chairman of the commune/town). The CPC will work with PMU to solve complaints and a representative PMU will respond in written form to the complainant. The CPC, as a whole body will meet personally with the aggrieved affected household and will have 30 days and a maximum of 60 days after the lodging of the complaint to resolve the complaint, however, depending upon whether it is a complicated case or case comes from a remote area. The CPC secretariat is responsible for documenting and keeping file of all complaints that it handles.

Stage 2: If after 30 days or 45 days (in remote areas) the aggrieved affected household does not hear from the CPC, or if the affected household is not satisfied with the decision taken on his/her complaint, the affected household may bring the case, either in writing, to any member of the DPC. The DPC in turn will have 30 days or a maximum of 70 days after the lodging of the complaint to resolve the case, however, depending on whether the case is complicated or in remote area. The DPC is responsible for documenting and keeping file of all complaints that it handles and will inform the District Resettlement Committee (DRC) of any decision made and the DRC is responsible for supporting DPC to resolve AH's complaint. The DPC must ensure that the complainant is notified of the decision made

Stage 3: If after 30 days or 45 days (in remote area) the aggrieved affected household does not hear from the DPC, or if the affected household is not satisfied with the decision made on his/her complaint, the affected household may bring the case, either in writing, to any member of the PPC. The PPC has 30 days or a maximum of 70 days to resolve the complaint to the satisfaction of all concerned. However, depending if the case is complicated or from a remote area The PPC is responsible for maintaining records of complaints received, action taken and outcomes.

Stage 4: If efforts to resolve disputes using the grievance procedures remain unresolved or unsatisfactory, after a period of thirty days, complainants have the right to bring the case to a Court of law for adjudication. The decision of the Court is binding on all parties.


Complaints from AH or APs
If complaint is not resolved within 30 days (60 in the case of a remote area)
Relevant CPC / PMU
Step 1
If complaint is not resolved within a further 30 days (45 in the case of a remote area)
DPC
Step 2
If complaint is not resolved within a further 30 days, or a maximum of 70 days
PPC
Step 3
Court of Law
Step 4

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. IMPLEMENTATION ARRANGEMENTS

99. Ha Tinh PMU will recruit one Environment Safeguard Specialist (ESP) under the Loan Implementation Consultants (LIC) to support subproject implementation in Ha Tinh. The ESP will support the PMU to update the EMP and to monitor the compliance of the contractors with EMP requirements during construction phase. The ESP will also be responsible for training and capacity building on the implementation of EMP.

100. The PMU will engage Construction Supervision Consultant (CSC) for the monitoring and supervision of the subproject in general and for environmental monitoring as well. CSC will ensure that the contractors implement the provisions of the subproject EMP.

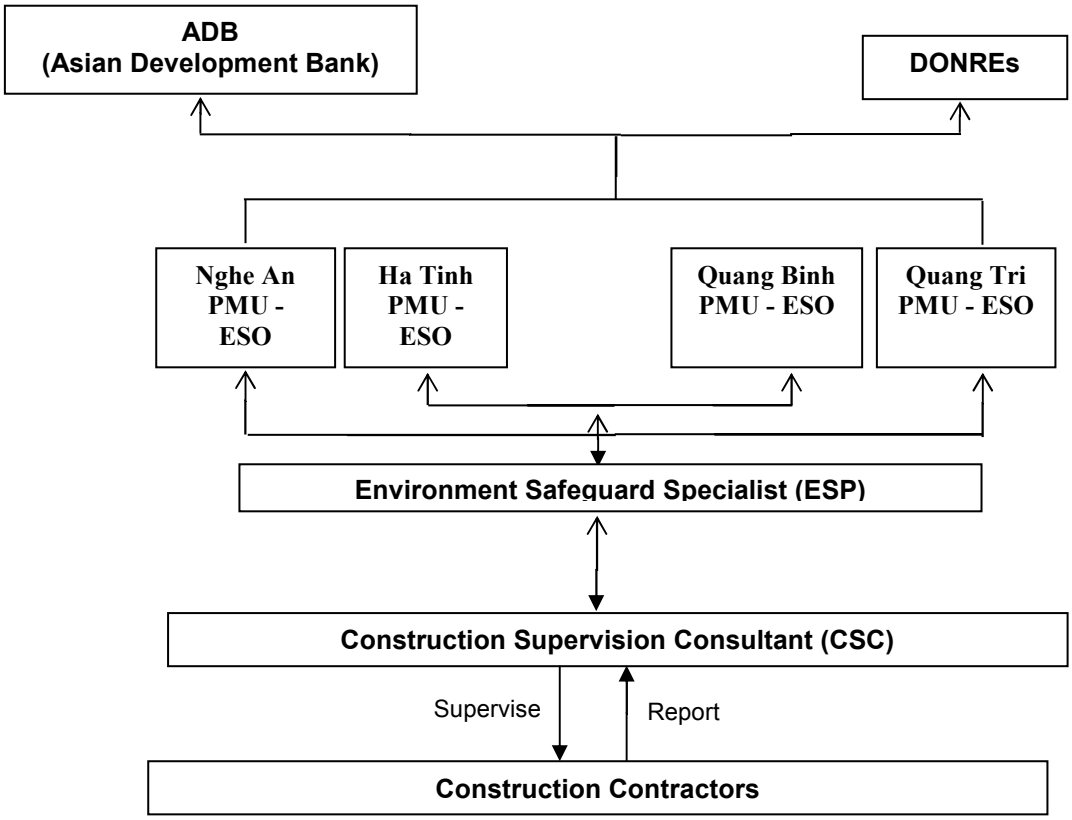
Table 10 – Responsibilities for EMP implementation

Agency	Responsibilities
Ha Tinh Project Management Unit under DPI (PMU)	- Ensure that EMP provisions are strictly implemented during the various subproject phases (design/pre-construction, construction and operation) to mitigate environmental impacts to acceptable levels. - Undertake monitoring of the implementation of the EMP (mitigation and monitoring measures) with assistance from CSC and ESP. - Ensure that Subproject implementation complies with ADB's environmental policy and safeguards policy statement (SPS 2009) principles and requirements - For subproject duration, commit and retain a dedicated staff within PMU as environment and safeguards staff to oversee EMP implementation - Ensure that environmental protection and mitigation measures in the EMP are incorporated in the detailed design. - With the support from ESP, updated EMP to suitable with any changing in subproject scope or any unanticipated impact rise. - Obtain necessary environmental approval(s) from DONRE prior to award of civil works contracts - Include the Subproject updated EMP in the bid and contract documents for civil works - Establish an environmental grievance redress mechanism, as described in the IEE, to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the Subproject's environmental performance - With assistance from ESP, prepare semi-annual environmental monitoring reports for submission to ADB - Based on the results of EMP monitoring, identify environmental corrective actions and prepare a corrective action plan, as necessary, for submission to ADB.
Environmental Safeguards Staff (ESO)	- Support to PMU for EMP implementation - Work closely with the ESP for supervision and monitoring of EMP implementation and preparation of EMP monitoring reports
Environment Safeguard Specialist (ESP)	- Update the EMP to ensure it is applicable to current conditions and design changes or whenever subproject scope change or any unanticipated impact arises. - Ensure that the environmental protection and mitigation measures identified in the EMP for the design stage has been incorporated in the detail design; - Assist the PMU to ensure that all environmental requirements and mitigation measures from the IEE and EMP are incorporated in the bidding documents and contracts. - During detailed design phase carry out baseline data collection as specified in

	the EMP - Carry out all tasks allocated to the ESP tasks in the EMP - Undertake environmental management capacity building activities for PMU as described in the IEE and EMP. - Engage international and national environment specialists to ensure proper implementation of EMP provisions. Through these specialists, the ESP shall: (i) ensure proper and timely implementation of ESP's tasks specified in the EMP, (ii) conduct environmental training as specified in the IEE/EMP for PMU, (iii) conduct workers' orientation on EMP provisions, (iv) undertake regular monitoring of the contractor's environmental performance, as scheduled in the EMP (v) conduct field measurements for surface/ground water quality, dust and noise as required in the EMP, and (v) prepare environmental baseline report and environmental semi-annual environmental monitoring reports , as specified in the EMP, for submission to ADB.
Construction Supervision Consultant (CSC)	- Assess environmental impacts resulting from on-going site works and operation related facilities, undertake environmental effects monitoring and orientation of workers on EMP implementation. - Undertake day-to-day subproject supervision to ensure that contractors properly implement the EMP. - Orient workers on EMP implementation, and health and safety procedures - Document and report to PMU on occupational accidents, diseases and incidents - As part of regular progress report submission to PMU, prepare reports on the status of the contractors' implementation of the EMP and health and safety issues - Engage environmental staff to ensure proper implementation of the above tasks.
Contractors	- Recruit or appoint a qualified individual to act as the Contrator's environmental officer to ensure compliance with environmental statutory and contractual obligations and proper implementation of the Subproject EMP. - During detailed design phase, prepare a method statement (Waste Management and Spoils Disposal Plan) described in the IEE/EMP. - Ensure full understanding of the EMP and resources require for its implementation when preparing the bid for the work. - Implement additional environmental mitigation measures, as necessary
Ha Tinh Water Supply Management Company (HWMC)	- Responsible for operation and maintenance of subproject. - Implement the EMP monitoring during operation
Ha Tinh Department of Natural Resources and Environment (DONRE)	- Review and approve environmental assessment reports required by the Government. - Undertake monitoring of the subproject's environmental performance based on their mandate

The organization structure of Environmental Management Plan is showed in the chart below:

Figure 7 – EMP Implementation Organization Chart



B. ENVIRONMENTAL MITIGATION

101. The anticipated environmental impacts and mitigation measures discussed in the previous section are presented in Table 10. The table also shows responsibilities and timeframe/schedule for implementation of mitigation measures and monitoring.

102. Table 10 shows that most mitigation activities during pre-construction are to be implemented by the ESP while during construction, measures shall be primarily implemented by the contractors. During the operation phase, DONRE shall monitor EMP implementation. To ensure implementation of mitigation measures during construction, the EMP shall be included in the tender and contract documents for civil works. Contractors' conformity with environmental contract procedures and specifications shall be regularly monitored by the PMU with assistance from the CSC and results shall be reported semi-annually to ADB.

Table 11 - Detail Environmental Mitigation Plan

Project Activity	Potential Impact	Proposed Mitigation Measures	Location	Timing	Reporting	Budget	Responsibility	
							Supervision	Implementation
Preconstruction Detailed Designs Phase								
Confirmation of required resettlement, forest clearance and temporary relocations	Impact on the communities, on Hong Loc protection forest	1. Affected persons well informed ahead of project implementation 2. Inform Hong Loc protection forest management board in advance on project implementation 3. Identify the area for reforestation and regularly manage and supervise the plantation process	In all subproject area	Before subproject start	In the resettlement plan	In the RP	PMU	Resettlement committees
Disclosure information	No impacts	2. Implement information disclosure and activate grievance redress mechanism (in the IEE)	In all subproject area	When the subproject starts	Quarterly	No extra cost	N/A	PMU
Government approvals	No impacts	3. Environmental Protection Plan (EPP) approved by Ha Tinh DONRE and required project permits and certificates obtained	In all subproject area	Before construction start	N/A	No extra cost	DARD office of Loc Ha DPC	PMU
Detailed designs	Minimize potential negative impacts	4. Complete detail design: - Review Cu Lay water source again for quality and resources. - Minimal acquisition of agricultural or other land. - Avoided or minimal disruption to public services like water supply, drainage, electricity with plan for unavoidable situation.	Water intake point, along the pipeline, booster station, WTP	Before construction start	Once with detail designs	No extra cost	DARD office of Loc Ha DPC	PMU
Environmental Management Plan	Minimize potential negative impacts	5. Complete detail design, including EMP with screened potential impacts, mitigation measures and monitoring requirements 6. Submit EMP with potential impacts to ADB for review	In all subproject area	Before detail design finalization	Once with detail designs	No extra cost	DARD office of Loc ha DPC	PMU
Develop bidding documents	No impacts	7. Ensure the EMP is included in tender documents for contractors so they could develop Construction Environmental Management Plan (CEMP). 8. Specify in bid documents that contractor must have experience with implementing EMPs, and provide staff for EMP implementation.	N/A	Before construction starts	Once for all tenders	No extra cost	DARD office of Loc Ha DPC	PMU
Training and capacity building	No impacts	9. Develop training program for PMU and HWMC staff for EMP implementation and manage contractor mitigation measures application. 10. Raising awareness and work with contractors for CEMP	N/A	Before construction starts	After each training session	No extra cost	N/A	ESO
Procurement of Contractors	No impacts	11. Ensure the contract with contractors including CEMP developed from the references Environmental protection consideration of Appendix 3	N/A	During contract signing period	Once	No extra cost	N/A	ESO
Recruitment of	Conflicts;	12. Recruit local workers as much as possible	All	Through	After worker	No extra	PMU	Contractor

construction workers	social evils; transmits diseases		construction location	out construction phase	recruitment step	cost		
Construction phase								
Obtain construction permits and licenses	Avoid/ minimize impacts	13. Comply with requirements of Ha Tinh DONRE for use of construction equipment, hazardous waste, and chemical management...	All construction sites	At construction start	Once	No extra cost	PMU	Contractor
Training and capacity building	Avoid/ minimize impacts through training	14. Implement training program for PMU (ESO), HWMC and contractors	PMU offices, Construction site	Construction start period	After each activities	No extra cost	N/A	Environment Specialist (ESP) under Loan Implementation Consultant (LIC)
Worker camp operation	Pollution and social problem	15. Site the workers' camp away from local residential areas 16. Ensure adequate housing including hygiene facilities (water; waste disposal services and facilities; drainage system) 17. Prohibit guns and weapons in the camps 18. Raise awareness on disease transmission, local regulations to avoid conflict. 19. Camp areas must be restored to original conditions upon completion of construction	All worker camps	Through out construction phase	Monthly	No extra cost	PMU; Construction Supervision Consultant (CSC)	Contractor
Tree and vegetation clearance and environmental recovery	Damage/ loss of trees and vegetation cover, soil erosion of landscape	20. Restrict tree and vegetation clearance within the designated Right of Ways for access road and pipe route (ROWs) and designated WTP area. 21. Minimize removals, install barriers around trees that do not need to be removed 22. Re-vegetated and landscaped after constructions complete.	Through out construction areas	Start and end of the subproject	Monthly	No extra cost	PMU	Contractor
Civil works	Degradation of forest and plantation area	23. Located construction sites away from Hong Loc protection forest, agricultural areas as much as possible 24. No trees cut down out of the plan for construction 25. Hazardous substances such as oils, fuels should be stored and handled far from forest and plantation areas. 26. Waste should not be dumped in the forests or agricultural areas.	Through out construction areas	Through out construction phase	Monthly	No extra cost	PMU	Contractor
Civil works	Degradation of water quality and aquatic resources	27. Locate material and temporary excavated soil stockpiles at least 20m far from water bodies (Nghen River and other rivers, reservoirs). 28. Create sedimentation ditches around material stockpiles to contain rain-induced erosion. 29. Conduct earthworks in the dry periods. 30. Liquid materials like oils, fuels and paints should be stored and handled at least 50m far	Through out construction areas	Through out construction phase	Monthly	No extra cost	PMU	Contractor

		from water bodies. 31. No washing and maintenance works of machinery within 50m of water bodies. 32. Toilet should be installed far away from water bodies.						
Material exploitation and transportation	Pollution, safety risks, increase traffics, block access	33. Inform 9 CPCs and Loc Ha, Can Loc DPCs for the material exploitation plan and construction plan in advance. 34. All borrow pits and quarries should have certificates from DONRE. 35. Borrow pits and quarries should be fenced with warning signs to keep public away. 36. After exploitation complete, borrow pits and quarries should be dewatered, fenced permanently with warning signs to keep public away. 37. Transportation trucks must be covered with canvas. 38. Restrict material transportation in the rush hours (7 - 8 am; 17h - 18h)	Through out construction areas	Through out construction phase	Monthly	No extra cost	PMU	Contractor
Excavation soil management	Contamination of land and surface waters by the excavated soil	39. Surplus soil must be disposed at the designated sites as agreed with local authorities and Ha Tinh DONRE. The disposal site must be far away from residential area and large water bodies such as the Nghen River. 40. Where possible, surplus soil should be used at other construction sites, or disposed in the old quarries, borrow pits. 41. Information (type, estimated volume, source...) of the disposed surplus soil must be recorded. 42. Temporary surplus soil must be stored in high place with impervious ground and cover with tarpaulin and far from residential areas and water bodies.	All excavation areas	Through out construction phase	Monthly	No extra cost	PMU, HWMC	Contractor
Solid construction waste and waste water	Contamination of land and surface waters by construction waste	43. Management of solid waste and wastewater follow Government regulations and will cover, collection, handling, transport, recycling and disposal of waste and wastewater. 44. Disposal sites should be determined by or approved by DONRE 45. Install enough trash bins at the construction sites (large one for the construction site) 46. Recyclable waste should be separated and sold to buyers in the community. *Hazardous waste* 47. Handling of hazardous waste such as used oil or gasoline containers or batteries must follow Government regulations. 48. Different hazardous types (hydrocarbons, paints, batteries, organic solvents) must be separated and stored in the areas with impervious	All construction areas and worker camps	Through out construction phase	Monthly	No extra cost	PMU, HWMC	Contractor

		ground and roof covers.						
Noise, vibration and dust generation	Dust, noise, vibration	49. Spray water, to control dust from material stockpiles, and exposed soil surfaces especially near sensitive receivers. 50. Cover and keep wet material at all stockpiles that contain fine material (not required where material is coarse and not transported by wind). 51. Minimize time that excavations and exposed soils are left exposed. Backfill as soon as possible	All construction areas	Through out construction phase	Monthly	No extra cost	PMU, HWMC	Contractor
Disruption of public services	Stop or disruption of public services such as water electricity supply and drainage	52. Set up weekly and daily work plans for locations where outages in utilities and services may occur and inform the public 53. Work with public services management companies for the construction schedule and scale to minimize the duration of services disruption. 54. Inform local authorities and local people of 9 subproject communes for the construction plan and scope.	All construction areas	Through out construction phase	Monthly	No extra cost	PMU, Public services management companies, 9 subproject CPCs	Contractor
Land and soil erosion	Soil erosion	55. Conduct earthworks in the dry seasons. 56. Maintain a stockpile of topsoil for immediate site restoration following backfilling. 57. Re-vegetation all soil exposure areas as soon as possible.	All construction areas	Through out construction phase	Monthly	No extra cost	PMU, HWMC	Contractor
Workers and public safety	Local people and worker could be hurt or injured. Local people and worker health	58. Install fences and warning signs at all the construction sites. 59. Provide sufficient information, disclosure at 9 subproject CPCs and Loc Ha, Can Loc DPCs subproject information. Assign guards at nighttime for all construction sites. 60. Stagnant water should be filled in to avoid disease vector breeding. 61. The contractor should guide and train workers on work safety and construction hazards before workers start working. 62. Provide workers with full protective gears such as helmet, safety boots, protection clothes, masks, gloves and train them in proper use. 63. Provide Medical cabinet with sufficient medicines and fire extinguishers at all construction sites. 64. Assign person in charge for Health, Safety and Environment (HSE) at each construction site and send this person to the training course organized by the subproject. 65. Supervise and check all construction sites daily to ensure potential hazards are removed or identified and marked	All construction areas	Through out construction phase	Monthly	No extra cost	PMU, CSC	Contractor
Construction and local traffic	Traffic disruption, traffic jam and	66. Schedule construction vehicle activity during light traffic periods. Install sufficient signage and warning lights at all construction sites.	All construction areas	Through out constructio	Monthly	No extra cost	PMU	Contractor

	block; accident	67. Inform local authorities and local people construction schedule and scope in advance.		n phase				
Operation phase								
Treated water supply	Unsustainable quantity or quality of supplied water	68. Develop and implement an Operation and Management (O&M) manual for equipment and operations of water supply system including regular maintenance and materials supply to ensure the design supplied capacity of the WTP. Setup backup plan or contingency plan in emergency case. 69. Set up a water quality monitoring program to ensure water quality of the WTP. 70. Coordinate with the Department of Health to periodically monitor water quality of the WTP and at the booster station to ensure it meets potable quality standards.	Entire Water supply system At the outlet of WTP and some location along the distribution pipeline	Quarterly	If required	No extra cost	DARD offices of Loc Ha, Can Loc DPCs	HWMC
	Chemical spills and pollution from waste	71. O&M manual provide methods and procedures for safe handling and storage of planned treatment chemicals such as chlorine in designated chemical house on WTP properly/ 72. Define and implement a formal waste (mainly domestic waste) collection and disposal protocol	Water Treatment Plan	Continuou sly	If required	Included in the operation cost of HWMC	DARD offices of Loc Ha, Can Loc DPCs	HWMC
Production of WTP sludge	Contamination of environment	73. Ensure sludge transportation with suitable truck tank and covered to landfill of Loc Ha district. 74. Develop and implement regular sludge quality monitoring to document sludge quality.	WTP	Continuou sly	If required	Included in the operation cost of HWMC	DARD offices of Loc Ha, Can Loc DPCs	HWMC
Operation of the whole water supply system	Worker and public injury	75. Provide protective gear for workers and train them how to use properly. Equip first aid kit and fire extinguishers for the WTP. 76. Ensure all Water supply system vehicles in good working order.	All facilities	Continuou sly	If required	Included in the operation cost of HWMC	DARD offices of Loc Ha, Can Loc DPCs	HWMC

C. ENVIRONMENTAL MONITORING

103. An environmental monitoring program will be outlined to monitor the environmental impacts arising during project implementation, including:

- Monitoring the surrounding environment: only typical pollutants arising from the project construction is required to be monitored in accordance with existing standards and regulations of Vietnam with a frequency of at least once in every 6 months, the supervisory positions will be expressed explicitly in a diagram with annotation and coordinate under current regulations.

104. Ha Tinh PMU or ESP under LIC will implement environmental monitoring program during the construction phase. In the operation phase, HWMC and DARD offices in Loc Ha, Can Loc districts, will implement environmental monitoring program.

Compliance Monitoring

105. Table 11 below shows the program for monitoring the compliance on various provisions of the EMP during construction and operation phases. ESP needs to implement a number of measures during detailed design phase (e.g., incorporation of environmental design measures into the detailed design, update EMP, etc.) and this will be confirmed by PMU to ADB. During construction, most of the mitigation the contractors shall implement measures and CSC and ESP shall monitor their environmental performance, in terms of implementation of such measures. The timing or frequency of monitoring is also specified in Table 11. During operation EMP implementation shall be the responsibility HWMC.

106. Prior to implementation of the subproject the IEE and EMP will be updated and amended, as necessary, by ESP after the detailed designs are complete and contracting arrangements are known. Such updating shall be based on reconfirmation and any additional information on the assumptions made at this feasibility stage on location scale and expected conditions of the subproject.

Table 12 - Environmental Monitoring Compliance

Environmental Indicators	Location	Means of Monitoring	Frequency	Reporting	Responsibility		Estimated Cost (USD)
					Supervision	Responsibility	
Pre-construction Phase – Update Baseline Conditions							
Update baseline on presence of rare & endangered fauna & flora, and critical habitat that may be affected by construction of the water collection supports, booster station, WTP, and pipeline construction and operation.	All sites.	Review of existing data and information supplemented by original surveys as required.	Once	Once	DARD offices of Loc Ha, Can Loc DPCs	PMU	Included in the operation budget of Ha Tinh PMU
Air quality (dust, CO, NOx, SOx, noise, wind, and vibration levels) to supplement baseline air quality data collected during PPTA and reported in IEE Water quality parameters sampled Cu Lay Reservoir and Tap water of Ha Tinh city water plant by PPTA & reported in IEE.	Representative sites of heavy civil & earthwork including along truck routes At raw water intake location	Using field and analytical methods described in QCVN and TCVN standards for ambient air and surface water quality sampling & analysis.	One day and one night measurement	One baseline supplement report before construction phase starts	DARD offices of Loc Ha, Can Loc DPCs	ESO	Included in the operation budget of Ha Tinh PMU
Construction phase							
A) Air quality: dust, CO, NOx, SOx, noise, wind, and vibration levels B) Surface water quality: TSS, heavy metals (As, Cd, Pb,) oil and grease, total & fecal coliform, pH, DO, COD, BOD_5, temperature, NH_3, and other nutrient forms of N & P. C) Public comments and complaints D) Incidence of worker or public accident or injury	A): At Cu Lay Reservoir and commune centers of 9 communes B): Surface water of Cu Lay, near water pumping station C): Using hotline number placed at construction areas D): At all construction	A – B: Using field and analytical methods described in QCVN and TCVN standards for ambient air and surface water quality monitoring. Include visual observations of dust and noise from contractor & public reports. C) Information transferred by telephone hotline number D) Regular reporting by contractors/ Ha Tinh PMU	(A–B): Quarterly during construction periods (1 time for baseline data and 4 times in 1 year construction) C) Continuous public input D) Continuous	Quarterly	PMU	ESP	A) &B) (60$ & 400$) per sample times under cost norm of Ha Tinh[13] C) & D) With (no extra cost)
					PMU/ CSC	ESP / contractor	
Operation of WTPs & Pipeline Network							
Worker & public injury associated		Regular record keeping			HWMC		

[13] Figures have been estimated base on Ha Tinh cost norm.

with WTP & pipeline network	On property of WTP, pipelines, and pump stations		Continuously	For each event		Included in the operation cost of HWMC
Treated water quality: total & fecal coliform, pH, DO, NH_3, NO_3, NO, chlorine, PAC, NaCl, and heavy metals (As, Cd, Pb,).	At WTP & random user locations along distribution network	Using field and analytical methods described in QCVN & TCVN standards for water quality monitoring, and parameters of QCVN 14:2008/BTNMT & TCXDVN 33:2008/BXD	Biannually, or when public complaint arises	For each event	DONRE offices of Loc Ha, Can Loc DPCs	Under DONRE offices regular operation cost
WTP sludge quality: ToC, heavy metals (As, Cd, Pb,), coliforms, pH, BOD, nutrients (N&P), PAC, chlorine,	After removal from sludge tank and before disposal at designated landfill.	Using field and analytical methods described in QCVN & TCVN standards for water quality monitoring	Quarterly for 5 years	Biannually	HWMC	Included in the operation cost of HWMC
Public complaints of operation of WTPs, drinking water availability & quality, and malfunctions with pipelines (e.g., leaks).	At all sites	Regular record keeping	Continuously	Biannually	HWMC	Included in the operation cost of HWMC

D. REPORTING

107. The PMU will submit the following reports to ADB:

- *Monitoring report for baseline environment:* this report shows the result of baseline measurements as required in the EMP. This report will be submitted to ADB before the construction starts.
- *Environmental monitoring reports:* Environmental monitoring reports will cover the status of EMP implementation in terms of required mitigation measures for different phases of the subproject, results of environmental effects monitoring, necessary remedial actions to effectively address negative environmental impacts due to subproject implementation, status of environmental capacity building activities as well as documentation of complaints received and corresponding action/resolution. The environmental monitoring reports will be submitted to ADB semi-annually during the construction phase and annually for two years after completion of construction.

Table 13 – Reporting procedures

Project Phase	Type Of Report	Frequency	Responsibility	Submitted To Whom
Construction	**Environmental Performance Report** indicating compliance with EMP and monitoring results at the contractor site	Monthly	Construction contractor	CSC
	Subproject EMP Compliance Report indicating compliance with subproject EMP and monitoring results	Quarterly	CSC	PMU
	EMP Compliance Report indicating compliance with subproject EMP and monitoring results	Semi-annually during construction phase	ESP/ PMU	ADB
Operation	**EMP Compliance Report: Operation** indicating compliance with subproject EMP commitments during operation	Annually in the first year of operation. On-going frequency to be determined based on review after 1 year.	HWMC	DONRE Offices of Loc Ha, Can Loc DPCs

Table 14 – Estimated cost for EMP Implementation (1-year construction/ 2-year in total)

Item	Estimated cost (US$)
1. Environment Safeguard Specialist (ESP)	***10,920***
1 National ESP - 03 man-months (intermittent in 1 year construction) – 2,000 US$/ man-month	6,000
Per diem for ESP: 48 US$ x 30 days x 3 months	4,320
Travelling cost for 2 round trips: 300 US$ x 2 trips	600
2. Environmental effects monitoring (implemented by ESP)	***4,400***
Ambient air quality: 8 monitoring location x 5 times x 60 US$/sample[14]	2,400
Water quality: 1 monitoring location x 5 times x 400 US$/sample[15]	2,000
3. Training/orientation, local transportation, supplies (by ESP)	***1,500***
a) Training/orientation: 1 formal training course for PMU, CSC, Contractors and DARD office of Loc Ha, Can Loc districts and other "on the job" training	1,000
b) Local transportation and supplies	500
4. Printing Environmental monitoring report by ESP (8 reports)	***300***
Subtotal (1+2+3+4)	**17,120**
5. Contingency	**880**
Total (1+2+3+4+5)	**18,000**

E. CAPACITY BUILDING

108. In Viet Nam, the environmental assessment process is established but environmental awareness and capability for implementation of EMP in infrastructure projects of both the executing agency and the implementation agency (PMU) are limited and in development. The safeguards staff of the PMU is usually responsible for many different task and do not have good background on safeguards issues. Usually, the engineer will also be in charge of the environmental monitoring and his/ her capacity is not suitable to check the adequacy of the subproject EMP. The IEEs and EMP are referred to the environmental department in DONRE for approval. During the Project PPTA phase, PPU has been established under Ha Tinh DPI with one staff has been assigned as ESO.

109. The most significant challenge is the lack of human and financial resources and necessary infrastructure. To address this constraint, Ha Tinh DPI/PMU will designate a full time staff as environmental safeguards officer (ESO) to handle the environmental aspects of the subproject during implementation stage. The ESO and other relevant staff of PMU will be trained by the Environment Safeguard Specialist (ESP) during subproject implementation as "on the job" training or by formal training courses.

Table 15 – Detail capacity building program

Objective	1. Build capacity and procedures in undertaking systematic environmental assessments in accordance with Government regulations and ADB guidelines

[14] Figures have been estimated base on environmental monitoring cost norm of Ha Tinh province.
[15] Figures have been estimated base on environmental monitoring cost norm of Ha Tinh province.

	2. Provide training on international best practice on environmental management, monitoring and reporting. 3. Provide guidance on how to effectively incorporate environmental measures into project design and how to incorporate EMP provisions into tender and contract documents.
Tasks/Scope of Work	1. Undertake training needs analyses and review prevailing government regulations and donor guidelines governing the assessment and management of environmental impacts for road development. 2. Review the skills of PMU and HWMC staff to establish existing capacity on environmental assessments, environmental monitoring and implementation of mitigation measures for road development project. 3. Prepare the training plan and relevant training materials. 4. Deliver the training, which may be through a combination of hands-on assistance, on-the-job training, and training workshops. 5. Evaluate the effectiveness of the training measuring improvements in attitudes and skills achieved. 6. Modify the training documents/materials as necessary. 7. Hand-over the amended training documents/ material to the project manager for use in the delivery of the training. 8. Prepare report on result of training.
Time frame	Possible within 2 months after construction commencement
Target participant	Staff in PMU and HWMC who responsible for environmental management
Staff resources	National environmental specialist with at least 7 years experience on environmental management water supply projects and must possess relevant graduate degrees in civil engineering, environmental management and other relevant courses.

X. CONCLUSIONS AND RECOMMENDATIONS

110. This IEE study was carried out in the Technical Assistant for Project Preparation (PPTA) phase. Primary and secondary data were used to assess potential environmental impacts in a comprehensive manner and public consultation and route reconnaissance were carried out in order complete the environmental assessments and recommend suitable mitigation measures. The IEE report provides a picture of potential environmental impacts associated with the upgrading of the subproject road and suitable mitigation measures have been recommended.

111. The implementation of the subproject "Water Supply System for 7 Communes in Loc Ha District and 2 Communes in Can Loc District, Ha Tinh Province" will improve conditions and enhance water supply services for people specially including the poor. Several actions are required during the detailed design stage to minimize impacts to acceptable levels. The negative environmental impacts from the upgrading works will mostly take place during the construction stage. All of the impacts during the construction phase can be mitigated and the required mitigation is detailed in the EMP. Additional human and financial resources will be required to improve environmental capability and to progress and achieve necessary statutory compliance and environmental clearance certification for the subproject or associated activities that also require environmental permits under the environmental laws of Viet Nam – LEP 2014.

112. No further or additional impact assessment is considered necessary at this stage. At the implementation stage, PMU through ESP will develop detail EMP to monitor the schedules of mitigation measures and conduct of environmental effects monitoring activities. EMP must be updated to ensure effective environmental monitoring and should be develop follow-monitoring plan as specified in the EMP. With these measures in place, environmental impacts of the subproject should be manageable and will not result in any residual impacts, which are above accepted environmental standards.

XI. APPENDIX

A. Appendix 1: Photos of the subproject area

Proposed access road to the WTP

Pine resin exploitation in the proposed WTP

Tea water turn to black after mixed with ground water in Hong Loc commune

Cu Lay Reservoir - Subproject water source 1

Location for water tank in booster station

Current pumping system of Thach Ha booster station

B. Appendix 2: Source of Reference Information

1. *Ha Tinh Status of Environmental Report 2015*
2. *Ha Tinh Climate Change Adaptation Plan (2011-2020)*
3. *Report on Water Quality Monitoring Plan in 2015 Ha Tinh DONRE*
4. *The PO reports of the PPTA for Ha Tinh Province*
5. *Social and Resettlement Report of the PPTA*

C. Appendix 3: Environmental Mitigation Measures to Include into Bidding Documents

Obtain construction permits and licenses	Comply with requirements of Ha Tinh DONRE for use of construction equipment, hazardous waste, and chemical management...
Training and capacity building	Implement training program for PMU (ESO), HWMC and contractors
Worker camp operation	Site the workers' camp away from local residential areas Ensure adequate housing including hygiene facilities (water; waste disposal services and facilities; drainage system) Prohibit guns and weapons in the camps Raise awareness on disease transmission, local regulations to avoid conflict. Camp areas must be restored to original conditions upon completion of construction
Tree and vegetation clearance and environmental recovery	Restrict tree and vegetation clearance within the designated Right of Ways for access road and pipe route (ROWs) and designated WTP area. Minimize removals, install barriers around trees that do not need to be removed Re-vegetated and landscaped after constructions complete.
Civil works	Located construction sites away from Hong Loc protection forest, agricultural areas as much as possible No trees cut down out of the plan for construction Hazardous substances such as oils, fuels should be stored and handled far from forest and plantation areas. Waste should not be dumped in the forests or agricultural areas.
Civil works	Locate material and temporary excavated soil stockpiles at least 20m far from water bodies (Nghen River and other rivers, reservoirs). Create sedimentation ditches around material stockpiles to contain rain-induced erosion. Conduct earthworks in the dry periods. Liquid materials like oils, fuels and paints should be stored and handled at least 50m far from water bodies. No washing and maintenance works of machinery within 50m of water bodies. Toilet should be installed far away from water bodies.
Material exploitation and transportation	Inform 9 CPCs and Loc Ha, Can Loc DPCs for the material exploitation plan and construction plan in advance. All borrow pits and quarries should have certificates from DONRE. Borrow pits and quarries should be fenced with warning signs to keep public away. After exploitation complete, borrow pits and quarries should be dewatered, fenced permanently with warning signs to keep public away. Transportation trucks must be covered with canvas. Restrict material transportation in the rush hours (7 - 8 am; 17h - 18h)
Excavation soil management	Surplus soil must be disposed at the designated sites as agreed with local authorities and Ha Tinh DONRE. The disposal site must be far away from residential area and large water bodies such as the Nghen River. Where possible, surplus soil should be used at other construction sites, or disposed in the old quarries, borrow pits. Information (type, estimated volume, source...) of the disposed surplus soil must be recorded. Temporary surplus soil must be stored in high place with impervious ground and cover with tarpaulin and far from residential areas and water bodies.
Solid construction waste and waste water	Management of solid waste and wastewater follow Government regulations and will cover, collection, handling, transport, recycling and disposal of waste and wastewater. Disposal sites should be determined by or approved by DONRE Install enough trash bins at the construction sites (large one for the construction site) Recyclable waste should be separated and sold to buyers in the community. *Hazardous waste* Handling of hazardous waste such as used oil or gasoline containers or batteries must follow Government regulations. Different hazardous types (hydrocarbons, paints, batteries, organic solvents) must be separated and stored in the areas with impervious ground and roof covers.
Noise, vibration and dust generation	Spray water, to control dust from material stockpiles, and exposed soil soil surfaces especially near sensitive receivers. Cover and keep wet material at all stockpiles that contain fine material (not required where material is coarse and not transported by wind). Minimize time that excavations and exposed soils are left exposed. Backfill as soon as possible
Disruption of public services	Set up weekly and daily work plans for locations where outages in utilities and services may occur and inform the public Work with public services management companies for the construction schedule and scale to minimize the duration of services disruption. Inform local authorities and local people of 9 subproject communes for the construction plan

	and scope.
Land and soil erosion	Conduct earthworks in the dry seasons. Maintain a stockpile of topsoil for immediate site restoration following backfilling. Re-vegetation all soil exposure areas as soon as possible.
Workers and public safety	Install fences and warning signs at all the construction sites. Provide sufficient information, disclosure at 9 subproject CPCs and Loc Ha, Can Loc DPCs subproject information. Assign guards at nighttime for all construction sites. Stagnant water should be filled in to avoid disease vector breeding. The contractor should guide and train workers on work safety and construction hazards before workers start working. Provide workers with full protective gears such as helmet, safety boots, protection clothes, masks, gloves and train them in proper use. Provide Medical cabinet with sufficient medicines and fire extinguishers at all construction sites. Assign person in charge for Health, Safety and Environment (HSE) at each construction site and send this person to the training course organized by the subproject. Supervise and check all construction sites daily to ensure potential hazards are removed or identified and marked
Construction and local traffic	Schedule construction vehicle activity during light traffic periods. Install sufficient signage and warning lights at all construction sites. Inform local authorities and local people construction schedule and scope in advance.

D. Appendix 4: National Technical Regulations of Vietnam

NATIONAL TECHNICAL REGULATION

ON SURFACE WATER QUALITY

1. GENERAL PROVISIONS

1.1. Scope of application

1.1.1. This regulation specifies the limit value of surface water quality parameters.

1.1.2. This regulation applies to assess and control the quality of surface water source, as a basis for the protection and use of water appropriately.

1.2. Explanation of terms

Surface water referred to in this Regulation is water flowing through or stagnate on the ground, streams, canals, ditches, gullies, arroyos, lakes, ponds, swamps, ...

2. TECHNICAL REGULATIONS

Limit values of the surface water quality parameters are specified in Table 1.

Table 1. Limit values of the surface water quality parameters

No.	Parameters	Unit	Limit values			
			A		B	
			A1	A2	B1	B2
1	pH		6-8,5	6-8,5	5,5-9	5,5-9
2	Dissolved oxygen (DO)	mg/l	≥ 6	≥ 5	≥ 4	≥ 2
3	Total suspended solidss (TSS)	mg/l	20	30	50	100
4	COD	mg/l	10	15	30	50
5	BOD_5 (20^0C)	mg/l	4	6	15	25
6	Ammonium (NH^+_4) (as N)	mg/l	0,1	0,2	0,5	1
7	Clorua Chloride (Cl^-)	mg/l	250	400	600	-
8	Florua Fluoride (F^-)	mg/l	1	1,5	1,5	2
9	Nitrite (NO^-_2) (as N)	mg/l	0,01	0,02	0,04	0,05
10	Nitrate (NO^-_3) (as N)	mg/l	2	5	10	15
11	Phosphate (PO_4^{3-}) (as P)	mg/l	0,1	0,2	0,3	0,5
12	Xianua Cyanide (CN-)	mg/l	0,005	0,01	0,02	0,02
13	Asen (As)	mg/l	0,01	0,02	0,05	0,1
14	Cadimi (Cd)	mg/l	0,005	0,005	0,01	0,01
15	Lead (Pb)	mg/l	0,02	0,02	0,05	0,05
16	Chrom III (Cr^{3+})	mg/l	0,05	0,1	0,5	1
17	Chrom VI (Cr^{6+})	mg/l	0,01	0,02	0,04	0,05

18	Copper (Cu)	mg/l	0,1	0,2	0,5	1
19	Zinc (Zn)	mg/l	0,5	1,0	1,5	2
20	Nickel (Ni)	mg/l	0,1	0,1	0,1	0,1
21	Iron (Fe)	mg/l	0,5	1	1,5	2
22	Mercury (Hg)	mg/l	0,001	0,001	0,001	0,002
23	Surface-active substances	mg/l	0,1	0,2	0,4	0,5
24	Total oil & grease	mg/l	0,01	0,02	0,1	0,3
25	Phenon (Total)	mg/l	0,005	0,005	0,01	0,02
26	Organic chlorine pesticide					
	Aldrin + Dieldrin	µg/l	0,002	0,004	0,008	0,01
	Endrin	µg/l	0,01	0,012	0,014	0,02
	BHC	µg/l	0,05	0,1	0,13	0,015
	DDT	µg/l	0,001	0,002	0,004	0,005
	Endosunfan(Thiodan)	µg/l	0,005	0,01	0,01	0,02
	Lindan	µg/l	0,3	0,35	0,38	0,4
	Chlordane	µg/l	0,01	0,02	0,02	0,03
	Heptachlor	µg/l	0,01	0,02	0,02	0,05
27	Organic phosphorus pesticide					
	Parathion	µg/l	0,1	0,2	0,4	0,5
	Malathion	µg/l	0,1	0,32	0,32	0,4
28	Herbicide					
	2,4D	µg/l	100	200	450	500
	2,4,5T	µg/l	80	100	160	200
	Paraquat	µg/l	900	1200	1800	2000
29	Total radioactivity α	Bq/l	0,1	0,1	0,1	0,1
30	Total radioactivity β	Bq/l	1,0	1,0	1,0	1,0
31	E.coli	MPN/ 100ml	20	50	100	200
32	Coliform	MPN/ 100ml	2500	5000	7500	10000

Note: The classification of surface water to assess and control the quality of water for various purposes of water use:

A1 - Good use for the purpose of domestic water supply and other purposes, such as type A2, B1 and B2.

A2 – Used for the purpose of domestic water supply but applying the appropriate treatment technology; aquatic plant and animal conservation, or purposes of use as type B1 and B2.

B1 - Use for irrigation and drainage purpose or other purposes with similar water quality requirements or other purposes of use such as type B2.

B2 – Water transportation and other purposes with low water quality requirements.

3. METHOD FOR DETERMINATION

3.1. Sampling for surface water quality monitoring conducted under the guidance of national standards:

- TCVN 5992:1995 (ISO 5667-2: 1991) - Water quality - Sampling. Guidance on sampling techniques.

- TCVN 5993:1995 (ISO 5667-3: 1985) - Water quality - Sampling. Guidance on storage and handling of samples.

- TCVN 5994:1995 (ISO 5667-4: 1987) - Water quality - Sampling. Guidance on sampling in natural and artificial lakes and ponds.

- TCVN 5996:1995 (ISO 5667-6: 1990) - Water quality - Sampling. Guidance on sampling in rivers and streams.

3.2. Analytical methods to determine the parameters of surface water quality shall comply with the guidance of the national standards or corresponding analytical standards of international organizations:

-TCVN 6492-1999 (ISO 10523-1994) - Water quality - Determination of pH.

-TCVN 5499-1995. Water quality - Determination of dissolved oxygen - Winkler method.

- TCVN 6625-2000 (ISO 11923-1997) - Determination of suspended solids by filtration through glass-fibre filters

- TCVN 6001-1995 (ISO 5815-1989) - Water quality - Determination of biochemical oxygen demand after 5 days (BOD 5) - Dilution and seeding method.

- TCVN 6491-1999 (ISO 6060-1989) - Water quality - Determination of the chemical oxygen demand.

- TCVN 6494-1999 - Water quality - Determination of ions of fluoride, chloride, nitrite, Orthophotphat, bromide, nitrate and soluble sulphate in liquid ion chromatography.

- TCVN 6194-1996 (ISO 9297-1989) - Water quality - Determination of chloride. The method of titration of nitrate silver with chromate indicator (MO method).

- TCVN 6195-1996 (ISO 10359-1-1992) - Water quality - Determination of fluoride - Electrochemical probe method for potable and lightly polluted water

- TCVN 6178-1996 (ISO 6777-1984) - Water quality - Determination of nitrite. Molecular absorption spectrometric method.

- TCVN 6180-1996 (ISO 7890-3-1988) - Water quality - Spectrometric method using sulfosalicylic acid

- TCVN 5988-1995 (ISO 5664-1984) - Water quality - Determination of ammonium - Distillation and titration method.

- TCVN 6181-1996 (ISO 6703-1-1984) - Water quality - Determination of total cyanide.

- TCVN 6336-1998 (ASTM D 2330-1988) - Test method for Methylene Blue Active Substances

- TCVN 5991-1995 (ISO 5666-3-1984) - Water quality - Determination of total mercury by flameless atomic absorption spectrometry - Method after digestion with bromine

- TCVN 6002-1995 (ISO 6333-1986) - Water quality - Determination of manganese - Formaldoxime spectrometric method

- TCVN 6053-1995 (ISO 9696-1992) - Water quality - Measurement of gross alpha activity in non-saline water - Thick source method

- TCVN 6177-1996 (ISO 6332-1988) - Water quality - Determination of iron - Spectrometric method using 1,10 - phenanthroline

- TCVN 6193-1996 (ISO 8288-1986) - Water quality - Determination of cobalt, nickel, copper, zinc, cadmium and lead - Flame atomic absorption spectrometric methods

- TCVN 6197-1996 (ISO 5961-1994) - Water quality - Determination of cadmium by atomic absorption spectrometry

- TCVN 6222-1996 (ISO 9174-1990) - Water quality. Methods for the determination of total chromium by atomic absorption spectrometry

- TCVN 6626-2000 (ISO 11969-1996) - Water quality - Determination of arsenic - Atomic absorption spectrometric method (hydride technique)

- TCVN 6216-1996 (ISO 6439-1990) - Water quality - Determination of phenol index - 4-Aminoantipyrine spectrometric methods after distillation

- TCVN 5070-1995 - Water quality - Weight method for determination of oil and oil products

- TCVN 6053-1995 (ISO 9696-1992) - Water quality - Measurement of gross alpha activity in non-saline water - Thick source method

- TCVN 6219-1995 (ISO 9697-1992) - Water quality - Measurement of gross beta activity.

- TCVN 6187-1-1996 (ISO 9308-1-1990) - Water quality - Detection and enumeration of coliform organisms, thermotolerant coliform organisms and presumptive Escherichia coli - Part 1: Membrane filtration method

The parameters specified in this Regulation not having national standards guiding the analytical method shall apply the corresponding analytical standards of the international organizations

4. IMPLEMENTATION ORGANIZATION

This Regulation shall apply in substitution for TCVN 5942:1995 - Water quality - surface water quality standards in the List of Vietnamese standards on environment which is mandatorily applied and issued together with Decision No. 35/2002/QD-BKHCNMT dated June 25, 2002 of the Minister of Science, Technology and Environment.

In case the national standards referred in this Regulation amended and supplemented or superseded shall be applied under new documents.

QCVN 09: 2008/BTNMT

NATIONAL TECHNICAL REGULATION

ON UNDERGROUND WATER QUALITY

Introduction

QCVN 09:2008 / BTNMT was written by the Compilation Board of national technical regulations on water quality, submitted by the General Department of Environment and Legal Department for approval and issued under the Decision No. 16/2008/QD-BTNMT dated December 31, 2008 of the Minister of Natural resources and Environment.

NATIONAL TECHNICAL REGULATION

ON UNDERGROUND WATER QUALITY

1. GENERAL PROVISIONS

1.1. Scope of application

1.1.1. This regulation specifies the limit value of underground water quality parameters.

1.1.2. This regulation applies to assess and control the quality of underground water source, as a basis for the orientation of various purposes of use.

1.2. Explanation of terms

Underground water in this Regulation is the water in the soil and rocks underground.

2. TECHNICAL REGULATIONS

Limit values of the underground water quality parameters are specified in Table 1.

Table 1: Limit values of the underground water quality parameters

No.	Parameters	Unit	Limit values
1	pH	-	5,5 - 8,5
2	Hardness (as CaCO3)	mg/l	500
3	Total solids	mg/l	1500
4	COD ($KMnO_4$)	mg/l	4
5	Ammonium (as N)	mg/l	0,1
6	Chloride (Cl-)	mg/l	250
7	Fluoride (F-)	mg/l	1,0
8	Nitrite (NO^-_2) (as N)	mg/l	1,0
9	Nitrate (NO^-_3) (as N)	mg/l	15
10	Sulgreasee (SO_4^{2-})	mg/l	400
11	Cyanide (CN-)	mg/l	0,01
12	Phenol	mg/l	0,001
13	Asenic (As)	mg/l	0,05

14	Cadimi (Cd) Cadmium (Cd)	mg/l	0,005
15	Lead (Pb)	mg/l	0,01
16	Chromium VI (Cr6 +)	mg/l	0,05
17	Copper (Cu)	mg/l	1,0
18	Zinc (Zn)	mg/l	3,0
19	Manganese (Mn)	mg/l	0,5
20	Mercury (Hg)	mg/l	0,001
21	Iron (Fe)	mg/l	5
22	Selenium (Se)	mg/l	0,01
23	Total radioactivity α	Bq/l	0,1
24	Total radioactivity β	Bq/l	1,0
25	E.Coli	MPN/100ml	Not found
26	Coliform	MPN/100ml	3

3. METHOD FOR DETERMINATION

3.1. Sampling for underground water quality monitoring conducted under the guidance of national standards:

- TCVN 5992:1995 (ISO 5667-2: 1991) - Water quality - Sampling - Guidance on sampling techniques

- TCVN 5993:1995 (ISO 5667-3: 1985) - Water quality -sampling -Guidance on the preservation and handling of samples

- TCVN 6000:1995 (ISO 5667-11: 1992) - Water quality -sampling -Guidance on the sampling of groundwaters

3.2. Analytical methods to determine the parameters of underground water quality shall comply with the guidance of the national standards or corresponding analytical standards of international organizations:

- TCVN 6492-1999 (ISO 10523-1994) - Water quality - Determination of pH

- TCVN 2672-78 – Potable water – Method for determing the general hardness

- TCVN 6178-1996 (ISO 6777-1984) - Water quality -Determination of nitrite - Molecular absorption spectrometric method

- TCVN 6180-1996 (ISO 7890-3-1988) - Water quality - Determination of nitrate - Spectrometric method using sulfosalicylic acid

- TCVN 6200-1996 (ISO 9280-1990) - Water quality - Determination of sulgreasee - Gravimetric method using barium chloride

- TCVN 6181-1996 (ISO 6703-1-1984) Water quality - Determination of total cyanide

- TCVN 5988-1995 (ISO 5664-1984) - Water quality - Determination of ammonium -Distillation and titration method

- TCVN 6194-1996 (ISO 9297-1989) Water quality -Determination of chloride - Silver nitrate titration with chromate indicator (Mohr's method)

- TCVN 6195-1996 (ISO 10359-1-1992) - Water quality - Determination of fluoride - Part 1: Electrochemical probe method for potable and lightly polluted water

- TCVN 6216-1996 (ISO 6439-1990) - Water quality - Determination of phenol index -4-Aminoantipyrine spectrometric methods after distillation

- TCVN 6626-2000 (ISO 11969-1996) - Water quality - Determination of arsenic - Atomic absorption spectrometric method (hydride technique)

- TCVN 6193-1996 (ISO 8288-1986) - Water quality - Determination of cobalt, nickel, copper, zinc, cadmium and lead - Flame atomic absorption spectrometric methods

- TCVN 6197-1996 (ISO 5961-1994) - Water quality - Determination of cadmium by atomic absorption spectrometry

- TCVN 6002-1995 (ISO 6333-1986) - Water quality - Determination of manganese - Formaldoxime spectrometric method

- TCVN 6177-1996 (ISO 6332-1988) - Water quality - Determination of iron - Spectrometric method using 1,10 - phenanthroline

- TCVN 6183-1996 (ISO 9965-1993) -Water quality - Determination of selenium - Atomic absorption spectrometric method (hydride technique)

- TCVN 59910-1995 (ISO 5666-3-1984) Water quality - Determination of total mercury by flameless atomic absorption spectrometry - Method after digestion with bromine

- TCVN 6222-1996 (ISO 9174-1990) - Water quality -Determination of chromium - Atomic absorption spectrometric methods

- TCVN 6187-1-1996 (ISO 9308-1-1990) - Water quality - Detection and enumeration of coliform organisms, thermotolerant coliform organisms and presumptive Escherichia coli - Part 1: Membrane filtration method

The parameters specified in this Regulation not having national standards guiding the analytical method shall apply the corresponding analytical standards of the international organizations

4. IMPLEMENTATION ORGANIZATION

This Regulation shall apply in substitution for TCVN 5944:1995- Water quality - underground water quality standards in the List of Vietnamese standards on environment which is mandatorily applied and issued together with Decision No. 35/2002/QD-BKHCNMT dated June 25, 2002 of the Minister of Science, Technology and Environment.

In case the national standards referred in this Regulation amended and supplemented or superseded shall be applied under new document

QCVN 05:2013/BTNMT

NATIONAL TECHNICAL REGULATIONS ON AMBIENT AIR QUALITY

Introduction

QCVN 05:2013/BTNMT was written by the Compilation Board of national technical regulations on ambient air quality, submitted by the General Department of Environment and Legal Department for approval and issued under the Circular No. 32/2013/TT-BTNMT dated October 25, 2013 of the Minister of Natural resources and Environment.

National Technical Regulation on Ambient Air Quality

1. GENERAL PROVISIONS

1.1. Scope of applications

1.1.1. This Regulation deals with limitations on values of basic factors including sulphur dioxide (SO2), carbon monoxide (CO), dioxide nitrogen (NO2), ozone (O3), total suspended particles (TSP), PM10, PM2.5, particles, and lead (Pb) in ambient air.

1.1.2. This Regulation applies to supervision and assessment of ambient air quality.

1.1.3. This Regulation does not apply to air within manufacturing facilities and indoor air.

1.2. Interpretation of terms

In this Regulation, the terms below are construed as follows:

1.2.1. Total suspended particles (TSP) is total particles with aerodynamic diameter less than or equal to 100 μm.

1.2.2. Particle PM_{10} is total suspended particles with aerodynamic diameter less than or equal to 10 μm.

1.2.3. Particle $PM_{2,5}$ is total suspended particles with aerodynamic diameter less than or equal to 2,5 μm.

1.2.4. Average 1 hour: The arithmetic average of the measured values over a period of 1 hour.

1.2.5. Average 8 hours: The arithmetic average of the measured values over a period of 8 consecutive hours.

1.2.6. Average 24 hours: The arithmetic average of the measured values over a period of 24 consecutive hours (a day).

1.2.7. Annual average: The arithmetic average of the 24-hour average values measured over a period of one year.

2. Technical Reputation

Maximum value of basic parameters of ambient air is specified in Table 1.

Table 1: Maximum value of basic parameters of ambient aire

Unit: Micro gram over cubic meter ($\mu g/m^3$)

No.	Paramater	Average 1 hour	Average 8 hours	Average 24 hours	Annual average
1	SO_2	350	-	125	50

2	CO	30.000	10.000	-	-
3	NO_2	200	-	100	40
4	O_3	200	120	-	-
5	Total Suspended Particle (TSP)	300	-	200	100
6	Dust PM_{10}	-	-	150	50
7	Dust $PM_{2,5}$	-	-	50	25
8	Pb	-	-	1,5	0,5
Note: (-) unspecified					

E. Appendix 5: Underground water testing - Manganese

Customer : Ha Tinh Irrigation Construction Consulting, JSC
Address : 04 Nguyen Huy Tu, Ha Tinh city, Ha Tinh province
Sample : Water sample
Code : N0816-222, 223 Sample No.: 2
Date of receiving: 17/09/2016 Date of completing: 21/09/2016

Test Result of Underground Water

No.	Indicators	Unit	Analysis result	Analyzing Standard	QCVN 09-MT:2015/BTNMT
			NM		
1	Mn[ab]	mg/l	1.05	SMEWW 3500-Mn(B)-2012	0.5
Test Result of Surface Water					
					QCVN 08-MT:2015/BTNMT (A2 column)
1	Mn[ab]	mg/l	<0.1	SMEWW 3500-Mn(B)-2012	0.2

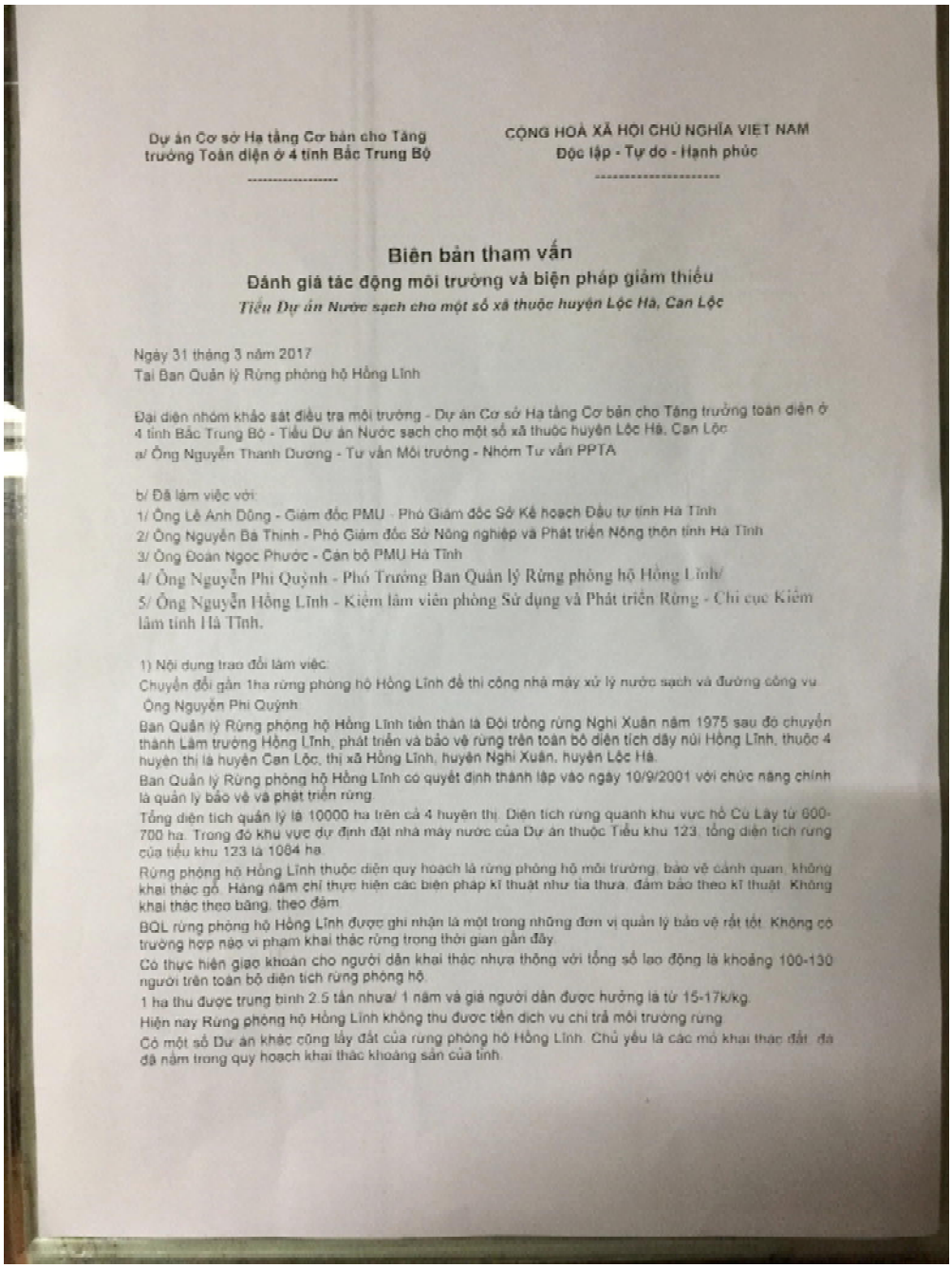
Notes:
- ***Notation***:
+ **NN**: Water from drilled well in Ms.Phuong's house in Hong Loc commune
+ **NM**: Surface water from Cu Lay lake, Can Loc district
+ Standard for comparison:
+ **QCVN 09-MT:2015/BTNMT**: National technical standard on quality of underground water
+ **QCVN 08- MT:2015/BTNMT**: National technical standard on quality of surface water
+ A2 column – used for the purpose of domestic use, but must be treated with proper technology; conservation of aquarium creatures or using purposes like B1 and B2.

Hanoi, September 21st, 2016

QA/QC	ANALYSIS DEPARTMENT MANAGER	DEPUTY DIRECTOR
(Signed)	*(Signed)*	*(Signed and sealed)*
Trinh Thi Oanh	**Phuong Thi Tam**	**Khuat Anh Tuan**

- (-): No regulation available
- This results is applicable on the analyzed sample only
- Indicators with (a) mark: recongnized by Vilas 755
- Indicators with (b) mark: reconginized by Vincents 034
- Indicators with (*) mark: carried out by subcontractor
- Names of sample and customer are as required by the customer
- After the time of sample saving, the Analysis Department is not responsible for any claim relating to this analysis.

F. Appendix 6: List of attendance - Public consultation



Dự án Cơ sở Hạ tầng Cơ bản cho Tăng trưởng Toàn diện ở 4 tỉnh Bắc Trung Bộ

CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc

Biên bản tham vấn
Đánh giá tác động môi trường và biện pháp giảm thiểu
Tiểu Dự án Nước sạch cho một số xã thuộc huyện Lộc Hà, Can Lộc

Ngày 31 tháng 3 năm 2017
Tại Ban Quản lý Rừng phòng hộ Hồng Lĩnh

Đại diện nhóm khảo sát điều tra môi trường - Dự án Cơ sở Hạ tầng Cơ bản cho Tăng trưởng toàn diện ở 4 tỉnh Bắc Trung Bộ - Tiểu Dự án Nước sạch cho một số xã thuộc huyện Lộc Hà, Can Lộc
a/ Ông Nguyễn Thanh Dương - Tư vấn Môi trường - Nhóm Tư vấn PPTA

b/ Đã làm việc với:
1/ Ông Lê Anh Dũng - Giám đốc PMU - Phó Giám đốc Sở Kế hoạch Đầu tư tỉnh Hà Tĩnh
2/ Ông Nguyễn Bá Thinh - Phó Giám đốc Sở Nông nghiệp và Phát triển Nông thôn tỉnh Hà Tĩnh
3/ Ông Đoàn Ngọc Phước - Cán bộ PMU Hà Tĩnh
4/ Ông Nguyễn Phi Quỳnh - Phó Trưởng Ban Quản lý Rừng phòng hộ Hồng Lĩnh/
5/ Ông Nguyễn Hồng Lĩnh - Kiểm lâm viên phòng Sử dụng và Phát triển Rừng - Chi cục Kiểm lâm tỉnh Hà Tĩnh.

1) Nội dung trao đổi làm việc:
Chuyển đổi gần 1ha rừng phòng hộ Hồng Lĩnh để thi công nhà máy xử lý nước sạch và đường công vụ

Ông Nguyễn Phi Quỳnh:
Ban Quản lý Rừng phòng hộ Hồng Lĩnh tiền thân là Đội trồng rừng Nghi Xuân năm 1975 sau đó chuyển thành Lâm trường Hồng Lĩnh, phát triển và bảo vệ rừng trên toàn bộ diện tích dãy núi Hồng Lĩnh, thuộc 4 huyện thị là huyện Can Lộc, thị xã Hồng Lĩnh, huyện Nghi Xuân, huyện Lộc Hà.
Ban Quản lý Rừng phòng hộ Hồng Lĩnh có quyết định thành lập vào ngày 10/9/2001 với chức năng chính là quản lý bảo vệ và phát triển rừng.
Tổng diện tích quản lý là 10000 ha trên cả 4 huyện thị. Diện tích rừng quanh khu vực hồ Cù Lây từ 600-700 ha. Trong đó khu vực dự định đặt nhà máy nước của Dự án thuộc Tiểu khu 123, tổng diện tích rừng của tiểu khu 123 là 1084 ha.
Rừng phòng hộ Hồng Lĩnh thuộc diện quy hoạch là rừng phòng hộ môi trường, bảo vệ cảnh quan, không khai thác gỗ. Hàng năm chỉ thực hiện các biện pháp kĩ thuật như tỉa thưa, đảm bảo theo kĩ thuật. Không khai thác theo băng, theo đám.
BQL rừng phòng hộ Hồng Lĩnh được ghi nhận là một trong những đơn vị quản lý bảo vệ rất tốt. Không có trường hợp nào vi phạm khai thác rừng trong thời gian gần đây.
Có thực hiện giao khoán cho người dân khai thác nhựa thông với tổng số lao động là khoảng 100-130 người trên toàn bộ diện tích rừng phòng hộ.
1 ha thu được trung bình 2.5 tấn nhựa/ 1 năm và giá người dân được hưởng là từ 15-17k/kg.
Hiện nay Rừng phòng hộ Hồng Lĩnh không thu được tiền dịch vụ chi trả môi trường rừng.
Có một số Dự án khác công lấy đất của rừng phòng hộ Hồng Lĩnh. Chủ yếu là các mỏ khai thác đất, đá đã nằm trong quy hoạch khai thác khoáng sản của tỉnh.

2/ Các ý kiến, đề xuất liên quan đến tác động môi trường và biện pháp giảm thiểu khi chuyển đổi gần 1 ha diện tích rừng phòng hộ môi trường thuộc tiểu khu 123

a) Ông Nguyễn Bá Thịnh: Số tiền nộp quỹ để trồng một ha rừng là 41 triệu đồng. Hàng năm tỉnh Hà Tĩnh trồng từ 6000-7000 ha rừng chủ yếu từ nguồn vốn trung ương cấp mỗi năm khoảng 20 tỉ đồng. Trồng rừng phải lập kế hoạch và trồng theo mục tiêu nên chắc chắn sẽ thực hiện đầy đủ.

Trong kế hoạch trồng rừng hàng năm, có phần phụ lục nêu rõ nguồn kinh phí để thực hiện. Ví dụ như năm 2017 là 6500 ha trong đó có phần kinh phí trồng 1 ha là tiền bồi hoàn trồng rừng từ Dự án.

b) Ông Lê Anh Dũng: PMU Hà Tĩnh sẽ thực hiện nghiêm túc quy định của Nhà nước về trồng rừng thay thế khi thu hồi, chuyển mục đích sử dụng rừng, đồng thời đề nghị UBND tỉnh Hà Tĩnh chỉ đạo và phân định rõ phần trồng bồi hoàn 1 ha của Dự án. Phần 1 ha nên phân tại khu vực dễ đi lại, quan sát để thuận tiện cho quá trình kiểm tra, theo dõi, giám sát trong suốt thời gian thực hiện Dự án.

c) Ông Nguyễn Hồng Lĩnh:

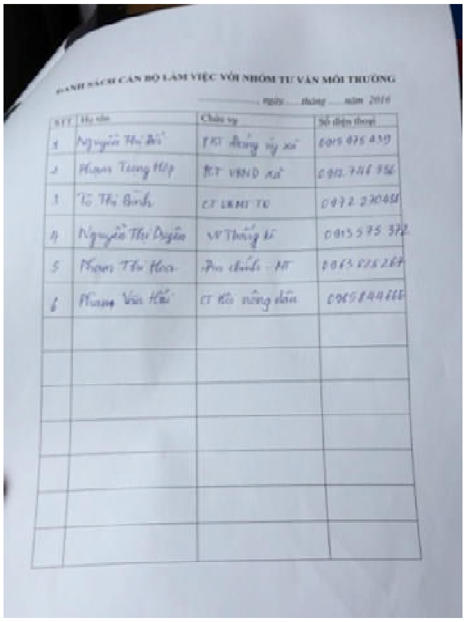
Cần thực hiện theo đúng quy định của nhà nước khi thay đổi mục đích sử dụng rừng. Diện tích nhỏ nhưng cần theo đúng thông tư 26/2015/TT-NNPTNT và Chỉ thị số 02/CT-TTg ngày 24/01/2014 của Thủ tướng Chính phủ về việc tăng cường chỉ đạo thực hiện trồng rừng thay thế diện tích rừng chuyển sang sử dụng mục đích khác.

d) Ông Nguyễn Phi Quỳnh:

Ngoài việc trồng bồi hoàn rừng hoặc nộp tiền vào quỹ trồng rừng, đề nghị xem xét bồi thường thiệt hại cho người dân lấy nhựa thông khi thay đổi mục đích sử dụng đất

Xác nhận

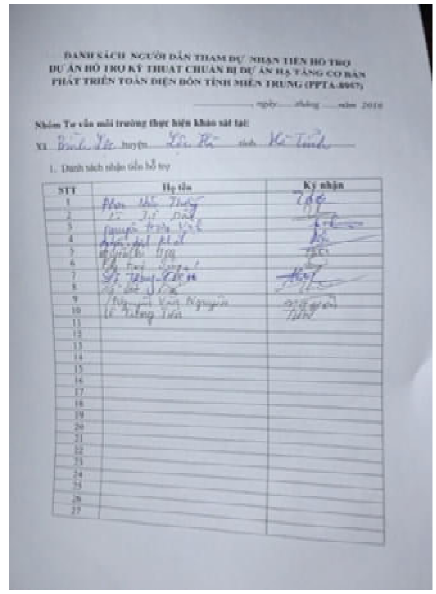
Stt	Họ và tên	Vị trí	Số điện thoại	Ký xác nhận
1.	Ông Lê Anh Dũng	Giám đốc PMU Hà Tĩnh - Phó Giám đốc Sở Kế hoạch và Đầu tư tỉnh Hà Tĩnh	0913294453	
2.	Ông Đoàn Ngọc Phước	Cán bộ PMU Hà Tĩnh	0913029730	
3.	Ông Nguyễn Phi Quỳnh	Phó Trưởng Ban Quản lý Rừng phòng hộ Hồng Lĩnh	0914869979	
4.	Ông Nguyễn Hồng Lĩnh	Kiểm lâm viên phòng Sử dụng và Phát triển Rừng	0944956787	
5.	Ông Nguyễn Thanh Dương	Tư vấn Môi trường	0942231079	



DANH SÁCH CÁN BỘ LÀM VIỆC VỚI NHÓM TƯ VẤN MÔI TRƯỜNG

..............., ngày ..... tháng ..... năm 2016

STT	Họ tên	Chức vụ	Số điện thoại
1	Nguyễn Thị Đối	PBT Đảng ủy xã	0915 075 439
2	Phan Trọng Hợp	PCT UBND xã	0912 748 956
3	Tô Thị Bình	CT UBMT TQ	0972 230458
4	Nguyễn Thị Duyên	VP Thống kê	0913 575 372
5	Phan Thị Hoa	Địa chính - NT	0913 025 264
6	Phan Văn Hải	CT Hội nông dân	0965 844 666



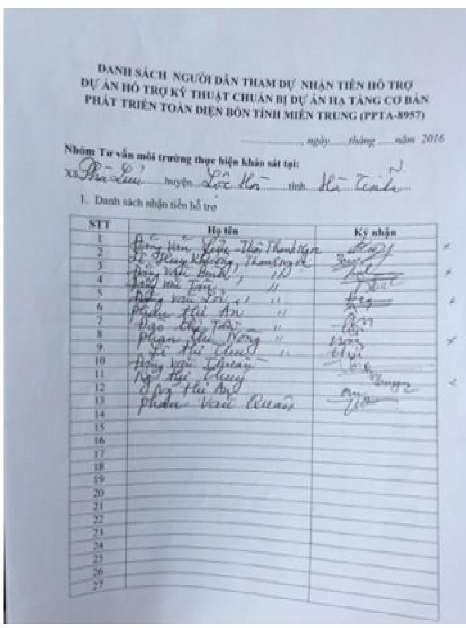
DANH SÁCH NGƯỜI DÂN THAM DỰ NHẬN TIỀN HỖ TRỢ
DỰ ÁN HỖ TRỢ KỸ THUẬT CHUẨN BỊ DỰ ÁN HẠ TẦNG CƠ BẢN
PHÁT TRIỂN TOÀN DIỆN BỐN TỈNH MIỀN TRUNG (PPTA-8957)

..............., ngày ..... tháng ..... năm 2016

Nhóm Tư vấn môi trường thực hiện khảo sát tại:

Xã Bình Lộc huyện Lộc Hà tỉnh Hà Tĩnh

1. Danh sách nhận tiền hỗ trợ



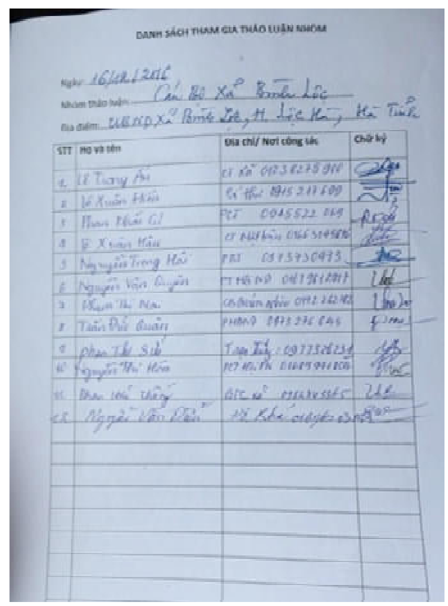
DANH SÁCH NGƯỜI DÂN THAM DỰ NHẬN TIỀN HỖ TRỢ
DỰ ÁN HỖ TRỢ KỸ THUẬT CHUẨN BỊ DỰ ÁN HẠ TẦNG CƠ BẢN
PHÁT TRIỂN TOÀN DIỆN BỐN TỈNH MIỀN TRUNG (PPTA-8957)

..............., ngày ..... tháng ..... năm 2016

Nhóm Tư vấn môi trường thực hiện khảo sát tại:

Xã Phù Lưu huyện Lộc Hà tỉnh Hà Tĩnh

1. Danh sách nhận tiền hỗ trợ

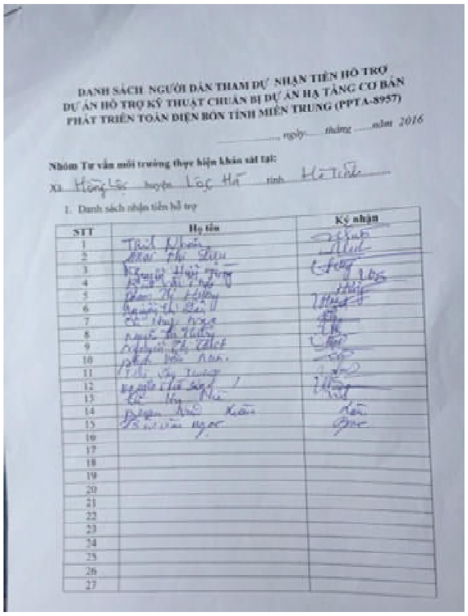


DANH SÁCH THAM GIA THẢO LUẬN NHÓM

Ngày: 16/08/2016

Nhóm thảo luận: Cán bộ xã Bình Lộc

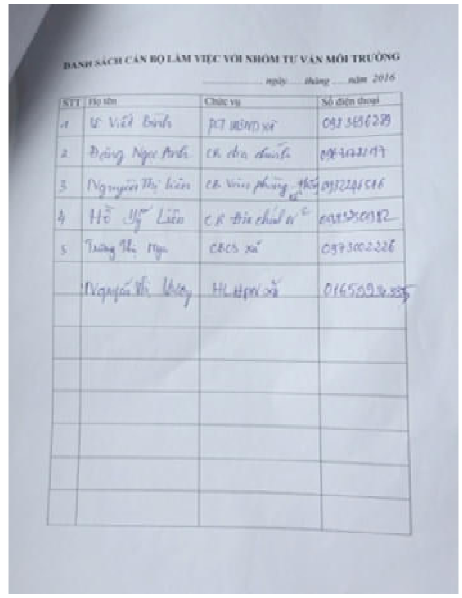
Địa điểm: UBND xã Bình Lộc, H. Lộc Hà, Hà Tĩnh


DANH SÁCH NGƯỜI DÂN THAM DỰ NHẬN TIỀN HỖ TRỢ
DỰ ÁN HỖ TRỢ KỸ THUẬT CHUẨN BỊ DỰ ÁN HẠ TẦNG CƠ BẢN
PHÁT TRIỂN TOÀN DIỆN BỐN TỈNH MIỀN TRUNG (PPTA-8957)
.... ngày ..... tháng ..... năm 2016

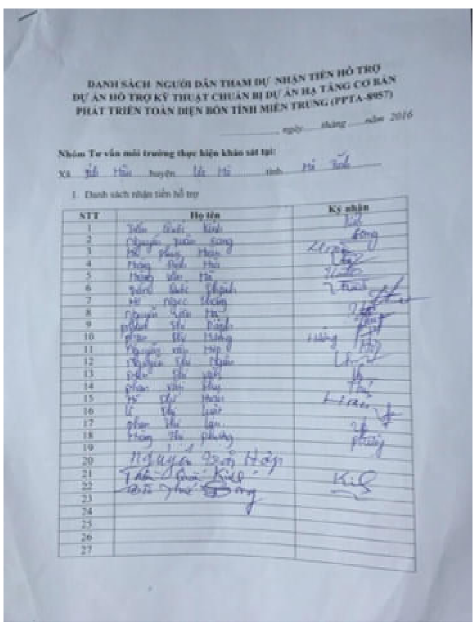
Nhóm Tư vấn môi trường thực hiện khảo sát tại:
Xã Hồng Lộc huyện Lộc Hà tỉnh Hà Tĩnh

1. Danh sách nhận tiền hỗ trợ

STT	Họ tên	Ký nhận


DANH SÁCH CÁN BỘ LÀM VIỆC VỚI NHÓM TƯ VẤN MÔI TRƯỜNG
.... ngày ..... tháng ..... năm 2016

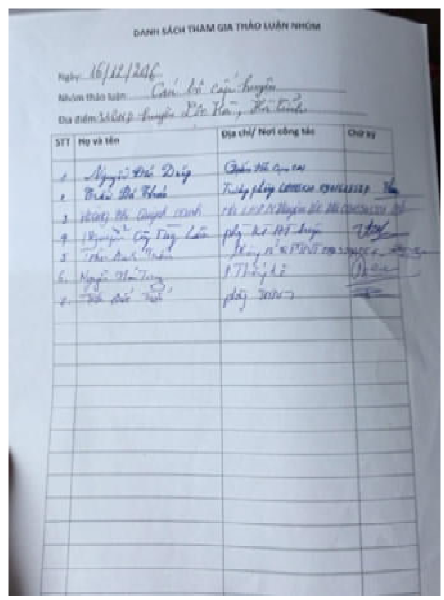
STT	Họ tên	Chức vụ	Số điện thoại


DANH SÁCH NGƯỜI DÂN THAM DỰ NHẬN TIỀN HỖ TRỢ
DỰ ÁN HỖ TRỢ KỸ THUẬT CHUẨN BỊ DỰ ÁN HẠ TẦNG CƠ BẢN
PHÁT TRIỂN TOÀN DIỆN BỐN TỈNH MIỀN TRUNG (PPTA-8957)
.... ngày ..... tháng ..... năm 2016

Nhóm Tư vấn môi trường thực hiện khảo sát tại:
Xã .... huyện .... tỉnh ....

1. Danh sách nhận tiền hỗ trợ

STT	Họ tên	Ký nhận


DANH SÁCH THAM GIA THẢO LUẬN NHÓM

Ngày:
Nhóm thảo luận:
Địa điểm:

STT	Họ và tên	Địa chỉ/ Nơi công tác	Chữ ký