NAM NGIEP 1
POWER COMPANY

Nam Ngiep 1 Hydropower Project

Environmental Management Monthly Monitoring Report

April 2017

Rev	Date	Author	Checked	Approved	Modification Details
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Accessibility	
☑	Public
☐	Internal
☐	Confidential

Document No.

NNP1-C-J0904-RP-028-A

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BBREVIATIONS / ACRONYMS

AIP	Annual Implementation Plan
ADB	Asian Development Bank
BBS	Biodiversity Baseline Survey
BAC	Biodiversity Advisory Committee
BOD_5	The 5 Days Biochemical Oxygen Demand
BOF	Biodiversity Offset Framework
BOMC	Biodiversity Offset Management Committee
BOMP	Biodiversity Offset Management Plan
CA	Concession Agreement between the NNP1PC and GOL,
CAP	Corrective Action Plan
COD	Commercial Operation Date
CVC	Conventional Vibrated Concrete
CWC	Civil Works Contract
CTA	Common Terms Agreement
DEB	Department of Energy Business, MEM
DEPP	Department of Energy Policy and Planning, MEM
DEQP	Department of Environment and Quality Promotion, MONRE
DESIA	Department of Environmental and Social Impact Assessment, MONRE
DFRM	Department of Forest Resources Management, MONRE
DLA	Department of Land Administration, MONRE
DSRP	Dam Safety Review Panel
EC	Electrolytic Conductivity
ECOCD	EGAT Construction Obligation Commencement Date
EDL	Electricite du Laos
EDL PPA	Power Purchase Agreement between NNP1PC and EDL
EGAT	Electricity Generating Authority of Thailand
EGATi	EGAT International Company Limited
EIA	Environmental Impact Assessment
EMMR	Environmental Management and Monitoring Reports
EMO	Environmental Management Office of ESD within NNP1PC
EMU	Environmental Monitoring Unit
EMWC	Electrical-Mechanical Works Contract
EPF	Environmental Protection Fund
ERIC	Environmental Research Institute Chulalongkhorn University
ERM	Environmental Resource Management

ESD	Environmental and Social Division of NNP1PC
ESMMP	Environmental and Social Monitoring and Management Plan
FY	Fiscal Year
GOL	Government of Lao PDR
GIS	Geographic Information Systems
HH	Household
HMWC	Hydraulic Metal Works Contract
HR	Human Resources
IEE	Initial Environmental Examination
IMA	Independent Monitoring Agency
INRMP	Integrated Natural Resources Management Plan
ISP	Intergraded Spatial Planning
km	kilometre
kV	kilo-Volt
LEPTS	Lao Electric Power Technical Standard
LHSE	Lao Holding State Enterprise
LTA	Lender's Technical Advisor
M	million
m	metre
MAF	Ministry of Agriculture and Forestry
MEM	Ministry of Energy and Mines, Lao PDR
MOF	Ministry of Finance, Lao PDR
MOM	Minutes of Meeting
MONRE	Ministry of Natural Resource and Environment, Lao PDR
MOU	Memorandum of Understanding
NBCA	National Biodiversity Conservation Area
NCI	Non-Compliance Issue
NCR	Non-Compliance Report
NH_3-N	Nitrogen-Ammonia
NN2	Nam Ngum 2 Power Company Limited
NNP1PC	Nam Ngiep 1 Power Company Limited
NPF	National Protection Forest
NTFP	Non-Timber Forest Products
NT2	Nam Theun 2 Hydropower Project
OC	Obayashi Corporation
ONC	Observation of Non-Compliance
PAFO	Provincial Department of Agriculture and Forestry

PAP	Project Affected People
PD	Property Damage
PONRE	Provincial Department of Natural Resource and Environment, MONRE
PvPA	Provincial Protection Area
RCC	Roller Compacted Concrete
SIR	Site Inspection Report
SLBMP	Salvage Logging Biomass Management Plan
SOP	Standard Operating Procedure
SMO	Social Management Office of ESD within NNP1PC
SS-ESMMP	Site Specific Environmental and Social Monitoring and Management Plan
TD	Technical Division of NNP1PC
TOR	Terms of Reference
TSS	Total Suspended Solids
UAE	United Analysis and Engineering Consultant Company Ltd.
UXO	Unexploded Ordinance
WMF	Watershed Management Fund
WMP	Watershed Management Plan
WRPC	Watershed and Reservoir Protection Committee
WRPO	Watershed and Reservoir Protection Office
WWTS	Waste Water Treatment System

EXECUTIVE SUMMARY

During April 2017, the Environmental Management Office (EMO) of NNP1PC received a total of seven new Site Specific Environmental and Social Management and Monitoring Plans (SS-ESMMP). With four SS-ESMMP carried over from previous months, there were eleven SS-ESMMP for EMO review during the reporting period. Out of these, one SS-ESMMP was cleared with conditions; two SS-ESMMP are pending for a review and the remaining eight SS-ESMMP are carried over to May 2017.

In addition, EMO issued five new Observations of Non-Compliances (ONC), one incident report on hazardous material management (regarding an oil spill) and resolved three ONC. A total of 13 ONC, two NCR1 and one NCR2 are carried over into May 2017. EMO will follow up with contractors to resolve the remaining issues during May 2017.

During 27 to 28 April 2017, Provincial and District EMUs conducted a joint environmental monitoring mission together with NNP1PC covering the main construction sites and camps, Houay Soup Landfill and Houay Soup Resettlement Area (HSRA). The recruitment of a part time local consultant is in progress and this consultant is expected to start the assignment in early May 2017 to support the laboratory operation including data analysis and Quality Assurance/Quality Control, and performance verification in collaboration with the laboratory of the United Analysis and Engineering Consultant Company Limited (UAE).

The development of the Nam Ngiep 1 Watershed Management Plan continued to progress. The plan was further improved based on discussions with ADB's consultant and NNP1 at the end of April 2017. The improved version will be submitted in the first week of May 2017 for ADB review and approval before further discussion with GOL line agencies.

Recruitment of a consultant for the development of the Biodiversity Offset Management Plan (BOMP) has been delayed pending further discussions with ADB on funding, and institutional and partnership arrangements for the implementation of the BOMP.

Biomass clearance continued to progress. The vegetation cutting is completed for around 47.26 ha out of the target 155 ha for April 2017. The total vegetation cutting until the end of April 2017 is around 946 ha. Biomass burning has started within an area of about 322 ha.

The fishery monitoring programme is progressing, and a database has been developed to support the future fish management programme as part of the Nam Ngiep 1 Hydropower Project Watershed Management Plan. Two types of surveys were conducted during April 2017 including daily fish catch logbook monitoring and gillnet survey. The gathered information is being put into the database system. The data from the daily fish catch logbook monitoring indicates that the mean daily fish catch in Nam Ngiep River was 2.3 kg/household/day in March 2017. The estimated total fish catch in the Nam Ngiep basin for March 2017 is 49,300 kg. Around 35% of the catch was sold, 56% was consumed fresh, 5% processed and approximately 4% was used for other purposes.

1. INTRODUCTION

The Nam Ngiep originates in the mountains of Xieng Khouang Province, flowing through Khoun District into Thathom District of Xaysomboun Province, through Hom District and into Bolikhan District of Bolikhamxay Province. The Nam Ngiep meets the Mekong River just upstream from Pakxan in Bolikhamxay Province (Figure 1-1).

Figure 1-1: Location Map

The project will consist of two dams. The main dam which is located 9.0 km upstream of Hat Gnuin Village in Bolikhan District, will create a 70-km-long, narrow reservoir that extends up the Ngiep Valley as far as Thathom District. At almost 150 m high, the main dam will be the second largest in Lao PDR. The Power Station at this dam will generate up to 272 MW of electricity for export to Thailand. With a combined capacity of 290 MW, Nam Ngiep 1 will generate around 1,620 GWh of electricity annually. Two transmission lines will be required to transport the electricity generated by the project. From the main power station a 230-kV line will run for 125 km to the Nabong outside Vientiane Capital. A 115-kV transmission line will be constructed by EDL from the Re-regulation Power Station to Pakxan substation over a distance of 40 km.

This Environmental Monthly Monitoring Report (EMMR) provides a summary of environmental monitoring activities and mitigation actions in April 2017. The EMMR was prepared by the Project's Environmental Management Office (EMO). It has been internally reviewed and cleared by EMO senior technical staff and management prior to submitting the report to the Government of Lao PDR (GoL) related agencies.

The EMMR and other related reports including related construction Site Specific Environmental and Social Monitoring and Management Plans (SS-ESMMPs) are publically disclosed on the Project website in line with the ADB and GoL Public Disclosure Policies. Hard copies of the final reports will also be available upon requests at the Project's main office in Vientiane Capital and field office in Pakxan, Bolikhamxay Province.

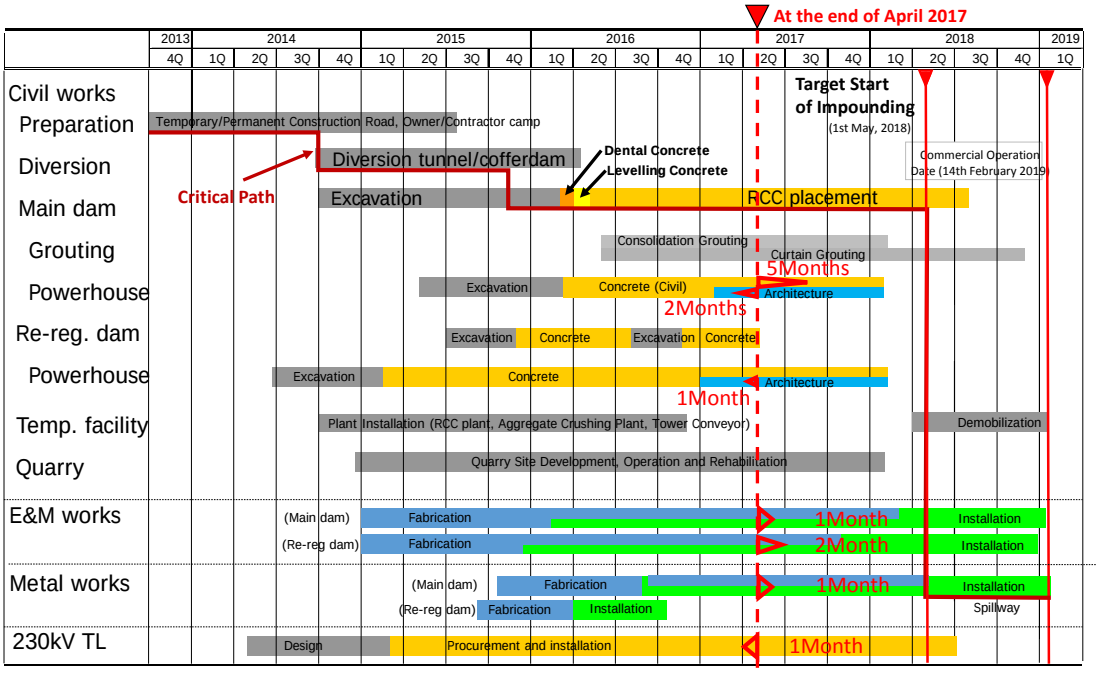
2. WORK PROGRESS OF PRINCIPAL CONTRACTORS

Construction Works for the Project are being carried out through four separate main construction contracts under the supervision of the Technical Division of NNP1PC. The four contracts are the Civil Works, the Electrical and Mechanical Works, the Hydraulic Metal or Hydro-mechanical Works and the 230 kV Transmission Line Works. Actual overall cumulative work progress until the end

of April 2017 was 68.4%[1] (compared to planned progress of 71.1%), based on achieved Interim Milestone Payments for all Contracts excluding the value of Advance Payments, varied works and other adjustments allowed under each Contract. In terms of the value of actual work done the percentage is slightly understated since work completed, but not paid, is not included.

The overall construction schedule and progress curve (by achieved Milestone Payments) are shown in Figure 2-1.

Figure 2-1: Overall Construction Schedule



2.1 Civil Work

The Civil Works Contract was executed between Obayashi Corporation and the Nam Ngiep 1 Power Company on 30 September 2013 and the NTP was issued on 03 October 2014. Excavation works of the main dam, the diversion tunnel and the re-regulation dam were commenced in October 2014 and completed in February 2016, following which the concreting works were commenced.

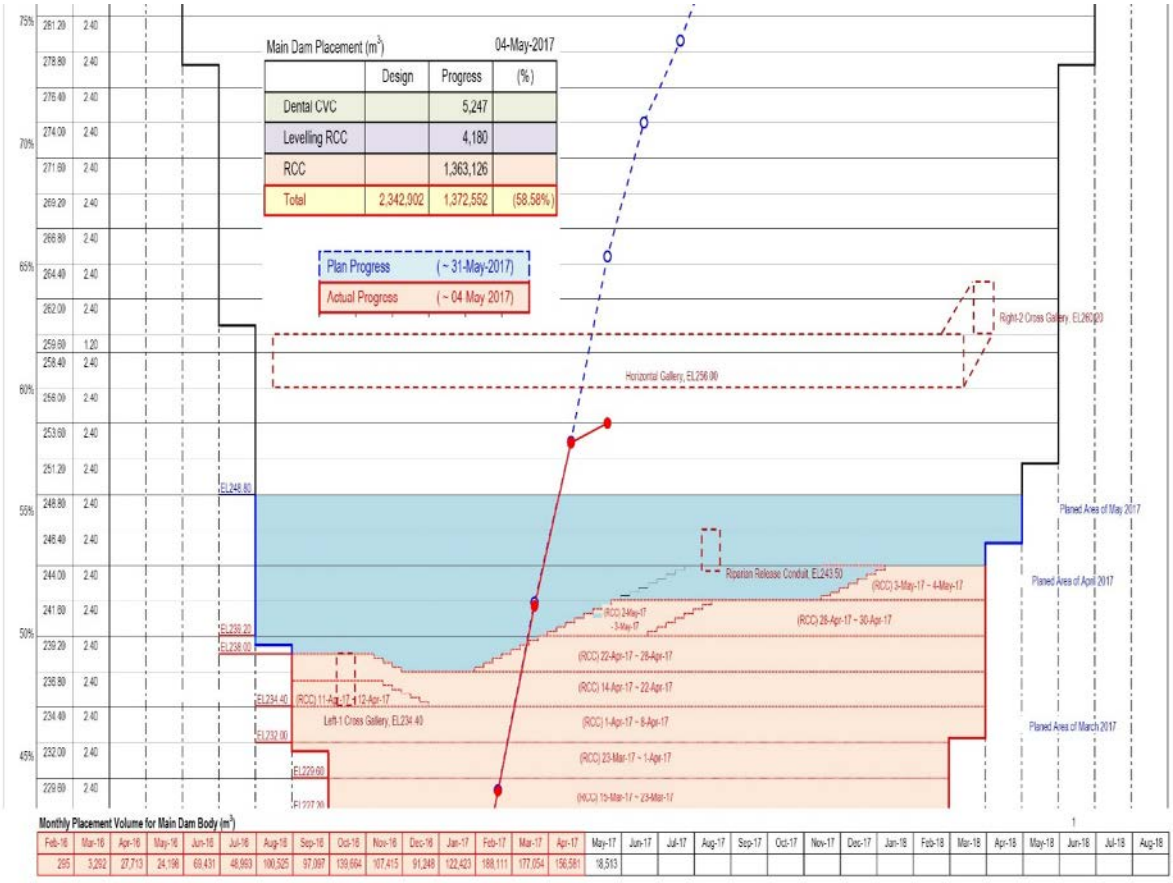
The cumulative actual work progress of the Civil Works until the end of April 2017 was 73.3% (compared to planned progress of 72.7 %) calculated in the same manner as described above for the value of achieved Interim Milestone Payments excluding advance payment.

[1] The progress to-date is calculated as (Cumulative Amount of Achieved Interim Milestone Payments) / (Total Agreed Original Price of Construction Contracts) and expressed as a percentage. These totals exclude varied works and other adjustments allowed under each Contract.

2.1.1 Main dam and power house

After starting the main dam excavation works in October 2014 on the left bank, the works were about one month advanced when diversion of the Nam Ngiep River was achieved at the end of October 2015. However, excavated volumes were 20% greater than expected and part of this additional work is necessary to construct a 'shear key' structure due to the weak layers of rock encountered in the dam foundation. Following the efforts on Site, the additional excavation work was completed at the end of February 2016.

Figure 2-2: Progress of Main Dam RCC Works as of 04 May 2017



The consolidation drilling and grouting for the main dam started in May 2016 and is ongoing. The progress is 88 % by achievement of total drilled length at the end of March 2017 as a proportion of the total expected drilling.

Table 2-1: Progress of consolidation and curtain drilling for grouting as of 28 April 2017

Item	Description	Total Drilling (m)	Completed (m)	Progress (%)
Consolidation Grouting	Anticipated Quantity	16,845	14,951	88
Curtain Grouting	Latest Design Quantity	27,945	5,391	19
	Anticipated Final Quantity	39,000	5,391	14

*The linear metres 'completed' are drilled and grouted.

Main powerhouse sub-structure excavation works were completed in January 2016 and levelling concrete works were started in coordination with installation of the grounding system. Overhead travelling crane runway beam was installed in December 2016. Progress of the powerhouse concreting works is still proceeding well and is shown in Table 2-2 below.

Table 2-2: Progress of Main Powerhouse Sub-Structure Concrete Works to 31 March 2017.

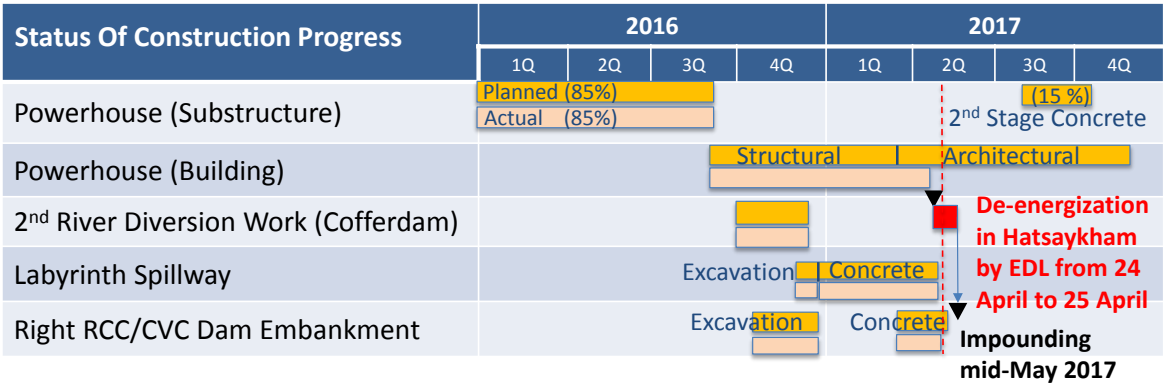
Location	Total Anticipated Volume (m^3)	Completed (m^3)	Progress (%)
Main Powerhouse	32,600	24,769	76
Penstock Embedment	10,117	7,329	72

2.1.2 Re-regulation dam and powerhouse

The re-regulation powerhouse excavation and cofferdam works for river diversion were commenced in early October 2014. The excavation works for the powerhouse on the left bank were fully completed down to El. 146.7 m at the end of February 2015.

Structural concrete works were commenced in March 2015, in coordination with installation of the grounding system. The progress of structural concrete works is shown in Figure 2-3 below

Figure 2-3: Progress of Re-regulation Dam Powerhouse Works to 29 April 2017



Structure	Civil Structure	Spillway		Building		Right Bank RCC Structure	Left Bank Backfill
	Intake + PH + Tailrace	Right Bank Side Concrete	Concrete Apron	Roof Sheet	Block Wall over El.177 m	RCC + CVC	Powerhouse and Switch Yard
	(m3)	(m3)	(m3)	(m2)	(m2)	(m3)	(m3)
Design	26,549	17,515	471	1,532	1,576	11,576	45,000
Completed	24,748	17,515	471	1,532	1,520	10,282	44,000
Progress %	**93**	**100**	**100**	**100**	**96**	**89**	**98**

The powerhouse concreting has advanced well and secondary concrete embedment for the draft tube liner was completed at the end of April 2016. The left bank structure was re-designed as roller compacted concrete (RCC) and was completed on 18 March 2016. Installation of the re-regulation waterway gate and stop log and re-regulation intake gate and structural concrete works for the retaining wall to support the substation yard were completed in October 2016. Building superstructure work continued for the powerhouse with the commencement of construction of concrete columns.

2.1.3 Temporary work facility

2.1.3.1 DIVERSION TUNNEL INLET AND OUTLET

The diversion tunnel works which is over 600 m in length and 10 m in diameter were commenced in October 2014 by drill and blast techniques and completed in late September 2015. The river diversion took place on 31 October 2015 together with construction of earth-fill cofferdams upstream and downstream.

2.1.3.2 SECONDARY UPSTREAM COFFERDAM

The concrete placement works in both conventional and roller compacted concrete (CVC and RCC respectively) for the secondary upstream cofferdam were started in November 2015 and completed ahead of construction schedule in the middle of February 2016. The grout curtain works were completed on 02 April 2016.

2.1.3.3 PLANT YARDS

These comprise the Aggregate Crushing Plant, the CVC Batching Plant and the RCC Batching Plant. Foundation work and installation of equipment were completed at all the plant yards and the belt conveyor system from the RCC plant to the main dam was completed in early April 2016.

2.1.3.4 QUARRY

After removal of overburden the excavation of raw materials for aggregate crushing were started in July 2015. The nature and type of the rock being exploited is acceptable though unsuitable soil layers are removed to spoil disposal areas, and good quarry management continues.

2.1.3.5 DISPOSAL AREAS

The disposal area on the right bank has been available for operation since January 2015, as was the adjacent waste disposal area. The Disposal Area No.9 along Road P1 near the entrance of Road T5 started operation in April 2015. Unsuitable material from the quarry continues to be hauled to Disposal area No.6 and Disposal Area No.9 is being developed by the E&M Contractor as stated above.

2.2 Electrical and Mechanical Works

The EMWC was executed between Hitachi-Mitsubishi Hydro Corporation and NNP1PC on 13 June 2014 and the NTP was issued on 03 October 2014. The cumulative work progress of the Electrical and Mechanical Works by value until the end of April 2017 was 60.8 % (compared to planned progress of 73.3%).

Figure 2-4: Preparation for installation of stay ring OHTC for unit 1 at the main powerhouse

Figure 2-5: Preparation for Installation of Stay Cone at the re-regulation powerhouse

2.3 Hydro-Mechanical Works

The HMWC was executed between IHI Infrastructure Systems (IIS) and NNP1PC on 18 April 2014 and the NTP was issued to the Contractor on 03 October 2014. The cumulative work progress of the Hydro-Mechanical Works until the end of April 2017 was 35.4 % (compared to planned progress of 35.4 %).

The latest progress of penstock pipe fabrication at IHI field shop and erection at main dam as of the end of April 2017 ***in Table 2-3*** below

Table 2-3: Progress of the penstock pipe fabrication at the IHI field shop as at the end of April 2017

Item No.	Work Description	Work Progress (%)	Remarks
1.1	Assembly and Welding	79 %	Straight Pipes
1.1	Painting	76 %	Straight Pipes
1.1	Delivery to Main Dam Laydown Area	34 %	Straight Pipes
1.1	Site Erection at Main Dam	34 %	Inclined Part

2.4 230kV Transmission Line Works

The TLW Contract was executed between Loxley-Sri Consortium and NNP1PC on 11 July 2014 and the NTP was issued to the 230 kV TL Contractor on 03 October 2014. The cumulative work progress of the Transmission Line Works until the end of April 2017 was 84.6% (compared to planned progress of 84.2%).

In respect of the delay to commencement of most works the Contractor is studying its programme to ensure that sufficient resources are committed as the works progress to ensure that completion is achieved in good time. Onset of daily rains has made access to all areas difficult but the Contractor follows its revised acceleration schedule, after the progress for the construction of tower foundations slowed after April, 2016 (See Figure 2-6 below)

Figure 2-6: Cumulative Work Progress of Tower Foundation (Original Planned and Actual)

Figure 2-7: Cumulative Works Progress of tower foundation (Revised Planned & Actual)

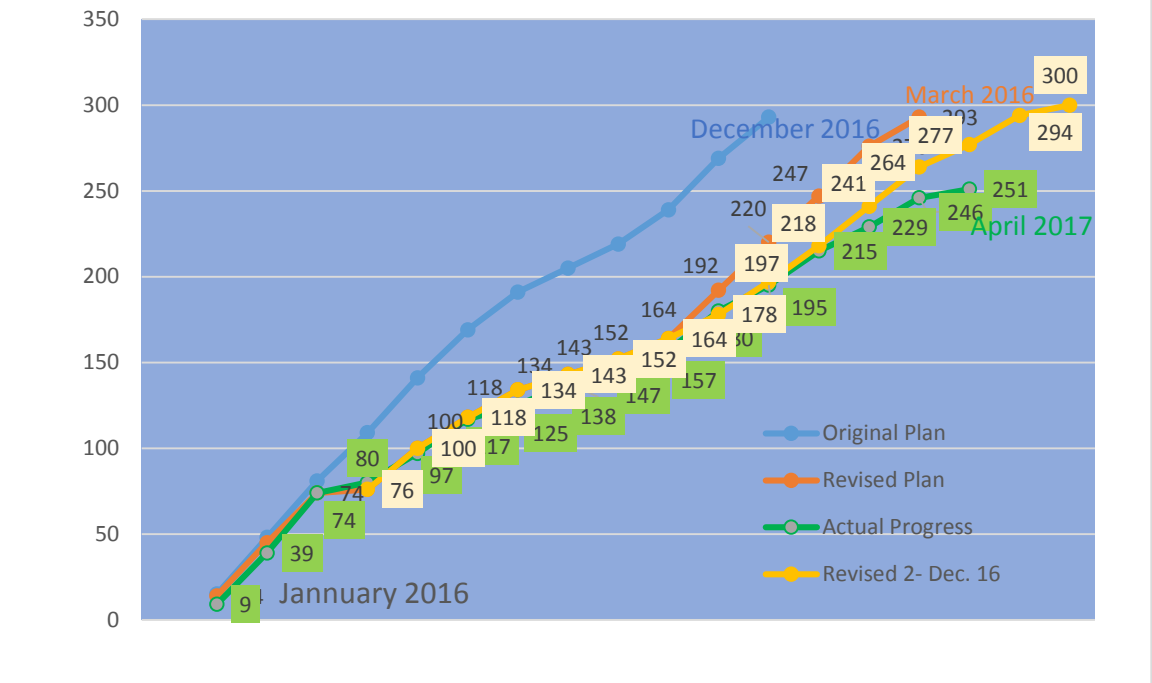


Figure 2-8: Revised Cumulative Works Progress of Tower Erection (Planned & Actual)

3. ENVIRONMENTAL MANAGEMENT MONITORING

3.1 Compliance Management

3.1.1 ESMMP-CP Update 2017

The finalisation of the Environmental and Social Management and Monitoring Plan for the Construction Phase (ESMMP-CP) was completed and will be submitted to the Ministry of Natural Resources and Environment (MONRE) in May 2017.

3.1.2 Site Specific Environmental and Social Management and Monitoring Plans

During April 2017, the Environmental Management Office (EMO) of NNP1PC received a total of seven new Site Specific Environmental and Social Management and Monitoring Plans (SS-ESMMP). With four SS-ESMMPs carried over from previous months, there were eleven SS-ESMMP for EMO review during the reported month. Out of these, one SS-ESMMP was cleared with conditions, two SS-ESMMP are pending for a review and the remaining eight SS-ESMMP are carried over to May 2017.

Table 3-1: SS-ESMMP review status in April 2017

Title	Date Received	Response Status	Comments
SS-ESMMP for Building Construction at Main Powerhouse	22 February 2017 (4th submission)	Pending a review	Provide a revised drawing for the WWTS that will ensure proper treatment of the waste water to comply with applicable standard.
SS-ESMMP for RCC Operation and Maintenance Work	08 March 2017	Pending a review	Provide a map demonstrating locations of temporary stockpiles of removed sediment.

Title	Date Received	Response Status	Comments
	(4th submission)		
SS-ESMMP for Irrigation Dam Reservoir Land Clearance at Houay Soup Resettlement Site on Nam Ngiep1 Hydro Power Project	27 March 2017 (1st submission)	Under review	
SS-ESMMP for the NNP1 Solid Waste Landfill Construction (Stage 2)	28 March 2017 (2nd submission)	Under review	
SS-ESMMP for Installation Work of Steel Structure for 115 kV Substation of Re-regulation Power Station	06 April 2017 (1st submission)	Responded with 'No objection with comments' on 07 April 2017	
SS-ESMMP for Curtain Grouting Works at Main Dam	29 April 2017 (8th submission)	Under review	
SS-ESMMP for Construction of Village Office & Hall	29 April 2017 (addition information)	Under review	
SS-ESMMP for Construction of Health Center at HSRA	29 April 2017 (addition information)	Under review	
SS-ESMMP for House Construction of Lot No. 1 &2 at HSRA	17 April 2017 (1st submission)	Under review	More information on the mitigation measures related to workers' camp and facilities has been requested.
SS-ESMMP for House Construction of Lot No. 4 &5 at HSRA	5 April 2017 (2nd submission)	Under review	
SS-ESMMP for Construction of Resource Centre and Pilot Plan Improvement at HSRA of Nam Ngiep 1 Hydro Project	29 April 2017 (2nd submission)	Under review	

3.1.3 Compliance Report

During April 2017, EMO issued five new Observations of Non-Compliances (ONC), one incident report on hazardous material management (an oil spill) and resolved three ONC. A total of 13 ONCs, two NCR1 and one NCR2 are carried over into May 2017. EMO will follow up with contractors to resolve the remaining issues in May 2017.

The ONC and NCR carried over from April 2017 to May 2017 are summarized in Table 3-2 below.

Table 3-2: Carried-Over ONCs and NCRs from April 2017 into May 2017

Site ID	Issues	Reporting	Actions
V&K Camp	Insufficient capacity of waste water treatment ponds to handle the operation of the V&K camp (ON_OC-0087). 1st inspection date: 02 June 2015 2nd inspection: 25 April 2017	ONC (Closure Pending)	On 19 April 2017, the deadline was agreed between NNP1PC and the Civil Contractor for completing the WWTS construction by the middle of May 2017
HM Hydro Subcontract Workers' Camp (LALIMA 10 Camp)	The LILAMA 10 Camp is accommodating 11 workers currently, but the construction of the Waste Water Treatment System (WWTS) remained incomplete. The Camp is expected to accommodate about 200 workers by May 2018 (NCR_HM-0001). 1st inspection date: 28 September 2016 2nd inspection: 04 April 2017	NCR-1 (Closure Pending)	The WWTS construction was completed, the as-built drawing will be submitted to NNP1PC by 11 May 2017 to be followed by a joint inspection of the completed construction work by 12 May 2017
RCC Plant	Not having proper sedimentation facilities to improve the quality of turbid water generated from the plant (ONC_OC-0217) 1st inspection date: 28 June 2016 2nd inspection: 25 April 2017	ONC (Closure Pending)	A site visit by the Managing Director of NNP1PC was made on 17 April 2017 to observe the current situation and further discuss the improvement of the plant. An intensive sedimentation control study is to be undertaken by EMO during 03-06 May 2017 to provide scientific data for management decision on further improvement of the sediment control system.

Site ID	Issues	Reporting	Actions
Re-Regulation Dam (Borrow Pit Area)	The Contractor started operating a borrow pit with inadequate environmental management practices as indicated below: - Topsoil was stockpiled at an area sensitive to erosion; - The slope of the cut had no berm and cut-off drains; - Spoil was disposed to stockpile on the access road to the SECC waste disposal pit. No information and management measures on the excavation of this borrow pit was included in the two approved SS-ESMMP for the Re-Regulating Dam (i.e. the Re-Regulating Dam Left Bank Excavation and Re-Regulating Dam and Power Station (ON_OC-0232). 1st inspection date: 30 August 2016 2nd inspection: 25 April 2017	ONC (Closure Pending)	During the latest joint site inspection on 25 April 2017, OC site engineer representative confirmed that the borrow pit will be closed following the submitted site closure plan for spoil disposal area located at the junction road P1 & P1A
Re-Regulation Dam (Spoil Disposal Area located at the junction road P1 & P1A.)	Ongoing spoil disposal activity from the Re-regulation Dam tailrace excavation (ON_OC-0236). 1st inspection date: 11 October 2016 2nd inspection: 25 April 2017	ONC (Closure Pending)	During the latest joint site inspection on 25 April 2017, the Contractor informed that this soil stockpile will be closed by following the submitted site closure plan for this spoil disposal area located at the junction road P1 & P1A
Re-Regulation Dam (**New** Spoil Disposal Area)	New Spoil Disposal Area created from the Re-regulation Dam tailrace excavation without management measures (ON_OC-0254). 1st inspection date: 25 April 2017 2nd inspection: Not available	ONC (New)	The following actions are to be completed by 19 May 2017: - Provide approval letter that has been issued by NNP1; site boundary map and estimated quantity of spoil to be disposed; - Provide environmental mitigation measures; - Incorporate the site closure plan into the existing site closure plan for spoil disposal areas located at the junction of Roads P1 and P1A.
Aggregate Crushing Plant	- Inadequate maintenance and implementation of agreed corrective actions on controlling the sediment pond at the Aggregate Plant below the Spoil Disposal Area No.7; - Improper monitoring and maintenance of the said sediment	NCR-2 (Closure Pending)	At the NNP1PC-Civil Contractor discussion meeting on 28 April 2017, it was agreed that the CW Contractor will: - Clean-up sediment from the sediment ponds every two days;

Site ID	Issues	Reporting	Actions
	pond resulted in leakage of turbid water from the sediment pond into Nam Ngiep River. This is a serious non-compliance with CA annex C and ESMMP-CP 2014 (NCR_OC-0013). 1st inspection date: 08 November 2016 2nd inspection: 25 April 2017		- Raise the level of the outlet by about 10 cm by 02 May 2017.
	Loose sediment collected from the road surface and sediment transportation activities was stockpiled at the Junction of Roads T8 and T9 and nearby the Nam Ngiep river. (ON_OC-0255). 1st inspection date: 25 April 2017	ONC (New)	Clean-up and remove the sand and sediment completely and dispose it at the designated spoil disposal area No. 6 before next bi-weekly joint inspection on 09 May 2017.
Sino Hydro Workshop	Poor housekeeping and improper hazardous waste management. Some oil spills were still observed, used oil and oily rags were stored in open areas (NCR_OC-0017). 1st inspection date: 21 March 2017 2nd inspection: 25 April 2017	NCR-1 (Closure pending)	The following actions have not been completed by the specified deadline (04 April 2017): - Move the used oil drums to an appropriate designated hazardous material storage area (no action); - Clean up contaminated ground with hydrocarbon by using absorbent pads/dry sand and store contaminated materials in designated hazardous storage area for proper elimination (no action).
	Referring to EMO previous Non-Compliance Report (NCR_OC-0017), this bi-weekly joint site inspection continues to observe a number of used oil and fuel drums being stored on the ground (at vehicle parking area in front of Sino Hydro's workshop), without any spillage protection facilities. As a result, there was some oil and hydrocarbon spills on the ground without cleaning up. (ON_OC-0256) 1st inspection date: 25 April 2017	ONC (New)	- Complete the removal of oil and fuel drums to designated hazardous storage in the workshop area; - Clean-up contaminated soil and store properly in hazardous waste storage for proper disposal; - Oil spill protective trays shall be applied for vehicle and machinery maintenance activities.
Kenber Camp	The Waste Water Treatment System (WWTS) has malfunctioned. The piping system is clogged and consequently causes the waste water to overflow from the first wetland pond to outside	ONC (Closure pending)	The renovation work was completed and the WWTS is in full operation in March 2017. A joint inspection of completed work will

Site ID	Issues	Reporting	Actions
	and the planted reeds are dead due to a lack of maintenance (ON_OC-0248). 1st inspection date: 07 February 2017 2nd inspection: 25 April 2017		be conducted in May 2017 to conclude the pending issue.
Biomass Clearance Zone	A 1,200 litre capacity oil tank and oil containers were installed at a temporary workers' camp without a proper storage facility. This resulted in some oil spills and contaminated soil at the handling point (ON_UCC-0001). 1st inspection date: 23 February 2017 2nd inspection: 21 April 2017	ONC (Closure Pending)	- Provide an impermeable oil tray to prevent oil dripping into the ground during fuel handling; - Clean-up oil contaminated soil and store it in the oil storage for proper elimination (such as incineration) by authorized NNP1PC vendor.
Sand stockpile at former RT camp	Another sand stockpiling area for material recovered from the RCC plant sediment pond (the first two sediment ponds) has been established at the former RT Camp without installing erosion and sediment control devices. In the absence of sound environmental practices in accordance with *ESMMP-CP SP01: Erosion and Sediment Control*, sediments from this sand stockpile are likely to be washed into the adjacent Nam Ngiep River just about 50 m from the site (see photographs); (ONC_OC-0250) 1st inspection date: 07 March 2017 2nd inspection: 25 April 2017	ONC (Pending closures)	90% of sand was removed. The Civil Contractor needs to completely remove the stockpile or move the sand stockpile away from the Nam Ngiep.

Site ID	Issues	Reporting	Actions
Loxley-SRI Subcontractor RCR: Temporary Camp (Thapabat District)	Improper establishment and operation of workshop facility: - A mixture of hazardous waste materials (used oil filters, hydraulic hoses, oily rags), scrap metal and other general waste were laying on the ground beside the workshop area; - Vehicle maintenance was not conducted properly inside the workshop area. This led to some oil spill on the ground; - Both sides of the workshop were extended with plastic roofing materials (Points 1 & 2) with no permeable floor. (ONC_LS-0020). 1st inspection date: 16 March 2017 2nd inspection: 20 April 2017	ONC (Closure pending)	Significant improvement of workshop housekeeping.However, evidence of oil and hydrocarbon spill was still observed. Therefore, additional works need to be completed by next biweekly inspection on 04 May 2017.
PK Camp	No proper hazardous material storage. Fuel drums were stored on bare ground without spill protection facilities (ON_PK-0002). 1st inspection date: 19 April 2017	ONC (New)	The Contractor is required to provide proper temporary storage of hazardous materials on site.
	Improper waste management implemented on site. Evidence of burning of non-segregated waste stockpile containing empty fertilizer plastic bags from paddy development activities (ON_PK-0003). 1st inspection date: 19 April 2017	ONC (New)	- Dispose all solid waste at Houay Soup Solid Waste Landfill located at Spoil Disposal No. 6; - Ensure that a stockpile of fertilizer bags is segregated and disposed of properly. Note: Burning of waste at site is prohibited.

Photograph 1: Improvement of Grey Water Ponds at Hydro Main Camp (90% Completed)

Photograph 2: Full operation of Grey Water Ponds at IHI Main Camp.

Photograph 3& 4: RCC Plant Sedimentation Control System (Control Valves and Weir Installation)

Figure 3-1: Site Inspection Locations

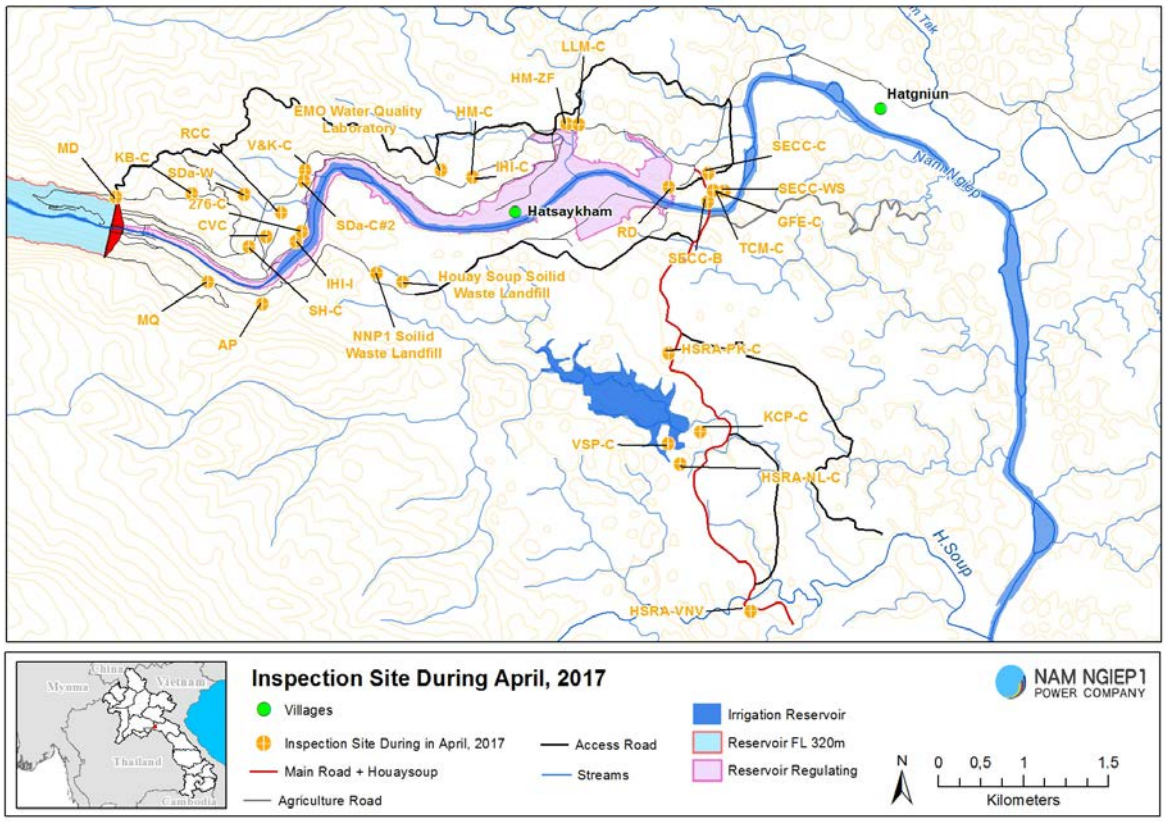


Figure 3-2: 230 kV Transmission Line Construction Monitoring

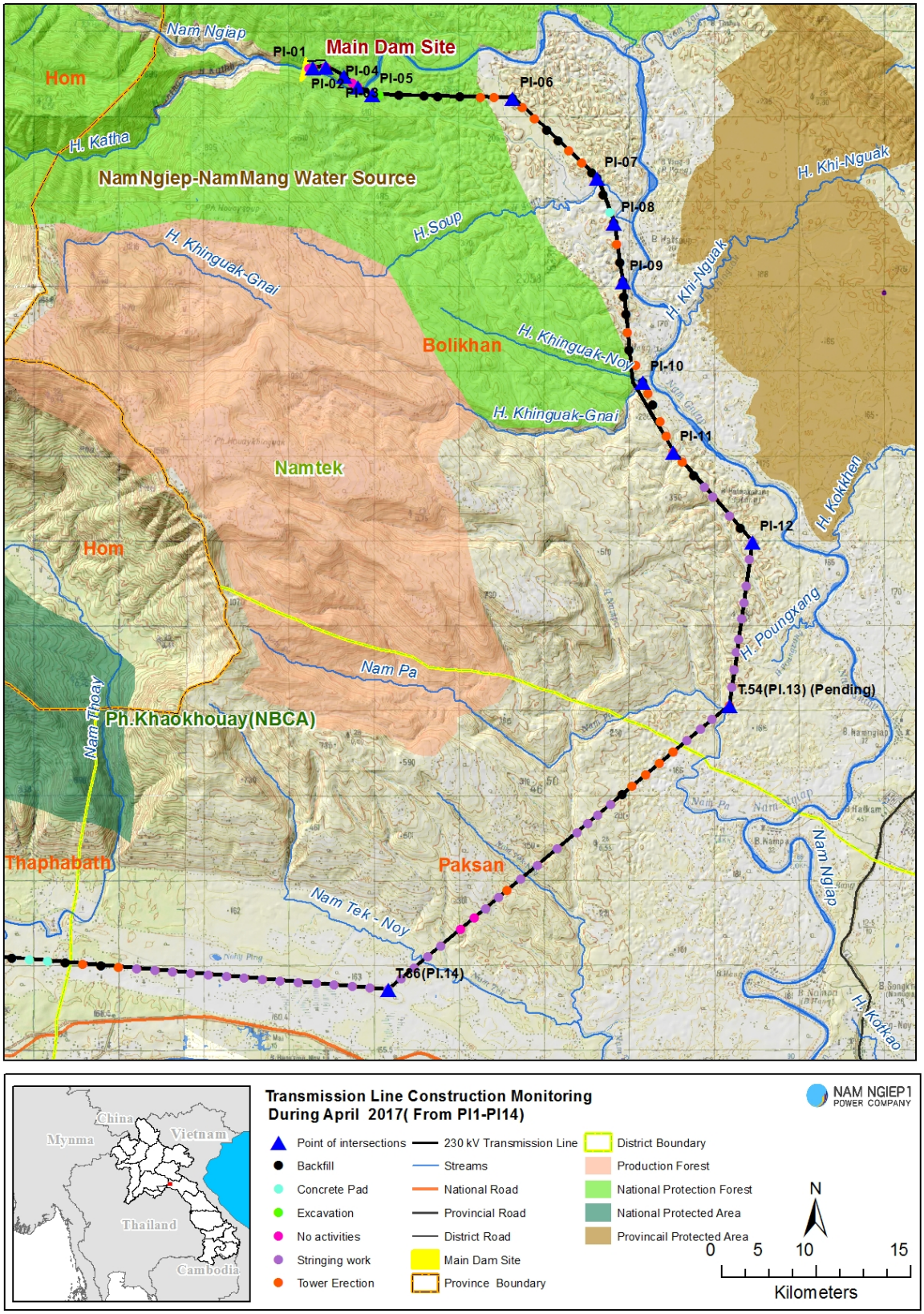
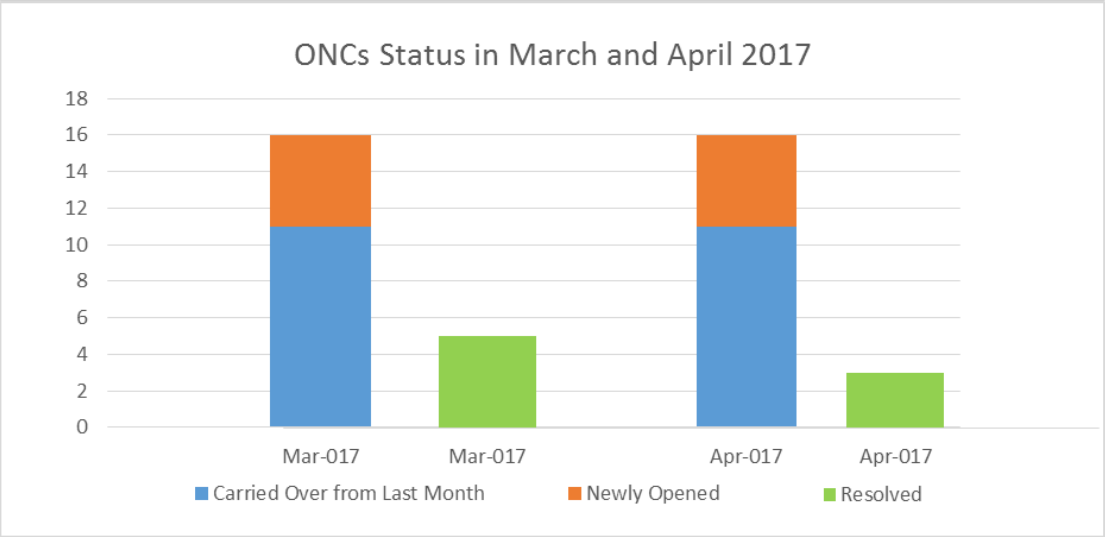


Table 3-3: Summary of ONC and NCR

Carried over from March 2017	11	2	1	0
New issues this month	5	0	0	0
Resolved this month	3	0	0	0
Carried forward into May 2017	13	2	1	0
Unresolved exceeding deadline	6	2	1	0

Figure 3-3: Observations of non-compliance (ONCs) in April 2017 Compared with March 2017



3.1.4 Inspection by Environmental Monitoring Units

During 27 to 28 April 2017, the Provincial and District EMU conducted a joint environmental monitoring mission together with NNP1PC covering the main construction sites and camps, Houay Soup landfill and Houay Soup Resettlement Area (HSRA). After the wrap-up meeting, the EMUs submitted their mission report to NNP1PC on 02 May 2017. The EMUs identified the following main environmental issues:

a) Dust generation at aggregate plant;
b) Construction waste management at LIMALA 10 Camp;
c) Based on the EMO water quality testing results, Chlorine dosage at Song Da 5 Camp No. 1 and No. 2 has to be adjusted by the Contractor as recommended by EMO;
d) Inadequate waste management at HSRA.

An official response with progress on the corrective action implementation will be submitted to the EMU in May 2017.

3.2 Environmental Quality Monitoring

The NNP1PC Environmental Laboratory at the Owner's Site Office and Village is operated mainly for TSS, BOD, total coliform, faecal coliform and E.Coli bacteria testing. This Laboratory, in collaboration with the United Analysis and Engineering Consultant Company Limited (UAE) has conducted a performance verification of its analyses for Total Suspended Solids (TSS) since March 2017 and will continue until May 2017 to obtain sufficient information to complete the verification.

In addition, the recruitment of a part time local consultant is in progress and the consultant is expected to start the assignment in early May 2017 to support the laboratory operation including

data analysis and quality assurance/quality control, and performance verification in collaboration with the UAE Laboratory.

The environmental quality monitoring has followed the environmental quality monitoring programme presented in the ESMMP-CP Volume III. The programme consists of the following components:

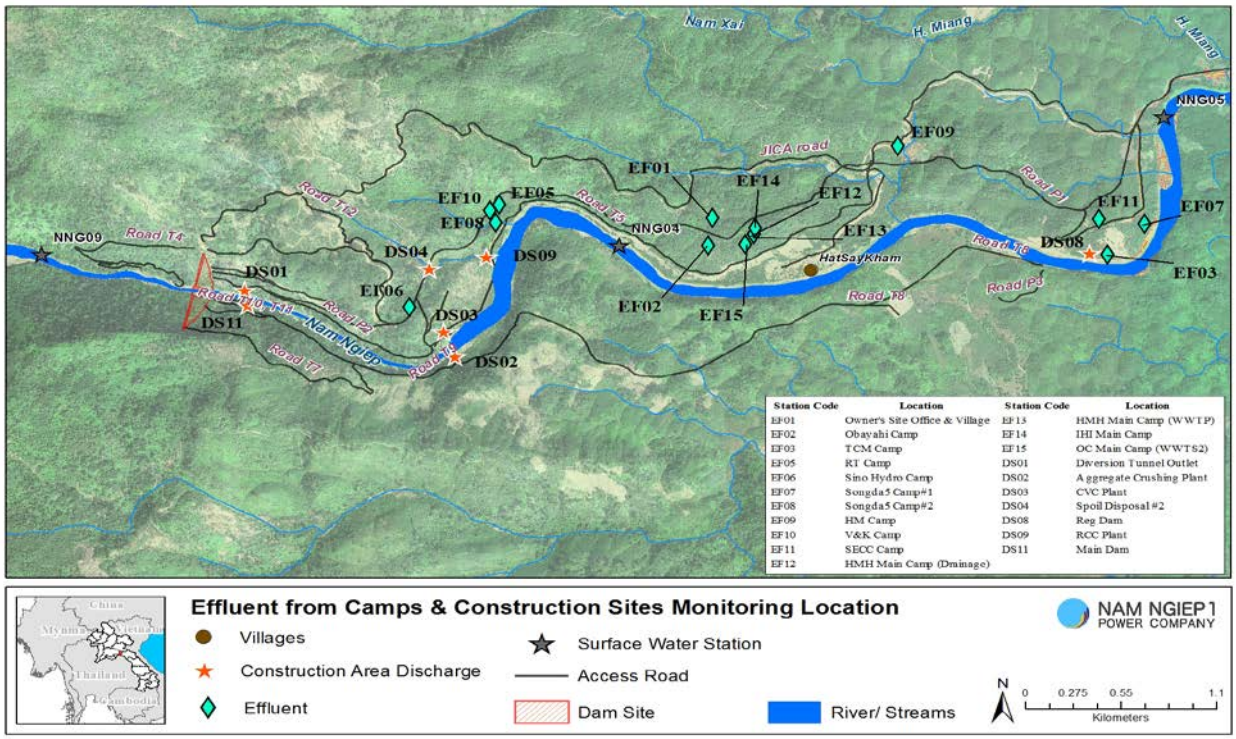
a) Effluent discharge from camps and construction sites;
b) Ambient surface water quality monitoring;
c) Groundwater and community water supply;
d) Landfill leachate;
e) Ambient noise and noise emission monitoring.

All Environmental Quality Monitoring data are routinely reported to the Ministry of Natural Resources and Environment (MONRE) in the Monthly Environmental Management and Monitoring Reports (EMMR) and to ADB in the Quarterly Environment Monitoring Reports.

3.2.1 Effluent Discharge from Camps and Construction Sites

Since July 2016, the frequency of effluent monitoring has increased from monthly to fortnightly at all the camps, and from fortnightly to weekly at the construction sites. During April 2017, all camp effluents regardless of the discharge condition were monitored. Results of effluent monitoring from the camps and construction sites are presented in **Table 3-4**, and the monitoring locations are displayed on the map in **Figure 3-4**.

Figure 3-4: Map of Effluent Discharge Monitoring Locations



Detailed monitoring results are provided in ***Annex A*** of this EMO section of the Report. The effluent monitoring results for April 2017 indicated that most of the camps did not comply with the effluent standards, except for the Owner's Site Office and Village and Song Da 5 Camp No. 1.

Progress on implementation of the corrective actions for the non-compliant camps and key construction areas is summarized below.

Table 3-4: Assessment of the Effluent Discharge from the Camps and Construction Sites against the Effluent Discharge Standards

Site	Sampling ID	Non-Compliance with Applicable Effluent Standards	Corrective Actions
Owner's Site Office and Village	EF01	Minor non-compliances for total nitrogen	No corrective actions are needed. These are not likely to cause major impacts on the ambient water quality of Nam Ngiep
Obayashi Camp (WWTP1)	EF02	Significant non-compliances for BOD_5, COD, ammonia nitrogen (NH_3-N), total nitrogen and total coliforms	The Contractor needs to improve its WWTS in accordance with the Owner's instruction letter issued in November 2016. The Contractor agrees to improve and complete its WWTS by the end of May 2017
Sino Hydro Camp	EF06	Significant non-compliance for BOD_5, NH_3-N, total nitrogen and total coliforms	As above
Song Da 5 Camp No. 1	EF07	Signification non-compliances: NH_3-N and total nitrogen	Dosing with calcium hypochlorite was monitored on a daily basis by -EMO to ensure that the contractor applied an appropriate dosage
Song Da 5 Camp No. 2	EF08	Significant non-compliance: BOD_5, NH_3-N, COD (on 7 April 2017), total nitrogen, and total coliform	As above
Zhefu Camp (Subcontractor of Hitachi-Mitsubishi Hydro Workers' Camp	EF09	Minor non-compliance of total nitrogen and total coliforms	The Contractor must install an additional of 1 m^3 Chlorine Contact Tank and a 1 m^3 Chlorine Monitoring Tank according to the Owner's letter of instruction issued in November 2016
V&K Camp	EF10	Significant non-compliances for TSS and total coliform	As above
SECC Camp	EF11	Minor non-compliance for total coliforms	No corrective actions are needed. These are not likely to cause major impacts on the ambient water quality of Nam Ngiep
H-MH Main Camp (WWTS)	EF13	Significant non-compliance for NH_3-N, BOD_5, COD, total nitrogen and total coliforms	Chlorination with sodium hypochlorite is used, but analyses to identify the breakpoint for chlorination are still being conducted by EMO
IHI Main Camp	EF14	Significant non-compliance: NH_3-N, BOD_5, COD, total nitrogen and total coliforms	As above

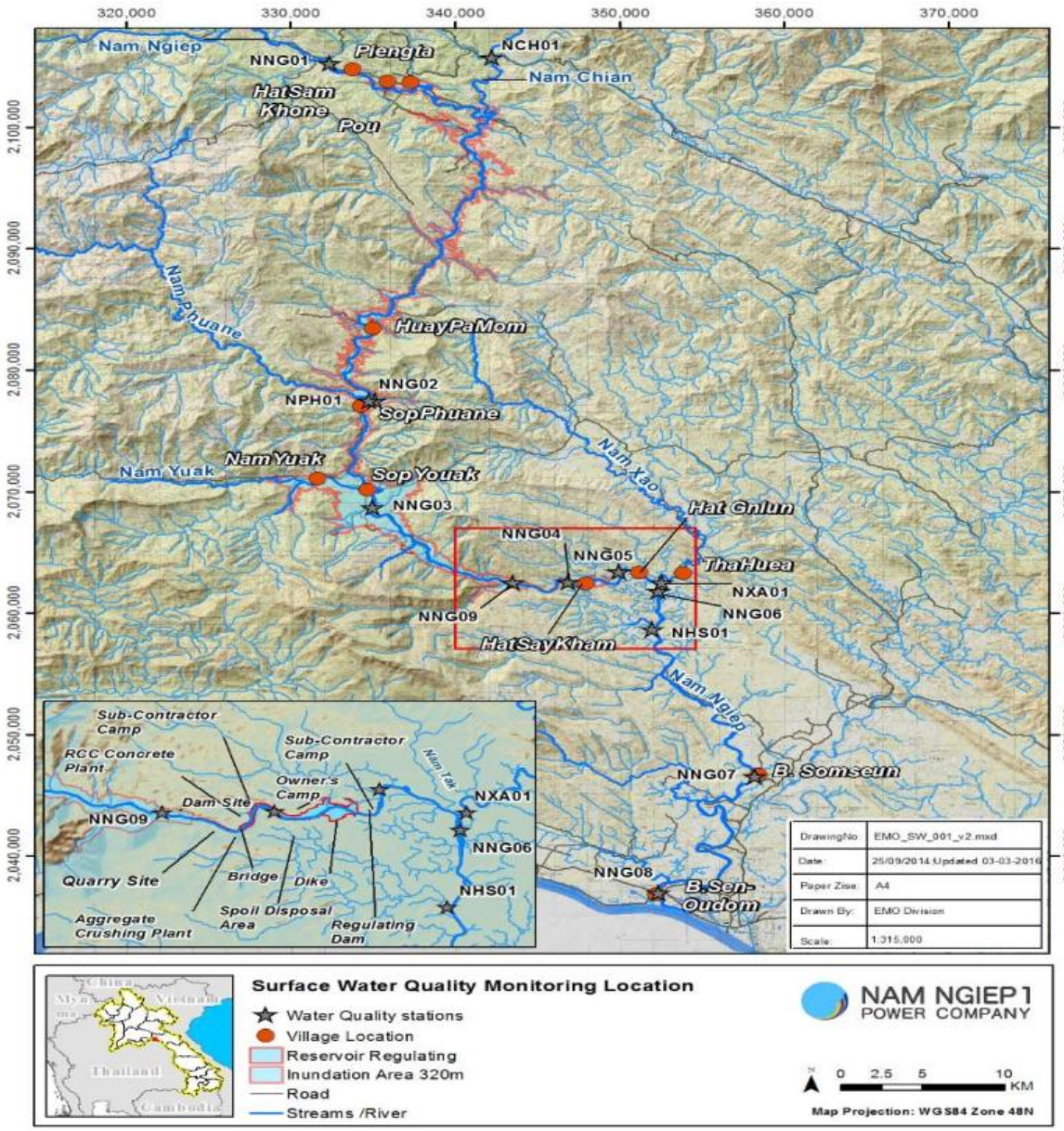
Site	Sampling ID	Non-Compliance with Applicable Effluent Standards	Corrective Actions
Obayashi Camp (WWTS2)	EF15	Significant non-compliance: BOD_5, COD, and total coliforms.	A working drawing for the WWTS improvement will be submitted to NNP1PC for review and approval in May 2017.
Kenber Camp	EF16	Significant non-compliance for BOD_5, COD, total nitrogen and total coliforms	No discharge was observed from the WWTS and the waste water was not yet treated with chlorine as the fourth pond was not full.
Main Dam Construction Area (Treatment Plant No.1)	DS11	Non-compliance for pH and TSS	The Contractor was instructed to check and ensure that the treatment plant system operates properly
Re-Regulatign Dam	DS08	Minor non-compliance for TSS	Though the construction of the re-regulating dam and spillway is almost completed, EMO will continue to monitor the effluent quality from this turbid water treatment plant
Spoil Disposal Area No.2 (Song Da 5 Workshop)	DS04	All parameters monitored complied with the Standard	No action is needed
RCC Plant	DS09	Significant non-compliance for TSS	Refer to Table 3-2for corrective action
Aggregate Crushing Plant	DS02	Significant non-compliance for TSS	See Table 3-2for corrective actions

3.2.2 Ambient Surface Water Quality Monitoring

Surface water samples are collected and analysed twice a month[2] from nine stations in Nam Ngiep and four stations in the main tributaries including the lower Nam Chian, Nam Phouane, Nam Xao and Houay Soup (total thirteen stations). From August 2016, weekly surface water quality monitoring (physical parameters only) has been undertaken with respect to Station NNG09 located immediately upstream of the Main Dam, NNG04 located in the reach within the Construction Area and NNG05 immediately downstream of the re-regulating dam.

[2] Monthly for chemical parameters and fortnightly for physical parameters

Figure 3-5: Surface Water Quality Monitoring Stations



Key findings for surface water quality monitoring in April 2017 are shown below.

Nam Ngiep

Most of the monitored parameters complied with the national surface water quality standards, except Chemical Oxygen Demand (COD). This exceedance was recorded at the station located at Nam Ngiep upstream Ban Phiengta (NNG01 – Nam Ngiep Upstream Construction Site) with a value of 8.6 mg/l. In addition, faecal coliform was also recorded as exceeding the Standard at Nam Ngiep downstream Ban Sopyuak (NNG03 – Nam Ngiep upstream the Construction Site) with a value of 3,300 MPN/100 ml.

Since Nam Ngiep surface water quality monitoring programme commenced in September 2014, EMO has frequently found elevated levels of COD and faecal coliform with concentrations exceeding the surface water quality standards.

Table 3-5: Results of the Physical and Chemical Parameters of Nam Ngiep Surface Water Quality Monitoring

	River Name	Nam Ngiep								
	Zone	Location Reference to Constructions Sites								
		Upstream				Within	Downstream			
	Station Code	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08
	Date	04-Apr-17	05Apr-17	05Apr-17	06-Apr-17	06/04/17	06-Apr-17	06-Apr-17	06-Apr-17	06-Apr-17
Parameters (Unit)	**Guideline**									
pH	5.0 – 9.0	7.44	7.7	7.97	7.48	7.29	7.91	7.83	7.64	7.36
DO (%)		75.9	93	85.3	78.7	101	103.8	102.8	105	85.9
DO (mg/l)	>6.0	6.36	7.3	6.69	6.63	7.84	8.28	8.12	8.24	6.93
Conductivity (µs/cm)		107	107	106	97	105	42.3	42.5	42.9	109
TDS (mg/l)		53	53	53	48	52	21	21	21	55
Temperature (°C)		22.01	25.34	26.24	24.81	26.35	25.7	26.2	26.6	26.23
Turbidity (NTU)		11.19	6.51	6.5	5.63	18.05	16.6	8.19	6.34	9.22
TSS (mg/l)		18.6	9.9	9	7.5	28.8	38.8	22.1	13.5	14.4
BOD5 (mg/l)	<1.5	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]
COD (mg/l)	<5.0	8.6	ND[12]	ND[12]	ND[12]	ND[12]	ND[12]	ND[12]	ND[12]	ND[12]
NH3-N (mg/l)	<0.2	ND[16]	ND[16]	ND[16]	ND[16]	ND[16]	ND[16]	ND[16]	ND[16]	ND[16]
NO3-N (mg/l)	<5.0	0.05	0.02	0.02	0.02	0.02	0.02	ND[6]	0.02	0.02
Total coliform (MPN/100 ml)	<5,000	1,700	280	3,300	170	330	460	490	330	1,700
Faecal coliform (MPN/100 ml)	<1,000	240	170	3,300	34	9	21	490	14	12

ND[1] (<0.0005 mg/L)	ND[2] (<0.0003 mg/L)	ND[3] (<0.0002 mg/L)	ND[4] (<0.005 mg/L)	ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L)	ND[7] (<0.07 mg/L)	ND[8] (<0.04 mg/L)	ND[9] (<0.02 mg/L)	ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L)	ND[12] (<0.2 mg/L)	ND[13] (<1.0 mg/L)	ND[14] (<1.5 mg/L)	ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L)	ND[17] (<2.7 mg/L)			

Table 3-6: Results of Physical Parameters of Nam Ngiep Surface Water Quality Monitoring – Weekly and Fortnightly

	River Name	Nam Ngiep		
	Zone	Upstream of Construction Sites	Within Construction Site	Downstream of Construction Sites
	Station Code	NNG09	NNG04	NNG05
	Date	11-Apr-2017	11-Apr-2017	11 April 2017
Parameters (Unit)	**Guideline**			
pH	5.0 – 9.0	7.78	8.48	8.61
DO (%)		90.5	100.6	100.3
DO (mg/l)	>6.0	6.68	7.29	7.13
Conductivity (µs/cm)		120	113	115
TDS (mg/l)		60	57	58
Temperature (°C)		29.7	30.66	30.84
Turbidity (NTU)		3.69	6.19	6.82

	River Name	Nam Ngiep		
	Zone	Upstream of Construction Sites	Within Construction Site	Downstream of Construction Sites
	Station Code	NNG09	NNG04	NNG05
	Date	20-Apr-2017	20-Apr-2017	20-Apr-2017
Parameters (Unit)	**Guideline**			
pH	5.0 – 9.0	8.05	7.69	7.89
DO (%)		83.3	86.8	88.9
DO (mg/l)	>6.0	6.46	6.88	6.86
Conductivity (µs/cm)		118	127	133
TDS (mg/l)		59	64	67
Temperature (°C)		27.92	26.5	27.83
Turbidity (NTU)		79	62.05	46.27

	River Name	Nam Ngiep								
	Zone	Upstream of Construction Sites				Within Construction Site	Downstream of Construction Sites			
	Station Code	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08
	Date	25--Apr-17	26-Apr-17	26-Apr-17	27Apr-17	27-Apr-17	27-Apr-17	27-Apr-17	27-Apr-17	27-Apr-17
Parameters (Unit)	**Guideline**									
pH	5.0 – 9.0	7.34	7.3	7.6	7.45	7.37	7.49	7.98	7.48	7.56
DO (%)		86.1	86.6	73.9	79.4	75	102.3	99.9	84.5	89.8
DO (mg/l)	>6.0	6.92	6.83	6.11	6.24	6.19	7.93	7.7	6.72	6.58
Conductivity (µs/cm)		115	113	108	108	111	36.7	37.3	111	104
TDS (mg/l)		57	57	54	54	56	18.35	18.65	55	52
Temperature (°C)		22.55	25.38	25.63	26.67	26.22	27	27.5	27.57	27.58
Turbidity (NTU)		103	86.98	65.65	55.6	63.03	68.2	68	59.33	55.39

Tributaries upstream the main dam: Nam Chiane (NCH01), Nam Phouan (NPH01)

Nam Chiane (NCH01) is located about 66 km upstream of the Main Dam. All parameters monitored comply with the applicable Standard.

Nam Phouan is located about 24 km upstream of NNP1 Project construction site. All parameters monitored comply with the applicable Standard.

Tributaries downstream of the main dam: Nam Xao (NXA01), Nam Houay Soup (NHS01)

Nam Xao has a confluence with the Nam Ngiep downstream of the NNP1 Project construction site. The COD exceeded the National Surface Water Quality Standard with a value of 7.3 mg/l. In addition, DO level was lower than the National Surface Water Quality Standard with a recorded value of 5.94 mg/l.

Houay Soup Nyai has a confluence with the Nam Ngiep River downstream of NNP1 Project construction site. The COD and total coliform exceeded the National Surface Water Quality Standard with a recorded values of 16 mg/l and 13,000 MPN/100 ml respectively. In addition, DO level was lower than the National Surface Water Quality Standard with a recorded value of 4.93 mg/l.

Table 3-7: Results of Physical and Chemical Parameters of Nam Chian, Nam Phouan, Nam Xao and Nam Houay Soup

	Site Name	Nam Chain	Nam Phouan	Nam Xao	Nam Houaysoup
	Zone	Tributaries Upstream		Tributaries Downstream	
	Station Code	NCH01	NPH01	NXA01	NHS01
	Date	04-Apr-17	05-Apr-17	06-Apr-17	06-Apr-/17
Parameters (Unit)	**Guideline**				
pH	5.0 - 9.0	7.28	7.18	7.75	7.22
DO (%)		103.3	80.6	76.2	60
DO (mg/l)	>6.0	8.89	6.82	5.94	4.93
Conductivity (µs/cm)		56	86	73.6	38.5
TDS (mg/l)		28	43	36	19
Temperature (°C)		20.56	23.31	27	24.2
Turbidity (NTU)		12	2.26	2.09	4.93
TSS (mg/l)		25.1	6.2	ND	5.1
BOD5 (mg/l)	<1.5	ND[13]	ND[13]	ND[13]	ND[13]
COD (mg/l)	<5.0	ND[16]	ND[16]	7.3	16
NH3-N (mg/l)	<0.2	ND[12]	ND[12]	ND[12]	ND[12]
NO3-N (mg/l)	<5.0	0.05	0.02	ND[6]	0.07
Total coliform (MPN/100 ml)	<5,000	1,300	330	330	13,000
Faecal coliform (MPN/100 ml)	<1,000	330	130	46	930

ND[1] (<0.0005 mg/L)	ND[2] (<0.0003 mg/L)	ND[3] (<0.0002 mg/L)	ND[4] (<0.005 mg/L)	ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L)	ND[7] (<0.07 mg/L)	ND[8] (<0.04 mg/L)	ND[9] (<0.02 mg/L)	ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L)	ND[12] (<0.2 mg/L)	ND[13] (<1.0 mg/L)	ND[14] (<1.5 mg/L)	ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L)				

Table 3-8: Physical Parameters Results of Surface Water Quality – Nam Chian, Nam Phouan, Nam Xao and Nam Houay Soup (measured Every Fortnight)

	Site Name	Nam Chain	Nam Phouan	Nam Xao	Nam Houaysoup
	Zone	Tributaries Upstream		Tributaries Downstream	
	Station Code	NCH01	NPH01	NXA01	NHS01
	Date	25-Apr-17	26-Apr-17	27-Apr-17	27-Apr-17
Parameters (Unit)	**Guideline**				
pH	5.0 - 9.0	7.39	7.15	7.75	7.35
DO (%)		73.6	78.4	81.7	69.4
DO (mg/l)	>6.0	6.19	6.18	6.21	5.43
Conductivity (µs/cm)		70	92	51.1	19.48
TDS (mg/l)		35	46	25.5	9.74
Temperature (°C)		21.83	24.29	28	26.7
Turbidity (NTU)		86	30.26	9.63	11.4

3.2.3 Groundwater Quality Monitoring

During April 2017, NNP1PC sampled and analysed the groundwater quality in seven boreholes. Out of these, one is a community owned borehole at Hatsaykham Village and six boreholes were built by the Project for re-settlers at Houay Soup Resettlement Area.

All groundwater quality data are routinely reported to the Social Management Office of NNP1PC which then communicates the results to the villagers and the local health centres as part of the Project's public health programme. The results are shown below.

Hatsaykham Village

Both faecal coliform and E. Coli bacteria exceeded the Standard with values of 7.8 MPN/100 ml for the borehole number GHSK01. In additional pH was lower than the Standard with a recorded value of 5.84. Other parameters complied with the standard.

Houay Soup Resettlement Area (HSRA)

Both faecal coliform and E. Coli bacteria for the borehole number GHSP04 and GHSP06 exceeded the Standard with values of 350 and 7.8 MPN/100ml respectively. In addition, the pH for the borehole number GHSP04 was 5.80, lower than the Standard (same boreholes with similar pH level as the previous month). Other parameters complied with the standard.

Figure 3-6: Groundwater Quality Monitoring Locations

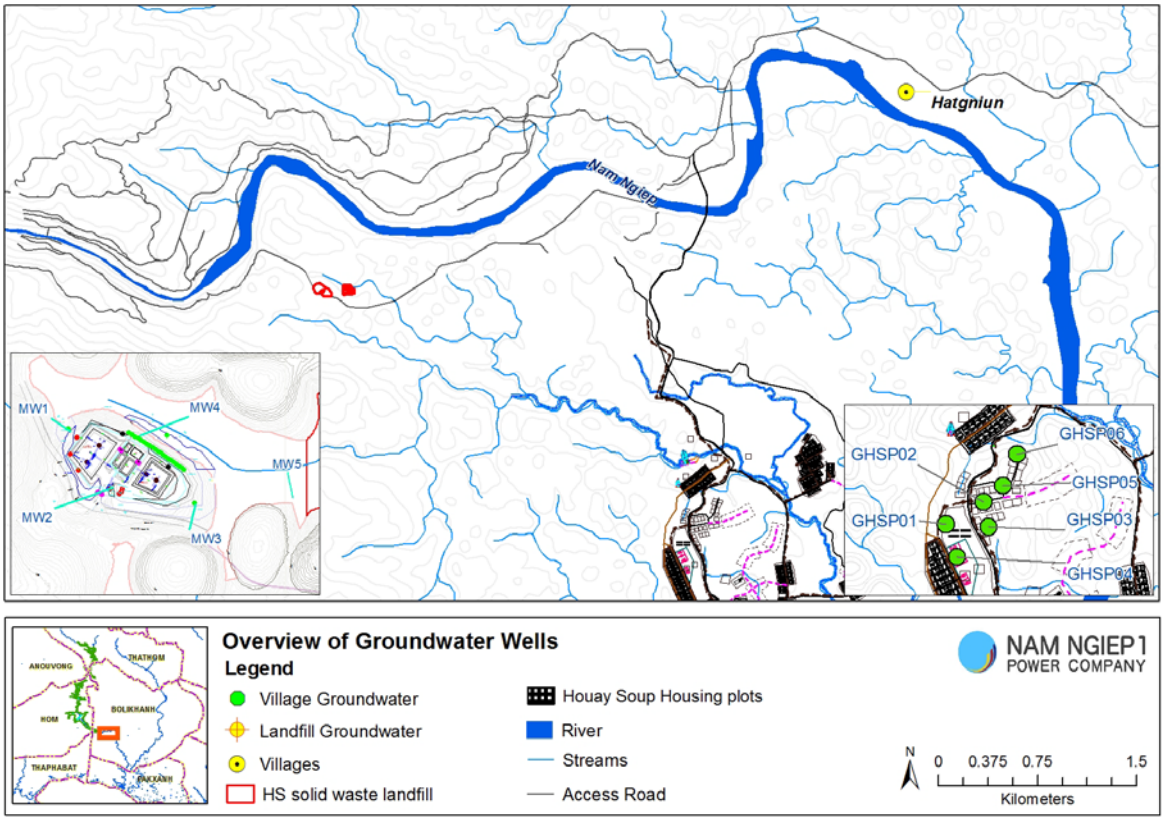


Table 3-9: Groundwater Quality Monitoring Results Hatsaykham and Hat Gniun Villages in April 2017

	Site Name	Hatsaykham Village		
	Station Code	GHSK01	GHSK02	GHSK03
	Date	20-Apr-2017	20-Apr-2017	20-Apr-2017
Parameter (Unit)	**Guideline**			
pH	6.5-9.2	5.84	Broken Pump	Broken Pump
DO (%)		19.5		
DO (mg/l)		1.51		
Conductivity (µs/cm)		106		
TDS (mg/l)	<1,200	53		

	Site Name	Hatsaykham Village		
	Station Code	GHSK01	GHSK02	GHSK03
	Date	20-Apr-2017	20-Apr-2017	20-Apr-2017
Parameter (Unit)	Guideline			
Temperature (°C)		26.9		
Turbidity (NTU)	<20	0.39		
Faecal coliform (MPN/100 ml)	0	7.8		
Ecoli Bacteria (MPN/100 ml)	0	7.8		

ND[1] (<0.0005 mg/L)	ND[2] (<0.0003 mg/L)	ND[3] (<0.0002 mg/L)	ND[4] (<0.005 mg/L)	ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L)	ND[7] (<0.07 mg/L)	ND[8] (<0.04 mg/L)	ND[9] (<0.02 mg/L)	ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L)	ND[12] (<0.2 mg/L)	ND[13] (<1.0 mg/L)	ND[14] (<1.5 mg/L)	ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L)	ND[17] (<2.7 mg/L)			

Table 3-10: Groundwater Quality Monitoring Results for Houay Soup Resettlement Area in April 2017

	Site Name	Houay Soup Resettlement Village					
	Station Code	GHSP01	GHSP02	GHSP03	GHSP04	GHSP05	GHSP06
	Date	20-Apr-17	20-Apr-17	20-Apr-17	20-Apr-17	20-Apr-17	20-Apr-17
Parameter (Unit)	Guideline						
pH	6.5-9.2	6.97	7.02	7.23	5.82	6.83	6.96
DO (%)		46	60	55.5	27.4	51.8	62.3
DO (mg/l)		3.74	4.56	4.26	2	3.92	4.85
Conductivity (µs/cm)		467	256	510	116	317	307
TDS (mg/l)	<1,200	234	128	253	58	159	153
Temperature (°C)		27.49	26.68	27.56	30	20.15	26.74
Turbidity (NTU)	<20	0.23	0.32	0.18	0.64	0.23	0.4
Faecal coliform (MPN/100 ml)	0	0	0	0	350	0	7.8
Ecoli Bacteria (MPN/100 ml)	0	0	0	0	350	0	7.8

ND[1] (<0.0005 mg/L)	ND[2] (<0.0003 mg/L)	ND[3] (<0.0002 mg/L)	ND[4] (<0.005 mg/L)	ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L)	ND[7] (<0.07 mg/L)	ND[8] (<0.04 mg/L)	ND[9] (<0.02 mg/L)	ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L)	ND[12] (<0.2 mg/L)	ND[13] (<1.0 mg/L)	ND[14] (<1.5 mg/L)	ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L)	ND[17] (<2.7 mg/L)			

3.2.4 Gravity Fed Water Supply (GFWS) Quality Monitoring

Water quality monitoring for GFWS systems is conducted on a monthly basis with the aim to alert the users in case of health risks when using the water for bathing or washing. During April 2017, water samples were taken from the taps at Thaheua and Hat Gniun Villages.

Results of the assessment for GFWS of both Thaheua and Hat Gniun Villages are shown and summarised as below:

Thahuea Village (WTHH02): All parameters complied with the National Drinking Water Standards except for faecal coliforms and E. Coli which were found to be 49 MPN/100 ml for both parameters.

Ban Hat Gnuin (WHGN2): All parameters complied with the National Drinking Water Standards except for faecal coliforms and E. Coli, which were found to be 79 MPN/100 ml for both parameters.

The presence of the E.Coli found in the GFWS system is a normal situation after rain where the surface water is likely to be contaminated by runoff from grazing land in the source area. The local villagers were informed about the results and encouraged to boil their drinking water.

Table 3-11: Results of the Gravity Fed Water Supply Quality Monitoring

	Site Name	Thaheua Village	Hat Gnuin Village
	Station Code	WTHH02	WHGN02
	Date	20-Apr-2017	20-Apr-2017
Parameter (Unit)	**Guideline**		
pH	6.5-9.2	7.11	7.46
DO (%)		62.8	67.7
DO (mg/l)		4.7	4.94
Conductivity (µs/cm)		90	123
TDS (mg/l)	<1,200	45	61
Temperature (°C)		28.01	28.79
Turbidity (NTU)	<20	0.73	0.72
Faecal coliform (MPN/100 ml)	0	49	79
Ecoli Bacteria (MPN/100 ml)	0	49	79

ND[1] (<0.0005 mg/L)	ND[2] (<0.0003 mg/L)	ND[3] (<0.0002 mg/L)	ND[4] (<0.005 mg/L)	ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L)	ND[7] (<0.07 mg/L)	ND[8] (<0.04 mg/L)	ND[9] (<0.02 mg/L)	ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L)	ND[12] (<0.2 mg/L)	ND[13] (<1.0 mg/L)	ND[14] (<1.5 mg/L)	ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L)	ND[17] (<2.7 mg/L)			

3.2.5 Landfill Leachate Monitoring

During April 2017, water samples were taken from the last landfill leachate ponds of the NNP1 Project Landfill (LL4). The location of landfill leachate monitoring is displayed in Figure 3-7. The results indicate compliance with the relevant standards in the final pond (LL4), except COD.

Figure 3-7: Landfill Leachate Monitoring Location

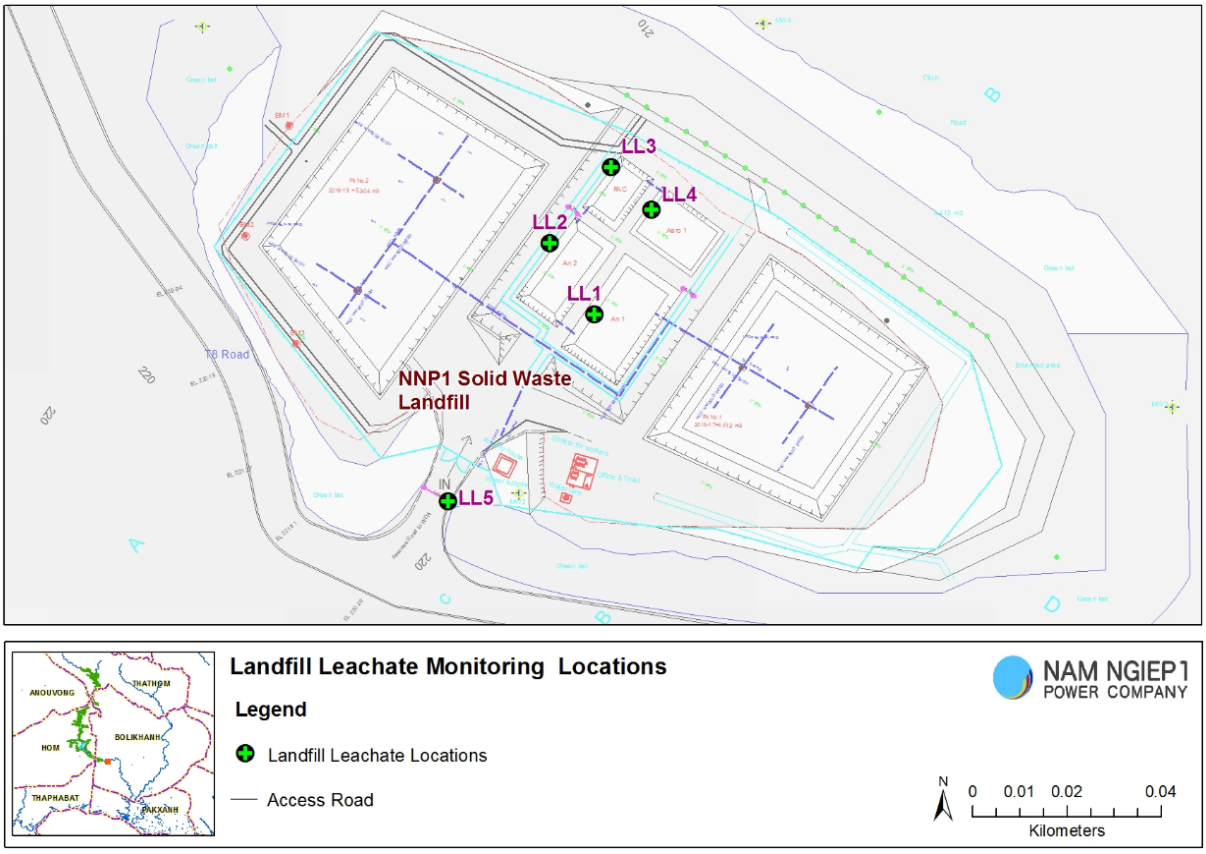


Table 3-12: Landfill Leachate Monitoring Results

	Site Name	**NNP1 Landfill (Leachate Ponds)**
	Station Code	**LL4**
	Date	**01**-Apr-**2017**
Parameters (Unit)	**Guideline**	
pH	6.0 - 9.0	7.38
Sat. DO (%)		3.56
DO (mg/l)		0.53
Conductivity (µs/cm)		386
TDS (mg/l)		193
Temperature (°C)		19.92
Turbidity (NTU)		0.27
BOD (mg/l)	<30	25.2
COD (mg/l)	<125	200
Total coliform (MPN/100ml)	<400	350

ND[1] (<0.0005 mg/L)	ND[2] (<0.0003 mg/L)	ND[3] (<0.0002 mg/L)	ND[4] (<0.005 mg/L)	ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L)	ND[7] (<0.07 mg/L)	ND[8] (<0.04 mg/L)	ND[9] (<0.02 mg/L)	ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L)	ND[12] (<0.2 mg/L)	ND[13] (<1.0 mg/L)	ND[14] (<1.5 mg/L)	ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L)	ND[17] (<2.7 mg/L)			

3.2.6 Dust Monitoring

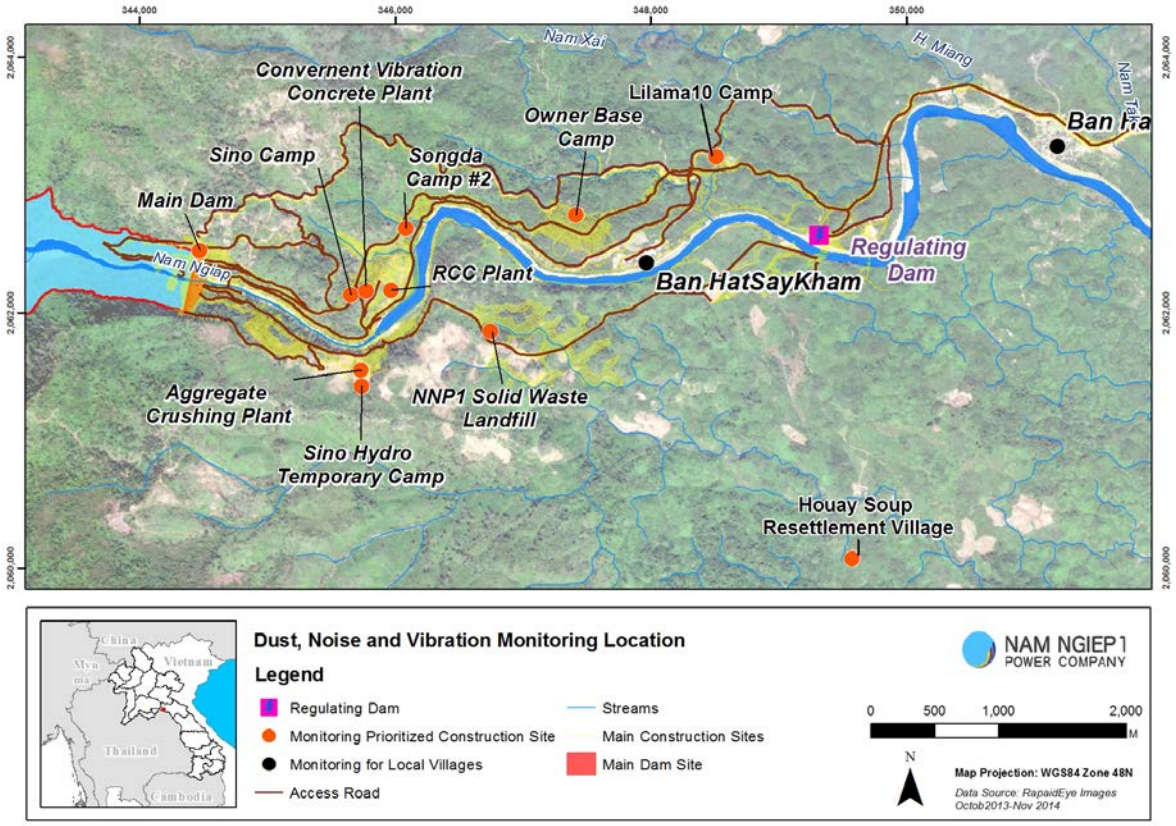
The monitoring points are indicated on the map in ***Figure 3-8***. . Most of dust measurements complied with the National Standard, except at the Aggregate Crushing Plant, Sino Hydro Temporary Worker Camp and RCC Plant. Staff have been advised to wear dust masks while working in the areas at risk. The results are presented in ***Annex B***.

3.2.7 Noise Monitoring

During April 2017, noise monitoring was conducted in Hat Gnuin and Houay Soup Resettlement Villages for at least 72 consecutive hours. Noise monitoring was also conducted at the Aggregate Crushing Plant, RCC Plant, Sino Hydro Camp, Sino Hydro Temporary Worker Camp and Lilama 10 Camp (new) to assess possible impact on workers' health and Owner's Site Office and Village (to monitor the ambient noise levels) for 24 consecutive hours.

The noise monitoring location are described in the Figure 3-8 below. The results are presented in ***Annex C.***

Figure 3-8: Noise and Dust Emission Monitoring Locations



The noise levels recorded at the monitoring stations indicated full compliance with the National Standard for the period of 06:01-22:00, except at the Sino Hydro Temporary Workers' Camp. The noise levels during the period of 22:01-06:00 were higher than the Standard at the Aggregate Crushing Plant, RCC Plant, Sino Hydro Camp, Sino Hydro Temporary Worker Camp and the Main Dam [between 54.79 – 61.92 dB(A) compared to the Standard of 50 dB(A)].

3.3 PROJECT WASTE MANAGEMENT

3.3.1 Solid Waste Management

In April 2017, approximately 133.8 m^3 of solid waste was disposed at the NNP1 Project Landfill, a decrease of 31 m^3 compared to Mach 2017.

The construction of NNP1 Landfill (stage 2) commenced on 10 April 2017. The waste pit excavation was completed, and HDPE lining and leachate piping system installation works are ongoing. The submitted DWP and SSESMMP (2nd submission) for NNP1 Landfill construction stage 2 is under review by EMO.

A total of 2,398 kg of recyclable waste were sold to Khounmixay Processing Factory as shown below:

Photograph 5: Waste compaction and soil cover at the NNP1 Project Landfill

Photograph 6 Waste disposal spot checking by NNP1PC staff at the NNP1 Project Landfill

Table 3-13: Amounts of Recyclable Waste Sold

No.	Type of Recycled Waste	Unit	Sold	Cumulative Total by Apr-17
1	Scrap metal	kg	1,670	16,527
2	Glass	kg	381	225
3	Plastic bottles	kg	100	250.5
4	Paper/Cardboard	kg	181	111
5	Aluminium	kg	66	85.5
Total		**Kg**	**2,398**	**17,199**

3.3.2 Hazardous Materials and Waste Management

In April 2017, joint hazardous materials and waste inventories were carried out at the main construction sites and subcontractors' camps. A monthly Hazardous Material and Waste Inventory is shown inTable 3-14.

Table 3-14: Results of hazardous material inventory

No.	Hazardous Waste Type	Unit	Total in April 2017 (A)	Disposal by Selling (B)	Remainder (A - B)
1	Used hydraulic and engine oil	litre (l)	10,770	7,200	3,570
2	Empty used chemical drum/container	drum (20 l)	2,500	2,300	200
3	Used oil filters	No.	843	250	593
4	Used tyre	No.	392	0	392
5	Ink cartridge	No.	288	0	288
6	Empty paint and spray cans	can	409	0	409
7	Cement bag	bag	300	0	300

No.	Hazardous Waste Type	Unit	Total in April 2017 (A)	Disposal by Selling (B)	Remainder (A - B)
8	Empty used oil drum/container	drum (20 l)	138	2	136
9	Empty contaminated bitumen drum/container	drum (200 l)	82	82	0
10	Empty used chemical drum/container	drum (200 l)	53	0	53
11	Empty used oil drum/container	drum (200 l)	46	3	43
12	Halogen/fluorescent bulbs	No.	28	0	28
13	Contaminated soil, sawdust and concrete	bag	25	0	25
14	Contaminated textile and material	Bag	28	6	22
15	Acid and caustic cleaners	bottle	120	0	120
16	Car battery	No.	11	0	11
17	Clinical waste	kg	4	0	4
18	Used oil mixed with water	liter (l)	0	0	0

The food waste generated from the Owner's Site Office and Village (OSOV), selected camps of Contractors and subcontractors continues to be collected by Hatsaykham villagers for use as animal feed (pig and poultry). A total of 6,805 kg was collected in April 2017 as shown Table 3-15:

Table 3-15: Amounts of Food Waste Collected by Villagers

NO.	SITE NAME	UNIT	TOTAL
1	Song Da5 Camp No. 2	kg	2,680
2	Song Da5 Camp No. 1	kg	2,410
3	Obayashi Corporation Camp	kg	1,133
4	Owner's Village and Site Office (OSOV)	kg	387
5	LILAMA 10 Camp	kg	195
6	HSRA-DLC-C	kg	0
Total		**kg**	**6,805**

3.4 Community Waste Management

3.4.1 Community Recycling Programme

In April 2017, a total of 765 kg of recyclable waste was recorded, an increase of 738 kg compared to March 2017.

The types and amounts of waste recycled in March and remaining in April 2017 are presented in Table 3-16

Table 3-16: Types and amounts of waste traded

Types of Waste	Unit	Remaining In March 2017	Additions In April 2017	Sold	Remaining In April 2017
Scrap metal	kg	544	375	0	919
Glass	kg	560	295	380	473
Paper/cardboard	kg	227	13	0	240
Aluminium cans	kg	92	50	92	50
Plastic bottle	kg	125	34	125	34
Total	**kg**	**1,548**	**765**	**597**	**1,716**

On 28 April 2017, ESD staff and villagers of Thaheau and Hat Gniun Villages carried out a joint waste clean-up activity in both Villages. A total of 8.5 m^3 of solid waste from this activity was disposed at Houay Soup Landfill and about 200 kg of recyclable waste was transported to the Community Waste Bank (see Photograph 7 and Photograph 8 below):

Photograph 7&8: ESD staff and villagers from Thaheau and Hat Gniun villages carried out a joint waste clean-up activity in their village areas.

3.4.2 Houay Soup Resettlement Area Waste Management

Erosion control and slope stabilisation for the Houay Soup Landfill were revised in April 2017 and document approval will be prepared accordingly by May 2017. Procurement of a local contractor to operate the Houay Soup Landfill is being reviewed and approved by NNP1PC.

3.5 Watershed and Biodiversity Management

3.5.1 Preparation of the Nam Ngiep 1 Watershed Management Plan

Obligation[3]	Status by April 2017
Prepare draft Watershed Management Regulations by 15 November 2016	There is no further progress on Watershed Management regulations this month after the draft was submitted to ADB on 13 January 2017. The discussion will be resumed after ADB approve the latest version of watershed management plan.
Final Watershed Management Plan by 23 December 2016	As agreed between ADB and NNP1PC, this target date is moved to the end of the First Quarter of 2017.The plan was further improved based on the discussion with ADB's consultant and NNP1 at the end of April 2017. The improved version will be submitted in the first week of May 2017 for ADB review and approval before further discussion with GOL line agencies.
1) A draft provincial regulation submitted to Provincial Justice Department by 23 December 2016 2) Start of public hearing process by 10 January 2017	As agreed between ADB and NNP1PC, this target date is moved to the end of the First Quarter of 2017. These processes will be continued after acceptance of draft provincial regulations by ADB.

[3] All previous deadlines on preparation of the Nam Ngiep 1 Watershed Management Plan and watershed management regulations were revised and agreed with ADB in August 2016. The Table only shows the current required submissions and their respective target dates.

Activities in April 2017	Results
Preparation for NNP1 Watershed Management Plan	Key discussion notes from discussion with ADB's consultant and EMO at the end of April 2017: o Budget and activities to be developed to fit within the existing CA budget. The consultant to refine the budget and identify when funds will run out given the expenditures already made; o The section addressing 'No Net Loss' has been placed in an appendix pending availability of funds; o A two-day technical workshop is planned in the 3rd week of May 2017. The provincial regulation will also be discussed at this technical workshop; o A further workshop for approval will be delayed until ADB's consultant has had an opportunity to provide feedback on the outcomes arising from the workshop in 3rd week of May 2017.
Prepare draft Watershed Management Regulations	The discussion will be resumed after the latest version of watershed management plan has been approved by ADB.
WRPO Activities	Due to the move of the Department of Forest Resource Management (DFRM) from MONRE to Ministry of Agriculture and Forestry (MAF), the WRPO will be reorganized. The new organization structure and assignment for Xaysomboun WRPO are being reviewed by MAF and MONRE, while Bolikhamxay Forestry Management Sector is already operated under Provincial Agriculture and Forestry Office (PAFO)
Xaysomboun Intergraded Spatial Planning (ISP)	Xaysomboun ISP team is finalizing the ISP and preparing it for final review and approval by the provincial and district leaderships

3.5.2 Biodiversity Offset Management

Obligation[4]	Status by April 2017
A consultant acceptable to ADB is engaged as technical consultant for preparation of biodiversity offset management plan by 30 November 2016.	Recruitment of a consultant for the development of the Biodiversity Offset Management Plan (BOMP) has been delayed pending further discussions with ADB on funding, and institutional and partnership arrangements for the implementation of the BOMP
ADB approval on the NNP1PC's draft legal agreement with the government by 31 January 2017 and execute the legal agreement by 15 February 2017	• The first draft was prepared on 14 October 2016 and the revised version elaborating Biodiversity Advisory Committee (BAC), comments was submitted to ADB on 28 November 2016. • ADB confirmed that NNP1PC could proceed and negotiate the draft legal agreement with GOL on 16 February 2017 • There was discussion between EMO and BOMC to improve the draft legal agreement on 18-19 April 2017. The improved draft was submitted to Bolikhamxay Provincial Governor Office at the end of April 2017 for further review.
Baseline survey for dry season (observations during March and April 2017)	On 21 February 2017, ADB confirmed that the summer baseline survey should be rescheduled and form part of BOMP implementation.

Activities in April 2017	Results
A consultant acceptable to ADB is engaged as technical consultant for preparation of biodiversity offset management plan by 30 November 2016.	Recruitment of a consultant for the development of the Biodiversity Offset Management Plan (BOMP) has been delayed pending further discussions on funding, and institutional and partnership arrangements for the implementation of the BOMP
Activities pre-BOMP period of 01 October 2016 – 31 September 2017	• BOMC started advertising for a consultant to assist with pre-BOMP activities in the second week of March 2017. Only two applicants have expressed an interest in the assignment. BOMC

[4] All previous deadlines on preparation of the Nam Ngiep 1 Watershed Management Plan and watershed management regulations were revised and agreed with ADB in August 2016. The Table only shows the current required submissions and their respective target dates

	will evaluate the applications in the 1st week of May 2017. • BOMC and NNP1 EMO had technical discussion on 19 April 2017 to further refine the detailed ToR of BOMC and Local Coordination Unit. The TOR has been circulated to BOMC members for review and feedback before submission to the BOMC Chairperson for approval. • BOMC and NNP1 EMO had discussion on 25 April 2017 to finalize the detailed proposal of community mapping with the following key points: simplify the objectives, refine the approaches, and finalize the schedule. The field activity was schedule from 02-23 May 2017 targeting 6 villages within the Nam Chouane – Nam Xang Offset Site. • BOMC were informed that the report on implemented activities is being prepared and will be shared with NNP1 after approval from BOMC Chairperson. BOMC will also share monthly financial records with NNP1 for reference. • BOMC also informed that some office equipment and vehicle have been purchased, and BOMC Secretariat Office in Viengthong District started to use this equipment in March 2017. The inventory list will be shared with NNP1 for reference.

3.5.3 Biomass Clearance

Activities in April 2017	Results
Labour recruitment and machinery management	• 11 workers from Longsan performed biomass clearance of a forest parcel land at Block 3. • 12 Contractor's field staff re-piling and re-burning the waste biomass in Block 4. • 1 self-loading log truck stockpiled waste wood and log with diameter >20 cm in Block 4. • 5 workers from Palavek performed biomass clearance of a fallow parcel land in Block 5. • 20 workers from Ban Nahong felling trees and piling waste biomass at Block 16 and 17.
Perform UXO work on priority biomass clearance areas.	• The contractor submitted completion report and certificates of completed UXO search and clearance of 1,487.68 ha out of target area 1,500 ha (99% of the target area) on 17 April 2017. Invitation of The National Regulatory Authority (NRA) for inspection and QA/QC performance is being prepared by the contractor. • The UXO work progress to date is showed inTable 3-17***.***
Perform biomass clearance.	• The vegetation cutting was completed for around 47.26 ha out of the target 155 ha in April 2017. One of the main reasons for not achieving the target is that the contractor could not mobilize workers as planned. The total vegetation cutting to-date is around 946 ha. • The biomass burning have started within the area of around 322 ha. Detail biomass burning at each block can be seen in ***Table 3-17.*** • There is no further update from local GOL authorities on the removal of the stockpiled logs from biomass clearance areas. • The biomass clearance progress to date can be seen inFigure 3-9, Figure 3-10, Figure 3-11, and ***Table 3-17***.

Figure 3-9: Biomass Clearance work Progress in figure as of 30 April 2017

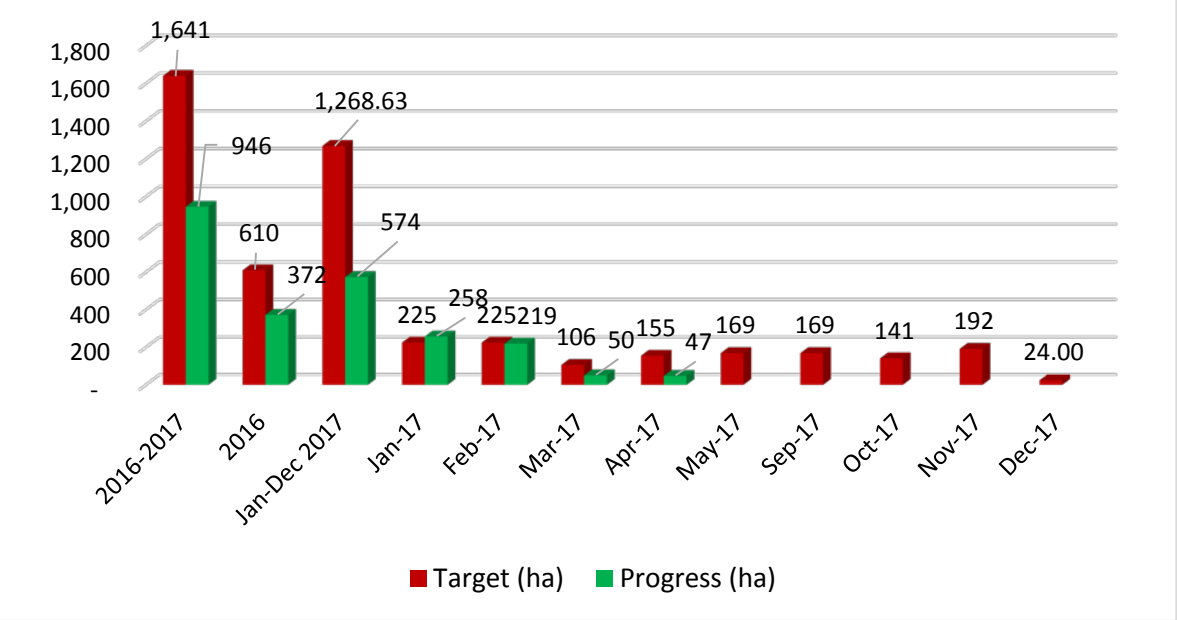
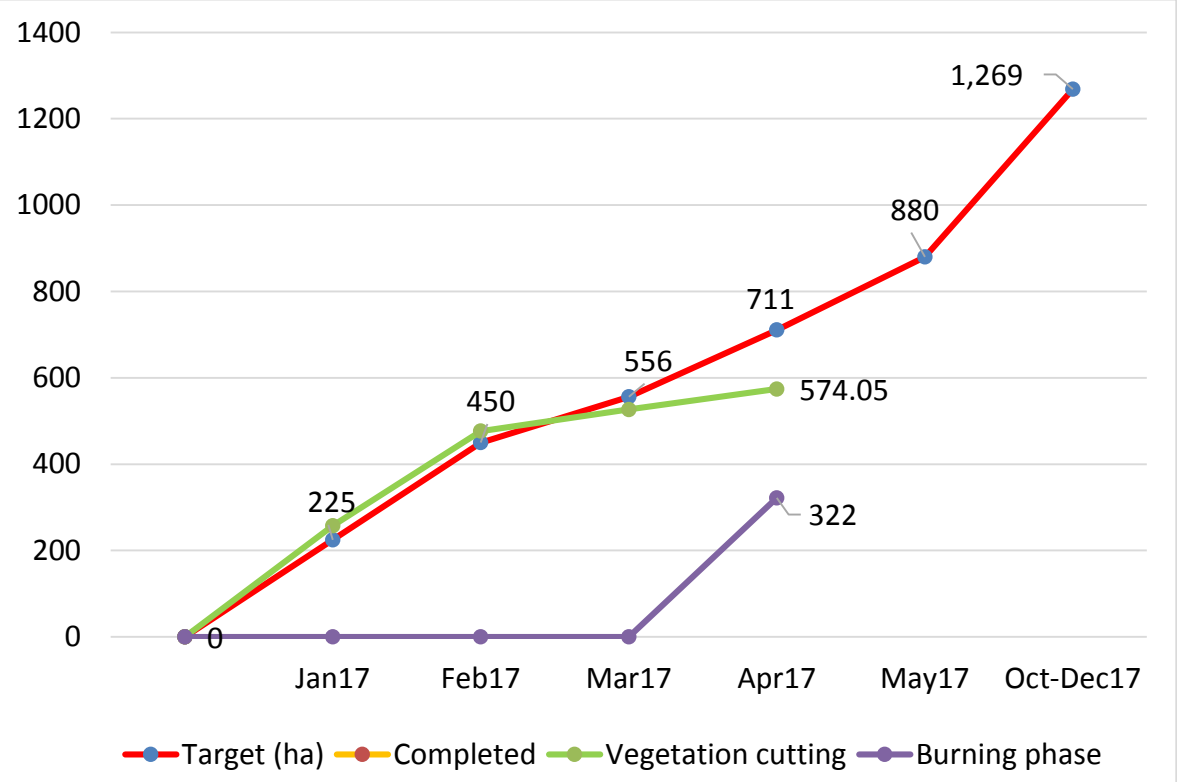


Figure 3-10: Status of Biomass Clearance in Different Phases as of 30 April 2017

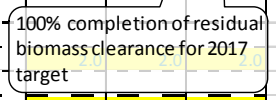


Note: Complete phase of clearance is from vegetation cutting until final burning into ashes

The overall progress of biomass clearance programme is demonstrated in Figure 3-11 below.

Figure 3-11: Gantt Chart of Biomass Clearance Programme in 30 April 2017

	Task List / Steps of work		Weight (%)	YEAR 2017 Q1 01	02	03	Q2 04	05	06	Q3 07	08	09	Q4 10	11	12	S curve
1	**UXO Search and Clearance**	Planed	100.0													100
		Actual	0.0													96
1.1	Perform UXO work for 549.20 ha (6 blocks) of priority biomass clearance on lower and central reservoir	Planed	13.0	5.0	5.0	3.0										93
		Actual	12.0	5.0	4.0	3.0										89
1.2	Perform UXO work for 334.03 ha (5 blocks) of priority biomass clearance on lower and central reservoir	Planed	13.0	5.0	5.0	3.0										86
		Actual	12.0	5.0	4.0	3.0										82
1.3	Perform UXO work for 84.58 ha (2 blocks) of priority biomass clearance on upper reservoir	Planed	4.0	2.0	2.0											79
		Actual	4.0	2.0	2.0											75
2	**Biomass Clearance**	Planed	0.0													71
		Actual	0.0													68
2.1	Perform biomass clearance for 593.61 ha (6 blocks) on lower and central reservoir	Planed	18.0	3.0	3.0	3.0	2.0	1.0								64
		Actual	7.0	3.0	2.0	1.0	1.0									61
2.2	Perform biomass clearance for 462.09 ha (5 blocks) on lower and central reservoir	Planed	18.0	3.0	3.0	3.0	2.0	1.0					2.0	2.0	2.0	57
		Actual	8.0	3.0	2.0	2.0	1.0									54
2.3	Perform biomass clearance for 212.66 ha (7 blocks) on central and upper reservoir	Planed	17.0	3.0	2.0	3.0	2.0	1.0					2.0	2.0	1.0	50
		Actual	9.0	3.0	2.0	3.0	1.0									46
3	**Preparation of Floating/Debris Removal**	Planed	0.0													43
		Actual	0.0													39
3.1	Procurement of service for floating logs/debris removal	Planed	5.0						2.5						2.5	36
		Actual	0.0													32
4	**Monitoring and Reporting**	Planed	0.0													29
		Actual	0.0													25
4.1	Field monitoring and inspection of biomass clearance and compliance to SS-ESMMP (weekly & Monthly)	Planed	10.0	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	1.0	1.0	1.0	21
		Actual	4.0	1.0	1.0	1.0	1.0									18
4.2	Coordination or Ad-hoc meeting to discuss the progress, concerns and problem solving	Planed	2.0		0.5				0.5			0.5			0.5	14
		Actual	0.5		0.5											11
	Total	Planed	100.0	**22.0**	**22.5**	**16.0**	**7.0**	**4.0**	**3.5**	**0.5**	**0.5**	**1.0**	**7.0**	**7.0**	**9.0**	7
		Actual	56.5	**22.0**	**17.5**	**13.0**	**4.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	4
	Planned Progress	monthly	0.0	22.0	22.5	16.0	7.0	4.0	3.5	0.5	0.5	1.0	7.0	7.0	9.0	
		Cumulative		22.0	44.5	60.5	67.5	71.5	75.0	75.5	76.0	77.0	84.0	91.0	100.0	
	Actual Progress	monthly		22.0	17.5	13.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		Cumulative		22.0	39.5	52.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	



The blue graph and yellow highlight represent the planned activity, the red graph and green highlight represent the actual progress.

Table 3-17: Biomass and UXO Clearance Progress in Each Priority Area as of 30 April 2017

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (El. 315 - 320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 30 Apr 2017 (ha)	Status of Biomass Clearance as of 30 April 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
Block 01	1	115.38	6.15	29.35	79.88	109.24	106.95	58.30	- Completed burning of dried larger vegetation and grown cover of around of 19 ha of forest area. - Completed vegetation cutting of 39.30 ha of community lands - Completed inventory of trees to be cut and stockpiled. - Waste biomass including 231 logs to be piled and burned at site - 6 trees will be cut and stockpiled for GoL further utilization.
Block 02	1	165.92	7.30	38.72	119.89	158.62	150.41	107.00	- Completed vegetation cutting of 69 ha of community land and 38 ha of forest area - Started burning of dried larger vegetation and grown cover of around 24 ha. The debris to be completely burned. - Completed inventory of trees to be cut and stockpiled - Around 323 trees will be cut and stockpiled

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (El. 315 - 320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 30 Apr 2017 (ha)	Status of Biomass Clearance as of 30 April 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
Block 03	1	88.86	8.51	14.43	65.92	80.35	74.84	49.50	- Completed vegetation cutting of 32.50 ha of community land and 14 ha of forest - Started burning of dried larger vegetation and grown cover of around 20 ha. The debris to be completely burned. - Inventory of trees to be cut and stockpiled is under completion
Block 04	1	167.68	3.94	122.97	40.77	163.74	156.49	132.28	- Completed vegetation cutting and burning of 35.38 ha of community land and 96.90 ha of forest - Completed burning of dried larger vegetation and grown cover of around 122 ha of forest area. The debris to be completely burned. - Stockpiling of 226 logs is under completion.
Block 05	1	350.72	10.61	66.53	273.58	340.11	285.52	130.17	- Completed vegetation cutting and burning of around 83.37 ha of community land and around 40 ha of forest - Completed burning of dried larger vegetation and grown

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (El. 315 - 320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 30 Apr 2017 (ha)	Status of Biomass Clearance as of 30 April 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
									cover of around 48 ha. The debris to be completely burned. - Continue biomass clearance of compensated area around 16 ha - Fire break of cut biomass area is under preparation
Block 06	1	46.71	14.87	20.31	11.54	31.84	10.87	10.00	- Completed vegetation cutting and burning (bush and small trees) of 10 ha of community land in 2016 - Further clearing will be resumed in the fourth quarter of 2017
Block 07	2	43.03	3.39	18.48	21.17	39.65	33.54		- Biomass clearing will start in Sep 2017
Block 08	2	41.00	3.40	14.64	22.97	37.61	35.21	4.00	- Completed vegetation cutting and burning (bush and small trees) of 4 ha of community land in 2016 - Further biomass clearing will be resumed in Sep 2017

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (El. 315 - 320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 30 Apr 2017 (ha)	Status of Biomass Clearance as of 30 April 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
Block 09	2	54.13	1.38	11.67	41.08	52.75	44.76		- biomass clearing will start in Sep 2017
Block 10	2	317.39	48.28	128.97	140.14	269.10	259.58	118.35	- Completed vegetation cutting of around 76.62 ha of community land and around 20 ha of forest area - Started burning of dried larger vegetation and grown cover of around 31 ha. The debris to be until completely burned. - Continue biomass clearance of the remaining area
Block 11	2	98.05	8.07	24.06	65.92	89.98	87.73	98.98	- Completed vegetation cutting of around 65.98 ha of community land and around 24.06 ha of forest area - Started burning of dried larger vegetation and grown cover of around 47 ha. The debris to be until completely burned.
Block 12	3	84.23	20.13	64.11		64.11	63.95	34.15	- Completed vegetation cutting around 27.42 ha. - Started burning of dried larger vegetation and grown cover of around 5 ha. The debris to be until completely burned.

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (El. 315 - 320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 30 Apr 2017 (ha)	Status of Biomass Clearance as of 30 April 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
Block 13	3	131.35	30.10	76.44	24.81	101.24	87.61	101.24	- Completed vegetation cutting of 101.24 ha - Completed inventory of trees to be cut and stockpiled - 96 trees were cut and stockpiled - Started burning of dried larger vegetation and grown cover of around 101 ha. The debris to be until completely burned.
Block 14	3	53.00	9.66	7.79	35.54	43.33	35.74	43.33	- Completed vegetation cutting of 43.33 ha - Started burning of dried larger vegetation and grown cover of around 43 ha. The debris to be until completely burned. - Completed inventory of trees to be cut and stockpiled - 454 trees were cut down and being stockpiled - 44 trees will cut and stockpiled
Block 15	3	93.27	49.54	13.52	30.21	43.73	39.43	43.73	- Completed vegetation cutting of 43.73 ha - Started burning of dried larger vegetation and grown cover of around 101 ha. The debris to be until completely burned.

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (El. 315 - 320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 30 Apr 2017 (ha)	Status of Biomass Clearance as of 30 April 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
									- Completed inventory of trees to be cut and stockpiled - 17 trees were cut down and stockpiled - 39 trees will cut and stockpiled
Block 16	3	9.86	6.53	1.30	2.02	3.32	3.32	3.32	- Completed vegetation cutting of 15.23 ha of Block 16, 17 and 18 - Started burning of dried larger vegetation and grown cover of around 7.27 ha. The debris to be until completely burned. - Completed inventory of trees to be cut and stockpiled - 39 trees in Block 16 will cut and stockpiled - 46 trees were cut down and stockpiled in Block 17. 14 trees in Block 17 will cut and stockpiled in the block - 26 trees were cut down and stockpiled in Block 18. 76 trees in Block 18 will cut and stockpiled in the block.
Block 17	3	44.25	36.29	1.33	6.63	7.96	7.78	7.96	
Block 18	3	7.18	3.23	3.95		3.95	3.95	3.95	
Total		**1,912.01**	**271.38**	**658.55**	**982.08**	**1,640.63**	**1,487.68**	**946**	

3.5.4 Fishery Monitoring

The fishery monitoring programme is progressing, and a database has been developed to support the future fish management programme as part of the in Nam Ngiep 1 Watershed Management Plan. Two types of the survey were conducted during April 2017 including daily fish catch logbook monitoring and gillnet survey. The gathered information is being put into the database.

The data from the daily fish catch logbook monitoring indicates that the mean daily fish catch in Nam Ngiep River was 2.3 kg/household/day in March 2017. The estimated total fish catch in Nam Ngiep basin for March 2017 is 49,300 kg. Around 35% of the catch was sold, 56% was consumed fresh, 5% processed and approximately 4% was used for other purposes.

The overall progress of fish monitoring programme is illustrated in Figure 3-12 below.

The overall progress of fish monitoring programme is illustrated in ***Figure 3-12*** below.

Figure 3-12: Gantt Chart of Fish Monitoring Programme as of 30 April 2017

	Task List / Steps of work		Weight (%)	YEAR 2017											
				Q1			Q2			Q3			Q4		
				01	02	03	04	05	06	07	08	09	10	11	12
1	**Daily catch logbook and Verification Survey**	Planed	-												
		Actual	-												
1.1	Daily catch logbook data collection on 108 HHs in 25 villages	Planed	24	2	2	2	2	2	2	2	2	2	2	2	2
		Actual	9	1.50	2.00	3.00	2.00								
1.2	Daily catch logbook verification survey for Q2 2016 to Q1 2017 on 144 HHs	Planed	4	2		2									
		Actual	4	2		2									
1.3	GPS for Fishing location cover 25 villages	Planed	8				2	2	2	2					
		Actual	-												
1.4	Make the posters for fish species and fishing gear composition along Nam Ngiep River	Planed	2											2	
		Actual	-												
2	**Species Veification Survey**	Planed	-												
		Actual	-												
2.1	Survey design, interview form design, test and development	Planed	2		2										
		Actual	-												
2.2	Data collection and validation on 108 HHs	Planed	8		2	3	3								
		Actual	-												
3	**Fish Migration and Spawning Survey**														
3.1	Survey design, interview form design, test and development	Planed	2	2											
		Actual	2	2											
3.2	Data collection and validation on 88 experience fishers	Planed	12	6	6										
		Actual	12	2	7	3									
4	**Data management and report**														
4.1	Data input to database system	Planed	24	2	2	2	2	2	2	2	2	2	2	2	2
		Actual	7	1	2	2	1.50								
4.2	Annual Data analysis and draft annual report for 2016-2017	Planed	5							5					
		Actual	-												
4.3	Disemination/presentation the report for 2016-2017	Planed	5							5					
		Actual	-												
4.4	Final Annual Report for 2016-2017	Planed	4								4				
		Actual	-												

The blue line and yellow highlights represent the planned activity, and the red line and green highlight represent the actual progress

Activities in April 2017	Results
Daily Catch Logbook and Verification Survey	• Completed the daily catch logbook survey in 108 households out of the total target of 108 households. 2,676 forms were used in the survey. • A fishery database has been developed. • The daily household catch on average for Nam Ngiep in March 2017 is 2.3 kg/household/day. The median catch for all fishing zone is presented in Figure 3-13. • The estimated total catch for Nam Ngiep in March 2017 is approximately 49,300 kg as shown in Figure 3-14.
Household Catch Assessment Survey	• Draft report was submitted by fishery consultant.
Village Community Interview	• On progress for data analysis and reporting by fishery consultant.
Fish Migration and Spawning survey	• On progress for data analysis and reporting by fishery consultant.
Gillnet Sampling Survey	• Trial data collection at Thaheua and Nampa Villages included some water quality measurement, setting and retrieving gillnet and fish size measurement.

Figure 3-13: Median daily household catch by fishing zone and Nam Ngiep mean value for all fishing zones combined (Kg/HH/day)

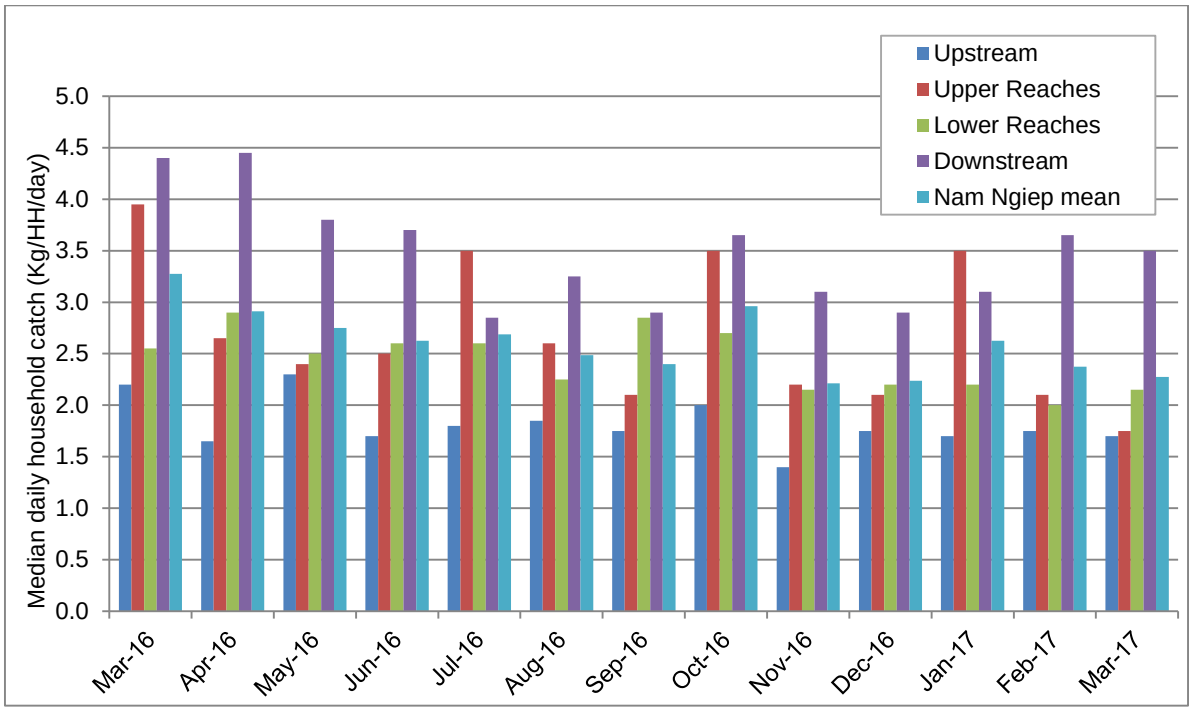
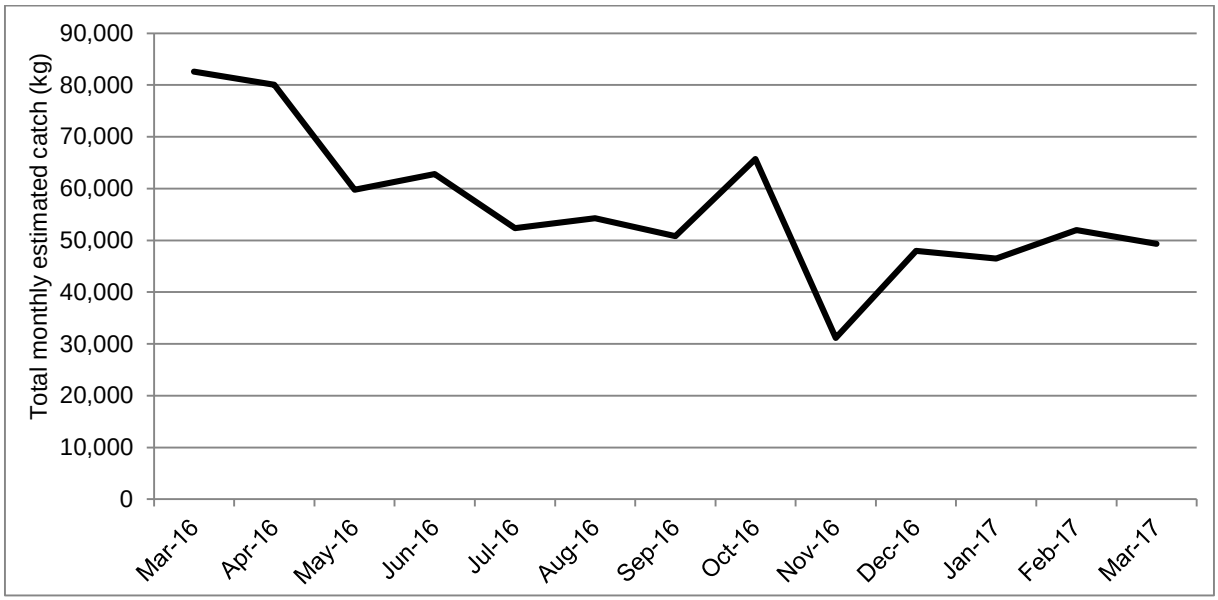


Figure 3-14: Total estimated fish catch for Nam Ngiep by month (Kg)



3.6 Other Obligations and Support Programmes

3.6.1 Environmental Protection Fund (EPF)

EMO team completed another round of review on the revised EPF sub-project proposal of Xaysomboun and Xiengkouang on 23 March 2017 for further improvement.

Bolikhamxay Team (sub-project implementation team) submitted the February progress report of sub-project implementation work to EPF. NNP1 EMO team also inquired Bolikhamaxay Team to share the document and for next progress reporting.

3.6.2 115 kV Transmission Line IEE Due Diligence Assessment

There was no update on the revision of IEE for 115kV TL during the reported period. The due diligence assessment (DDA) will be resumed once the IEE is revised (based on the new alignment) and environmental and social mitigation measures are implemented.

3.7 External Monitoring

There was no external monitoring during the reported period.

3.7.1 Biodiversity Advisory Committee

BAC submitted the 5th BAC mission report in the first week of February 2016.

NNP1 EMO provided the comments to 5th BAC mission report in the second week of March 2017. The report was further revised by BAC Team Leader in the last week of March 2017. Second feedback was provided by NNP1 EMO on 28 April and the final version is expected sometime in May 2017 for further sharing with BOMC, IAP, ADB, IMA and LTA.

ANNEXES

ANNEX A: RESULTS OF EFFLUENT ANALYSES

Table A- 1: Results of Camp Effluents in April 2017 (first mission)

	Site Name	Owner Site Office and Village	Obayashi Camp WWT1	Obayashi Camp WWT2	TCM Camp	Sino Hydro Camp	V & K Camp
	Station Code	EF01	EF02	EF15	EF03	EF06	EF10
	Date	07Apr-17	07-Apr-17	07-Apr-17	07-Apr-17	07-Apr-17	07-Apr-17
Parameters (Unit)	**Guideline**						
pH	6.0 - 9.0	7.22	7.87	8.57		7.25	7.03
Sat. DO (%)		15	0	61.2		0	0
DO (mg/l)		1.43	0	4.84		0	0
Conductivity (µs/cm)		460	797	826		614	382
TDS (mg/l)		230	398	413		307	191
Temperature (°C)		27.94	27.7	25.57		26.63	26.47
Turbidity (NTU)		0.35	16.74	30.24		8.76	26
TSS (mg/l)	<50	ND[16]	18	20.9	No	17.1	110
BOD_5 (mg/l)	<30	3.6	41.6	43.5	water	26.5	3.8
COD (mg/l)	<125	ND[18]	134	187		77.6	25
NH3-N (mg/l)	<10.0	7	27	ND[12]		23	4
Total Nitrogen (mg/l)	<10.0	15.5	31.8	9.14		25	6.52
Total Phosphorus (mg/l)	<2	1.68	1.62	0.75		1.56	0.26
Oil & Grease (mg/l)	<10.0	ND[10]	2	1		3	1
Total coliform (MPN/100ml)	<400	49	160,000	160,000		160,000	11,000
Faecal Coliform (MPN/100ml)		0	160,000	160,000		160,000	3,300
Discharge Volume (m3/day)		***1.7***	***0***	***0***		***0***	***0***

	Site Name	Song Da 5 Camp No.1	Song Da 5 Camp No.2	Zhefu Camp	SECC Camp	HMH Main Camp WWTP	IHI Camp	Kenber Camp
	Station Code	EF07	EF08	EF09	EF11	EF13	EF14	EF16
	Date	07-Apr-17	07-Apr-17	07-Apr-17	07-Apr-17	07-Apr-17	07-Apr-17	07-Apr-17
Parameters (Unit)	**Guideline**							
pH	6.0 - 9.0	7.83	7.62	6.89	7.59	7.69	7.49	7.74
Sat. DO (%)		19.8	0	22.2	66.2	0	0	0
DO (mg/l)		1.47	0	1.58	4.94	0	0	0
Conductivity (µs/cm)		826	585	310	284	627	497	184
TDS (mg/l)		413	294	155	142	314	248	92
Temperature (°C)		29.35	26.63	29.32	29.24	29.29	27.58	25.63
Turbidity (NTU)		7.22	25.9	7.11	12.29	7.91	12.34	10.85
TSS (mg/l)	<50	23.7	45.6	16.2	31.5	38.7	22.1	11.4
BOD_5 (mg/l)	<30	ND[13]	46.5	10.9	3.1	36.4	55.2	63
COD (mg/l)	<125	98.4	200	41.6	65.6	174	156	190
NH3-N (mg/l)	<10.0	31	88	ND[12]	ND[12]	25	18	8

	Site Name	Song Da 5 Camp No.1	Song Da 5 Camp No.2	Zhefu Camp	SECC Camp	HMH Main Camp WWTP	IHI Camp	Kenber Camp
	Station Code	EF07	EF08	EF09	EF11	EF13	EF14	EF16
	Date	07-Apr-17	07-Apr-17	07-Apr-17	07-Apr-17	07-Apr-17	07-Apr-17	07-Apr-17
Parameters (Unit)	**Guideline**							
Total Nitrogen (mg/l)	<10.0	34.2	42	17.6	2.43	31.4	20.7	12.5
Total Phosphorus (mg/l)	<2	1.67	2.84	1.65	0.05	1.54	1.44	0.95
Oil & Grease (mg/l)	<10.0	2	1	ND[13]	ND[13]	3	2	ND[13]
Total coliform (MPN/100ml)	<400	0	160,000	160,000	920	160,000	160,000	160,000
Faecal Coliform (MPN/100ml)		0	160,000	160,000	33	160,000	4,600	160,000
Discharge Volume (m3/day)		***86.4***	***17.3***	***0***	***0***	***0***	***0***	0

ND[1] (<0.0005 mg/L) ND[2] (<0.0003 mg/L) ND[3] (<0.0002 mg/L) ND[4] (<0.005 mg/L) ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L) ND[7] (<0.07 mg/L) ND[8] (<0.04 mg/L) ND[9] (<0.02 mg/L) ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L) ND[12] (<0.2 mg/L) ND[13] (<1.0 mg/L) ND[14] (<1.5 mg/L) ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L) ND[17] (<2.7 mg/L) ND[18] (<25.0 mg/L)

Table A- 2: Results of Camp Effluents in April 2017 (second mission)

	Site Name	Owner Site Office and Village	Obayashi Camp WWT1	Obayashi Camp WWT2	TCM Camp	Sino Hydro Camp	V & K Camp
	Station Code	EF01	EF02	EF15	EF03	EF06	EF10
	Date	21-Apr-17	21-Apr-17	21-Apr-17		21-Apr-17	21-Apr-17
Parameters (Unit)	**Guideline**						
pH	6.0 - 9.0	6.78	7.63	8.33	No waste water	7.43	7.15
Sat. DO (%)		9.4	13.3	29.7		0	0
DO (mg/l)		0.72	3.99	2.29		0	0
Conductivity (µs/cm)		462	877	853		712	443
TDS (mg/l)		231	438	427		356	221
Temperature (°C)		28.72	29.82	26.66		29.38	28.46
Turbidity (NTU)		0.66	26.27	23.35		12.09	5.1
TSS (mg/l)	<50	ND	29.6	30.3		10	9.9
BOD_5 (mg/l)	<30	2	60.2	53		46	3.7
COD (mg/l)	<125	ND[18]	135	170		96.8	ND[18]
NH3-N (mg/l)	<10.0	3	28	ND		26	4
Total Nitrogen (mg/l)	<10	11.4	32	6.49		29.2	4.86
Total Phosphorus (mg/l)	<2	1.47	1.67	0.82		1.59	0.18
Total coliform (MPN/100ml)	<400	2	160,000	160,000		160,000	54,000
Faecal Coliform (MPN/100ml)		***2***	***160000***	***160000***		***160000***	***17***
Discharge Volume (m3/day)		***1.7***	***0***	***0***		***0***	***0***

	Site Name	Song Da 5 Camp No.1	Song Da 5 Camp No.2	Zhefu Camp	SECC Camp	HMH Main Camp WWTP	IHI Camp	Kenber Camp
	Station Code	EF07	EF08	EF09	EF11	EF13	EF14	EF16
	Date	21-Apr-17	21-Apr-17	21-Apr-17	21-Apr-17	21-Apr-17	21-Apr-17	21-Apr-17
Parameters (Unit)	**Guideline**							
pH	6.0 - 9.0	7.54	7.65	6.96	6.78	7.5	8.08	8.97
Sat. DO (%)		4.5	0	1	5.1	0	0	37.2
DO (mg/l)		0.54	0	0.08	0.38	0	0	2.57
Conductivity (µs/cm)		910	874	375	238	636	1323	292
TDS (mg/l)		455	437	187	119	318	662	146
Temperature (°C)		27.61	29.29	30.39	26.9	29.33	27.79	31.74
Turbidity (NTU)		23.47	6.29	13.17	14.71	14.6	26.13	34.97
TSS (mg/l)	<50	21.3	23.2	28.2	27.1	27.8	21.2	50
BOD_5 (mg/l)	<30	28	38.7	22	3.4	77.1	113	58.9
COD (mg/l)	<125	98.4	114	62.2	45.2	150	235	174
NH3-N (mg/l)	<10.0	29	44	ND[12]	ND[12]	26	21	ND[12]
Total Nitrogen (mg/l)	<10	32.8	40.1	8.81	3.25	26.2	20.3	5.67
Total Phosphorus (mg/l)	<2	1.61	1.76	1.75	0.13	1.57	1.61	0.28
Total coliform (MPN/100ml)	<400	2	160,000	160,000	140	160,000	160,000	160,000
Faecal Coliform (MPN/100ml)		***0***	160,000	92,000	***23***	160,000	160,000	54,000
Discharge Volume (m3/day)		***86.4***	***17.3***	***0***	***0***	***0***	***0***	0

ND[1] (<0.0005 mg/L)	ND[2] (<0.0003 mg/L)	ND[3] (<0.0002 mg/L)	ND[4] (<0.005 mg/L)	ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L)	ND[7] (<0.07 mg/L)	ND[8] (<0.04 mg/L)	ND[9] (<0.02 mg/L)	ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L)	ND[12] (<0.2 mg/L)	ND[13] (<1.0 mg/L)	ND[14] (<1.5 mg/L)	ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L)	ND[17] (<2.7 mg/L)	ND[18] (<25.0 mg/L)		

Table A- 3: Results of the Construction Area Discharge in April 2017

	Site Name	Aggregate Crushing Plant				Spoil Disposal #2			
	Station Code	DS02				DS04			
	Date	06-Apr-17	11-Apr-17	20-Apr-17	27/04/17	06-Apr-17	11-Apr-17	20-Apr-17	27-Apr-17
Parameter (Unit)	**Guideline**								
pH	6.0 - 9.0	8.67	8.6	7.74	7.31	6.11		7.94	7.93
Sat. DO (%)		51.1	75.5	36.7	47.1	73		41	58.7
DO (mg/l)		4.21	5.66	2.49	3.23	5.36	No water	2.98	4.18
Conductivity (µs/cm)		136	136	148	138	110	discharged	118	85
TDS (mg/l)		68	68	74	69	55		59	42
Temperature (°C)		23.23	28.68	29.26	31.12	25.51		29.4	31.84
Turbidity (NTU)		15,100	7,820	2,110	7,160	9.59		18	20
TSS (mg/l)	<50	2,558	3,100	558	2,425	10		5	8
Oil & Grease (mg/l)	<10	2	N/A	N/A	N/A	N/A		N/A	N/A
Discharge Volume (m^3/day)		***43.20***	***86.00***	***86.00***	***30.00***	***86.40***		***86.00***	***90.00***

	Site Name	RCC Plant				Regulating Dam			
	Station Code	DS09				DS08			
	Date	06-Apr-17	11-Apr-17	20-Apr-17	27-Apr-17	06-Apr-17	11-Apr-17	20-Apr-17	27-Apr-17
Parameter (Unit)	**Guideline**								
pH	6.0 - 9.0	No water discharged	7.9	7.52	7.48	8.95	No water discharged	No water discharged	No water discharged
Sat. DO (%)			81.4	41.6	49.7	69.5			
DO (mg/l)			6.19	3.11	3.18	5.47			
Conductivity (µs/cm)			259	242	259	145			
TDS (mg/l)			130	121	128	72			
Temperature (°C)			31.04	29.12	34.74	26.25			
Turbidity (NTU)			75	62,500	1,166	118.88			
TSS (mg/l)	<50		156	49,682	1,260	183			
Oil & Grease (mg/l)	<10		N/A	N/A	N/A	ND[13]			
Discharge Volume (m^3/day)			***86.40***	***173.00***	***190.00***	***4.30***			

	Site Name	Main Dam (Treatment Plant No.1)				Main Dam (Treatment Plant No.2)			
	Station Code	DS11				DS12			
	Date	06-Apr-17	11-Apr-17	20-Apr-17	27-Apr-17	06-Apr-17	11-Apr-17	20-Apr-17	27-Apr-17
Parameter (Unit)	**Guideline**								
pH	6.0 - 9.0	11.24	3.23	7.23	6.07	No water discharge	No water discharge	9.82	No water discharge
Sat. DO (%)		71.5	63.3	54.6	57.8			54.3	
DO (mg/l)		5.79	4.76	4.04	4.39			4.05	
Conductivity (µs/cm)		1,049	966	1,211	1,288			188	
TDS (mg/l)		525	483	605	644			94	
Temperature (°C)		24.54	28.45	29.44	27.17			29.18	
Turbidity (NTU)		7.19	17.96	13	8.13			29.02	
TSS (mg/l)	<50	53	44	27	20			31	
Oil & Grease (mg/l)	<10		N/A	N/A	N/A			N/A	
Discharge Volume (m^3/day)		***6,000***	***6,000***	***6,000***	***6,000***			90	

ND[1] (<0.0005 mg/L)	ND[2] (<0.0003 mg/L)	ND[3] (<0.0002 mg/L)	ND[4] (<0.005 mg/L)	ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L)	ND[7] (<0.07 mg/L)	ND[8] (<0.04 mg/L)	ND[9] (<0.02 mg/L)	ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L)	ND[12] (<0.2 mg/L)	ND[13] (<1.0 mg/L)	ND[14] (<1.5 mg/L)	ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L)	ND[17] (<2.7 mg/L)	ND[18] (<25.0 mg/L)		

ANNEX B: Ambient Dust Quality

Table B- 1: 24-hour Average Dust Concentrations Measured in Ban Hat Gniun

Hat Gnuin Village - 24 Hours Average Particulate Matter (PM10) Concentration			
Period	00 to 24 Hours	24 to 48 Hours	48 to 72 Hours
Start Time	20-04-17 15:56	21-04-17 15:56	22-04-17 15:56
End Time	21-04-17 15:56	22-04-17 15:56	23-04-17 15:56
Average Data Record in 24h (mg/m3)	0.08	0.09	0.10
Guideline Average in 24h (mg/m3)	0.12	0.12	0.12

Figure B- 1: Dust Monitoring Results at Ban Hat Gnuin in April 2017

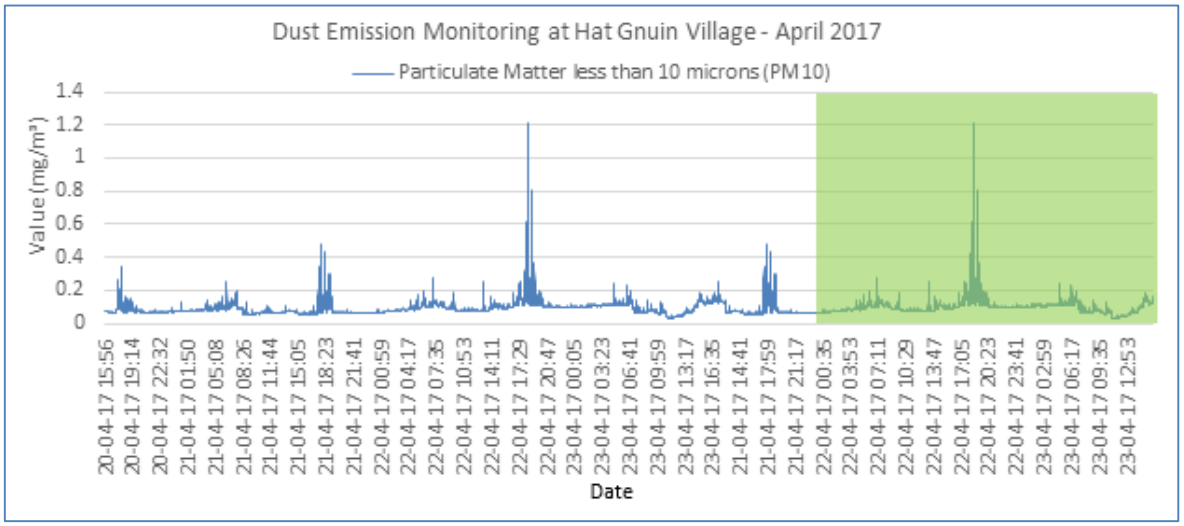


Table B- 2: 24-hour Average Dust Concentrations Measured in Houay Soup Resettlement Area

Houay Soup Resettlement Area - 24 Hours Average Particulate Matter (PM10) Concentration			
Period	00 to 24 Hours	24 to 48 Hours	48 to 72 Hours
Start Time	01-Apr-17 14:30	02-Apr-17 14:30	03-Apr-17 14:30
End Time	02-04-17 14:30	03-04-17 14:30	04-04-17 14:18
Average Data Record in 24h (mg/m3)	0.03	0.04	0.08
Guideline Average in 24h (mg/m3)	0.12	0.12	0.12

Figure B- 2: Dust Monitoring Results at Houay Soup Resettlement Village in April 2017

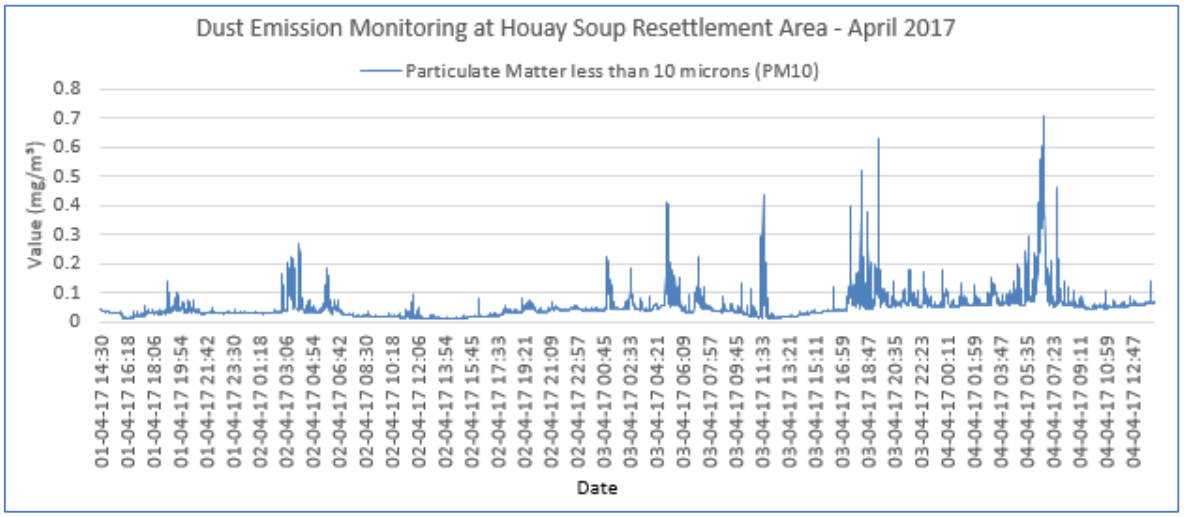


Figure B- 3: Dust Monitoring Results at the Aggregate Crushing Plant in April 2017

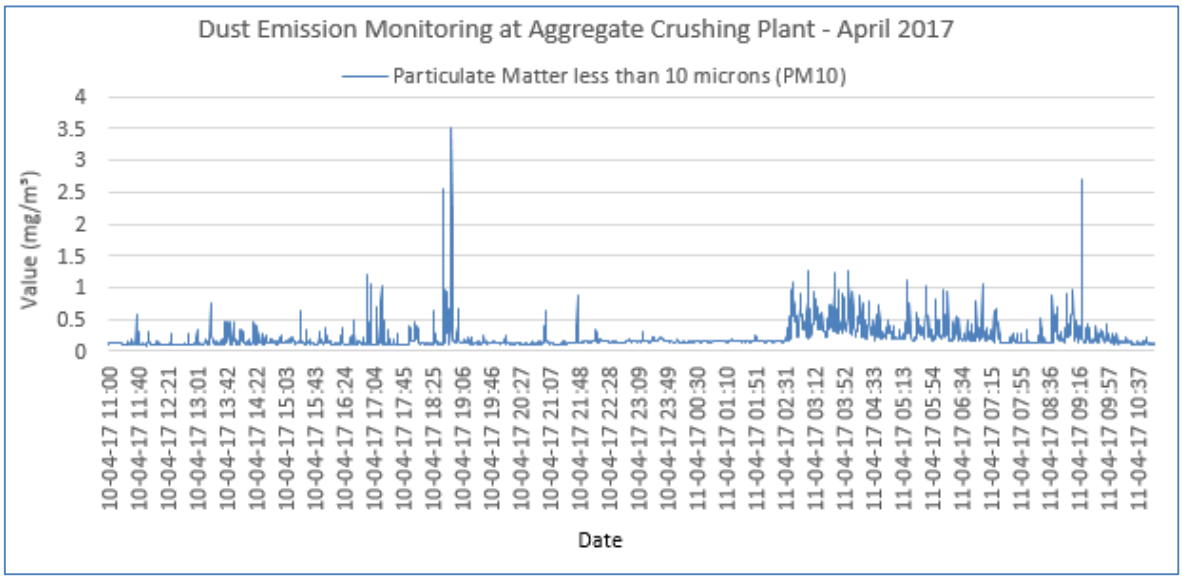


Figure B- 4: Dust Monitoring Results at the RCC Plant in April 2017

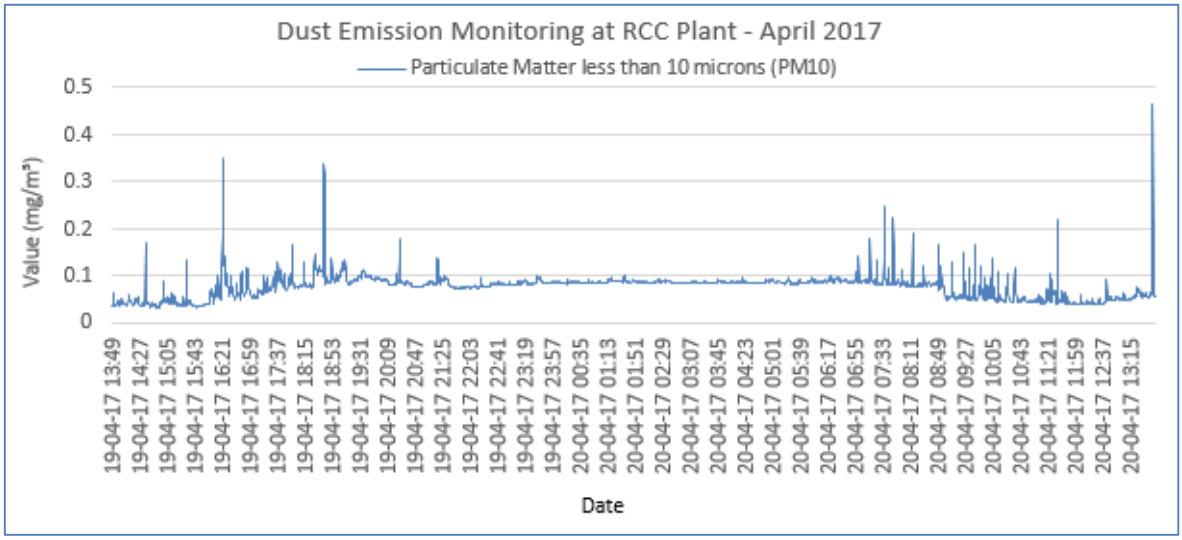


Figure B- 5: Dust Monitoring Results at the Sino Hydro Camp in April 2017

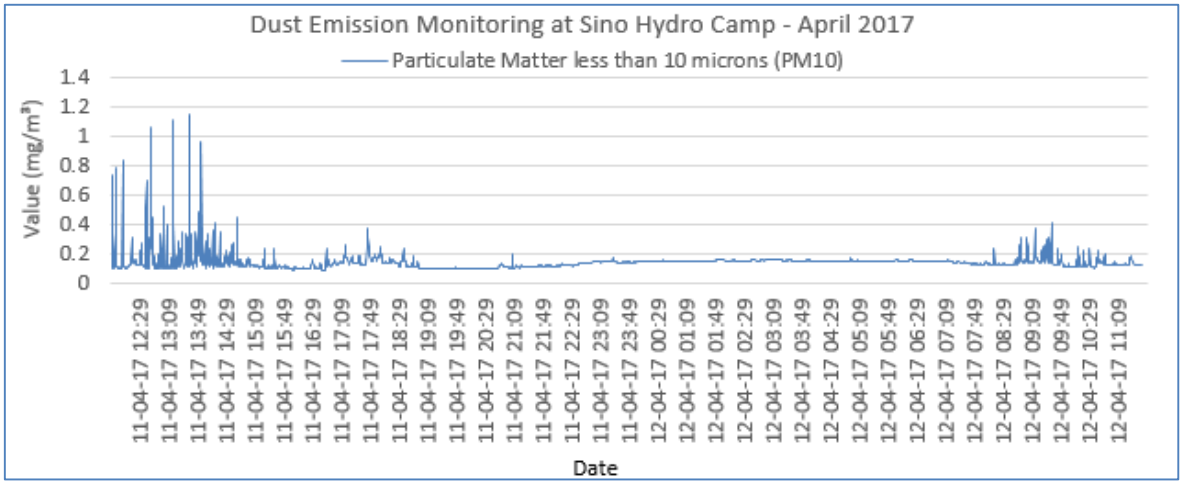


Figure B- 6: Dust Monitoring Results at the Sino Hydro Temporary Camp in April 2017

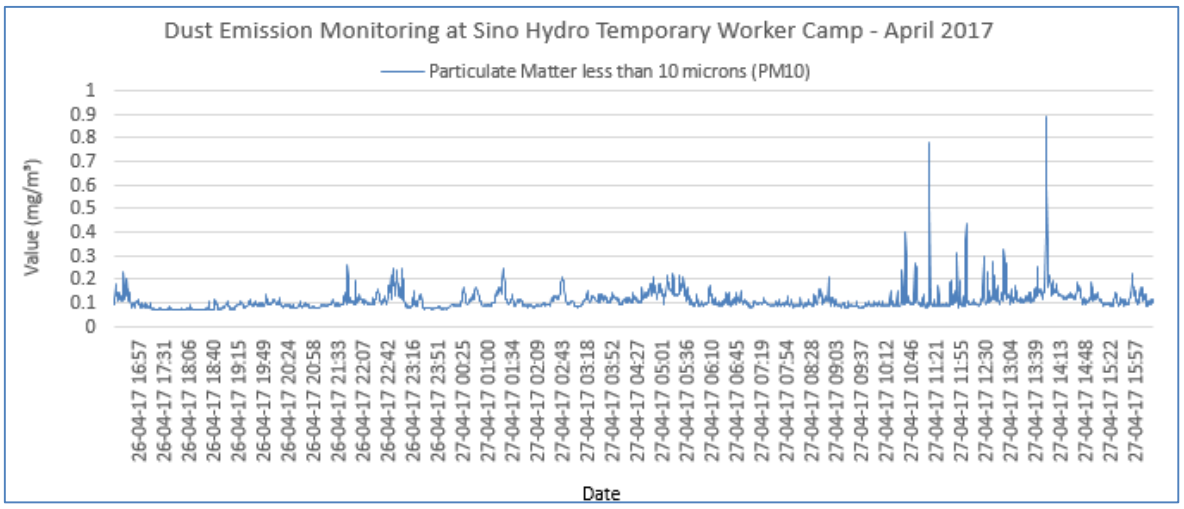


Figure B- 7: Dust Monitoring Results at the SongDa5 No.2 Camp in *April 2017*

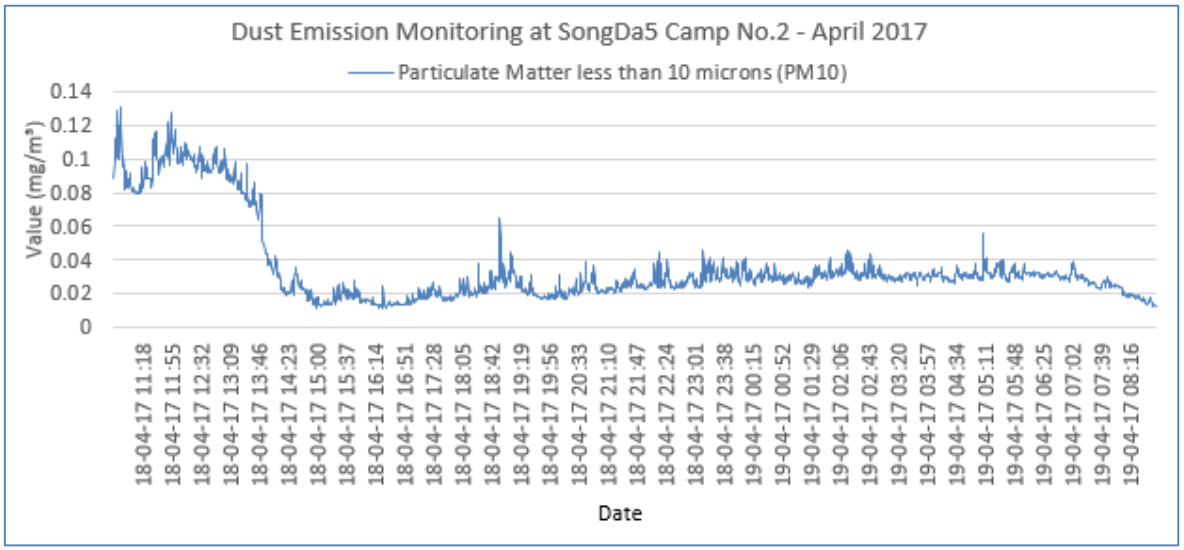


Figure B- 8: Dust Monitoring Results at Main Dam in April 2017

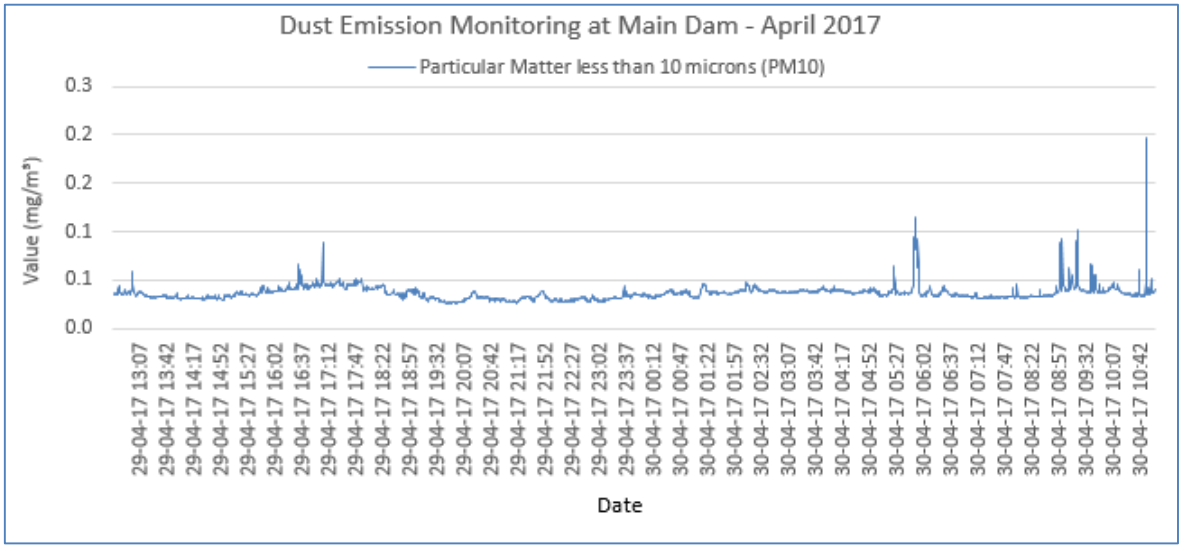
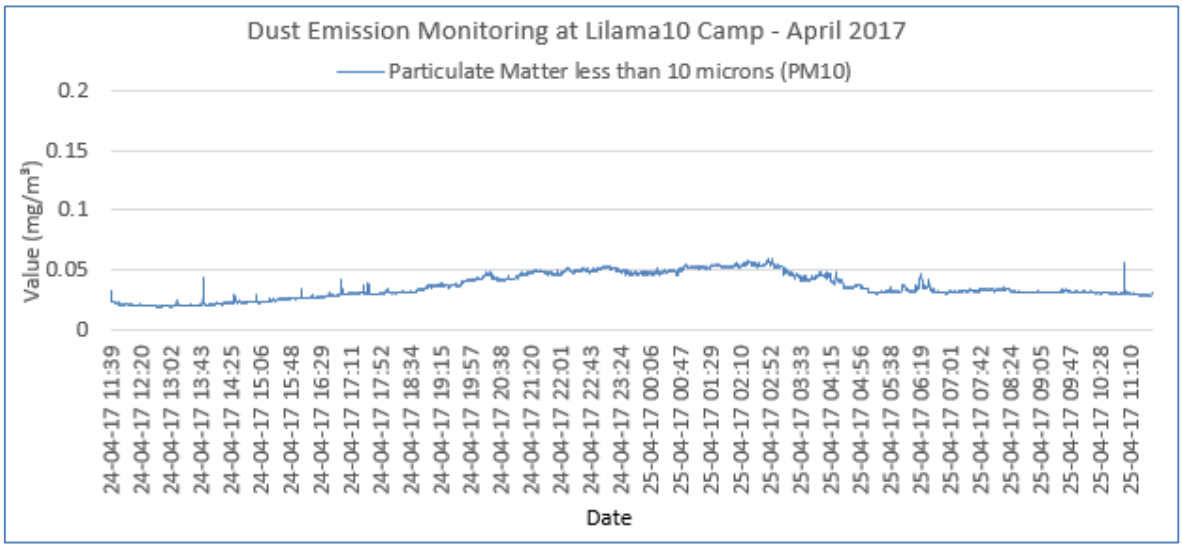


Figure B- 9: Dust Monitoring Results at the Lilama10 Camp in April 2017



ANNEX C: AMBIENT NOISE DATA

Table C- 1: Average Results of Noise Monitoring at Ban Hat Gnuin in April 2017

Noise Level (dB)	20-21/04/2017			21-22/04/2017			22-23/04/2017			23/04/2017
	16:49-18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 - 13:37
Maximum Value Recorded	63.20	67.80	67.70	67.90	62.60	69.30	70.40	64.30	62.40	69.30
Guideline Max	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	46.25	45.91	41.39	43.72	46.32	43.31	43.85	45.21	41.11	45.07
Guideline Averaged	***55***	***55***	***45***	***55***	***55***	***45***	***55***	***55***	***45***	***55***

Figure C- 1: Result of Noise Level Monitoring at Ban Hat Gnuin in April 2017

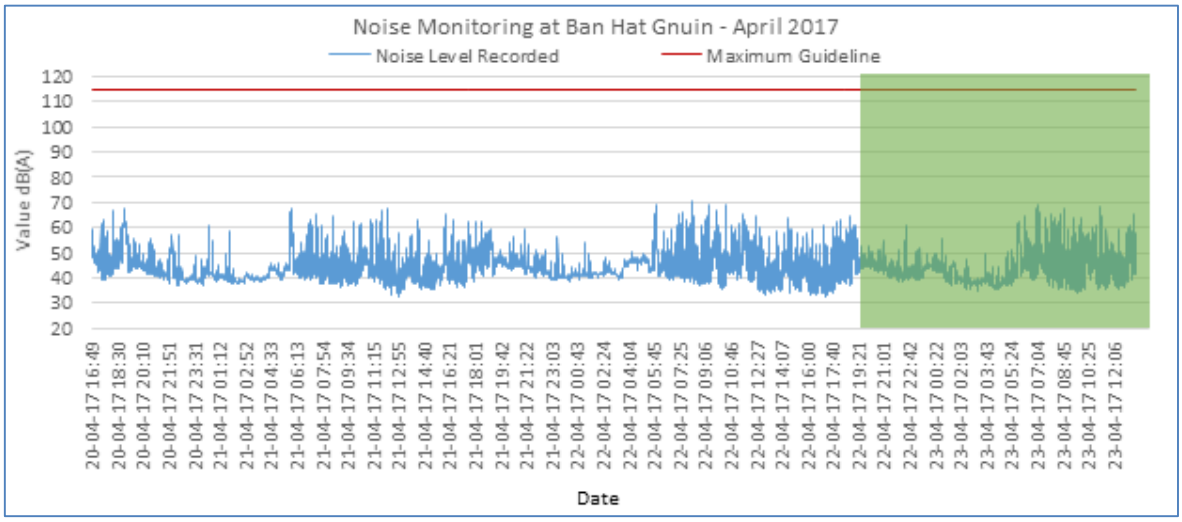


Table C- 2: Average Results of Noise Monitoring at Houay Soup Resettlement Area in April 2017

Noise Level (dB)	1-2/04/2017			2-3/04/2017			3-4/04/2017			04/04/2017
	15:07-18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 - 15:07
Maximum Value Recorded	57.50	57.30	52.80	66.20	73.60	51.50	66.20	65.00	58.10	65.90
Guideline Max	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	42.87	39.53	37.79	40.50	44.44	39.84	41.46	47.64	39.60	42.55
Guideline Averaged	***55***	***55***	***45***	***55***	***55***	***45***	***55***	***55***	***45***	***55***

Figure C- 2: Result of Noise Level Monitoring at Houay Soup Resettlement Village in April 2017

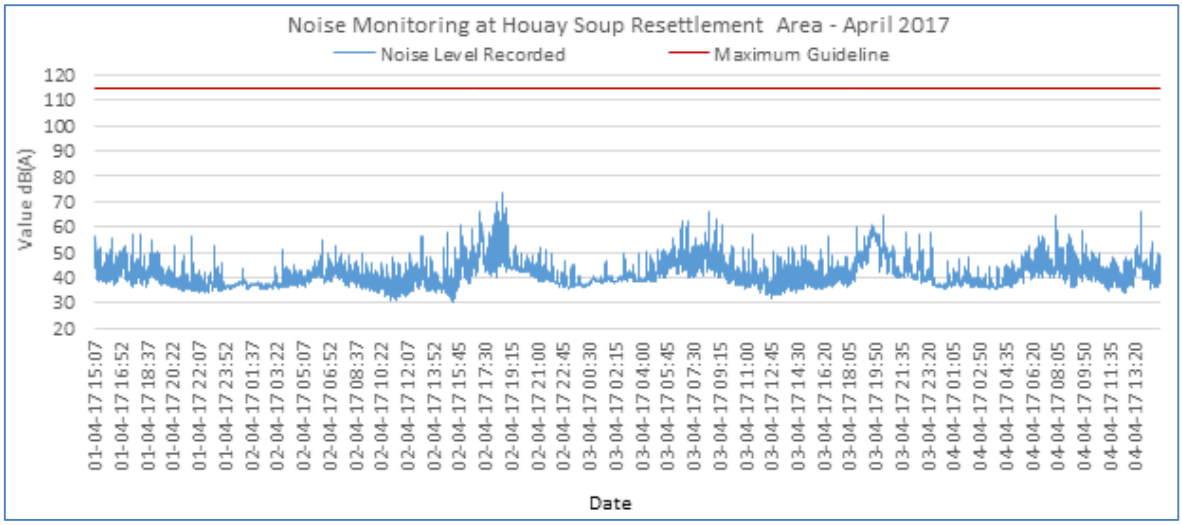


Table C- 2 and Table C-3: Average Results of Noise Monitoring at Aggregate Crushing Plant and RCC Plant in April 2017

Aggregate Crushing Plant

Noise Level (dB)	10-11/04/2017		11/04/2017
	11:47 – 22:00	22:01 – 06:00	06:01-11:47
Maximum Value Recorded	76.7	78.4	78.3
Guideline Max	***115***	***115***	***115***
Average Data Recorded	52.92	60.20	71.43
Guideline Averaged	***70***	***50***	***70***

RCC Plant

Noise Level (dB)	19-20/04/2017		20/04/2017
	14:40 – 22:00	22:01 – 06:00	06:01-14:40
Maximum Value Recorded	65.2	69.4	69
Guideline Max	***115***	***115***	***115***
Average Data Recorded	59.63	61.92	57.49
Guideline Averaged	***70***	***50***	***70***

Figure C- 3: Results of Noise Level Monitoring at the Aggregate Crushing Plant in April 2017

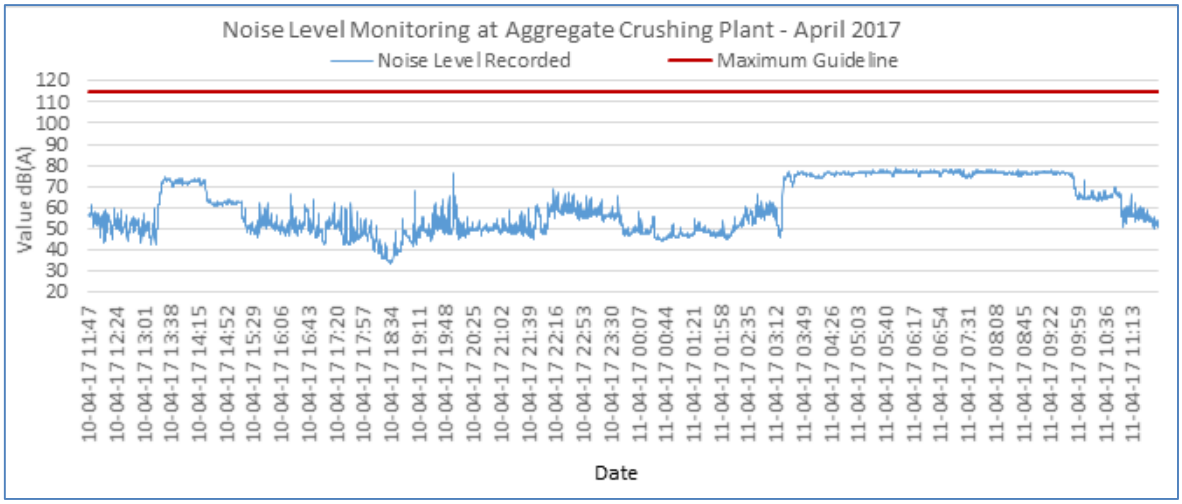


Figure C- 4: Results of Noise Level Monitoring at the RCC Plant in April 2017

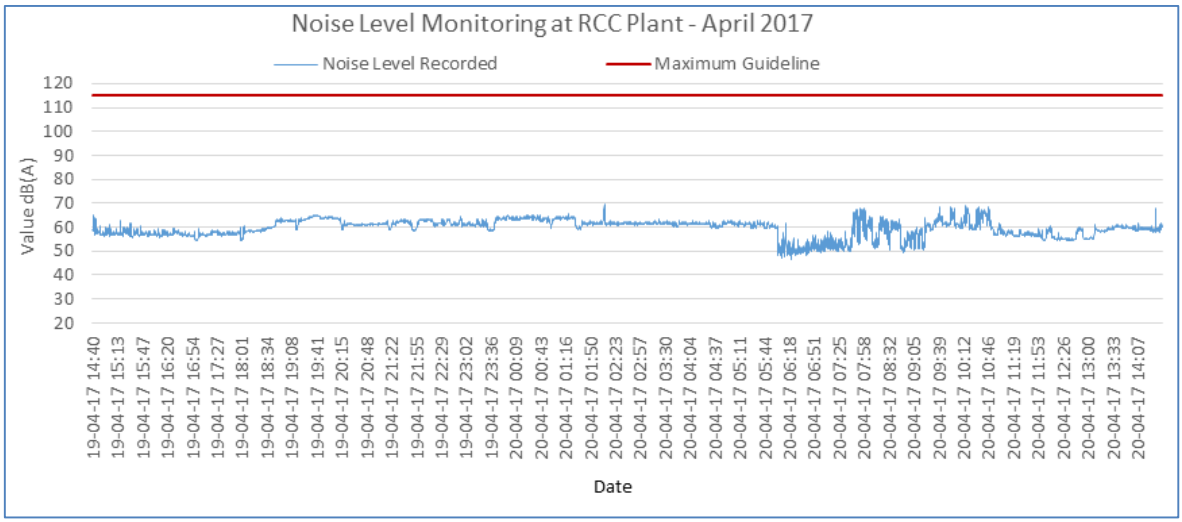


Table C- 5 and Table C- 6: ***Average Results of Noise Monitoring at SongDa Camp#2 and Sino Hydro Camp in April 2017***

Song Da 5 Camp No.2

Noise Level (dB)	18-19/4/2017		19/04/2017
	11:31 – 22:00	22:01 – 06:00	06:01-11:31
Maximum Value Recorded	81.2	53.8	54.4
Guideline Max	***115***	***115***	***115***
Average Data Recorded	50.43	47.33	46.49
Guideline Averaged	***70***	***50***	***70***

Sino Hydro Camp

Noise Level (dB)	11-12/04/2017		12/04/2017
	12:40 – 22:00	22:01 – 06:00	06:01-12:34
Maximum Value Recorded	66.5	71.4	76.5
Guideline Max	***115***	***115***	***115***
Average Data Recorded	53.30	57.61	55.26
Guideline Averaged	***70***	***50***	***70***

Figure C- 5: Results of Noise Level Monitoring at SongDa5 Camp#2 in April 2017

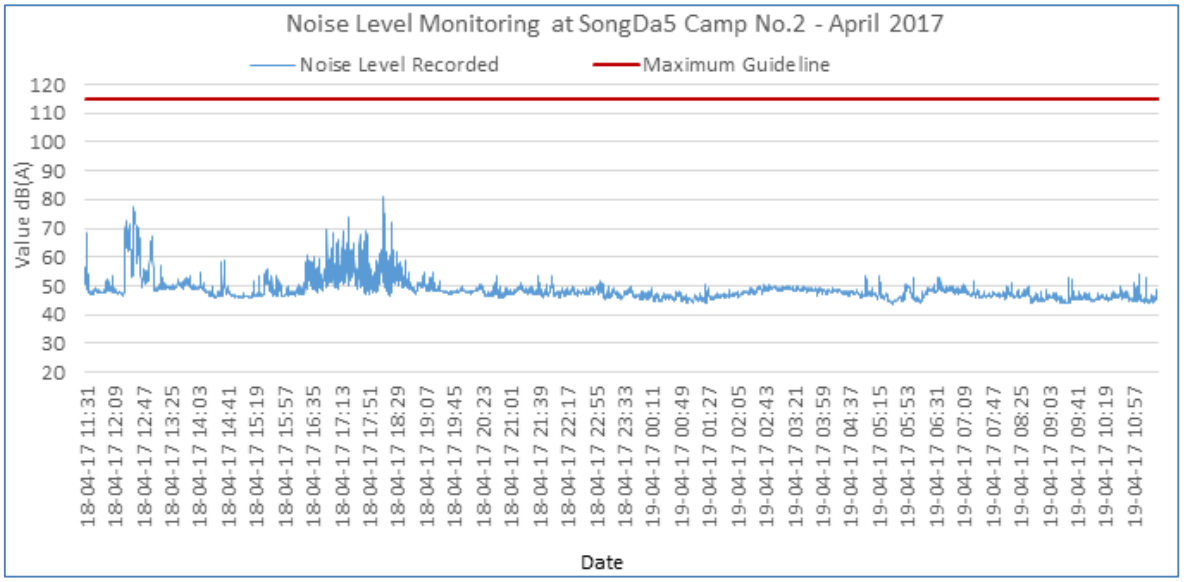


Figure C- 6: Results of Noise Level Monitoring at Sino Hydro Camp in April 2017

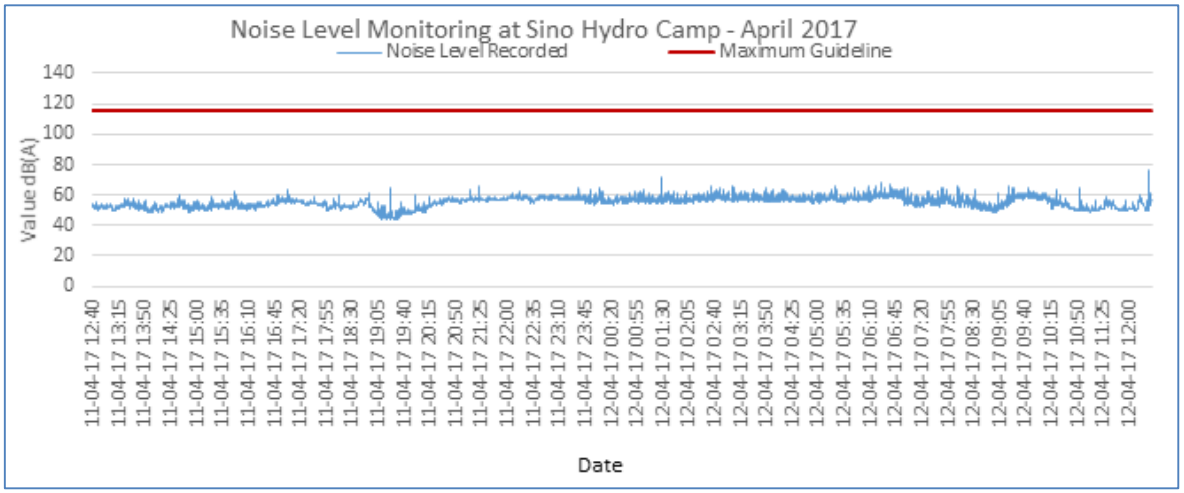


Table C- 7 and Table C- ***8: Average Results of Noise Monitoring at the Owner's Site Office and Village and, the Main Dam in April 2017***

Owner's Site Office and Village

Noise Level (dB)	25-26/04/2017		26/04/2017
	13:05 – 22:00	22:01 – 06:00	06:01-13:05
Maximum Value Recorded	65	52.3	58.1
Guideline Max	***115***	***115***	***115***
Average Data Recorded	39.87	39.57	38.26
Guideline Averaged	***70***	***50***	***70***

Main Dam

Noise Level (dB)	29-30/04/2017		30/04/2017
	16:21 – 22:00	22:01 – 06:00	06:01-16:21
Data Record Max	58.8	63.8	63.1
Guideline Max	***115***	***115***	***115***
Data Record Average	50.52	54.79	55.56
Guideline Averaged	***70***	***50***	***70***

Figure C- 7: Results of Noise Level Monitoring at Owner's Site Office and Village in April 2017

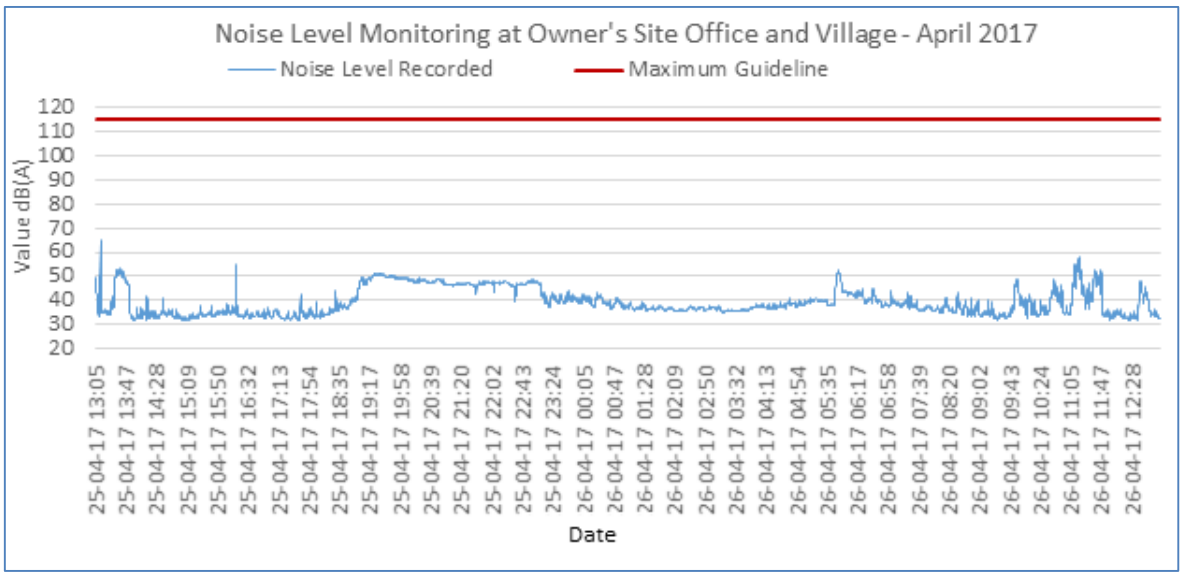


Figure C- 8: Results of Noise Level Monitoring at Main Dam in April 2017

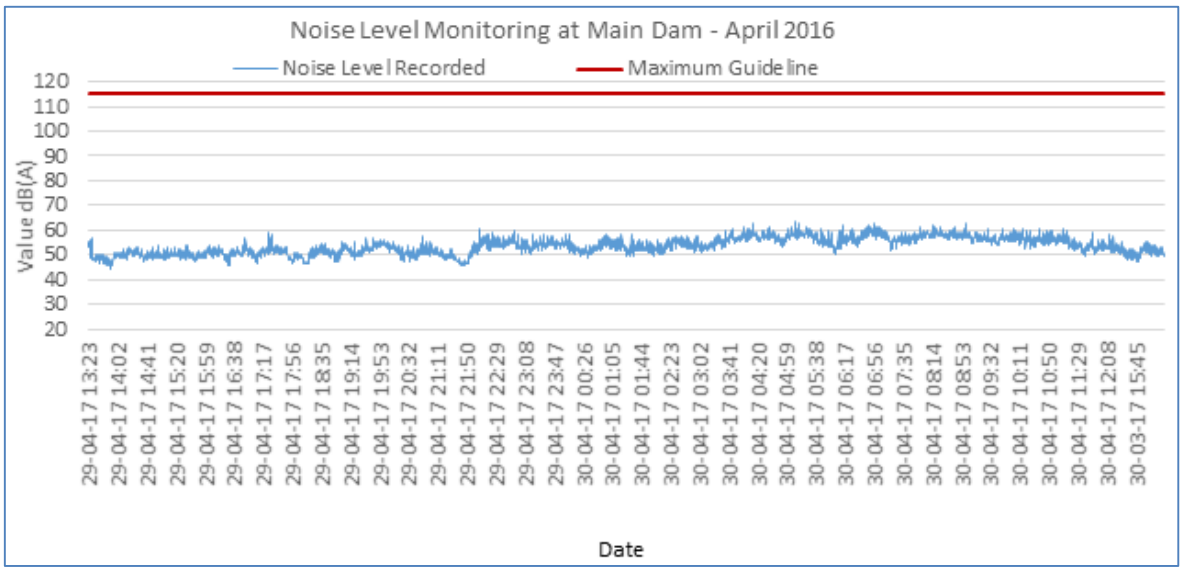


Table C- 9: Average Results of Noise Monitoring at the Sino Hydro Temporary Worker Camp *and Lilama10 Camp in April 2017*

Sino Hydro Temporary Worker Camp

Noise Level (dB)	26-27/04/2017		27/04/2017
	17:07 – 22:00	22:01 – 06:00	06:01-17:07
Maximum Value Recorded	80.4	68.7	77.7
Guideline Max	***115***	***115***	***115***
Average Data Recorded	80.40	58.47	53.58
Guideline Averaged	***70***	***50***	***70***

Lilama 10 Camp

Noise Level (dB)	24-25/04/2017		25/04/2017
	12:23 – 22:00	22:01 – 06:00	06:01-12:23
Maximum Value Recorded	61.2	74.3	68.1
Guideline Max	***115***	***115***	***115***
Average Data Recorded	42.84	59.51	42.66
Guideline Averaged	***70***	***50***	***70***

Figure C-9: Results of Noise Level Monitoring at Sino Hydro Temporary Worker Camp

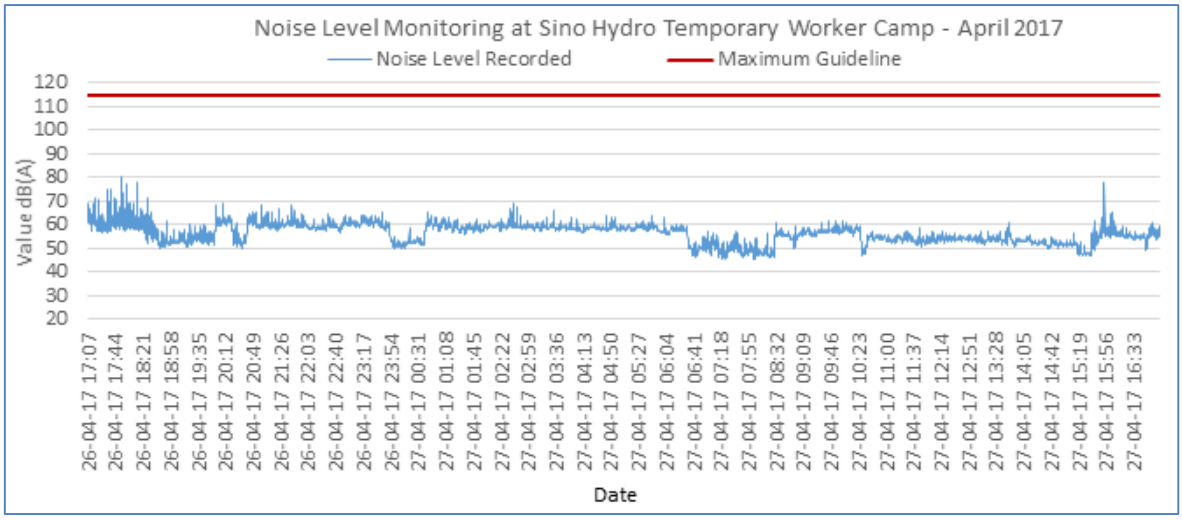


Figure C-10: Results of Noise Level Monitoring at Lilama10 Camp in April 2017