


<p>日立三菱水力(株) 技術資料</p> <p>この資料は、当社及び/又は協力会社の機密情報を含んでおりますので、本提出（貸与）目的以外に使用されることは、ご遠慮ください。また、当社の同意なくこの資料の全部又は一部を複製すること、他者に伝達、開示されることのないように願います。</p>	<p>COMPANY PROPRIETARY</p> <p>NOT TO BE REPRODUCED OR DISCLOSED IN WHOLE OR IN PART, WITHOUT SPECIFIC WRITTEN PERMISSION OF HITACHI MITSUBISHI HYDRO CORPORATION</p>
---	---

Detailed Work Program (DWP) and
Site-Specific Environmental and
Social Monitoring and Management Plan
(SSESMMP)
for Installation Work of Draft Tube Liner
for Main Power Station



RE-APPROVAL

NAM NGIEP 1 HYDROELECTRIC PROJECT
MAIN POWER STATION

Prepared by	M. KAWANISHI	Title, Supplementary title Detailed Work Program (DWP) and Site-Specific Environmental and Social Monitoring and Management Plan (SSESMMP) for Installation Work of Draft Tube Liner for Main Power Station		
Checked by	K. YAMAMOTO			
	J. ENDOH			
Approved by	Y. MAEDA	Document type	Document status	
Date of issue	13. September. 2016	-	-	
	Drawing No.		Sheet	Rev.
	PRD10-199075		1/N	2
Responsible dept. Installation Group Project Management Dept.	WORKS DWG. NO.	HITACHI	MELCO	MHI
		-	-	-

Rev.	DESCRIPTION	ISSUED	
		REVD.	
0	First issue	REVD.	
		CHVD.	
		APPD.	
		DATE	
1	Revised as per the result of coordination meeting at site.	REVD.	M. KAWANISHI
		CHVD.	K. YAMAMOTO
		APPD.	Y. MAEDA
		DATE	31. Oct. 2016
2	It was revised (refer to NNP-MRP-119).	REVD.	M. KAWANISHI <i>S.T</i>
		CHVD.	K. YAMAMOTO <i>/k.n</i>
		APPD.	<i>Y. Maeda</i>
		DATE	<i>15. Mar. 2017</i>
3		REVD.	
		CHVD.	
		APPD.	
		DATE	
4		REVD.	
		CHVD.	
		APPD.	
		DATE	
5		REVD.	
		CHVD.	
		APPD.	
		DATE	
6		REVD.	
		CHVD.	
		APPD.	
		DATE	
7		REVD.	
		CHVD.	
		APPD.	
		DATE	
8		REVD.	
		CHVD.	
		APPD.	
		DATE	

Contents

	Page
Part 1 DETAILED WORKS PROGRAM (DWP)	4
1 General	4
2 Installation Schedule	4
3 Nominated Subcontractor	5
4 Safety Control	5
5 Quality Assurance	5
6 Site Organization	6
7 Installation Procedure and Manual	6
8 Equipment and Tools	6
9 Attached Documents	6
Appendix 1: Construction Schedule	
Appendix 2: Site Organization Chart	
Appendix 3.1: Drawing No. D3B-02623-R4 Installation Instruction for Lower Draft Tube liner	
Appendix 3.2: The method for installation of Draft tube liner	
Appendix 3.3: Plan of Assembly for Crawler Crane 180T in Tailrace Area	
Appendix 4: Main Equipment and Tools for DTL Installation	
Part 2 Site-Specific Environmental and Social Monitoring and Management Plan (SSES MMP)	7
1 Introduction	8
2 Environmental and Social Pre-Construction Description	10
3 Chance Find Procedures	15
4 Appendix	16
4.1 Emergency Action Plan	17
4.2 Emergency Response Procedure	19
4.3 Environmental and Social Management Activity Table for Working Area	21

Part 1

Detailed Works Program (DWP)

Installation Work of Draft Tube Liner For Main Power Station

1. General

This detailed works program focuses on the development for Installation work of Draft Tube Liner (hereinafter DTL) for Main Power Station.

Working area is located at the following location. The date of area receiving from Civil Contractor for Draft Tube Liner is planned on 31st October, 2016.

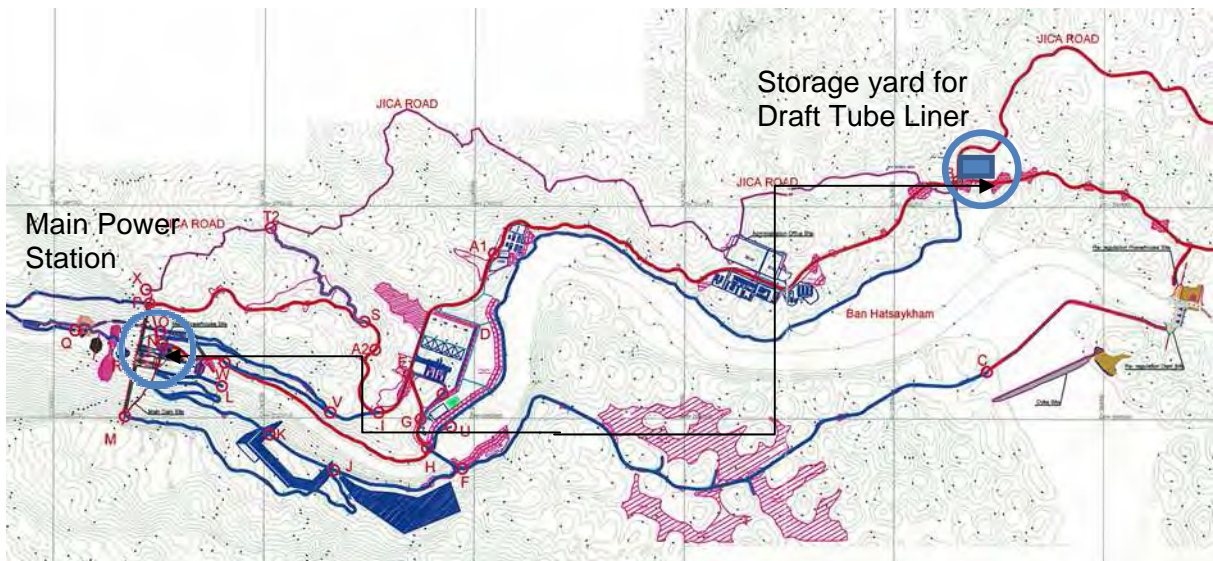


Figure 1-1 - Location of Working area

2. Installation Schedule

Overall Schedule is as follows:

- 1) Preparation of Crawler Crane for DTL installation and setting of plate for supports of DTL: 21 October, 2016 to 31 October, 2016.
- 2) Installation of DTL for No.1 Unit : 1 November, 2016 to 31 December, 2016
- 3) Installation of DTL for No.2 Unit : 1 December, 2016 to 31 January, 2017

Please refer to Appendix 1. for detail schedule.

3. Nominated Subcontractor

Nominated Subcontractor:

1. Hitachi Plant Construction Corporation (hereinafter HPC)
2. LILAMA 10 JOINT STOCK COMPANY (hereinafter LILAMA 10)
Under the management and control of HPC, LILAMA 10 will perform all the site work of DTL installation.

In general, the Subcontractor will be nominated, concerning not only price/rate but also following items, fully described below.

- 1) Technical competence
- 2) Financially stable
- 3) Administrative competence
- 4) Past project experience and reference
- 5) Ability to meet schedule
- 6) Quality and skill of work
- 7) Capacity (equipment, staff, worker) and organization
- 8) Ability to meet safety and environment requirements

And then, the evaluation for Subcontractor will be done and recorded.

4. Safety control

Safety control for site works shall follow the latest Safety and Health Program (Document No. PRD10-399002).

The following potential incident shall be observed in Labor Working Area.

- 1) Accident to third party
 - For all staffs and workers, the safety training shall be carried out.
 - Warning sign board will be arranged.
- 2) Striking with heavy equipment
 - Watch man shall be arranged
 - When equipment park on site, stopper shall be set
 - Before commencement of work, safety training shall be carried out to relevant staffs and workers. The emergency action plan is attached in Appendix 6.1

The safety control on site will be changed, revised and added every time in accordance with the occurrence of a dangerous situation and/or the Owner's comments.

The safety meeting based on the daily work risk assessment shall be performed in the toolbox before starting the work.

5. Quality Assurance

Quality Assurance shall be followed to the Quality Assurance Program at Site (Document No. PRD10-399004).

Basically, Quality Control works shall be conducted by the Contractor whereby proper implementation and inspection of this work shall be made to ensure that the quality is maintained.

6. Site Organization

Site work will be performed in accordance with the Site Organization Chart as shown in Appendix 2. Site Organization Chart.

7. Installation Procedure and Manual

Detail of installation work including inspection items, safety points are described in attached documents as below:

Appendix 3.1 Drawing No. WTI-5281 INSTALLTION INSTRUCTION FOR LOWER DRAFT TUBE LINER

Appendix 3.1: Drawing No. D3B-02623-R4 Installation Instruction for Lower Draft Tube liner

Appendix 3.2: The method for installation of Draft tube liner

Appendix 3.3: Plan of Assembly for Crawler Crane 180T in Tailrace Area

Reference drawings:

WRD10-18003 Assembly of Draft Tube Liner (1/3) – (3/3)

WRD10-10100 Foundation Drawing of Draft Tube Liner (1/2) – (2/2)

8. Equipment and Tools

The main equipment and tools for DTL installation work are listed and shown in Appendix 4.

9. Attached Documents

Appendix 1: Construction Schedule

Appendix 2: Site Organization Chart

Appendix 3.1: Drawing No. D3B-02623-R4 Installation Instruction for Lower Draft Tube liner

Appendix 3.2: The method for installation of Draft tube liner

Appendix 3.3: Plan of Assembly for Crawler Crane 180T in Tailrace Area

Appendix 4: Main Equipment and Tools for DTL Installation

Part 2

**Site-Specific Environmental and Social
Management and Monitoring Plan
(SSESMMP)**

**Installation Work of Draft Tube Liner
For Main Power Station**

Part 2 Site Specific Environmental and Social Management and Monitoring

1. Introduction

This Site Specific Plan has been prepared to highlight environmental and social conditions prior to the beginning of installation work activity and will be used as a tool to ensure the particular activity follows the correct management and mitigation procedures. Sub-Plans will be used to detail mitigation methods for the activities associated with the installation works.

The Working Area is storage yard of DTL for secondary transportation to site and Main Power Station for various installation work activities around the Project site. The Detailed Works Program is described in Part 1 DWP.

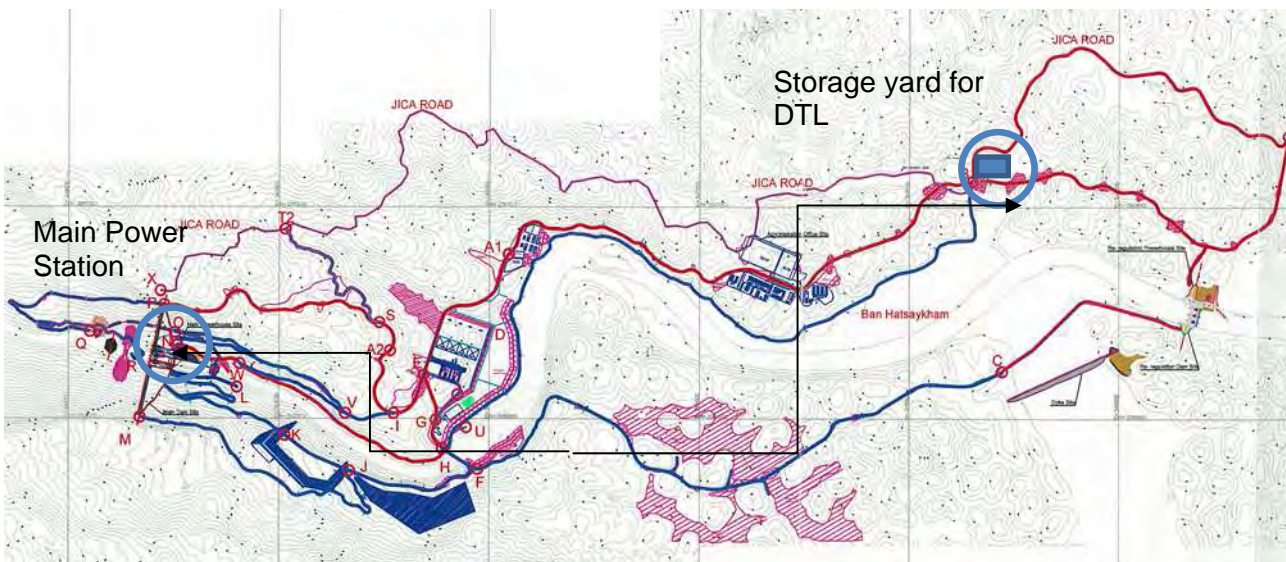


Figure 2-1 General location of Working Area

Table 2-1 below is a listing of the current companies and Working Area within the Project area. Locations can be referred to in figure 2-1.

Table 2-1 List of company and working area

No.	Company Name	*Workers	Working Area	GPS	Area (m2)
1	HPC	2~3	Storage yard & Main Power Station	-	2000
2	LILAMA 10	10~15	Storage Yard	-	1000
3	LILAMA 10	20-25	Main Power Station	-	1000
4					
5					
6					
7					
8					
9					
10					

Table 2-2 below shows the referential linkages of documents regarding environmental matters in the NNP1 Project. The Owner (NNP1) documents use references and information from the Concession Agreement. This SSESMMMP (Contractor) uses references and information from Owners EIA/ESMMP and Owners ESMMP-CP.

Table 2-2 List of main documents and approving authority

Item	Hierarchy of Documents	Approving Authority
1	Concession Agreement	GOL
2	NNP1 EIA/ESMMP	GOL
3	ESMMP-CP	GOL
4	Contractors ESMMP	NNP1
5	SSESMMMP	NNP1

The Contractor documents are; Contractors ESMMP (Item 4) and SSESMMMP (Item5) which have used applicable information extracted from the Owners documents which are Concession Agreement (Item 1), NNP1 EIA/ESMMP (Item 2) and ESMMP-CP (Item 3).

All obligations of the Contractor are stated in the Contract and is the only governing document for the Contractor

2. Environmental and Social Pre-Construction Description

Land and Water Use in the Area

The existing area covered for the installation work of DTL of Main Power Station is handed over completed by the Owner

Therefore, there is no more permanent land use by local villagers in the direct vicinity of the main power station.

Domestic water for working area is used ground water which installed water tank from well as a domestic water supply by LILAMA 10 if necessary.

Proximity to Villages and Cultural Sites

The Main Power Station is located with approximately 6km upstream from the villages of Ban Hatsaykham. The degree of impact that will be caused by installation work Embedded Piping of main power station will be limited in working area only. As a provision, the installation work schedule will be done basically between 8:00 am and 17:30 pm. The owner had been already confirmed that there were no physical and cultural resources along the Main Power Station area. No impact is expected to cultural sites.

There has been a significant rise in Camp Followers since the beginning of the Project, these followers set up restaurants or general goods stores within local Villages to take advantage of the newly constructed access roads and increase in workforce. Camp Followers are generally not a problem, however, restaurants or bars can be the center for antisocial behavior when workers and local residents congregate late at night or over the weekend.

Table 2-3 is a checklist used to assess pre-construction description of the Working Area after the checklist has been completed the sub-plans can be selected accordingly.

Table 2-3 Environmental Assessment Checklist – for Pre Construction

General Information			
Site Location	Storage yard Area (for DTL) Main Power Station Area		
Photo	Attached photos of both working area		
Date	September 2016		
Estimated Area/	Storage yard area (for DTL): 1000 m ² Main Power Station area: 1000m ²		
Prepared By	Masao Miyamoto (HPC)		
Checked By	Mitsuhiro Kawanishi (HM Hydro)		
Site Description	The Installation Work of DTL for Main Power Station.		
Item	Yes	No	Description
Will the site require UXO clearance?		X	All working area have already been cleared and approved by the Owner prior to installation work
Is there surface water located in close proximity to the site?	X		All working area are within 500m of Nam Ngiep River
Is there a village or community located in close proximity to the site?	X		Ban Hatsaykham over 1km away from the Storage yard area Ban Hatsaykham with approximately 6 km from Main Power Station area
Is the site located in a vegetated area?	X		Vegetation remains around the Storage yard area. The Storage yard area and the Main Power Station area have already been cleared.
Is the site located in agricultural land?	X		Some agricultural land remains around the Storage Area.
Are there any Physical Cultural Resources (PCR) in the area?		X	No PCRs have been recorded near any of the working area
Is there an existing access road to the site?	X		The road P1 and the road P1, T13 and P2 connect the Storage yard and the Main Power Station respectively
Can the site be viewed from public viewpoints?	X		Can be viewed from road T10,11,13
Is the site located within an existing Construction Area?	X		The Storage yard area and the Main Power Station area are already existing

Will the site development require the construction of a sub-camp, office and storage? (if yes, provide a list)	X	The Storage yard area is for DTL already existing and Tool house/office area will be required in the Main Power Station area
---	---	--

Other Comments:		
Environmental Impacts	Likelihood (Yes/No)	Mitigation measure to be Implemented
Will the site development result in increased dust generation at near-by villages?	Yes	An increased number of vehicles will pass through local villages. Roads will be watered depending on weather condition.
Will the site development result in increased noise generation at near-by villages?	No	Villages are located away from Working area.
Will site development result in changes to drainage patterns?	No	
Will construction activities result in erosion?	No	
Will vegetation clearing be required?	No	
Will the site be setting up Hazardous components? (i.e. storage, workshops)	Yes	Paint and storage workshops must have impermeable flooring (or Sheets), and away from rain
Will the site generate waste?	Yes	Sufficient waste bins will be placed around work site and camp. A main collection point will be designated with all waste separated into general/recycle and hazardous

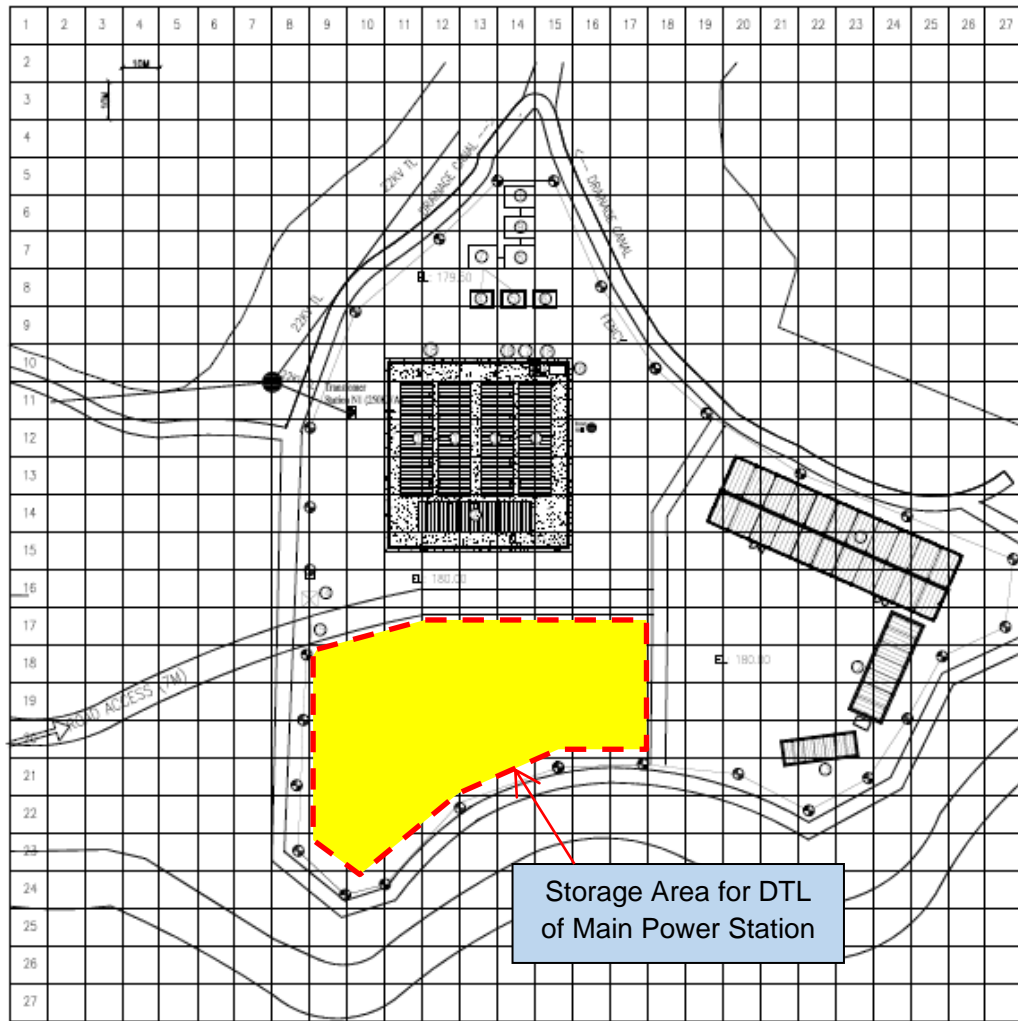


Figure 2-2 Storage yard Area

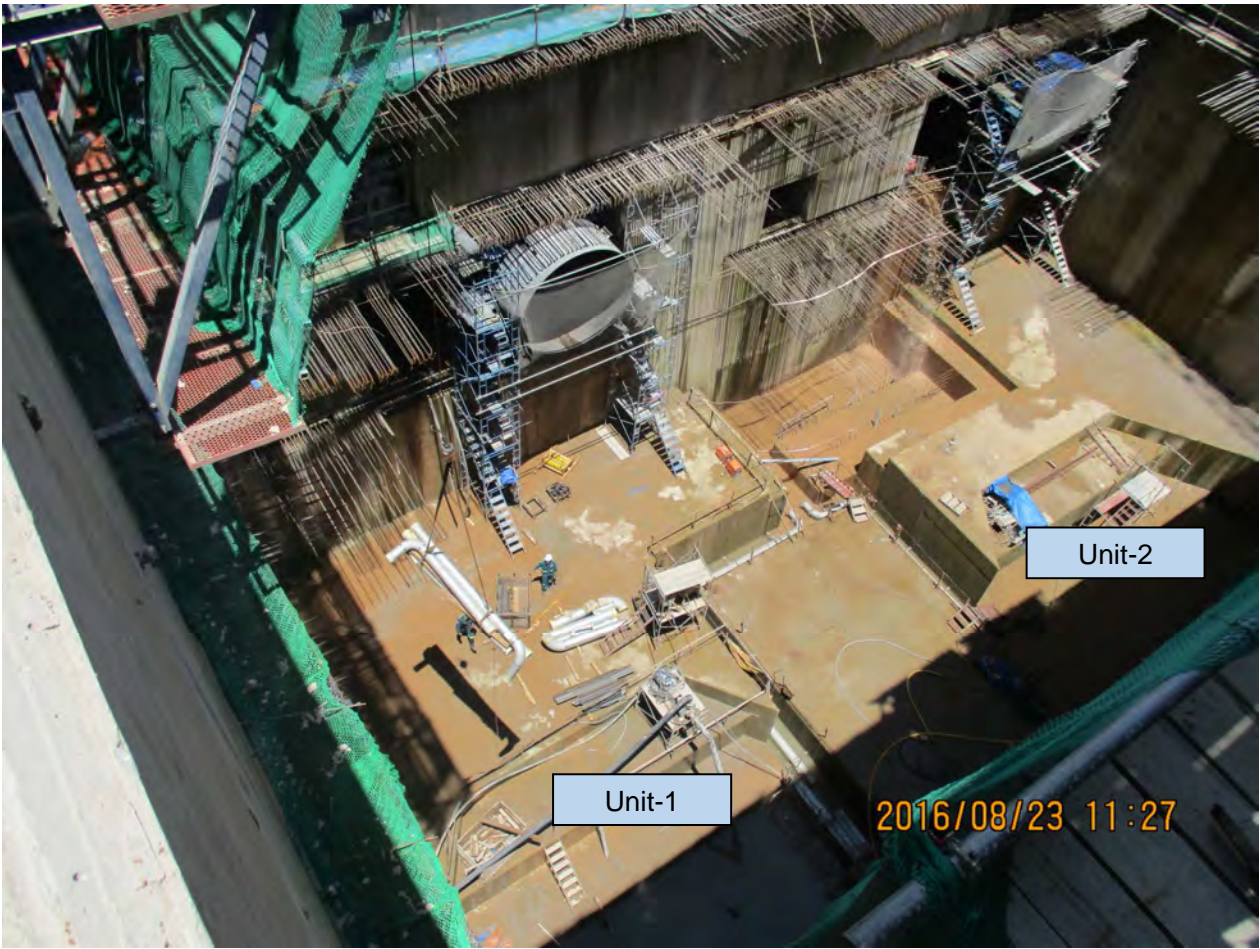


Figure 2-3 Main Power Station Area

Table 2-4 identifies the relevant list of Sub Plans required for Working Area. The Sub Plans were selected after a review of the following:

- Detailed Works Program (DWP)
- Pre-Construction assessment (Table 2.3 Environmental Assessment Checklist)
- NNP1 EIA and ESMMPs

Table 2-4 Relevant Sub-Plans for working areas

Sub-Plan	Item	Environmental	Social
SP01	Erosion and Sediment Control	N/A	
SP02	Water Availability and Pollution Control	X	
SP03	Emission and Dust Control	X	
SP04	Noise and Vibration		X
SP05	Waste Management	X	
SP06	Hazardous Material Management	X	
SP13	Construction of Working Area		X
SP14	Traffic and Access		X
SP15	Training Awareness		X
SP16	Project Personal Health Program		X
SP17	Emergency Preparedness		X

Detailed descriptions are found in the relevant sections regarding to Environmental and Social Management Activity Table.

Detailed Environmental Management Activity Schedule for the working area is according to Appendix 4.3.

3. Chance Find Procedures

Objectives of the Chance Find Procedures are to; (a) minimize impacts to resources from the Owner related activities and (b) to ensure that any artifacts uncovered are appropriately recorded, documented and reported to the appropriate line agencies.

If any fossil or cultural item of significance is found the Contractor will promptly give notice to the owner. The Contractor will work with the Owner to ensure safe removal of the artifacts.

4 APPENDIX

4.1 Emergency Action Plan

4.2 Emergency Response Procedure

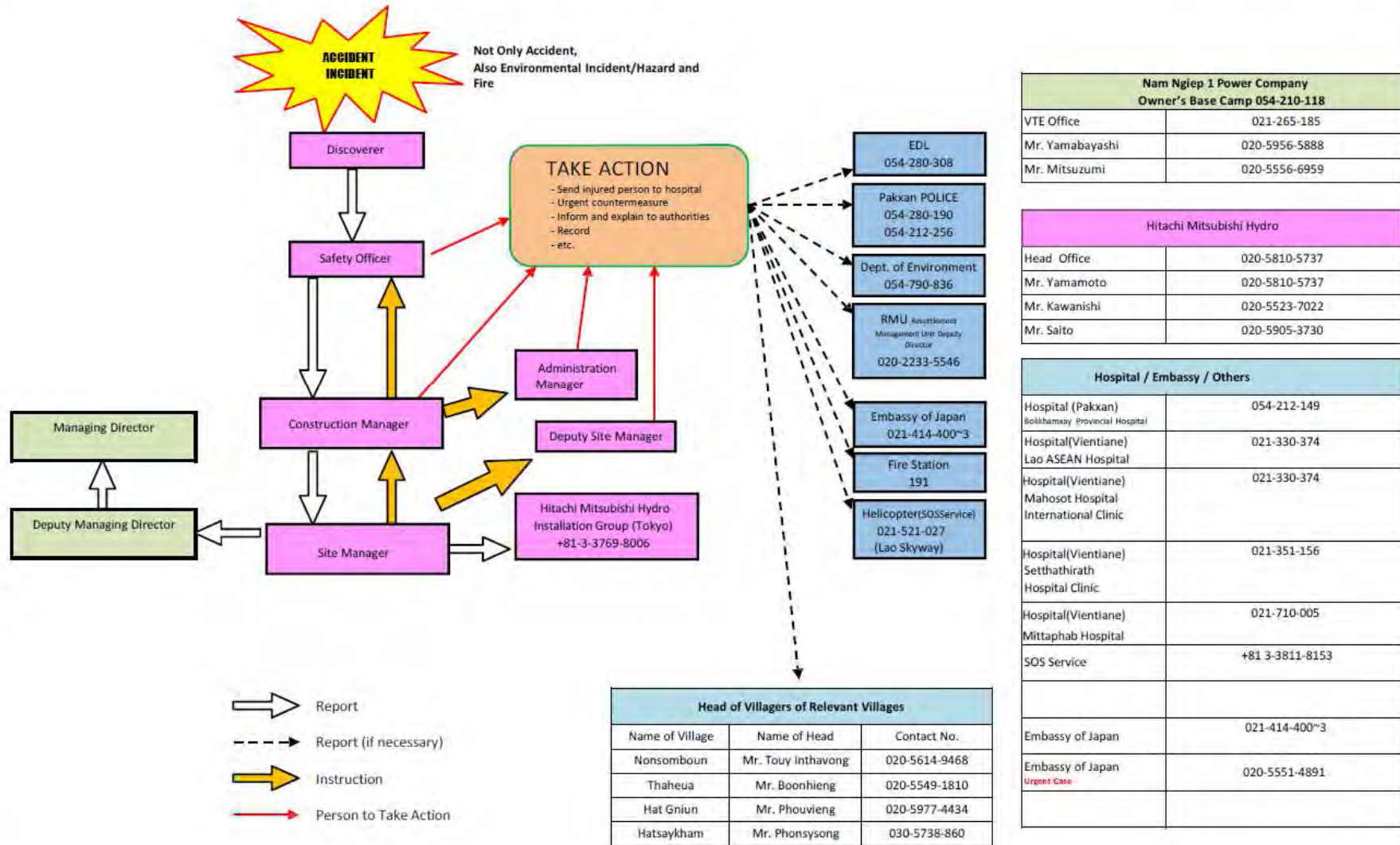
4.3 Environmental and Social Management Activity Table for Working Area

Appendix 4.1

Emergency Action Plan

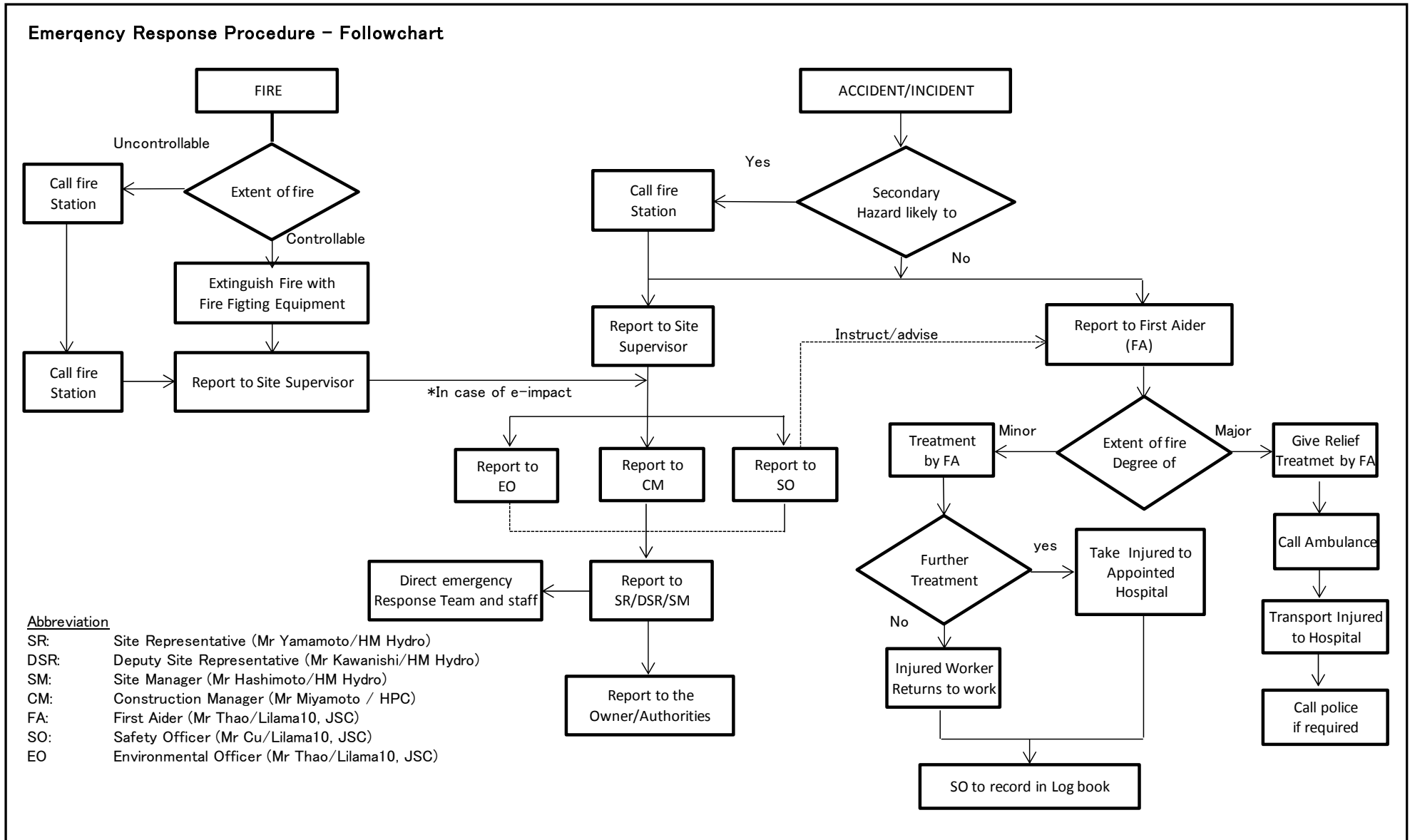
Emergency Action Plan for Nam Ngiep 1 Hydropower Project

Hitachi Mitsubishi Hydro



Appendix 4.2

Emergency Response Procedure



Appendix 4.3

Environmental and Social Management Activity Table for Working Area

Environmental and Social Management Activity Table for Working Area

This table covers key environmental and social management activities that are to be implemented on site.

Sub-Plan Item		Monitoring Method	Monitoring Frequency	On-site implementation
SP01	Erosion and Sediment Control	Visual	Routine	N/A
SP02	Water Availability and Pollution Control	Visual	Routine	<ul style="list-style-type: none"> • Equipment service and storage workshops will have impermeable/bonded flooring. • Oil depots must be on a raised platform away from potential flood areas and rain. • Oil traps must be installed in areas where washing of equipment or machinery is conducted. This is to minimize the risk of surface water contamination. • Working Areas are to be provided with portable toilet with sufficient capacity and to be pumped from the tank by the licensed contractor. • Warning signs will be placed in areas of hazardous material use or storage to avoid inadvertent disposal. • Construction materials and chemicals must be properly disposed of by authorized Contactors.

Sub-Plan Item		Monitoring Method	Monitoring Frequency	On-site implementation
SP03	Emission and Dust Control	Visual / Verbal	Each time	<ul style="list-style-type: none"> Working Areas and surrounding access roads will be regularly watered to suppress dust when necessary. During the dry season it is recommended to be conducted at least 3 times a day. The burning of waste materials shall be minimized on site and only take place under the following conditions: <ul style="list-style-type: none"> (i) Burning will only be undertaken in the presence of a trained fire protection officer. (ii) Burning will not be undertaken during severe wind conditions. (iii) Appropriate fire protection equipment will be available on-site during the burn. (iv) Burning will be undertaken at a safe distance from vegetated area. (v) Burning will not be undertaken near a village.
SP04	Noise and Vibration	Visual	Each time	<ul style="list-style-type: none"> Stationary noise sources (e.g. generators) that produce noise levels well above background levels (i.e. 45 dB and above) shall be set back as far as possible from site offices or accommodation buildings. All workers operating drilling machinery or rock breakers must use the correct PPE. This includes eye and ear protection, footwear, gloves and hardhat.
SP05	Waste Management	Visual	Weekly	<ul style="list-style-type: none"> Dumping of waste into watercourses, agricultural land and surrounding areas is highly prohibited. If any camp is found to illegally dump rubbish, immediate action against the Subcontractor will be taken. A sufficient number of waste containers will be made available around each of the working areas. At least two waste container at each location and will be marked for "General" and "Recycle". Waste containers within workshops and working area will be marked clearly for "Hazardous Waste" and "Non- Hazardous Waste". Waste will be stored in appropriate facilities (e.g. bins, stockpiles), with hazardous waste stored in secured areas. It is important that all Working Area implement recycling as part of their waste regime, this is not only good practice but also will greatly reduce the amount of landfill produced. It is not allowed to eat any food at working area. General waste shall be disposed in the designated landfill site.

Sub-Plan Item		Monitoring Method	Monitoring Frequency	On-site implementation
SP06	Hazardous Material Management	Visual	Weekly	<ul style="list-style-type: none"> • All hazardous materials such as fuels, oils and solvents will be stored in a fenced and adequately bounded area (with capacity at least 120% of the total capacity of the tanks) to minimize the potential risk of spillage. • Storage areas will be located away from watercourses, flood-prone and accommodation area. • Designs of any oil or fuel depot must be provided to the Owner for approval prior to construction. This is especially important if any depots need to be constructed on site. • All chemicals and waste considered as potentially hazardous materials will be registered in order to follow up type, quantities stored, quantities used or generated. • Hazardous Materials Containers of or waste must be labelled with correct Material Safety Data Sheet (MSDS). • Personal protective equipment (PPE) will be provided to all workers and used correctly when handling any hazardous chemicals such as fuels. • Safety procedures regarding fire and accidental spill management to be posted around Working Area. • “No Smoking” labels and posters will be placed wherever fuel is handled or stored. • The hazardous materials and chemical used in the construction shall be separated and kept in a suitable storage and MSDS shall be in place. • Firefighting equipment will be kept available next to each storage facility. • Ensure availability of spill clean-up materials (e.g., absorbent pads or cloth) specifically designed for flammable products and other hazardous substances where such materials are being stored and used. If spills or leaks do occur, undertake immediate clean up. • Discharge of oil or fuel contaminated water into the environment is prohibited. • Disposal of any hazardous waste such as used oil, filter or solvents should be done through authorized waste handlers.
SP14	Traffic and Access	Visual	Routine	<ul style="list-style-type: none"> • A security guard at the main access gate to control traffic entering or leaving shall be provided by the Owner. • Provide sufficient lighting at night around the Working Area. • Implement suitable safety measures to minimize risk of adverse interactions between construction works. • Safety issues and regulations regarding traffic and site access will be included in the training plan for construction personnel (refer to SP15). • Camp employees will be limited to a driving speed of 30 - 40km/h outside villages and 10 - 20km/h in the vicinity of each village.

Sub-Plan Item		Monitoring Method	Monitoring Frequency	On-site implementation
SP15	Training and Awareness	Visual / Verbal	Routine	<ul style="list-style-type: none"> • All new employees will be required to complete Induction Training from the Contractor prior to commencing any work on site. • The Contractor will highlight site regulations/rules, safety and environmental issues. • A register of induction training will be maintained and provided to the Owner on request. • Joint safety inspection and safety committee meetings will be conducted between the Contractor Safety and Environment staff and with all Subcontractor Construction Managers and Safety Officers. These inspections and meetings will be used to highlight all relevant health and safety issues in and around the Project site. • Weekly meetings will also be held to improve awareness of environmental health and safety issues.
SP16	Project personnel health program	Visual / Verbal	Routine	<ul style="list-style-type: none"> • Health and safety related posters covering; disease, drug use, waste disposal, PPE, use of toilet facilities and site rules will be provided in visible locations around each Camp. • First aid kits will be provided and will be appropriately located at each Working Area • Urgent Vehicle will be contacted when an accident occurs. • Vector control of mosquitoes and other pests will be managed according to the following actions: <ul style="list-style-type: none"> i. Effective storm water drainage systems implemented to avoid stagnant water ii. Storm water drains and borrow pits will be kept free of vegetation iii. Minimizing the presence stagnant water within containers and other pools of water iv. Removal of discarded items that could contain water • Adequate drainage at construction site will be provided to avoid water logging/accumulation of stagnant water and formation of breeding sites for mosquitoes. • Training in general housekeeping and sanitation facilities for all workers at The workers'/construction Working Area will be provided. • Reliable supply of water for drinking shall be provided at working area. • Wastewater emanating from working area will be treated according to Lao National Regulations. • Ensure proper collection and disposal of solid wastes within the workers'/construction Working Area consistent with local regulations. • Provide fire-fighting equipment at the working area. • Appropriate safety equipment such as safety boots, helmets, gloves, protective clothes, breathing mask, goggles, ear protection, etc. must be worn when required.

Sub-Plan Item		Monitoring Method	Monitoring Frequency	On-site implementation
SP17	Emergency Preparedness	Visual/ Verbal	Each time	<ul style="list-style-type: none"> • Hazardous materials shall be stored at site with correct MSDS in accordance with the requirements of SP06. • Assembly point shall be notified to all the workers at site. • In the event of a spill of any hazardous material, the following response hierarchy will apply and will be used at development of the detailed emergency response procedures: <ul style="list-style-type: none"> i. seek medical attention for any injured personnel ii. prevent further injury to personnel iii. prevent environmental damage iv. clean-up spill v. remediate area of spill • At each working area , information on emergency response procedures, including fire prevention, emergency contact numbers and communication procedures will be clearly displayed on notice boards. • All workers/staff shall be trained in basic emergency response procedures including communication and response procedures to be implemented in case of an emergency situation. • In the event of a personnel emergency implement the Emergency Response Procedure (Appendix 6.2). All staff shall be made aware of the procedure during induction. • The communication processes shall include the following information in relation to accidental releases or spills: <ul style="list-style-type: none"> i. location of spill ii. nature of material spilt iii. amount of material spilt iv. clean-up processes to be implemented. v. any injuries to personnel vi. need for emergency or external assistant vii. any safety/evacuation requirements to be implemented on the construction site. • Within 48 hours of the completion of a spill clean-up, a report shall be submitted to the Owner. The report will be used to identify any required corrective or preventive actions and emergency response procedures and training programs will be modified accordingly. • First aid kits shall be readily accessible by workers. • Include clearly marked exclusion barriers around hazardous areas within/around working site to exclude access from non-working staff and the public.