

# Environmental Monitoring Report

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January – August 2017  
Project Number: 47381-002

## Sri Lanka: Mahaweli Water Security Investment Program – Tranche 1 (Upper Elahera Canal Project)

Prepared by the Ministry of Mahaweli Development and Environment for the Asian Development Bank.

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## MAHAWELI WATER SECURITY INVESTMENT PROGRAM

### SEMI ANNUAL ENVIRONMENTAL MONITORING REPORT FOR UECP

January to August 2017

**AUGUST 2017**



**Program Management, Design and Supervision Consultant**

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# SEMI ANNUAL ENVIRONMENTAL MONITORING REPORT FOR UECP

## January to August 2017

**Prepared for:**

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**ABBREVIATIONS**

ADB	Asian Development Bank
AIS	Alien Invasive Species
CEA	Central Environmental Authority
CEMP	Contractor's Environmental Management Plan
D&B	Drill and Blast
D/S	Down Stream
DS	Divisional Secretary
DWC	Department of Wildlife Conservation
EARF	Environmental Assessment Review Framework
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Method Statements
EO	Environmental Officer
EPL	Environmental Protection License
FAM	Facility Administration Manual
FD	Forest Department
GoSL	Government of Sri Lanka
GRC	Grievance Redress Committee
GSMB	Geological Survey and Mines Bureau
ICB	International contractor bidding
IML	Industrial Mining License
KMTC	Kaluganga Moragahakanda Transfer canal
MLBCRP	Minipe Left Bank Canal Rehabilitation Project
MMDE	Ministry of Mahaweli Development and Environment
MRB	Mahaweli River Basin
MWSIP	Mahaweli Water Security Investment Program
NATM	New Austrian Tunnelling Method
NCB	National Contractor bidding
NWPCP	North Western Canal Project
PD	Program Director/Project Director
PIU	Project Implementation Unit
PMDSC	Project Management Design Supervision Consultant

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PMU	Program Management Unit
RE	Resident Engineer
SAEMR	Semi Annual Environmental Monitoring Report
SPS	Safeguard Policy Statement
STC	State Timber Cooperation
TBM	Tunnel Boring Machine
UECP	Upper Elahera Canal Project

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## 1. INTRODUCTION

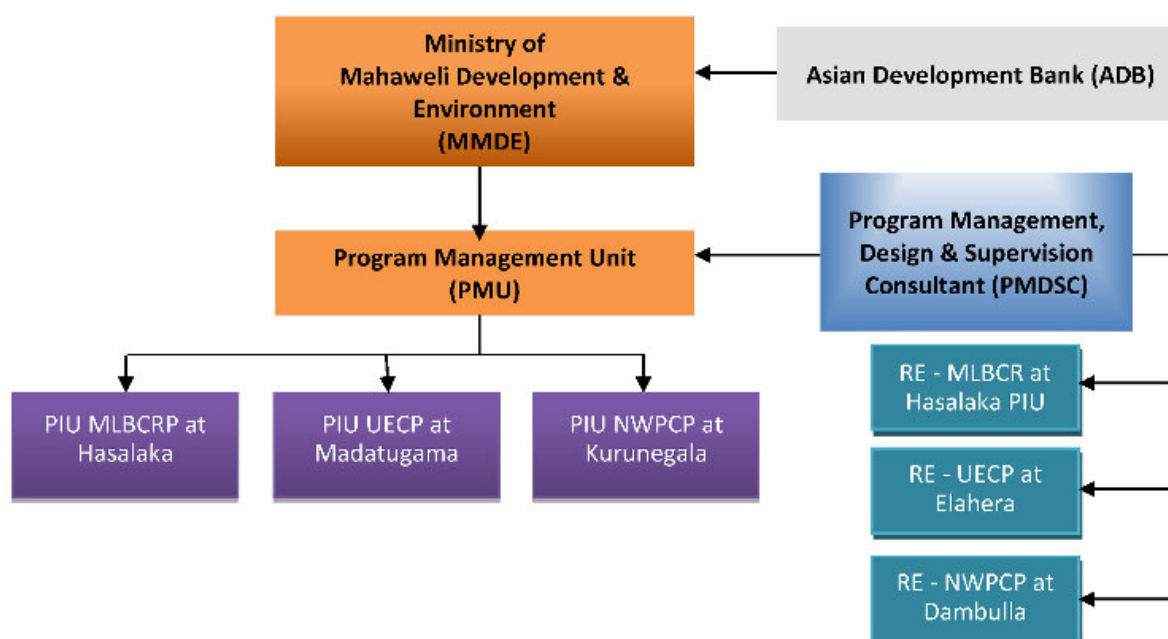
### 1.1 Overview of MWSIP and UECP

1. The Mahaweli Water Security Investment Program (MWSIP) was commenced in December 2015, under the Ministry of Mahaweli Development and Environment (MMDE) of the Government of Sri Lanka (GoSL), funded by the Asian Development Bank (ADB) (Loan No. 47381-002-SRI (SF) and GoSL, and is aimed at achieving the goal of maximizing the productivity of the Mahaweli River Basin (MRB) water resources by transferring available water to the north and north western dry zone areas for irrigation, drinking and commercial purposes.

2. The Investment Program consists of 3 individual projects named as Minipe Left Bank Canal Rehabilitation Project (MLBCRP), North-Western Canal Project (NWPCP) and Upper Elahera Canal Project (UECP).

3. The three PIU offices and the three Resident Engineers' (RE) offices are operated at site level to monitor closely the performance of Contractors constructing infrastructure of the Program. The organization structure of the MWSIP is shown in

4. **Figure 1-1.**



**Figure 1-1 : Organization Structure of MWSIP**

5. The **Upper Elahera Canal Project (UECP)** comprises two components. The first component is the 9 km Kalu Ganga-Moragahakanda Transfer Canal (including 8km of tunnel) that transfers water between the Kalu Ganga and Moragahakanda reservoirs. The second component is the Upper Elahera Canal that connects the Moragahakanda reservoir to the existing reservoirs: Huruluwewa, Eruwewa and Mahakanadarawa via 92 km of canals (including a 26.6-km tunnel). These reservoirs supply existing irrigation and water supply schemes. The UEC is to be implemented in 3 Tranches:

- (i) Tranche 1 is to construct the UEC from 0+100 km to 3+860 km (UEC-ICB-1)

- (ii) Tranche 2 will include construction of UEC Tunnel 3 and Tunnel 4 from 27+509 km to 55+600 km (UEC-ICB-2A), and the Kaluganga – Moragahakanda Transfer Canal (KMTC) from 0+000 km to 8+830 km (UEC-ICB-2B)
- (iii) Tranche 3 will include construction of UEC from 6+226 km to 17+700 km (UEC-ICB-3), UEC from 17+700 km to 27+509 km (UEC-ICB-4), 55+600 to 65+500 km (UEC-ICB-5) and the transfer canal from the end of UEC to Mahakanadarawa reservoir is to be constructed under UEC-ICB-6

6. There are 6 contracts packages under the MLBCRP, 3 contract packages under the NWPCP and 1 contract package, UEC-ICB-1 under the UECP to be completed under the Tranche 1 of the development program during 2016 to 2017. Out of the total of 10 contract packages under Tranche 1 of MWSIP, 6 construction contracts have been awarded and mobilized, as 4 national contractors in the MLBCRP, 1 national contractor in the NWPCP and 1 contractor in the UECP areas.

## 1.2 Scope of the Report

7. This Semi-Annual Environmental Monitoring Report (SAEMR) is prepared to update the progress of UECP with respect to environmental safeguard aspects, for the period of January to August 2017, which is an ADB requirement to submit an SAEMR to ADB and Central Environmental Authority (CEA) for the “Category A” projects as documented in FAM<sup>1</sup> and EARF<sup>2</sup>.

8. The purpose of this report is to ensure that the project is implemented with due concern for environment and social safeguards according to the ADB’s Safeguard Policy Statement (SPS) 2009, and specifically to ensure that these issues are adequately addressed in compliance the requirements of ADB. Further, this report is to assess the progress with implementation of the program in complying with the approved Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP)<sup>3</sup> as per the stipulation No. 14.3 of the EIA approval No. 08/EIA/Water/04/2012 issued by CEA on 31.03.2016.

## 1.3 UECP Project at a Glance

9. The only UECP construction package mobilized under MWSIP Tranche 1 is UEC-ICB-1, which mainly includes the water conveyance system from chainage 0+100 km to 3+860 km, constructed as cut and cover rectangular conduits, associated structures and inlet transition to Kongetiya level crossing. The improvements to the existing Kongetiya level crossing of length 2,343.6 m is excluded from this contract. In addition to the above, the Naula - Elahera new road diversion is included under the contract package, where design and construction will be undertaken by the Road Development Authority (RDA), Sri Lanka. This diversion will be a 350 m length of 2-lane public road with one 1.5 x 1.5 m culvert at a specified location.

10. **Table 1-1** summarizes the status of designs, contract bidding and awards of UECP contract packages by the end of August 2017. The updated Environmental Management Plans (EMPs) have been

<sup>1</sup> Paragraph 60 of Facility Administration manual (FAM), June 2015 prepared by MMDE

<sup>2</sup> Paragraph 111 of Environmental Assessment Review Framework (EARF) November 2014 (updated in June 2017) by MMDE

<sup>3</sup> Environmental Impact Assessment Report (EIAR) dated June 2015 and approved by CEA on 31.03.2016

prepared and submitted along with the bidding documents for the packages UEC-ICB-1, UEC-ICB-2A, UEC-ICB-2B and UEC-ICB-4.

**Table 1-1: Summary of the UECP contract bidding and awarding**

Time	Contract Name	Status by End August 2017
<b>Tranche 1 (2015 - 2019)</b>	UEC-ICB-1; Upper Elahera Canal Stage 1 (0+100 to 3+860km)	PMU issued the Letter of Award to Ms CML-MTD Construction Ltd on 15 November 2016 and the Contractor has mobilized on 7 December 2016.
<b>Tranche 2 (2017 - 2024)</b>	UEC-ICB-2A; Upper Elahera Canal - (27+509 to 55+600 km); Tunneling of UEC Tunnel 3 (TBM) and Tunnel 4 (D&B)	Draft bidding document was submitted to PMU on 7 April 2017. Final bidding document along with the <u>updated EMP</u> was submitted on 29 May 2017. Review by Presidential IRP ongoing.
	UEC-ICB-2B; Upper Elahera Canal; KMTC (0+000 to 8+813 km)	<u>Updated EMP</u> submitted with the bidding documents. Bids were invited through newspaper advertisement on 7 March 2017. Pre-bid site visit and the meeting were conducted respectively on 20 & 21 April and 24 April 2017. Addendum No.1 to the bid document was issued on 12 May 2017 and bidding concluded on 7 June 2017. The technical bid evaluation was submitted to ADB and is being finalized.
<b>Tranche 3 (2018 - 2024)</b>	UEC-ICB-3; Upper Elahera Canal (3+860 to 17+700km) including Kongetiya, Bogahawewa, and Madeththawewa Level Crossings.	Draft bidding document was submitted to PMU on 26 September 2016. Final bid document incorporating TRC comments is scheduled for submission during October 2017, with the updated EMP due to be submitted in September 2017.
	UEC-ICB-4; Upper Elahera Canal (17+700 to 27+509 km)	Draft bidding document with updated EMP was submitted on 28 August 2017.
	UEC-ICB-5; Upper Elahera Canal (55+600 to 65+500km)	Designs (progress 55%); scheduled to finalize bid document in October 2017
	UEC-ICB-6; Feeder Canal to Manankattiya, Eruwewa and Mahakanadarawa Reservoirs (0+000 to 19+000km)	Preparation of bidding document awaiting preparation of feasibility study
	UEC-ICB-7; NCPP Water Management Software & Control Centre	Scheduled to finalize document in March 2021

11. The Contractor's Environmental Officer appointed for UEC-ICB-1 package has been advised and trained to make independent monitoring of their safeguard activities, and submit the monthly environmental monitoring report along with the monthly construction progress report. Reviewing and carrying out progress meetings take place regularly at RE's office with the participation of PIU, PMDSC staff.

## 2. PROGRESS OF UECP

### 2.1 Safeguard documentation and approvals

#### 2.1.1 EIA and updated EMPs

12. UECP is classified as Category “A” according to ADB’s SPS (2009) and the conditional approval was granted by CEA for a period of 3 years commencing from 31 March 2016. The significance of environmental impacts is identified as high, since the majority of the UEC project area falls within ecologically sensitive habitats (Elahera Girithale sanctuary, Minneriya Girithale Nature Reserve, Seegiriya sanctuary, Hurulu forest reserve and other state forests in the Moragahakanda and Kaluganga reservoir areas). Hence, it is one of the conditions given by the Department of Wildlife Conservation (DWC) to prepare a comprehensive Wildlife Management Plan (WMP) together with a monitoring program by the client (MASL) in consultation with the DWC prior to commencing construction activities in the area. The preparation of WMP is its final stage, and the draft final report has been submitted in July 2017.

13. Complying with condition No. 14 of the CEA approval, the updated EMPs have been prepared for the packages for which designs are completed and bidding documents are issued (refer to **Table 1-1**). The updated EMP for the UEC-ICB-1 contract was prepared and submitted to CEA in January 2017 and the second update was made to the EMP incorporating a deviated canal section (2+820 km up to 3+860 km) in June 2017. Approval for the updated EMP for UEC-ICB-1 of Tranche 1, ICB-2A and ICB-2B of Tranche 2 was obtained in August 2017.

14. During the design review done by PMDSC consultants, the main design changes different from the EIA study findings were assessed by conducting additional environmental surveys and the “Supplementary Information Related to Infrastructure Design Changes for Tranche 1 and Tranche 2 components” (Addendum to EIA) was submitted to CEA in July 2017 and to ADB in August 2017. Volume I of this document contains the EIA updates for Tranche 1 and 2 and Volume II includes the updated EMPs for the relevant packages considering the design changes.

15. The key design changes related to UEC ICB 1 of Tranche 1 and UEC ICB 2 A and UEC ICB 2B of Tranche 2 packages are summarized in **Table 2-1**.

**Table 2-1: Summary of the UECP design changes highlighted in the Addendum to EIA**

Package	Design Change
Upper Elahera Canal: UEC-ICB-1 (Tranche 1)	Deviation of the alignment between 2+820 km and 3+860 km after the contract award and the reason for this design change lies in the fact that UEC-ICB-1 was one of PMDSC’s “advance packages”. For this package, it was not possible to consider a precise canal strip survey and it had to be solely based on the 1:10,000 scale topographic map, which is known to be imprecise in the vertical direction.
Upper Elahera Canal: UEC-ICB-2A (Tranche 2)	(i) Original Tunnel 3 construction method of TBM was changed to a TBM drive from the north and NATM drill-and-blast drive from the south (confirming Option B for Tunnel 3 as described in Special Report 3 <sup>4</sup> )

<sup>4</sup> Special Report 3. UEC Tunnel 3: Selection of Construction Method and Comparison of Construction Options. June 2016.

Package	Design Change
	<p>(ii) Identifying new power line, disposal, tunnel portal sites, access to southern portal of Tunnel 3, access shaft (diameter 4 m) around 39+400 (30 m x 40 m spoil pile) including fine-level details of works required at the Tunnel 3 for northern portal and area for start shaft (diameter 26 m) required at 55+290</p> <p>(iii) Tunnel 4 replaces the original proposed section of deep cut and cover canal to the north of Tunnel 3 and will be constructed by NATM.</p>
<b>Kalu Ganga – Moragahakanda Transfer Canal (KMTC): UEC-ICB-2B (Tranche 2)</b>	<p>(i) Tunnels 1 and 2 will be constructed by NATM rather than TBM</p> <p>(ii) more certainty about the route and design of access roads to the outlet (northern portal) of Tunnel 2</p> <p>(iii) more certainty about the locations and capacities of required disposal sites.</p>

16. The above design changes were finalized after holding consultations with the relevant stakeholder agencies and the required approval has been obtained for the new areas identified for the construction facilities and access roads. The summary of consultative sessions undertaken on the design changes of UECP is given in **Table 2-2** and the details are given in “Addendum to EIA” (Vol 1).

**Table 2-2: Summary of consultative sessions undertaken on the design changes of UECP (Tranche 1 and Tranche 2) that appeared in the Addendum to EIA**

Date	Location/ Purpose	Participants	Outcome/ Remarks
2017.01.25	DWC Head office, Battaramulla to arrange site clearance plan and make the DWC aware about the construction program of the contractor UEC ICB 1	Deputy Director (Natural Resources Management) of DWC, Contractor of UEC-ICB-1, PD-PIU UECP, PMU and PMDSC	Consent from DWC on the access to the site, and finalizing construction program and site clearance, tree felling with the coordination of DWC and Timber Corporation
2017.01.26	Field inspection/ survey along the canal trace of ICB-1 including the deviated section	Department of Archaeology (Polonnaruwa District Office), PIU	Approval of Archaeological Dept. granted to commence the construction – ICB-1
2017.02.28	Field inspection/ survey at proposed tunnel infrastructure facility areas of KMTC	FD (Naula & Laggala Pallegama range of-fices), PIU	Recommendation was granted to the DFO of Matale for releasing of lands as to the Project.
2017.03.05, 06 & 07	Ecological survey along deviated canal trace	DWC (Elehera, Bakamuna offices), IUCN, PIU	Priority fauna and flora species were identified & collected from canal trace. Fauna species released to similar habitats and flora species transferred to temporary plant nursery established at DWC, Elehera

Date	Location/ Purpose	Participants	Outcome/ Remarks
2017.03.28	Poththatawela, Kalluganga; Field inspection/ discussion along new Access Road trace (c & f)	FD (Naula & Laggala Pallegama range offices), PIU	Approval for rehabilitation of access road to tunnel No. T2 granted by FD (near Moragahakanda Reservoir)
2017.04.26	Moragahakanda-Kalluganga Link tunnel trace observation	FD (DFO office Matale, Naula & Laggala Pallegama range offices), PIU	Components related to construction of KMTTC Tunnel (tunnel portal areas, disposal sites, accommodation sites etc.) observed by officials of FD. Recommendation of FD, Matale already sent to Head Office of FD.
2017.06.01	Konduruwawa; Field visit	FD (Polonnaruwa DFO office, Elahera range office), DWC (Elehera, Bakamuna offices), PIU	Officials of FD and DWC visited to observe the areas of tunnel components of the Tunnel 3 (T3) and Tunnel 4 (T4) to observe the trace including changes.
2017.07.14	Kongetiyawewa; proposed disposal area inspection	DWC (Elehera, Bakamuna offices), PIU	Field visit with DWC, who agreed to allocate this site as disposal site and recommended to DWC head office for releasing to Project.
2017.07.18	Identification of locations for reforestation/ enrichment tree planting UEC-ICB-1 (within the Elahera-Girithale sanctuary along the canal trace including deviated sections)	DWC (Elahera, Bakamuna offices), FD (Polonnaruwa DFO office), PIU	Proposal for tree planting activities were prepared considering the outcomes of discussion of DWC and FD.
2017.07.19	Field visit along the deviated canal trace	STC (Minneriya Office), PIU	Field visit were carried out with officials of STC, Minneriya in order to observe the trees which are situated on the deviated canal trace of ICB-1.
2017.08.09	Head Office of Forest Department; presented overall design changes to key staff	FD (Divisional Heads in Colombo Office), PMU, PIU, PMDSC	FD officers agreed in principle to proposed revised trace and construction methodology.

Date	Location/ Purpose	Participants	Outcome/ Remarks
2017.08.21	Head Office of DWC; presented overall design changes & proposed mitigations in Wildlife Management Plan to key staff	DWC (Divisional Heads in Colombo Office), PMU, PIU, PMDSC	All parties agreed upon adoptable environmental/ wildlife impact mitigations in relation to the proposed deviations in trace with construction designs & methodology as well as [x1][AK2]additional structures proposed for the safe wildlife movements

### 2.1.2 Contractor's Environmental Management Plan (CEMP)

17. It is a contractual requirement to submit the CEMP within 56 days of signing the contract and ADB recommended that no construction activities should be allowed for the Contractor until the CEMP is approved by the PMDSC Environmental Specialist following the guidance of ADB. The guidance note (Annex 2) was shared with the Contractor to prepare the CEMP, and consultative sessions and awareness programs were conducted to encourage the contractor to prepare a standard CEMP. However, obtaining an acceptable level CEMP could not be achieved within 56 days by the selected Contractor and the Environmental Officer (EO) appointed under the Contractor due to lack of past experiences of preparing such documents.

18. The progress of the CEMP submission by the contractor of UECP ICB 1 is given in **Table 2-3**.

**Table 2-3: CEMP submission summary of UECP ICB 1 contractor**

Date of contract Award	Date of 1 <sup>st</sup> CEMP submission	Date of CEMP approval	Number of revisions	Remarks
15 November 2016	25 January 2017	29.05.2017	04	Initial CEMP doc submitted in early January was not in an acceptable version, and revisions made at a discussion had with EO of ICB-1 on at Colombo office. Review comments were submitted to contractor on 31.01.17, 20.02.2017, 29.03.2017 and Final CEMP was received on 29.05.2017

## 2.2 UECP Physical progress

19. The summary highlighting the construction progress as of August 2017 for the UECP ICB 1 contract package mobilized under UECP Tranche 1 is given in **Table 2-4**.



**Table 2-4: Construction Progress of UECP ICB 1 contract by August 2017**

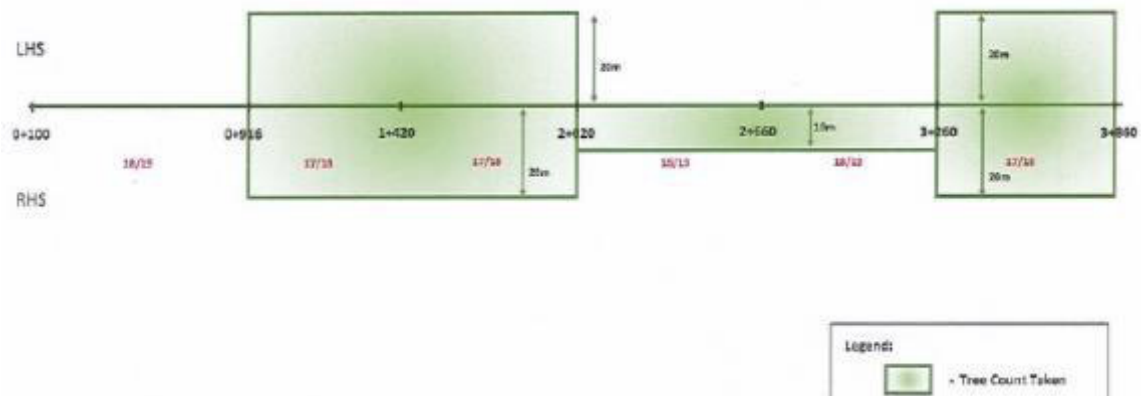
<b>Contract No.</b>	MMDE/MWSIP/ADB/ UEC/ICB-1/3267-3268-SRI/ICB/2016/002	
<b>Contractor Name:</b>	CML MTD	
<b>Letter of Acceptance:</b>	11 Nov. 2016	
<b>Value of Contract:</b>	LKR 3,742,442,875.47 (incl. VAT @ 15%)	
<b>Contractual Start Date:</b>	11 January 2017	
<b>Contract Duration:</b>	36 months	
<b>Status:</b>	Deliverables:	Being received, discussions & approvals on-going
	Construction programme:	Received and accepted
	Topographic surveys:	Ongoing - progress; LS 80% & CS 80%
	Preparation of Construction drawings by Contractor:	Ongoing; completed construction drawings for rectangular and circular conduits; progress 50%.
	Construction work:	Site clearing and tree felling ongoing; Strip-ping top soil along canal trace from 0+960 to 3+520km in progress; Construction of rectangular and circular conduits are in progress.
	Concrete batching plant:	Batching plant installed and awaiting test run, field laboratory building finished.
<b>Problems:</b>	Slow progress	
<b>Special Event:</b>	None	

20. The UEC-ICB-1 construction is carried out by 3 teams allocated for (i) excavation; (ii) concreting, and (iii) backfilling. The key physical activities carried out in the site by the UEC-ICB-1 Contractor as of August 2017 are as follows:

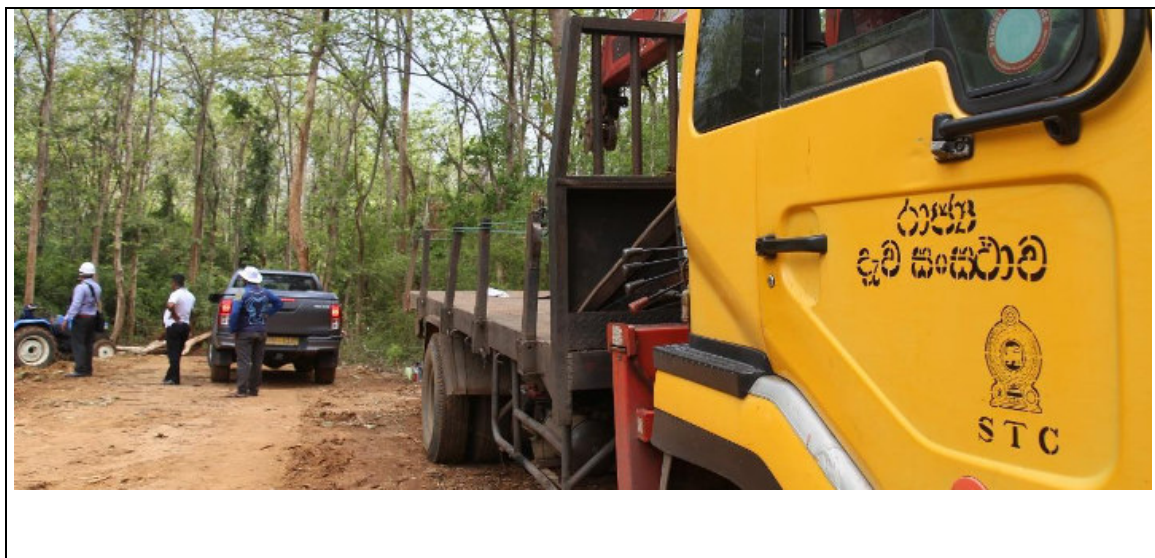
- i. Construction of Contractor's office premises, Contractor's accommodation and plants including laboratory and preparation of temporary access road (0+916 to 3+030 km) started in January and completed by May 2017

**Figure 2-1: Contractor's facility construction and site preparation (Feb 2017)**

- ii. Vegetation clearance: The tree felling within the Elahera Girithale sanctuary area is planned to be carried out section wise as per the recommendations made by DWC and PMDSC/PMU Environmental Specialist to reduce the disturbance to the elephant and other wild animal migrations. The 40-m belt from 0+916 to 2+300 km and the 10-m access was cleared first from March to May 2017 (see **Figure 2-2**) for the construction work and the tree felling is in progress from end August for the second section from 3+260 km to 3+860 km by State Timber Corporation (STC) under the supervision of DWC and FD.



**Figure 2-2: Tree felling and site clearance lay out at 1<sup>st</sup> phase of UEC ICB 1**







**Figure 2-3: Tree felling by STC**

- iii. Establishment of electric fence for elephants and barricade with small mesh to the ground level along the boundary where vegetation clearance taken place to avoid falling of animal into the excavated sections was done for the cleared section from May to August 2017.



**Figure 2-4: Electric fencing for elephants and mesh fencing for small animals**

- iv. Other permanent construction work of top soil removal, common excavation, dewatering and rock excavation was carried out in May 2017 and the test blast for the rock excavation with the approval of GSMB was carried out in June 2017. Steel reinforcement and base concrete work has been commenced in August 2017 and is in progress.



Figure 2-5: Excavation (July 2017)



Figure 2-6: Steel reinforcement and concreting

## 2.3 Approval Status

21. The summary of required approvals was identified by the Contractor during the CEMP preparation stage with support of the Engineer, and the RE approved commencement of construction activities upon the receipt of required key approvals. The summary of the approval status is given in **Table 2-5**

**Table 2-5: Summary of the approval status for the construction work under UEC-ICB-1**

Project activity	Type of approval	Responsible Institution	Licence/ approval Ref No.	Status as of end August 2017
Implementation of the Project	Environmental clearance for EIA- UECP	CEA	08/ EIA/ Water/ 04/ 2012	Received on 31.03.2016
Site access and land for construction	Written consent	DWC	WL/6/1/1/266 of DWC	Received



Project activity	Type of approval	Responsible Institution	Licence/ approval Ref No.	Status as of end August 2017
Land labour camps and accommodation	Written consent	DWC	WL/6/1/1/255-1 of DWC	Received
Removal of trees	Written consent	DWC	WL/6/1/1/266 of DWC	Received
Site clearing	Written consent	DWC	WL/6/1/1/266 of DWC	Received
Project implementation	Clearance from Archaeology department	Department of Archaeology	ARCH/ PO/ EXP/ 04/ 11/ 2017	Received
Electric fencing	Written consent	DWC	PMDSC-UEC-Site/ICB-1/CMLMTD/067	
Handling of explosives	Explosive Permit	Ministry of Defence	Letter No. 275258	Received on 19.08.2017
Rock Blasting Activities	Written consent	DWC	WL/6/1/1/255-1 of DWC	Received
Developing the face for the Test Blast	Written consent	GSMB	CME/ TB/ IML/ A/ CP/ MQUR/ 2017/ 25052/ 119	Received
Rock excavation	Industrial Mining Licence	GSMB	IML/ A/ HO/ 10778	Received
Construction of Concrete Batching Plant	Clearance for construction of batching plant	CEA	CEA/ CPO/ MT/ 07/ 403/ 2017	Construction completed
Operation of Concrete Batching Plant	Environmental Protection Licence (EPL)	CEA	Pending	Application submitted on 12.09.17
Construction of Mobile Crusher Plant	Clearance for construction	CEA	CEA/ CPO/ MT/ 07/ 402/ 2017	Construction completed
Operation of Mobile Crusher Plant	Environmental Protection Licence (EPL)	CEA	Pending	Application submitted on 12.09.17
Water extraction from Ambanganga - MDP	Approval	Irrigation Department	MKDP/ PD/ ENG/ 44	Received
Construction waste disposal	Written consent	DWC	WL /6/1/1/266 of DWC	Received

22. The site selection for the Contractor's facilities and relevant concurrence are being followed up by the relevant subject specialists and officers attached to PMDSC, PMU and PIU. The map of the project area indicating the disposal areas, Contractor's facilities are given in Annex 1.

## 2.4 Training and Awareness

23. The training and awareness programs carried out to improve awareness of the Contractors' staff by the Environmental Officers appointed under UEC-ICB-1 as identified in the CEMP are summarized in **Table 2-6**.

**Table 2-6: Training and awareness programs conducted during the period from January 2017 to August 2017 under UECP ICB 1 contract**

Type of Training	Target group	Originally Planned Date in CEMP	Conducted on
Environmental protection (General)	All staff	17.07.2017	06.03.2017
First Aid Training	All staff		14.03.2017
Fire emergency preparedness	All staff	18.09.2017	27.04.2017
Environmental emergency preparedness	All staff	14.08.2017	23.08.2017
Awareness on Wildlife reserve and conservation responsibilities	All staff	19.06.2017	
Workers and public safety	All staff	24.04.2017	
Site tidiness	All staff	15.05.2017	
Air pollution (dust and gaseous emissions) control	All staff	16.10.2017	
Waste management (solid, liquid, hazardous, Metal)	All staff	20.11.2017	
Noise and Vibration control	All staff	18.12.2017	
Solid waste management and spoil disposal	All staff	15.01.2018	
Waste water management	All staff	19.02.2018	
Traffic management	All staff	19.03.2018	
Batching plant and Crusher plant	Plant manager, Operators, Drivers and helpers	23.04.2018	
Handling of chemical associated with the project works	Technical, Mechanical and stores staff	14.05.2018	

## 2.5 Compliance with CEA's Conditions

24. The conditional approval issued (08/EIA/Water/04/2012 dated 31.03.2016) by Central Environmental Authority (CEA) for EIAR consist of 14 conditions with detail subsections covering (i) General conditions; (ii) Ecological aspects; (iii) Hydrological aspects; (iv) Geological/land stability and erosion aspects; (v) Disposal of excavated material; (vi) Social aspects; (vii) extraction of construction material; (viii) Restoration, rehabilitation of construction site; (ix) Waste disposal; (x) Archaeological aspects; (xi) Noise and Vibration; (xii) Transportation of material and machinery; (xiii) Safety, emergencies and (xiv) Environmental Management Plan.

25. Complying with the conditions related to regulatory and approval requirements, as described in **Table 2.5**, relevant approval has been obtained prior to commence the relevant construction activity.

26. The Contractor has been made aware of the CEA conditions and it is being ensured that the Contractor is complying with the conditions related to construction activities. The Department of Wildlife Conservation (DWC) has included their conditions annexed to the CEA conditions, and complying

with the general conditions from Section 2.12 to 2.32 of the DWC conditional approval (j'Ô'/6/1/1/252-ii on 16.03.2016), following steps has been taken by the project;

- (i) The site clearance was arranged in such a way keeping the adequate tree belt for the movement of wild animals in the sanctuary area (**Figure 2-2**)
- (ii) No night time work is allowed for the construction within sanctuary area
- (iii) No worker is allowed to hunt or harm any animal or plant in the protected area, and the construction area boundaries are demarcated to avoid illegal movements within sanctuary area
- (iv) The necessary awareness has been made to stop work and keep away from the area when elephant movements occur in or around the construction area
- (v) No new access roads are prepared, and 10 m belt of the canal trace was cleared for the access, and fenced properly to avoid any unauthorized people/public to enter the sanctuary area
- (vi) The area where deep excavation and blasting taken place along the canal trace is protected with electric fencing to avoid elephants to reach the excavated area, and for the safety of small animals the green mesh is installed to the ground level (**Figure 2-4**)
- (vii) Waste management is properly arranged using the identified waste disposal areas, and no left over in the sanctuary area disturbing existing wildlife movements
- (viii) The construction work is carried out accompanying the officers from the Elahera Wildlife Range office and under the guidance and supervision of them

27. Complying with the CEA conditions, EMP was updated twice considering the design changes occur under the UEC ICB 1 package. And additional surveys were carried out for all the designs or construction work deviated from the EIA stage and duly informed the CEA and other stakeholder agencies through reporting (Addendum to EIA) or stakeholder consultations as highlighted in **Table 2-7**.

## 2.6 Additional Surveys carried out under UECP within the reporting period

28. As highlighted in the previous section, complying with the CEA guidelines every single change in the canal trace and additional areas identified for the construction purposes are surveyed to identify the possible environmental impacts other than the impacts identified in the EIA stage in 2015. Accordingly following additional surveys (**Table 2-7**) were carried out during the period from January to August 2017 in the UECP area.

**Table 2-7: Additional environmental surveys and studies carried out in UECP area from January to August 2017**

Survey	Study area	Period
Additional tree survey to verify the trees to cut down (after demarcating canal trace by the contractor)	UECP - ICB 1 area	January 2017
Environmental Screening	UEC ICB 1, UEC ICB 2A, UEC ICB 2B areas where design changes are made from the EIA stage (Refer Table 2-1)	May 2017
Ecological surveys carried out by IUCN to prepare WMP	Sample survey covering UECP area	May – July 2017

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Survey	Study area	Period
Tree survey in the deviated canal section (between 2+820 km and 3+860 km)	UECP – ICB 1 area (between 2+820 km and 3+860 km)	July 2017



### 3. CEMP IMPLEMENTATION & MONITORING

29. The Contractor is contractually bound to implement the CEMP and carry out independent monitoring during the construction period as per the formats agreed with the RE/PMDSC Environmental Specialist. In addition to the CEMP, prior to each construction activity, it is compulsory to submit the Environmental Method Statement (EMS) based on the format discussed during the Contractor's orientation program.

30. The other relevant documentation and reporting managed by the Contractor's Environmental Officer include: (i) Environmental Issue Log, (ii) Contractor's Schedule for CEMP implementation, (iii) Grievance Log, and (iv) Monthly Environmental Monitoring Report. The environmental issues of the previous month is discussed in the monthly progress meetings carried out by the RE/PMDSC with the participation of PD/PIU.

31. Lack of adequate technical staff under RE and not having a dedicated expert in the field level to carry out the continuous environmental monitoring in the site from the RE/PMDSC, comprise a key disadvantage, where there is a possibility of non-compliance occurring during the construction period. Alternative institutional arrangements adopted under the existing provisions to avoid or control arising non-compliances and duly contain if arise.

#### 3.1 Environmental risks and safeguard compliance

32. This section includes the information gathered through periodical site visits, Contractors' independent monitoring reports, and discussions held at the Contractors' monthly progress meetings, since there is no continuous CEMP monitoring take place on site. Since only the UEC-ICB-1 Contractor had commenced their physical work on site by the end of the reporting period, the relevant details are available related to that construction package only. Summary is given in **Table 3-1**.

33. The Explosive storage magazine was previously planned by the contractor to place in the same premises where Contractor's office building, and fuel tank is proposed adjacent to the Naula – Bakamoona main road. ADB and the Environmental staff of PMU/PMDSC advised to shift this location to avoid risks of explosions having it closer to fuel tanker. Figure 3-1 shows the previous location and the proposed existing location mitigating possible impacts.

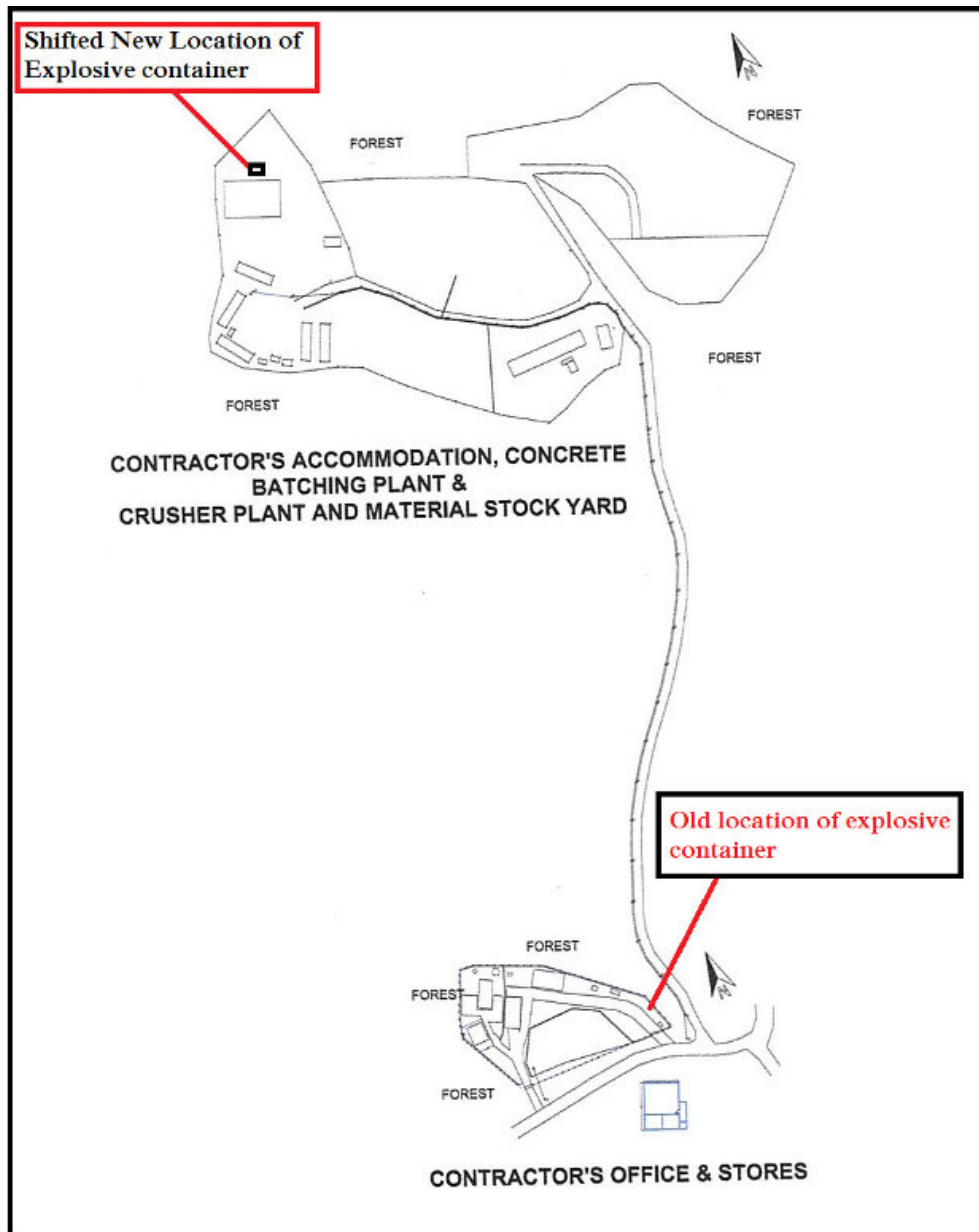




Figure 3-1: Diagram to show the change of location of Explosive container

Table 3-1: Summary of Significant Environmental Impacts and Measures Adopted

Activity	Observed Impact	Risk level	Adopted Mitigation measure	Effectiveness of the mitigation
Felling trees and clearing vegetation in the Minneriya-Girithale sanctuary area	Disturbance to wildlife and migratory paths Habitat loss	High	<ul style="list-style-type: none"> <li>Clearing minimum required area stage wise with the approval and guidance of DWC and STC</li> </ul>	Moderate
Deep excavations	Accidental falling animals into the deep cut sections	High	<ul style="list-style-type: none"> <li>Establishing electric fencing for elephants and small mesh net to barricade the area to prevent falling small animals</li> </ul>	Moderate
Survey and site clearance	Spreading Alien Invasive Species (AIS)	Moderate	<ul style="list-style-type: none"> <li>Manual removal of AIS and collection, transport to the waste disposal area and burning immediately</li> <li>Washing and cleaning transported vehicles</li> </ul>	Moderate
Operation of batching and crusher plants	Delay in obtaining EPL	High	None	NA
Waste disposal	<ul style="list-style-type: none"> <li>Disturbances to the migratory paths of the wildlife in the sanctuary area</li> <li>Risk of spreading invasive species</li> </ul>	High	<ul style="list-style-type: none"> <li>Material separation (top soil, Class D and unclassified) and dumping only in the approved disposal areas</li> <li>Keeping sufficient spacing in the stockpiles and maintaining maximum height</li> </ul>	High
	<ul style="list-style-type: none"> <li>Food waste disposal will attract elephants, and other predatory species</li> <li>Foul smell and health issues</li> </ul>	High	<ul style="list-style-type: none"> <li>Food and kitchen waste in workers camp dumped in pits and dispose in regular basis</li> <li>Waste collection is not done by the Pradeshiya Sabha and hence, the waste disposal is localized</li> </ul> 	Moderate

Activity	Observed Impact	Risk level	Adopted Mitigation measure	Effectiveness of the mitigation
			within the project area <ul style="list-style-type: none"> <li>Other waste (plastic, paper, debris) collect separately and send out of the project area for the managed disposal</li> <li>No waste burning inside the project area to avoid risk of wildfires</li> </ul>	
Excavation, blasting, moving trucks and other vehicles in the construction area	Emission of dust	High	<ul style="list-style-type: none"> <li>Sprinkling water 3 times per day using a permanent water bowser for the project</li> </ul> 	Moderate
Canal excavation and other project activities in a critical habitat	Hindrance to the seasonal stream network	High	<ul style="list-style-type: none"> <li>Bypassing seasonal stream by cutting additional drains</li> </ul>	Moderate
	Disturbances to the wildlife safety risk to the employers	High	<ul style="list-style-type: none"> <li>No work is allowed after 2.30 PM in the sanctuary area</li> <li>Elephant fencing and hard barricading either side of the canal</li> <li>Conducting awareness programs</li> </ul>	Moderate
Storage of explosives	Safety risks to the surrounding environment including wildlife	High	<ul style="list-style-type: none"> <li>Approval taken from the Divisional explosive controller and instructions followed to establish the explosive container</li> <li>The instructions given by ADB was followed to replace the previous plan to establish explosive container adjacent to the road side and fuel tank</li> </ul>	

Activity	Observed Impact	Risk level	Adopted Mitigation measure	Effectiveness of the mitigation
Rock basting	Disturbances to the wildlife safety risk to the employers and people using the main road	High	<ul style="list-style-type: none"><li>Blasting carry out under the guidance and approval of GSMB</li></ul>	Low

### **3.2 Environmental issues and grievances recorded**

34. Environmental Issue log and Grievance Log are maintained at the site office, but there are no records for the period of January to August 2017. Grievance Redress Mechanism (GRM) is established by forming Grievance Redress Committees (GRC) for UECP by April 2017.

35. The Contractor of UEC-ICB-1 is placed a Grievance Box at the site office to receive any complaints and suggestions about the construction work.

#### **4. KEY ACTIVITIES FOR NEXT YEAR (SEPTEMBER TO DECEMBER-2017)**

36. Several environmental and ecological surveys are planned related to Tranche 2 UECP packages, which include tree enumeration for the newly proposed sections, and ecological survey to update the baseline conditions related to the critical species in the project impact area.

37. Identifying a qualified accredited laboratory to carry out periodical environmental quality data collection will be achieved through the competitive bidding process.

38. Implementation of standard environmental monitoring system through RE/PMDSC and implementation of the reforestation program will comprise another important activity during the next two quarters.



# Landuse Plan for Upper Elehera Canal - UEC-ICB-1

**SECTION - 03**  
2+660 to 3+980

MWSIP TRANCHE 1  
(0+000 TO 3+860 km)  
UEC-ICB-1

**SECTION - 02**  
1+420 to 2+660

**SECTION - 01**  
0+100 to 1+420

MWSIP TRANCHE 2  
(3+860 TO 17+700 km)  
UEC-ICB-3

PROPOSED BUND  
EXTENSION

EXISTING BUND

DISPOSAL SITE

PROPOSED ACCESS ROAD

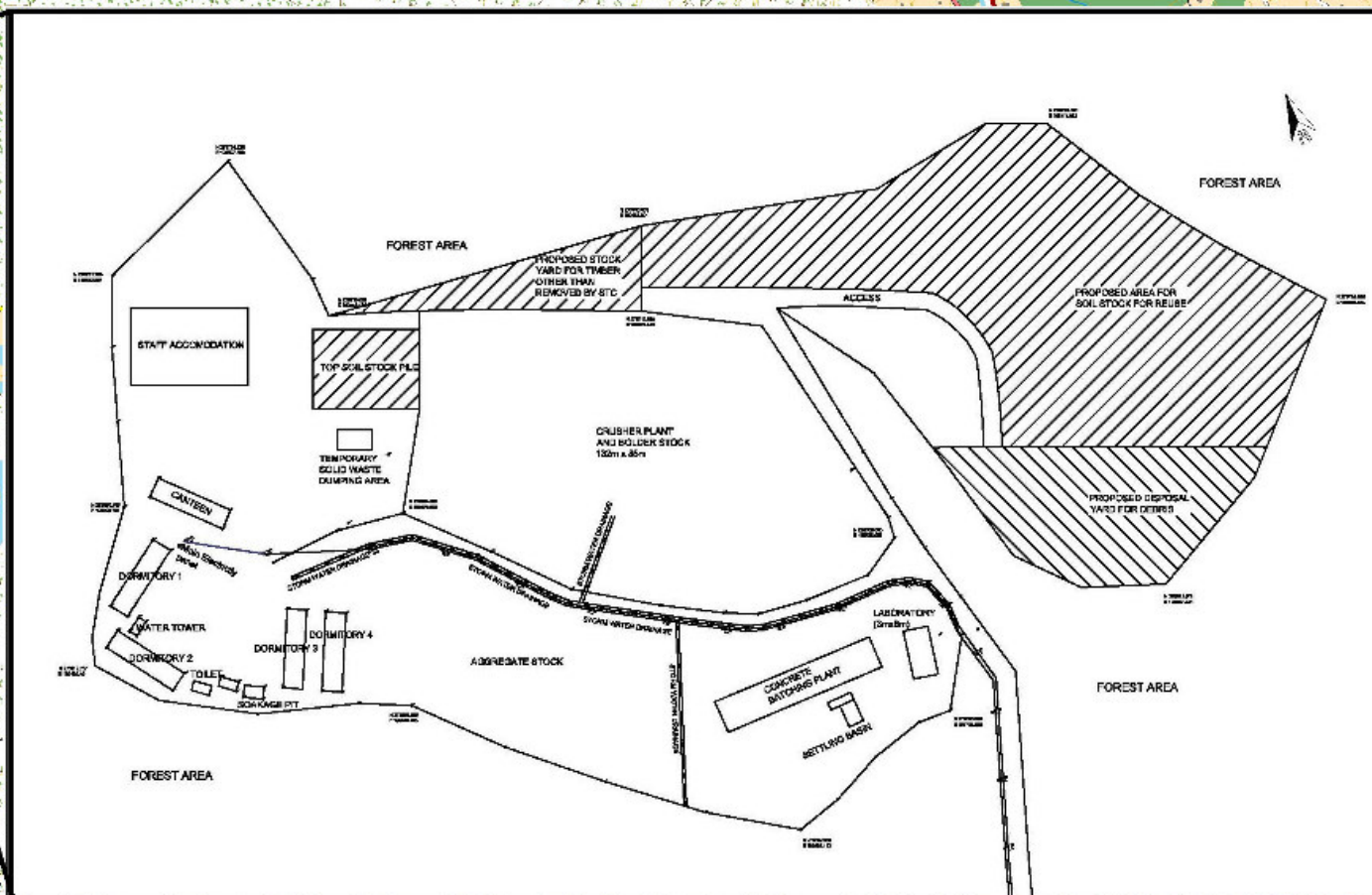
Contractor's Yard

Disposal Site

MORAGAHAKANDA RESERVOIR

Galwetikanda

Attaragallew

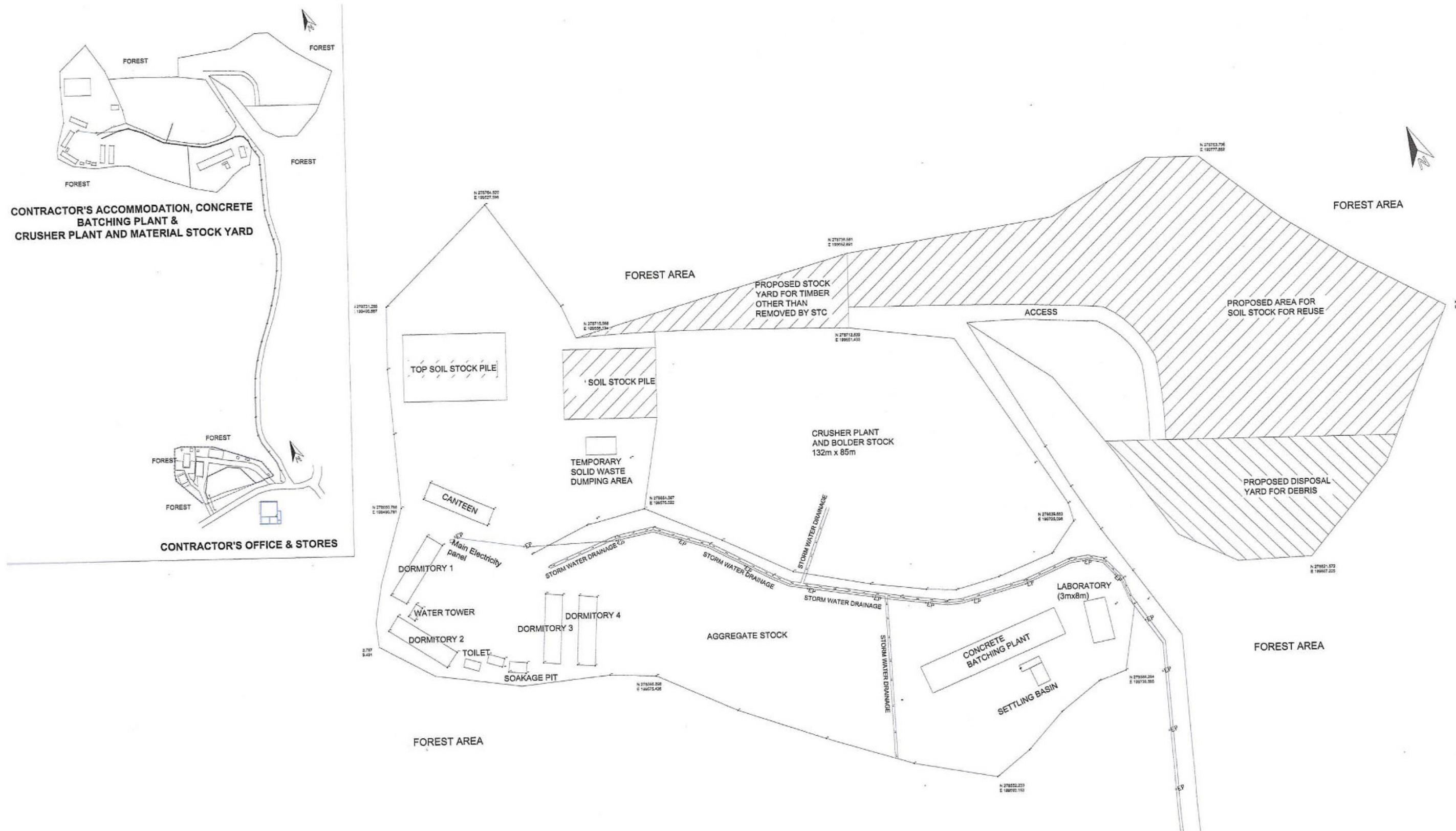


DATA SOURCE: 1:10,000 LAND USE PLAN DEPARTMENT OF SURVEY SRI LANKA

0 0.5 1 2 Kilometers

- LEGEND**
- Village Name
  - Archeological Sites
  - Road Class B
  - Minor-Jeep Trac
  - Bund Road
  - Foot Path
  - Existing Elephant Fence
  - River /Tributarie
  - Major Contour
  - Minor Contour
  - Dumping Sites
  - Reservoir Under Construction
  - Forest - Unclassified
  - Home Garden
  - Marsh
  - Other cultivation
  - Paddy
  - Plantation area
  - Rock
  - Scrub land
  - Stream
  - Tank Abandoned
  - Tank Working
  - Cut & Cover Circular Conduit
  - Cut & Cover Rectangular Conduit
  - Level Crossing
  - Rectangular Open Canal
  - Trapezoidal Open Canal





**CONTRACTOR'S ACCOMMODATION, CONCRETE BATCHING PLANT & CRUSHER PLANT AND MATERIAL STOCK YARD**

REVISION					
NO.	DATE	DESCRIPTION	CERTIFIED	NPK	20 <sup>th</sup> March 2017
			APPROVED	AMJ	20 <sup>th</sup> March 2017
			CHECKED	SAR	20 <sup>th</sup> March 2017
			DRAWN	NIM	20 <sup>th</sup> March 2017
			SURVEY	JAP	20 <sup>th</sup> March 2017

<b>EMPLOYER</b> DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA MINISTRY OF MAHAWEI DEVELOPMENT AND ENVIRONMENT <b>MAHAWEI WATER SECURITY INVESTMENT PROGRAM</b>		<b>CONSULTANT</b> LAHMEYER INTERNATIONAL GEOCONSULT InfotechsIDEAS ENGINEERING CONSULTANTS PVT. LTD. NIRAS	
<b>CONTRACTOR</b> CML-MTD CONSTRUCTION LTD		<b>CONSTRUCTION OF UPPER ELAHERA CANAL</b> UEC/ICB-1 CONSTRUCTION OF UPPER ELAHERA CANAL FROM 0+100 km TO 3+860 km <b>SITE INSTALLATION PLAN OF THE CONTRACTOR'S FACILITIES</b>	

DATE.	20 <sup>th</sup> MARCH 2017
DRAWING NO.	UEC-CML-SI-D-001
SHEETS	01 OF 04
SCALE	ORIGINAL
	Rev.
A3	02