Environmental Monitoring Report

Semi-Annual Report no. 3
For the period covered January to June 2018
Project Number: 47381-002
July 2018

SRI: Mahaweli Water Security Investment Program – Tranche 1

North Western Canal Project (NWPCP)

Prepared by Ministry of Mahaweli Development and Environment with the assistance of Program Management, Design and Supervision Consultant (Joint Venture Lahmeyer International GmbH – GeoConsult ZT GmbH) for Democratic Socialist Republic of Sri Lanka and the Asian Development Bank.

Democratic Socialist Republic of Sri Lanka
Ministry of Mahaweli Development and Environment

Mahaweli Water Security Investment Program

SEMI ANNUAL ENVIRONMENTAL MONITORING REPORT No. 3 FOR NWPCP

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Program Management, Design and Supervision Consultant

LAHMEYER INTERNATIONAL | GC GEOCONSULT | InfotechsIDEAS KNOWLEDGE. INNOVATION. SOLUTIONS. | ENGINEERING CONSULTANTS (PVT.) LIMITED | NIRAS

SEMI ANNUAL ENVIRONMENTAL MONITORING REPORT FOR NWPCP - JANUARY to JUNE 2018

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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
	Environmental Monitoring Specialist
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 Burau
ICB	International contractor bidding
IML	Industrial Mining License
KMTC	Kaluganga Moragahakanda Transfer canal
MIT	Mahakithula Inlet Tunnel
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
PMU	Program Management Unit
RE	Resident Engineer
SAEMR	Semi Annual Environmental Monitoring Report
SPS	Safeguard Policy Statement
SEO	Senior Environmental Officer
STC	State Timber Cooperation
TBM	Tunnel Boring Machine
UECP	Upper Elahera Canal Project

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1. INTRODUCTION

1.1 Mahaweli Water Security Investment Program (MWSIP) and North Western Province Canal Project (NWPCP)

1. The objective of the NWPCP is to transfer Mahaweli water to water short Upper Mi Oya irrigation systems and Hakwatuna Oya irrigation scheme in the Upper Deduru Oya basin. The project is to be implemented in two stages with transfer of 30 MCM annually from Nalanda reservoir in Stage 1 and further 100 MCM of Mahaweli water to be diverted from Dambulu Oya below Bowatenna Tunnel under Stage 2, on completion of Upper Elahera Canal from Moragahakanda reservoir.

2. The proposed project includes construction of conveyance canals of 91 km length and two medium reservoirs namely Mahakithula and Mahakirula located in the Kahalla-Pallekele forest reserve.

3. The North Western Province Canal (NWPC) project area is divided into sub-project components listed in the table below. The environmental significance is high for the ICB-1 and ICB-2 contract packages of NWPCP where construction activities are taking place within Kahalla – Pallekele sanctuary (proposed national park) area.

NWPC-NCB-1	**Wemedilla Sluice and LBMC from Reservoir to Nabadagahawatta (0+000 to 5+250 km)**
NWPC-ICB-1	Mahakithula Inlet Tunnel, Mahakithula and Mahakirula Reservoirs, Feeder Canal 3.66 km
NWPC-ICB-2	Main Canal from Nebadagahawatta to Mahakithula Reservoir (5+250 to 22+500 km)
NWPC-ICB-3	Mi Oya RB 1 Canal, Mahakirula Reservoir to Galgiriyawa (0+000 to 13+731 km) and Mi Oya RB 2 Main Canal from Galgiriyawa to Kaduruwewa (13+731 to 21+231 km)
NWPC-ICB-4	Mahakithula Reservoir to Potuwila (0+000 to 1+491 km) and Upper Mediyawa (0+000 to 19+980 km) and Yapahuwa Canal from Mediyawa Canal (0+000 to 11+200 km)
NWPC-ICB-6	Dambulu Oya to Wemedilla LBMC and Diversion Structure (0+000 to 8+590km)

4. There are 3 contract packages, NWPCP-NCB[1]-1, NWPCP-ICB[2]-1 and NWPCP-ICB-2 under the NWPCP to be completed under Tranche 1 of the development program during 2016 to 2021. Out of these 3 packages, Contracts have been signed for NWPCP-NCB-1 (01 December 2016) and NWPCP-ICB-2 (05 July 2018), while contract package NWPCP-ICB-1 is waiting for the finalization of the financial evaluation of the submitted bids.

[1] NCB – National Competitive Bidding
[2] ICB – International Competitive Bidding

1.2 Scope of the Report

5. This Semi Annual Environmental Monitoring Report (SAEMR) is prepared addressing following aspects, based on the available information with respect to the monitoring period from January to June 2018:

(i) Background/context of the monitoring report (adequate information on the project, including physical progress of project activities, scope of monitoring report, reporting period, and the monitoring requirements including frequency of submission as agreed upon with ADB);

(ii) Changes in project scope and adjusted safeguard measures;

(iii) Qualitative and quantitative monitoring data;

(iv) Monitoring parameters/indicators and methods based on the EMP previously agreed upon with ADB;

(v) Monitoring results compared against previously established benchmarks and compliance status (e.g., obtaining necessary approvals for establishment of certain facilities, national environmental emission and ambient standards and/or standards set out in the WB's EHS guidelines; timeliness and adequacy of environmental mitigation measures; and training, capacity building, etc.);

(vi) Monitoring results compared against the objectives of safeguards or desired outcomes documented (environmental impacts avoided or minimized, etc.);

(vii) Corrective action plan in any case of non-compliance or any major gaps identified;

(viii) Records on disclosure of monitoring information to affected communities;

(ix) Identification of key issues, or grievances from affected people, or recommendations for improvement;

(x) Monitoring adjustment measures recommended based on monitoring experience/trends and stakeholder's response;

(xi) Information about actual institutional arrangements for implementing the monitoring program;

(xii) Proposed items of focus for the next reporting period and due date.

6. This SAEMR No. 3 is prepared to update the progress of NWPCP with respect to environmental safeguard aspects for the period of January to June 2018, which fulfils an ADB requirement to submit a SAEMR to ADB and Central Environmental Authority (CEA) for the "Category A" projects as documented in FAM[3] and EARF[4].

7. The purpose of this report is to ensure that the Project is implemented with due concern for environmental 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 with 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) including Addendum to the EIA: NWPCP Tranche 1 packages (May 2017) and Environmental Management Plan (EMP)[5] as per the stipulation No. 14.3 of the EIA approval No. 08/EIA/WATER/07/2012 issued by CEA on 23 February 2016 and approval for the addendum (Ref.08/EIA/Water/07/2012/Vol 2 dated as 11 April 2018).

[3] Paragraph 60 of Facility Administration manual (FAM), June 2015 prepared by MMDE.
[4] Paragraph 111 or Environmental Assessment Review Framework (EARF) November 2014 (updated in June2017) by MMDE.
[5] Environmental Impact Assessment Report (EIAR) dated June 2015 and approved by CEA on 31.03.2016.

8. This SAEMR for NWPCP is prepared by the Environmental Specialist of PMDSC based on the monthly monitoring and progress reports received from the Environmental Monitoring Specialist (EMS), and the updates which were received from the Environmental Specialist of PMU and Senior Environmental Officer of PIU.

2. OVERALL PROGRESS OF NWPCP

2.1 NWPCP at a Glance

9. NWPCP-NCB-1 and NWPCP-ICB-2 Contracts have been awarded. The details of the respective Contractors are summarized in the **Table 2-1.**

Table 2-1: Summary of the NWPCP Awarded Contract Packages

Package	NWPCP-NCB-1	NWPCP-ICB-2
Work Description	Improvements to Wemedilla Left Bank Main Canal up to Nabadagahawatta (0 to 5+250 km) and Construction New Sluice and Tail Canal (0 to 0+600 km)	Construction of Main Canal from Nebadagahawatta to Mahakithula Reservoir Inlet Tunnel (from 5+250 km to 22+500 km)
Package No.	MMDE/MWSIP/ADB/NWPCP/NCB-1/3267-3268-SRI/NCB/2016/001	MMDE/MWSIP/ADB/NWPCP/ICB-2/3267-3268-SRI/ICB/2017/003
Name of the Contractor	M/S NEM Construction (Pvt) Ltd.	M/S China State Construction Engineering Corporation Limited
Address	No. 629, Baseline Road, Colombo 9	No. 15, Sanlihe Road, Haidian District, Beijing, China
Contract Amount LKR (incl. VAT)	926,113,863.39	7,226,621,051.00

10. **Table 2-2** summarizes the status of designs, contract bidding and awarding of NWPCP contract packages by end June 2018. The updated Environmental Management Plans (EMPs) have been prepared and incorporated along with the bidding documents for the packages NWPCP-NCB-1, NWPCP-ICB-1 and NWPCP-ICB-2.

Table 2-2: Summary of the Tranche 1 NWPCP Contract Bidding and Awarding

Package	Contract Name	Status by End August 2017
NWPCP-NCB-1	Improvements to Wemedilla Left Bank Main Canal up to Nabadagahawatta (0 to 5+250 km) and Construction New Sluice and Tail Canal (0 to 0+600 km)	• Letter of Acceptance: 21 November 2016 • Contract signed: 01 December 2016 • Commencement: 29 December 2016 • Date of Completion: 29 December 2018
NWPCP-ICB-1	Construction of Mahakithula Inlet Tunnel, Mahakithula and Mahakirula Reservoirs, Feeder Canal from Mahakithula to Mahakirula Reservoir	• Technical Bid Opening Date: 18 September 2017 • Technical Bid approved by ADB: 19 March 2018 • Financial Bid Opening Date: 25 April 2018
NWPCP-ICB-2	Construction of Main Canal from Nebadagahawatta to Mahakithula Reservoir Inlet Tunnel (from 5+250 km to 22+500 km)	• Technical Bid Opening Date: 31 July 2017 • Technical Bid approved by ADB: 12 October 2018 • Financial Bid Opening Date: 19 October 2018 • Financial Bid approved by ADB: 01 February 2018 • Letter of Acceptance : 06 June 2018 • Contract signed date : 05 July 2018 • Contract period is 1,092 days; no commencement yet

2.2 Safeguard Documentation and Approvals

2.2.1 EIA Addendum and updated EMPs

11. NWPCP is classified as Category "A" according to ADB's SPS (2009) and the conditional approval (EIA approval No. 08/EIA/WATER/07/2012 issued by CEA) is valid for a period of 3 years commencing from 23 February 2016.

12. As updated in the previous SAEMR, the design changes made in comparison to the approved EIA with respect to NWPCP Tranche 1 packages were submitted in an Addendum to EIA to CEA in July 2017 and to ADB in August 2017. CEA held the Technical Review Committee (TRC) meeting on 30 November 2017 on the submitted report, and the letter summarizing comments and clarifications required were sent to PMU on 28 November 2017. CEA and DWC approval on the EIA addendum was granted on 11 April 2018 (Ref. 08/EIA/Water/07/2012/ Vol 2 given in **Annex 1**).

13. The updated EMPs have been completed and submitted to CEA and ADB, for the Tranche 1 packages of NWPCP-ICB-1 and -ICB-2. While complying with Section F of the CEA conditional approval, amendment of the updated EMP for NWPCP-ICB-2 is in progress incorporating the findings of the ecological baseline and tree enumeration survey.

2.2.2 Other Safeguard Compliances

14. The compliance status related to the CEA approval conditions related to NCB-1 canal trace - followed up by the Senior Environmental Officer (SEO) of PIU and Environmental Monitoring Specialist of PMDSC - is summarized below in **Table 2-3**.

Table 2-3: Compliance with CEA Conditional Approval

No.	Approval Condition	Compliance Status	Remarks
1	Preparation of Wildlife Management Plan (WMP)	Plan prepared & submitted to CEA for approval	Accepted for implementation at stake holder meeting on 17 May 2018 by CEA subject to further improvements, which are being undertaken now
2	Implementing recommendations of WMP	Implementation works of the WMP is in progress	
		Work plan & activity plan prepared for implementation	Refer **Annex 2**
3	Implementing non-construction-based recommendations of EIAR approval	i. <u>Reforestation:</u> Initial discussion for the reforestation in NWPCP: 31 May 2018 Concept agreed and documentation preparation in progress ii. <u>Hakwatunaoya Elephant Corridor:</u> Meeting on Hakwatunaoya Elephant Corridor establishment: 01 June 2018 and 07 June 2018 at District secretariat, Kurunegala	• FD, PMDSC, PIU participated • MOU was signed between DWC, MMDE and ID (**Annex 3**) • All relevant regional stakeholders Participated (DWC, FD, ID, CEA, PEA, DAD, DSD, etc.)

3. STATUS OF NWPCP-NCB-1 CONTRACT PACKAGE

3.1 Physical Progress

15. The only NWPCP construction package mobilized under MWSIP Tranche 1 is NWPCP-NCB-1. The summary highlighting the construction progress as of June 2018 is given in **Table 3-1**.

Table 3-1: Construction Progress of NWPCP-NCB-1 Contract by June 2018

Package Name/s	NWPCP-NCB-1 by NEM Construction Co (pvt) Ltd.
Canal chainage	Wemedilla LB Main Canal up to Nebadagahawatta (0+000 km to 5+250 km) and construction of New Sluice and Tail Canal (0+000 km to 0+600 km)
Ongoing construction activities as per construction schedule	<u>Construction work in section 0+850 km to 2+860 km</u> • Earth and rock excavation • Aqueduct across Malawa Oya <u>Construction work in section 2+860 km to 3+055 km</u> • Removal of trees <u>Construction work in section 3+055 km to 3+500 km</u> • Blasting • Concreting of conduit section <u>Construction work in section 3+500 km to 5+250 km</u> • Earth excavation • Embankment filling • Concrete lining • Drainage under-crossing • Bathing steps <u>Construction work in new tail canal (0+000 to 0+533 km)</u> • Excavation for the rectangular open canal • Construction of the rectangular open canal • Construction of drop structures <u>Construction work in new sluice</u> • Construction of the sluice barrel • **Construction of the superstructure of the tower and approach bridge**
Cumulative Physical Progress as of June 2018	New sluice (excavation, concreting) - 30 %
	Tail canal (excavation, concreting) - 70 %
	Aqueduct - 80 %
	Main Canal, excavation - 75 %
	Embankment filling - 65 %
	Canal trimming - 60 %
	Canal lining - 60 %

16. The tree removal has been completed along the construction areas of the entire canal section (0+000 km to 5+250 km including new sluice area), except for those canal reservation areas where the land acquisition has not yet been completed.

3.2 Changes in Project Scope and Adjusted Safeguard Measures

17. **Table 3-2** summarizes the actions taken due to change of project scope in the NWPC-NCB-1 contract package.

Table 3-2: Actions Taken due to Change of Project Scope in the NWPCP-NCB-1

No.	Scope Change	Impact	Adjusted Safeguard Measures
1.	20 m canal reservation from the centre of the existing Devahoowa Feeder canal was not properly surveyed; acquisition was not completed at the time of award of contract package.	Additional trees and structures to be removed	• Joint tree survey was carried out in February and March 2018; a new list with 264 trees were identified; approval has been obtained from the relevant Local Gov. Authority (Galewela DS). • Tree removal is not possible until the valuation for the acquired lands is completed. The private land owners are allowed to cut the trees within their premises, and any remaining trees shall be removed through the State Timber Corporation. • Consent has been granted from the paddy land owners to carry out construction work with compensation payments pending.
2.	Increased demand for borrow material for backfilling	Arise of approval requirements	• Follow up with the Contractor's EO about the approval requirements; obtaining relevant Method Statements including restoration plans.

18. Requirement of earth quantities for backfilling and other construction activities has necessitated to search for new borrow areas. Close follow up with the Contractor on obtaining the relevant approvals and preparation of Environmental Method Statements by the EMS is required.

3.3 Approval Status

19. The summary of the approval records related to the ongoing construction activities are summarized in **Table 3-3**.

Table 3-3: Summary of Approvals under NWPCP-NCB-1

Activity/ Location	Approving Agency	Type of Approval	Validity Period		
			Date of Issue	Date of Expiry	
Batching plant	CEA	EPL	02.02.2018	01.02.2019	
	UDA	Trade licence / permit	05.08.2017	04.08.2018	
Blasting permit	GSMB	Blasting permit	03.01.2018	02.07.2018	

20. The batching plant had been in operation for about 1 month without the EPL, and once the EMS was recruited in December 2017, he had raised this issue. The Contractor was made following up on this lapse and finally obtained the EPL in February 2018.

21. The explosive licence for blasting subjected to GSMB approval and UDA permit for the batching plant are already expiring (at the time of reporting). The Contractor will not be allowed to carry out the relevant activities under these permits unless the approvals are renewed and updated.

22. The Contractor has been requested several times during the Monthly Progress Meetings to submit copies of the approvals and permits related to the environmental safeguard compliances. The Contractor did not comply with these requirements. Hence, the RE has sent formal correspondence in this regard which the Contractor is required to follow.

23. The record of the approved disposal sites (**Figure 3.1** and **Figure 3.2**) is listed in **Table 3-4**. In addition, it was noted that some temporary stockpiling areas were established along the canal.

Figure 3.1: Disposal Site 01 – Walaswewa

Figure 3.2: Disposal Site 02 - Malawa Mukalana

Table 3-4: Record of Approved Disposal Sites for NWPCP-NCB-1 Construction Package

No.	Site Location (GPS Coordinates)	Temporary or Permanent Site, within Protected Areas or not	Type of Disposal (Rock, Top Soil, Aggregates, Earth, etc.)	Approximate Dimensions (m)			Approval Status (Details)			
				L	W	H	Approv-ing Agency	Approval Ref. No.	Validity Period	
									from	to
1	Disposal Site 01 - Walaswewa N 7.767385, E 80.600733	Permanent Not within any protected area	Top Soil/Earth	40	25	4.5	CEA	CEA/CPO/MT/Other/04/2017	2017.09.08	2018.09.07
2	Disposal Site 02 - Malawa Mukalana N 7.751007, E 80.610964	Permanent Not within any protected area, but by the side of canal reservation	Top Soil/Earth	44	352	4.0	CEA	CEA/CPO/MT/Other/247/2017	2018.02.05	2019.02.04

3.4 Site Inspections, Training and Awareness

3.4.1 Site Inspections and Consultative Sessions Carried Out during Monitoring Period

24. Summary of the meetings, site visits and consultative sessions carried out with the participation of the Environmental Specialist (ES) and/or the Environmental Monitoring Specialist (EMS) of PMDSC is given in **Table 3-5**.

Table 3-5: Site Inspections, Consultative Sessions, Meetings Carried Out Related to NWPCP-NCB-1 Contract during Monitoring Period

Date	Location	Participants	Objective
04.01.2018	RE's Office	- PIU Project Director, PIU staff including SEO - NEM: PM & his staff - PMDSC: CRE, RE and his staff, EMS	December 2017, Monthly Progress Review for NWPCP-NCB-1
05.01.2018	NCB-1 construction area	- PIU staff - District Irrigation Engineer (DIE) Dambulla	Site audit with DIE Dambulla for NCB-1
11.01.2018	NCB 1 construction area	- PIU staff - Contractor NEM - PMDSC	Joint field inspection with Contractor & Engineer
23.01.2018	RE's Office	- PIU staff including SEO, PIU Project Director - NEM: PM & his staff - PMDSC: CRE, RE and his staff, EMS	Site meeting on Current Site Issues, taking decisions for solving them
24.01.2018	RE's Office & Project site	- NEM: Environmental Manager and HSE Officer - PMDSC: EMS	Site inspection to monitor the status of the Environmental Management on site
26.01.2018	RE's Office & Project site	- NEM: Environmental Manager - PMDSC: EMS	Joint monitoring of the status of the Environmental Management on site
03.02.2018	NWPCP-NCB-1 area	- NEM: HES Officer - PMDSC: EMS	Monitoring the status of the Environmental Management on site
15.02.2018	NWPCP-NCB-1 area	- NEM: Environmental Manager - PIU SEO - PMDSC: EMS	Tree enumeration in the canal reservation areas where land acquisition has not been not completed
19.02.2018	NWPCP-NCB-1 area	- NEM – HES Officer - EMS	Monitoring the status of the Environmental Management on site
20.02.2018	RE's Office	- PIU Project Director, PIU staff including SEO - NEM: PM & his staff - PMDSC: CRE, RE and his staff, EMS	Site meeting on Current Site Issues, take decisions for solving them
23.02.2018	NWPCP-NCB-1 area	- NEM: HES Officer - PMDSC: EMS	Monitoring the status of the Environmental Management on site

Date	Location	Participants	Objective
27.02.2018	NWPCP-NCB-1 area	- PIU SEO	Site inspection
28.02.2018	NWPCP-NCB-1 area	- NEM: HES Officer - PMDSC: EMS	Monitoring the status of the Environmental Management on site
06.03.2018	NWPCP-NCB-1 area	- PIU SEO	Site inspection
08.03.2018	NWPCP-NCB-1 area	- ADB - PIU, PMU, - Contractor NEM - PMDSC: EMS	ADB mission
15.03.2018	NCB-1 canal reservation area	- PIU staff	Walk-through Survey for LA work
16.03.2018	NCB-1 construction areas	- PIU staff - Members of Dewahuwa Farmer Organization	Dewahuwa farmers' visit of NCB-1
23.03.2018	NWPCP-NCB-1 area	- PIU SEO	Site inspection
24.03.2018	RE's Office	- SEO, Engineer, Engineer Assistant of PIU - NEM: PM, Engineers - PMDSC: RE, Concrete Engineer, Senior Surveyor, Engineer Assistant, EMS	Site meeting
27.03.2018	NWPCP-NCB-1 area	- PIU - Contractor - PMDSC: RE, EMS	Site meeting
03.04.2018	NWPCP-NCB-1 area	- EMS of PMDSC - with participation of Contractor	Site inspection and monitoring environmental progress of the site. Key findings of the visit: • Identified soil erosion prone areas on the banks of Malawa Oya, upstream of aqueduct construction site • Identified flood prone areas upstream of Malawa Oya aqueduct construction site due to blocking of cross-drainage pipes across the stream
05.04.2018	RE Office Dambulla	- Contractor - PIU - PMDSC: RE staff, EMS	Monthly Progress Meeting
09.04.2018	NWPCP-NCB-1 area	- EMS of PMDSC - with participation of Contractor	Site inspection and monitoring environmental progress of the site. Key findings of the visit: • Identified soil erosion prone areas on the banks of Malawa Oya,

Date	Location	Participants	Objective
			upstream of aqueduct construction site • Identified flood prone areas upstream of Malawa Oya aqueduct construction site due to blocking of cross-drainage pipes across the stream
10.04.2018	NWPCP-NCB-1 area	- PIU staff - Grievance committee	Site inspection to investigate grievances
23.04.2018	NWPCP-NCB-1 area	- EMS of PMDSC - with participation of Contractor	Site inspection and monitoring environmental progress of the Site. Key findings of the visit: • Identified soil erosion prone areas on the banks of Malawa Oya, upstream of aqueduct construction site • Identified flood prone areas upstream of Malawa Oya aqueduct construction site due to blocking of cross-drainage pipes across the stream • Identified soil erosion prone areas due to O&M road construction
02.05.2018	NWPCP-NCB-1 area	- EMS of PMDSC	Site inspection and monitoring environmental progress on Site
08.05.2018	NWPCP-NCB-1 area	- EMS of PMDSC	Site inspection and monitoring environmental progress on Site • Identified stream water pollution at aqueduct construction site due to breach of cofferdam caused by blocking of cross-drainage pipes across the stream
14.05.2018	NWPCP-NCB-1 area	- EMS of PMDSC	Site inspection and monitoring environmental progress on Site
21.05.2018	NWPCP-NCB-1 area	- EMS of PMDSC	Site inspection and monitoring environmental progress on Site • Identified broken areas of the protection fence at steep excavated areas of the new sluice construction area
22.05.2018	NWPCP-NCB-1 area	- PIU - Contractor - PMDSC: RE, EMS	Site meeting
23.05.2018	NWPCP-NCB-1 area	- EMS of PMDSC	Site inspection and monitoring environmental progress on Site
30.05.2018	NWPCP-NCB-1 area	- EMS of PMDSC	Site inspection and monitoring environmental progress on Site
01.06.2018	NWPCP-NCB-1 area	- Contractor's staff - PIU	Site inspection and monitoring environmental progress on Site

Date	Location	Participants	Objective
		- PMDSC: RE staff, EMS	
05.06.2018	Community hall Welamitiyawa	- PIU - Contractor - PMDSC: EMS	Contractor's Environment Day program
06.06.2018	NWPCP-NCB-1 area	- EMS of PMDSC	Site inspection and monitoring environmental progress on Site
07.06.2018	RE Office Dambulla	- Contractor - PIU - PMDSC: RE staff, EMS & ES	Monthly Progress Meeting
12.06.2018	NWPCP-NCB-1 area	- EMS of PMDSC	Site inspection and monitoring environmental progress on Site
23.06.2018	NWPCP-NCB-1 area	- EMS of PMDSC	Site inspection and monitoring environmental progress on Site
25.06.2018	NWPCP-NCB-1 area	- ES and Communication Specialist of PMDSC	Visiting NWPCP-NCB-1 area
26.06.2018	RE office, Galewela	- PIU - Contractor staff - PMDSC: RE	Site meeting

3.4.2 Training and Awareness Carried Out during Monitoring Period

25. An awareness program commemorating "World Environmental Day" was organized on 05 June 2018, to make the Contractor's staff aware about the effects due to plastic pollution and how to reduce plastic waste (**Figure 3.3**).

26. The Contractor has declared the construction area as a PET bottle free area, and parallel to the awareness meeting, there was a joint cleaning campaign organized with the participation of PIU, PMDSC/Engineer and the Contractor's staff.

Figure 3.3: Awareness on Plastic Waste Management

3.5 Summary of Construction Monitoring Findings in NWPCP-NCB-1

3.5.1 Best Environmental and Engineering Practices Implemented by NWPCP-NCB-1 Contractor

27. The Contractor is always trying his best to implement and maintain environmental protection measures complying with the EMP recommendations. Photographic evidences for some of the key environmental mitigation measures adopted by the Contractor are shown in **Figure 3-3**.

Watering during excavation work

Maintenance of green fence around the batching plant	**Landscaping in the batching plant area**

Figure 3.4: Best Environmental Practices by NWPCP-NCB-1 Contractor (I)

<table>
<tr><td colspan="2">   </td></tr>
<tr><td colspan="2">Installation of sign boards</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Erosion minimization measures at aqueduct area</td><td>Soil compaction to minimize erosion temporary stock piling alone the canal</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>Safety fence installation to prevent animal falls at deep excavated section at new sluice</td><td>Proper waste management at stores</td></tr>
</table>

Figure 3.5: Best Environmental Practices by NWPCP-NCB-1 Contractor (II)

3.5.2 Prioritised List of Non-Conformance Findings and Recommended Corrective Actions Related to NWPCP-NCB-1

28. The prioritised list of non-conformances recorded during the monitoring visits of the ES and EMS are summarised with the corrective actions recommended to the Contractor.

Table 3-6: Non-conformances Recorded in NWPCP-NCB-1 Area and Recommended Corrective

Date	Non-conformance Records	Recommended Corrective Actions	Compliance Progress
23.01.2018	Cut-down trees and vegetative parts have not been removed from the site.	• Remove with immediate effect	Rectified by the Contractor.
05.03.2018 06.03.2018 03.04.2018	Identified soil erosion prone areas on the banks of Malawa Oya, upstream of aqueduct construction site.	• Place sand bags along the banks of soil erosion prone area • Cover the exposed soil by polythene	Not satisfactory; still there are soil erosion prone areas during rainy period.
23.03.2018	Operation of unplanned borrow areas.	• Obtain relevant approvals; submit Environmental Method Statement including site restoration plan	Operation of unplanned borrow areas has been stopped.
09.04.2018	Identified stream water pollution at aqueduct construction site due to breach of cofferdam caused by blocking of cross-drainage pipes across the stream.	• Clean up pipes • If possible place more pipes • Immediately remove soil bund after completion of the concreate works	Not satisfactory. Discharge capacity of existing pipes is insufficient at heavy rains; therefore, flood threat is not removed.
02.05.2018	Identified soil erosion areas downstream of the O&M road due to construction of the O&M road.	• Properly manage drainage system • Cover the exposed soil by polythene • Place sand bags along the erosion areas	Not satisfactory; still there are soil erosion prone areas during rainy period
14.05.2018	Follow-up action for: Identified soil erosion areas downstream of the O&M road due to construction of the O&M road.	• Place sand bags across the stream • Remove all loose soils resulting from breach of cofferdam	Rectified.
21.05.2018	Identified turbid water in Wemedilla tank near new sluice construction area.	• Place sand bags along the banks of soil erosion prone area	Rectified.
30.05.2018	Identified invasive plant species on the cofferdam of the new sluice construction area.	• Remove all invasive plant species on the coffer dam	Removed and disposed in a proper manner.
06.06.2018	Identified areas of the fence at the steep excavated areas of the new sluice construction area, which were broken.	• Repair the broken fence	Repair works pending.

3.5.3 Photographic Monitoring Records for Key Non-Compliance Issues Recorded in NWPCP-NCB-1 Area

Breached cofferdam because of blocked cross-drainage pipes across the stream

Areas of broken fence at steep excavated areas of the new sluice construction area

Invasive plant species on the cofferdam of the new sluice construction area

Turbid water in the tank near new sluice construction area

Figure 3.6: Non-Compliance Issues Recorded in NWPCP-NCB-1 Contract (I)

	
Soil erosion prone areas on the banks of Malawa Oya, upstream of aqueduct construction site	Flood prone areas upstream of Malawa Oya aqueduct construction site due to blocking of cross-drainage pipes across the stream
	
Identified soil erosion prone areas due to O&M road construction	Identified soil erosion prone areas due to O&M road construction
	
Cut-down trees and vegetative parts are not removed from the site	

Figure 3.7: Non-Compliance Issues Recorded in NWPCP-NCB-1 Contract (II)

	
Steep slopes at the new sluice tower location; possibility of falling animals coming out of the jungle behind	Steep excavated areas which requires safety mesh
	
Operation of unplanned borrow areas	Excavation in the batching plant area for borrow material

Figure 3.8: Non-Compliance Issues Recorded in NWPCP-NCB-1 Contract (III)

3.6 Contractor's Reporting, Documentation Progress, Comments

CEMP approval / update status : Contractor's EO was asked to update the CEMP. This has not been completed yet.

Self-monitoring records of the Environmental Officer : Summary report of the monthly check list of environmental monitoring parameters is maintained. It is annexed to the Contractor's Monthly Progress Report.

Submission and approval of Environmental Method Statement : An environmental component is usually included in the Construction Method Statement by the Contractor. However, no separate Environmental Method Statements are submitted. The Contractor's EO is advised and guided to submit a separate Environmental Method Statement for the key construction activities.

Environmental Issue Log : An Environmental Issue Log is to be maintained by the Environmental Office of the Contractor in the site office.

		No significant issues have been recorded for May and June 2018. However, the key issues identified as per the monitoring checklist maintained by the EMS are summarized under section 3.5.2.
Grievance Log	:	No grievances have been recorded during the first five months of reporting period. One (01) grievance rose in the month of June related to a domestically dug well located close to the canal that has been filled with soil during construction. The Contractor has discussed the issue with the affected party and agreed to reinstate the well. Follow-up actions have to be monitored.
Submission of Monthly Environmental Monitoring Report	:	The Contractor's EO is submitting the Progress Report every month; reporting needs improvements. The main reason is that the EO is not on site fulltime. Instead, an appointed Engineer overseas the environmental safeguard aspects.

4. DISCLOSURE AND ADDITIONAL MITIGATORY MEASURES

4.1 Disclosure of Monitoring Information to Affected Communities

29. PIU and PMU have conducted several community awareness and consultation programs related to NWPCP project activities. These are summarized in **Table 4-1**.

Table 4-1: Summary of the Awareness Sessions and Community Consultations

No.	Type of Event	Purpose	No. of Participants	Location (GN-DS)	Date	Resource Persons
1	Awareness meetings	Aware school children about project Environment & Safety	120	Nikawehera School	21.03.2018	SCO & SEO (PIU)
		World Water Day Program	250	Galewela Central College	22.03.2018	IEs, STO, SEO, SCO
		World Environment Day Program	45	Welamitiyawa Community Hall	05.06.2018	PIU: PD, SEO PMDSC: ES NEM: PM, EO etc.
2	Consultations	World Environment Day Program Sramadana Campaign	25	PIU Office premises	05.06.2018	PIU staff

30. **Table 4-2** summarizes the number of Grievance Redress Committee (GRC) meetings conducted during the monitoring period by PMU/PIU in the NWPCP project area. Although there are no any environmental related grievances, all complaints and concerns were registered under GRC mechanism as part of Accountability Policy requirements of ADB, which will be back examined in case a community complaint is made to ADB.

Table 4-2: Summary of the GRCs established in NWPCP area

Type of Committee	GRC-Name	Members	No. of Meetings	Issues Raised
GRC	GND level for 12 GND (1 no. at Dambulla, 11 nos. at Galewela)	GN, DO, ARPA CBO leaders	15	Land related issues
	DS level		3	Land acquisition issues of Bambawa & Danduyaya
	GA level		2	Land acquisition issues of Bambawa & Danduyaya
	MMDE Level		1	Land acquisition issues of Bambawa & Danduyaya

31. A detailed summary of the meetings, awareness sessions and trainings conducted by PIU/PMU staff in the NWPCP area for the upcoming Tranche 1 packages are given in **Table 4.3**.

Table 4-3: Awareness Sessions and Trainings Conducted by PIU/PMU Staff

Date	Activity	Place
22.01.2018	Joined field inspection with PMDSC	Ranwediyawa & Nilagama
23.01.2018	Joint inspection with FD (BFO) for Nilagama Tunnel	Nilagama Tunnel area
24.01.2018	Tunnel Training & field inspection	ICB-2 area
09.04.2018	Tunnel Training & Discussion	
19.04.2018	Tunnel area inspection	Ranwediyawa & Nilagama
20.04.2018	Site inspection for ICB-2 land inspection	ICB-2 area
25.04.2018	Field inspection with audit team	ICB-1, ICB-2
27.04.2018	Site inspection Nilagama area	ICB-2
18.01.2018	Tunnel Training Meeting	PIU/NWPCP
24.05.2018	Tunnel training & awareness	Dambulla DS office
31.05.2018	Meeting with FD, PMDSC for reforestation	PMU
01.06.2018	Meeting on Hakwatunaoya Elephant Corridor	District Secretariat, Kurunegala
07.06.2018	Meeting on Hakwatunaoya Elephant Corridor	District Secretariat, Kurunegala

32. In addition, PMDSC EMS/ES and relevant Engineers as well as PIU and PMU staff attended the following meetings listed in **Table 4-4** related to NWPCP Tranche 1 packages to be awarded.

Table 4-4: Special Meetings and Discussions Related to Upcoming Tranche 1 Packages

Date	Location	Participants	Objective
09.03.2018	PMU Office, Colombo	- ADB mission team - PD-PMU, PD-PIUs, PMU and PIU relevant officers - EMS	ADB mission meeting on Environmental Safeguard aspects
	Wildlife Department Head Office, Battaramulla	- DWC: Director NRM and Developments, relevant DWC officers, IUCN - PMU - PMDSC: ES, Design Engineers	Finalization of design changes related to Tranche 1 NWPCP packages included in the EIA Addendum
	Regional Forest Office (RFO), Galewela Office	- RFO - Galewela & his relevant Officers - PMDSC: EMS	Verification of land ownership of NWPCP-ICB-2 forest areas
16.03.2018	DWC Pibidunagama Office	- DWC: Ranger – Pibidunagama and his officers - PMDSC: EMS	Request for corporation and assistance to carry out tree enumeration in Kahalla-Pallekele sanctuary area for NWPCP-ICB-2 area
04.04.2018	DWC Pibidunagama Office	- Fauna, flora survey and tree enumeration team - PMDSC: EMS	DWC officers' involvement for fauna and flora surveys and tree enumeration at Kahalla-Pallekele sanctuary
17.05.2018	CEA Colombo	- CEA, DWLC, FD, - PMU: PIU-UEC, PIU-NWPC, staff	Stakeholder review of Wildlife Management Plan for UECP and NWPCP

Date	Location	Participants	Objective
		- PMDSC: EMS, ES	
18.05.2018	PMU office, Colombo	- PMU: ES - PMDSC: ES	Implementation of WMP and reforestation in Minipe

4.2 Additional Surveys Carried Out under NWPCP within the Reporting Period

33. The majority of the NWPCP-ICB-2 area traverses private lands; the balance is state land. About 5 km pass through Kahalla-Pallekele sanctuary area which falls under the Department of Wildlife Conservation (DWC); some lands have been declared to fall under the Forest Department (FD). **Figure 4.1** shows the distribution of protected areas in the NWPCP-ICB-2 area. The construction work for this contract package is set to commence during the next reporting period from July to December 2018.

34. Complying with the CEA conditions of approval (Ref. Section 3 of 08/EIA/Water/07/2012/Vol 2 dated 11 April 2018), the requirement of carrying out baseline ecological survey and tree enumeration has arisen. Such survey in NWPCP-ICB-2 area (from 5+250 km to 23+000 km) was commenced - under the supervision of Environmental Monitoring Specialist and Environmental Specialist of PMDSC - in April 2018.

35. The survey and tree enumeration were completed up to Neelagama Tunnel (from 5+250 km to 14+500 km) by end of June 2018. The list of 523 trees including its scientific names, common names, ecological and conservation status as per the National Red List 2012, up to Ranwediyawa Tunnel (from 5+250 km to 9+060 km) was prepared and submitted to PMU in June 2018 (**Annex 4**) to proceed with required approvals for tree felling. The tree list from 9+060 km to 14+500 km is under preparation. It will be submitted for approval then.

36. The tree enumeration in the private lands was temporary held in June 2018 due to social unrest observed in the NWPCP-ICB-1 project area due to land acquisition issues. It shall be restarted. It is planned to be completed by end of August 2018.

37. The Tree enumeration in the lands which belong to FD shall be carried out by the FD officers under the coordination of PIU/PMU staff. The canal trace shall be shown on the ground by PMDSC staff.

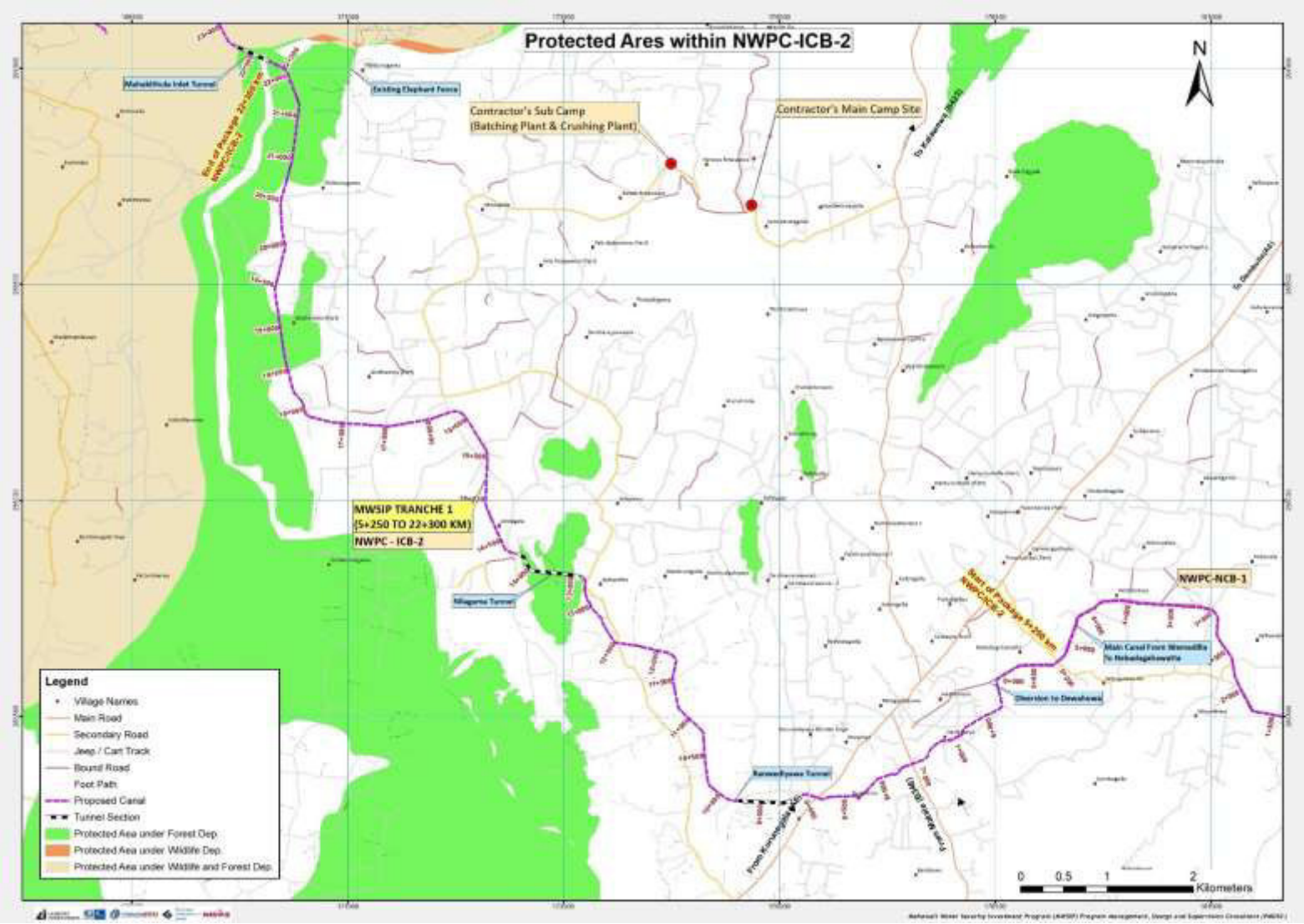

Figure 4.1: Distribution of Protected Areas under NWPCP-ICB-2 Area

5. KEY ACTIVITIES FOR NEXT REPORTING PERIOD (JULY - DECEMBER 2018)

38. The Environmental Action Plan is given in **Annex 2**. The Summary of the Work Plan for the next reporting period of July to December 2018 by PMU and PIU is given in **Annex 5**.

39. In addition, following activities are planned by PMDSC Environmental Team to comply with the ADB SPS (2009) and GoSL environmental regulations:

- Completing Ecological baseline survey and tree enumeration in NWPCP-ICB-2 area (by September 2018)
- Carrying out species rescue program in the protected areas within NWPCP-ICB-2 package (September to November 2018 considering the wet season)
- Initiate relevant habitat enrichment and biodiversity conservation programs in the NWPCP-ICB-1 and -ICB-2 project areas within Kahalla Pallekele sanctuary, with the coordination of DWC (by December 2018)

40. Although it was targeted, the environmental quality baseline data collection in the NWPCP-ICB-2 area could not be completed. It is planned to be completed through an Accredited Laboratory within the next reporting period.

41. Several awareness sessions shall be carried out targeting the newly mobilizing Contractors in the NWPCP area.

Annex 1: Proposed North Western Province (NWP) Canal Project

Your Ref.

Our Ref. 08/EIA/Water/07/2012/Vol. 2

Date 11 April 2018

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மத்திய சுற்றாடல் அதிகாரசபை

Central Environmental Authority

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"பரிசர பியச", 104, டெனசில் கொப்பேகடுவ மாவத்தை, பத்தரமுல்ல, இலங்கை.
"Parisara Piyasa", 104, Denzil Kobbekaduwa Mawatha, Battaramulla, Sri Lanka.
Web : www.cea.lk

Director General
Irrigation Department
Bauddhaloka Mawatha
Colombo 07.

PROPOSED NORTH WESTERN PROVINCE (NWP) CANAL PROJECT

This is to inform you that the CEA, after study of the original environmental approval letter dated 23rd February 2016 issued by the CEA, your letter No. MIMDE/PMU/07/03-IVI dated 25.08.2017, the study report dated 17.01.2018 submitted to this Authority on 30.01.2018 and the comments of the members of the Technical Evaluation Committee appointed by the CEA on the above study report, has decided to grant environmental approval for the proposed alterations made to the above project subject to following conditions.

A. General

A.1 This environmental approval is valid for the implementation of the proposed alterations to the North Western Province Canal project as described in the study report dated 17.01.2018 submitted by the Programme Director, Mahaweli Water Security Investment Programme on your behalf.

A.2 This environmental approval is issued on the assumption that the information provided in the study report dated 17.01.2018 submitted by you to the CEA is true and accurate.

A.3 This approval is valid until 22.02.2019 from the date of issue of this letter.

A.4 Necessary approvals shall be obtained from the RDA for the road sections where the canal crosses or uses the right of ways of the roads.

Chairman	Tel : 2872861, 2872348 Fax : 2872347	Director General	Tel : 2872359 Fax : 2872358	Gen. Office	Tel : 2872779, 2873447, 2873458 7877277-286	Complain Unit : 2880999
Deputy Director Generals	HRD, Admin & Finance Division Tel : 2865396 Fax : 2877515	Envt. Pollution Control Division Tel : 2873453 Fax : 2872695	Envt. Mgt & Assm. Division Tel : 2872300 Fax : 2872296	Envt. Edu. & Awareness Division Tel : 2872297 Fax : 2872689		
Directors Tel Fax	2873607 (Admin), 7877280 (Finance) 2872301 (HRD), 7877288 (Planning) 2872601 (Admin), 2865994 (Finance)	2873432 (EPC) 2873606 (Lab) 2882331 (WM)	2872344 (NRM), 2876643 (EIA) 2807263 (R&D) Fax : 2872296	2867266 (EEA) Fax : 2872609 Media Unit : 2873449	2872984 (Legal) (Western Province) Tel : 2667851 Fax : 2663293	

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B. Ground water/ hydro geological aspects

B.1 A detailed hydro-geological study should be carried out at Ranwediyawa and Nilagama tunneling areas prior to commencing tunneling activities.

This study should cover the baseline hydro geological set up of the tunneling area including the peripheral impacted areas (important sites such as community water supply sources, common wells, favourable ground water potential zones used by the community etc.). Necessary guidance in this regard shall be obtained from the Water Resources Board.

B.2 Monitoring programme should be set up in order to assess periodic variation of groundwater level and ground water quality of the impact area at proposed new tunneling areas during construction and operation of the project.

C. Wildlife / Ecological aspect

C.1 All the conditions stipulated by the DWC letter No. WL/6/1/1/270-I dated 27.03.2018 should be adhered to.

C.2 Disposal of debris /residues/ unwanted material generated by the project shall not be disposed at Kahalla-Pallakele Sanctuary managed by the Department of Wildlife Conservation or any forest area managed by the Department of Forest.

C.3 Baseline ecological condition of the new project areas should be established.

C.4 Monitoring programme should be set up in order to assess ecological conditions of the impact area of the proposed new tunneling areas during construction and operation of the project.

D. Geological aspects

D.1 A pre crack survey should be carried out of houses located on either side of the tunnel traces covering potential impact area.

D.2 A detailed survey on slope instabilities and subsidence should be carried out in the proposed tunnel areas and required mitigation measures adopted. Necessary guidance in this regard shall be obtained from the National Building Research Organization.

E Social aspects

E.1 A suitable grievance redress mechanism relevant to the project should be set up during the project implementation and after completion of the project.

E.2 Any flood impact caused due to implementation of the project on neighbouring community and their agricultural field should be adequately compensated.

E.3 A detailed socio economic survey should be carried out covering the proposed new development area in order to identify affected parties due to alterations. This data should be taken into consideration in developing the Resettlement Action Plan of the entire project.

F. Environmental Management Plan (EMP)

An amended EMP should be submitted to the CEA incorporating additional mitigation measures suggested due to alterations.

All the terms and conditions already stipulated by the CEA letter No. 08/EIA/WATER/07/2012 dated 23.02.2016 issued under regulation 13 of the National Environmental (Procedure for approval of projects) Regulation No 1 of 1993 to the Irrigation Department shall be adhered to.

P B Hemantha Jayasinghe
Director General

CC: Secretary / Ministry of Mahweli Development and Environment
Conservator General of Forest / Forest Department
Director General / Dept. of Wildlife Conservation
Director General / National Building Research Organization
Director General / Department of Agrarian Development
Director General / Department of Archeology
Director General / Department of Agriculture
Director General/Geological Surveys and Mines Bureau
Director General/Mahaweli Authority of Sri Lanka
District Secretary, Matale/Kurunegala
Divisional Secretary, Dambulla/Galewela/Polpithigama/ Maho/ Ehetuwewa/ Galgamuwa
Chairman, Pradeshiya Sabha, Dambulla/Galewela/Polpithigama/ Maho/ Galgamuwa
Director / Central Province / CEA
Director /North Western Province / CEA
OIC / North Central Province /CEA

emmm\f\r\mydoc\.sh\approval for the alteration NWP canal project

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வனசீவராசிகள் பாதுகாப்புத் திணைக்களம்
DEPARTMENT OF WILDLIFE CONSERVATION
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பிரதான அலுவலகம், இல. 811/ஏ, ஜயந்திபுர வீதி, பத்தரமுல்லை
Head Office - No. 811/A, Jayanthipura Road, Battaramulla

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Your No.

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திகதி
Date 2018.03. 23

RECEIVED
23 MAR 2018
06:46

Eng.K.R.Neil Bandara,
Program Director (MWSIP)/ Additional Secretary (WRP),
Ministry of Mahaweli Development & Environment,
Colombo 10.

Dear Sir

Release of Kahalla-Pallekele Sanctuary Lands for Construction Works- NWPC-ICB1- and ICB2
Mahaweli Water Security Investment Program (MWSIP)

This refers to the letters numbered MMDE/MWSIP/PMU/ENV/NWPCP/Gen and dated 30 3rd January 2018 regarding the above matter.

02. Proposed area falls inside the Kahalla Pallekele Sanctuary. After evaluating the EIA process, the approval is already given for North Western Canal Project. Hence, permission is hereby granted for construction activities subject to the following conditions.

1. All the conditions given by EIA report should be remains unchanged.
2. This land permission is given only for the construction activities. And this letter should not be treated as a permission for the land release of the Kahalla Pallekele Sanctuary.
3. Activities recommended by the EIA and Wildlife Management Plan should be completed before completion of the project.
4. All monitoring and environmental impact mitigatory activities should be coordinated by the PP
5. This approval is valid for a period of 03 years from the date of this letter. The project should be commenced before the expiry of the validity period.
6. Approvals from other relevant agencies should be obtained before commencing the project.
7. After canal construction is completed, land area should be properly rehabilitated and native trees should be planted under the supervision of the DWC officer nominated by the Assistant Director (Kurunegala) and protected until self-survival stage.
8. Precautions should be taken not be spread/introduce any invasive species.
9. Department of Wildlife Conservation (DWC) is not responsible for any human or property damages caused by the wild animals within this project area and adjacent area.
10. Do not allow to collect any alive or dead specimens of Fauna & Flora and minerals from the Sanctuary.

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අධ්‍යක්ෂ (පාලනය) - 011 2888583
අධ්‍යක්ෂ (සත්ත්වවේදී) - 011 2888582
අධ්‍යක්ෂ (මිලදී) - 011 2888584

11. Any kind disturbance/damages to the wildlife/wildlife habitats/migratory routes should be avoided and compensated by the Project Proponent (PP).

12. All the construction activities should be conducted within 6.00 a.m to 6.00 p.m.

13. All the project activities should be conducted under the supervision of DWC officers and DWC officers should have permission to enter, constriction site & contractors camp sites at any time.

14. PP should get the proper measures to prevent the mosquito breeding places during construction and operation periods.

15. PP should ensure adhering these terms and conditions during project implementation. The PP shall have full control over a third party that may be involved in project implementation by entering into agreements which contain the conditions stipulated in this letter with such parties. DWC should have access to the contract documents pertaining to environmental aspects, entered into by the project proponents and any outside contractors.

16. Collection of flora and fauna or their parts from natural forest and carrying out of any other illegal activity which is harmful to natural forest, should be prevented by the PP.

17. All access roads should be properly managed by responsible officers appointed by the project under the supervision of DWC officers.

18. Awareness on the safeguarding the fauna and flora in the site should be carried out for workers.

20. Trees, scrubland or nearby forest should not be felled or cleared for the any reason

21. Waste water arising from domestic activities and sewage should be directed into a waste water treatment system.

22. All residuals and solid waste generated by workers/residents should be strictly managed to avoid pollution of the project area.

23. Solid waste arising from the project activities should not be allowed to stagnate within the premises or dumped in neighboring lands and should not be disposed of into any water body and should not be burnt at any time inside the premises.

24. Solid waste should be discharged through an appropriate waste management programme.

25. Proper sanitary facilities and personnel protective equipments should be provided for the workers

26. All the structures should be created at the project site will be designed to blend well with this environment.

27 After completion of the project any worker/officer should be not be remain inside the Sanctuary.

28. In the event that PP fails to compensate or rehabilitate the damage caused by the proposed project to the environment within the stipulated project period, DWC has authority to cancel this project.

29. Wild Animals Migratory Paths and their habitat should not be disturbed by this project.

30. The PP shall comply with any requirement that would be stipulated from time to time by the DWC.

31. The DWC reserves the right to cancel/suspend/withdraw of this approval in the event that major environmental problems for wildlife, arise due to the operation of the project or in a situation where the surrounding environment has been altered or changed due to the natural factors or otherwise.

32. All the wildlife related activities should be conducted under the supervision of the Wildlife officers.

03. Please note that all the activities of the proposed project should be adhered with the provision of Fauna and Flora Protection Ordinance.

Yours Faithfully,

Manjula Amararathne
Director General (Cover up Duty)

Cc –
Assistant Director (Kurunegala) - For you information & supervise the survey activities
Ranger (Kahall Pallekele Sanctuary) - -do-

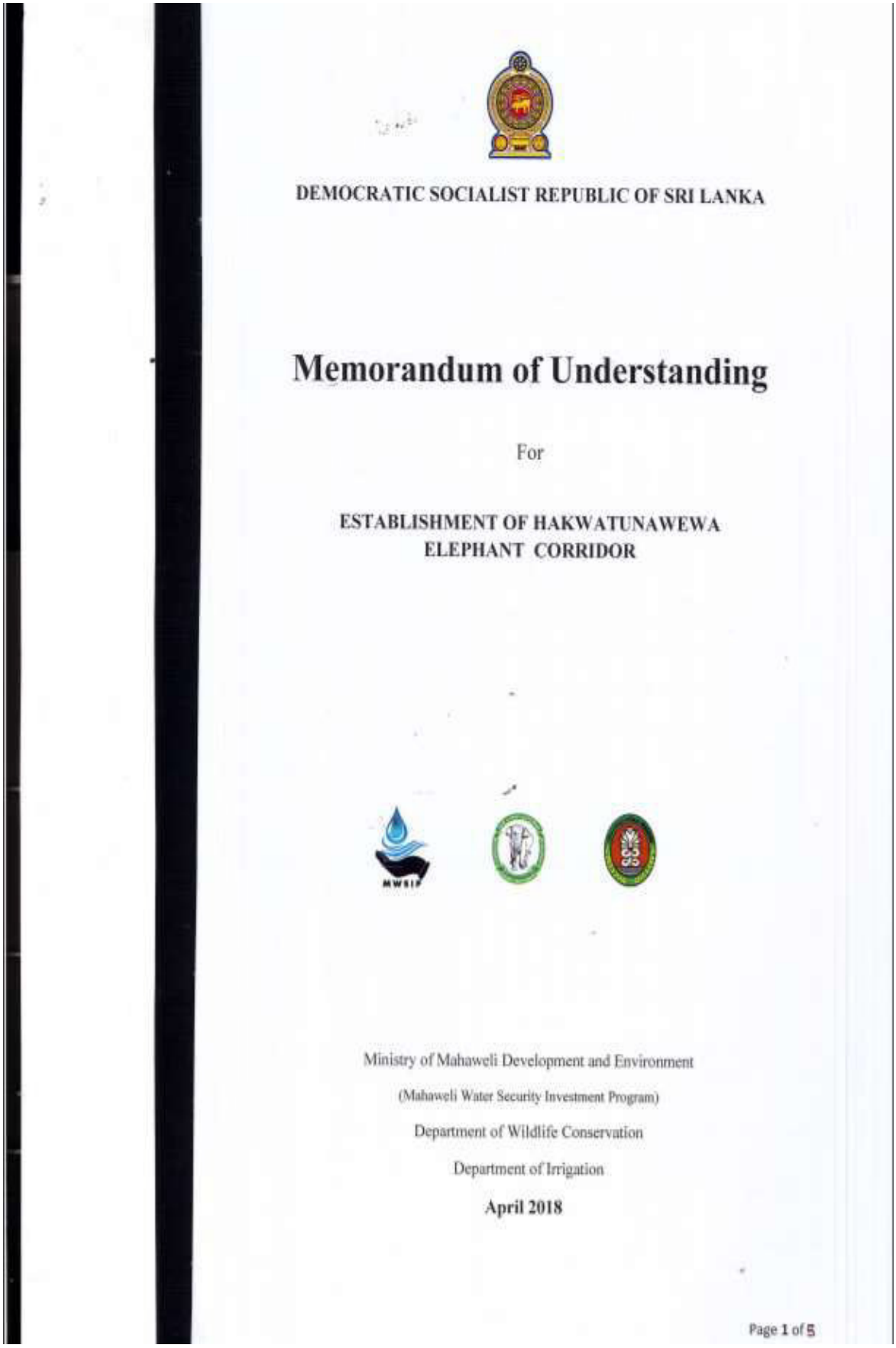
Annex 2: Estimated Expenditure of PMU & PIU for Environment Management & Monitoring as per the EMP of EIAR, CEA Approval (forms CEMP) & WMP Revised Draft Action Plan - 2018

NWPCP
Estimated Expenditure of PMU & PIU for Environment Management & Monitoring as per the EMP of EIAR, CEA Approval (forms CEMP) & wmp
Revised Draft Action Plan - 2018

No.	Mitigation Action	Cost (LKR)													
		PMU Budget	2018	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	CEA monitoring committee & other external monitoring requirements	3,240,000.00	360,000.00							180,000.00				180,000.00	
										Facilitate CEA & 11 other agencies (monitoring committee)				Facilitate CEA & 11 other agencies (monitoring committee)	
2	Operating GRC on Environment issues	390,000.00	78,000.00	6,000.00	6,000.00	6,000.00	9,000.00	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	9,000.00	6,000.00	6,000.00
				Summon GRC as & when required to resolve environmental issue; for refreshments											
3	Environment awareness & monitoring	300,000.00	60,000.00		10,000.00		10,000.00		10,000.00		10,000.00		10,000.00		10,000.00
				Conduct awareness programs for community/ stake holder consultatoins											
	Sub total-Environment monitoring	3,930,000.00	498,000.00	6,000.00	16,000.00	6,000.00	19,000.00	6,000.00	16,000.00	186,000.00	16,000.00	6,000.00	19,000.00	186,000.00	16,000.00
	WMP Implementation & Monitoring in 2018		3,432,000.00	572000											
4	Set up a Unit to implement WMP (PMU & PIU level officers recruitment with infrastructurers); 6.7.6.1; 8.1	42,000,000.00	1,925,000.00				0.00					800,000.00	375,000.00	375,000.00	375,000.00
									Preapre job ToR with DWC, get MSD approval as 1-PMU & 2-PIU (NWPCP, UECP)			Recruit 3 officers		Salaries and office mintenane	
									Get approval to procure 2 moter bicycles			Procure same			
									Get approval to purchase office infrastructure facilities			Procure same			
5	Initiate Ecological restoration of selected tanks; 25 tanks out of 50 to start with; 6.5.1.2.3	34,000,000.00	5,500,000.00										1,000,000.00	2,000,000.00	2,500,000.00
													Identify 50 tanks, survey & demarcate boundaries of 20 tanks & plan restoration,		
6	Management of AIS Introduce biological control program ; 6.5.2.1	7,500,000.00	1,200,000.00									300,000.00	500,000.00	200,000.00	200,000.00
										Study, plan and introduce biological control program for Salvenia & Eichhornia & monitor through an hired technical advisor for monitoring					
7	Management of AIS awareness-training for key stsake holders on AIS control ; 6.5.2.1	5,000,000.00	100,000.00									10,000.00	70,000.00		20,000.00
										Identify resource persons		Plan & implement awareness for MWSIP staff	Prepare awareness material		Plan & implement awareness for Farmers
8	Management of AIS restoration of lands with native flora ; 6.5.2.1	5,000,000.00	450,000.00							200,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
										Start plant nursery		Maintain PN			
9	Annexing a 33.81 km2 area to Kahalla-Pallekele Sanctuary & Annexing 22.51 km2 to forest reserves managed by the Forest Department; 6.5.4	3,000,000.00	650,000.00									50,000.00		50,000.00	550,000.00

												Consultation with DWC/FD/DS/Community/ Com. Leaders		Identify boundaries, demarcate	Identify boundaries, demarcate & survey
10	Rescue of priority plants and animal species; 6.6.1. 2 (initiate process & reimburse from Contractor)	8,500,000.00	1,000,000.00		400,000.00			600,000.00							
					Conserve Sp. in ICB-2			Conserve Sp. in ICB-1							
11	Radio collar 5 elephants ; 6.7.6.1.3	33,840,000.00	5,300,000.00									5,000,000.00	100,000.00	100,000.00	100,000.00
							Consultation of DWC/ ESCAMP to plan task, prepare procurement arrangment			Procure collars, plan colarring process			Install collars		
12	Initiate establisherat of elphant corridors 1; 6.7.6.1.3	252,100,000.00	620,000.00								40,000.00	40,000.00	40,000.00		500,000.00
											Consult DWC,DS,DI,FD,DAD,Sur Dept., Experts, PAuth. & Com'ty; Roughly mark EC boundary			Surveying and acquiring process as necessary and need arise	
13	Prevent obstructions to 28 identifiedelphant crossing points & facilitate regularise lectric fencing 6.7.6.1.3	71,820,000.00	300,000.00				20,000.00	20,000.00	20,000.00	40,000.00	40,000.00	40,000.00	100,000.00		20,000.00
							Consult DWC,DS,DI,FD,DAD,Sur Dept., PAuth.Experts & Com'ty;t to set TOR for guideline to protect E Crossings			Prepare guideline in consultation with key stake holders			Finalize with Key Agencies	Adopt actions to legalize the practise and guideline with DWC	
14	Demarcate forests under FD in use as elphant habitats 6.7.6.1.4	510,400,000.00	125,000.00								25,000.00	25,000.00	25,000.00	25,000.00	25,000.00
											Conduct discussions with FD/DS & field work to identify non-demarcated forest patches				
15	Regulate chena cultivation 6.7.6.1.4	10,140,000.00	60,000.00									20,000.00		20,000.00	20,000.00
												Consultative workshop with FD, DS, DAD, NGO, Experts, PID,DWC		Finalize the Management Plan with well defined implementing mechanism of the action plan and regulatory ammendment requirements	
16	Initiate establisherat of paddy field fences; 6.7.6.1.5	200,140,000.00	60,000.00							20,000.00		20,000.00		20,000.00	
										Undertake consultative session with DWC,DS,DI,FD,DAD on paddy field fencing to prepare action plan					
17	Initiate establisherat of village fences; 6.7.6.1.6	207,640,000.00	60,000.00										20,000.00	20,000.00	20,000.00
												Undertake consultative session with DWC,DS,DI,FD,DAD on village fencing to prepare action plan			
18	Initiate development of insurance scheme for crop damages by elephants; 6.7.6.1.7	100,300,000.00	0.00												
												Facts finding survey to understand requirements of Insurance Companies (IC) & with Agrarian Insurance Board (AIB)			
19	Development of awarenes programms on WMP & implementation 6.7.8	5,500,000.00	100,000.00										50,000.00		50,000.00
												Consultation with DWC,DS,DI,FD,DAD,NGO,Experts,CBO, Com. Leaders to identify need of awareness materials			
	Sub Total-implementing WMP based actions in 2018	**1,496,880,000.00**	**17,450,000.00**	**0.00**	**400,000.00**	**0.00**	**20,000.00**	**620,000.00**	**20,000.00**	**260,000.00**	**155,000.00**	**6,355,000.00**	**2,330,000.00**	**2,860,000.00**	**4,430,000.00**
	Total-implementing EMP by PMU-PIU in 2018	**1,500,810,000.00**	**17,948,000.00**	**6,000.00**	**416,000.00**	**6,000.00**	**39,000.00**	**626,000.00**	**36,000.00**	**446,000.00**	**171,000.00**	**6,361,000.00**	**2,349,000.00**	**3,046,000.00**	**4,446,000.00**

Annex 3: Memorandum of Understanding for Establishment of Hakwatunawewa Elephant Corridor



DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

Memorandum of Understanding

For

ESTABLISHMENT OF HAKWATUNAWEWA ELEPHANT CORRIDOR

Ministry of Mahaweli Development and Environment

(Mahaweli Water Security Investment Program)

Department of Wildlife Conservation

Department of Irrigation

April 2018

Page 1 of 5

MEMORANDUM OF UNDERSTANDING

FOR

ESTABLISHMENT OF HAKWATUNAWEVA ELEPHANT CORRIDOR

Preamble

This Memorandum of Understanding (herein after referred to as the **MoU**) is made and entered into at Colombo in the Democratic Socialist Republic of Sri Lanka on this 25th day of April Two Thousand Eighteen (25/04/2018) by and between the Secretary, Ministry of Mahaweli Development and Environment (**MMDE**) being the Executing Agency which is represented by the Program Management Unit of the Mahaweli Water Security Investment Program (MWSIP), having its head office at No. 500, T.B. Jayah Mawatha, Colombo 10 (hereinafter referred to as the **1st Party**, which term shall include his assign and or successors in his Office).

AND

the Director General, Department of Wildlife Conservation (**DWC**), having its head office at No 811A, Jayanthipura, Battarmulla (hereinafter called and referred to as the **2nd Party**, which term shall include his assign and or successors in his Office).

AND

the Director General, Department of Irrigation (**DoI**) being the Implementing Agency, which is represented by the Project Implementation Unit of the North Western Province Canal Project (NWPCP) under the Mahaweli Water Security Investment Program, having its head office at No. 230, P.O.Box 1138, Bauddhaloka Mawatha, Colombo 7 (hereinafter referred to as the **3rd Party**, which term shall include his assign and or successors in his Office).

WHEREAS

a) Recognizing that any condition stipulated in this document shall be executed in accordance with the provisions of Fauna and Flora Protection Ordinance (Chapter 469).

b) The 1st Party is the Secretary of the Executing Agency of the Government of Sri Lanka for the North Western Province Canal Project of the Mahaweli Water Security Investment Program.

c) The 2nd Party is the Head of the Department of Wildlife Conservation, which is charged with protecting wildlife, Flora, Fauna in the Island of Sri Lanka and the statutory body established under the provisions of Fauna and Flora Protection Ordinance (Chapter 469).

d) The 2nd Party desires to Establish the Hakwatunaweva Elephant Corridor (hereinafter referred to as the **agreed activity**) to reduce Human-Elephant Conflict in Polpithigama Divisional Secretariat in Kurunegala District.

The 2nd Party also stipulates that the 1st and 3rd Parties shall assist for the same as per the condition No. 3.8 of the Environmental Approval reference 08/EIA/WATER/07/2012 dated 23/02/2016 issued by Central Environmental Authority for the North Western Province Canal Project (*appended as Attachment 1 and treated as a part and parcel of this MoU*).

e) The 3rd Party is the Director General of the Implementing Agency of the Government of Sri Lanka for the North Western Province Canal Project of the Mahaweli Water Security Investment Program.

f) The 1st Party and 3rd Party desire to assist the establishment of Hakwatunaweva Elephant Corridor, Under the North Western Province Canal Project of the Mahaweli Water Security Investment Program implemented by Program Management Unit (PMU) established under the MMDE through Project Implementing Unit on behalf of the DoI.

NOW THIS MEMORANDOM OF UNDERSTANDING WITHNESSETH and is hereby agreed between the Parties hereto that in consideration of the covenants conditions and stipulations herein contained, the Parties hereto will collaborate with each other for Establishment of Hakwatunaweva Elephant Corridor.

Responsibilities of the 1st Party

1. The 1st Party Shall;

1.1.a. provide sixty percent (60%) of the total estimated budget (*appended as Attachment 2 to this document and treated as a part and parcel of this MoU*) including human resettlement cost of the establishment of Hakwatunaweva Elephant Corridor.

1.1.b. the 60% shall be paid on three (3) instalments, after satisfactory achievement of the deliverable milestones mentioned in the Attachment 2, based on the recommendation by the Monitoring Committee (of establishment of Hakwatunaweva elephant corridor) comprises of the following members;

i. Additional Secretary (Technical Services), MMDE
ii. District Secretary – Kurunegala
iii. Program Director (MWSIP)

1.2 prepare and implement the Wildlife Management Plan including Human Elephant Conflict mitigation (*appended as Attachment 3 and treated as a part and parcel of this MoU*) in compliance with the stipulation No. 3.1 of the Environmental Approval reference 08/EIA/WATER/07/2012 dated 23/02/2016.

1.3 facilitate the 3rd party for implementing the tasks described under the item 3.1 to 3.3 and any other tasks associated with establishment of Hakwatunaweva Elephant Corridor

Responsibilities of the 2nd Party

2. The 2nd Party Shall;

2.1 bear a forty percent (40%) of the total estimated budget (*appended as Attachment 2*) including human resettlement cost of the establishment of Hakwatunaweva Elephant Corridor.

2.2 assist relevant agencies to initiate and continue legal procedures for the resettlement program of the agreed activity.

2.3 provide inputs for preparation and implementation of Wildlife Management Plan including Human Elephant Conflict mitigation referred in section 1.2 above.

2.4 provide necessary guidance, legislative and administrative assistance for implementation of the wildlife management plan referred in section 1.2 above.

2.5 allow the officials of Irrigation Department (3rd party of this agreement) to enter and attend at maintenance or development work up to the High Flood Level (HFL) boundary of Hakwatunaweva reservoir (tank) and HFL boundary should be permanently marked before the construction of the fence. Further, Department of Wildlife Conservation should temporarily remove the fence upon the request of

the Irrigation Department in order to facilitate the maintenance or rehabilitation of tank bund, spill, sluice, rip-rap or inlet canals to the tank. The period of such temporary removal should be as requested by the Irrigation Department.

Responsibilities of the 3rd Party

3. The 3rd Party Shall;

3.1 provide technical assistance in the form of machineries and the skilled manpower with the assistance of 1st Party for;

3.1.1 preparation of resettlement site layout/plot plans and prototype household unit designs.

3.1.2 ground preparation of the resettlement locations.

3.1.3 secretarial work related to resettlement of people and contracting the construction of necessary infrastructure facilities at resettlement location/s.

3.1.4 and any other technical assistance as may be required

3.2 conduct public awareness for resettlement of families with the participation of relevant stakeholders and securing the agreement for the resettlement proposal from the concerned Parties.

3.3 give priority to the resettled families in providing economic benefits such as alternate income/job opportunities.

3.4 assist 1st Party to implement the wildlife management plan as described in section 1.2 above and ensure continuity of the mitigation during the operational phase of the Project.

Responsibilities of all Parties

4. All Parties shall;

4.1. agree upon the cost estimates, which will be prepared by 2nd Party with the breakdown for each main activity, including the resettlement cost of families for implementing the agreed activity based on estimated budget (*appended as Attachment 2*).

4.2. initiate relevant administrative procedures and coordinate relevant agencies in implementing the agreed activity including resettlement of families.

Modifications

5. This Memorandum of Understanding may be modified at the written request of one of the Parties, and upon the Agreement of the other Parties.

Dispute Settlement

6. All Parties shall use their best effort to settle amicably, all disputes arising out of or in connection with this MoU or the interpretation thereof, and in the event of an amicable settlement cannot be arrived at the Party shall appoint a Mediator with mutual consent to settle the dispute.

7. Any notice or other information required by or authorized by this Memorandum of Understanding by either Party to the other may be given by hand with due acknowledgement, sent by registered post, telex facsimile transmission or comparable means of communication to the respective address and facsimile number herein mentioned, or to such other address or facsimile number provided by the Parties.

Page **4** of **5**

Attachment 1: Approval issued by the Central Environmental Authority of Sri Lanka for the North Western Province Canal Project (NWPCP) of MWSIP under the MMDE

Attachment 2: The estimate for establishment of elephant corridor with deliverables and payment milestones.

Attachment 3:

Attachment 3.a Executive Summary of the report on Wild Life Management Plan Including Human Elephant Conflict Management and Mitigation (WMP) for NWPCP (which will be replaced with the updated WMP on acceptance by Central Environmental Authority).

Attachment 3.b The full report on WMP for NWPCP

The 1st Party (Executing Agency)	The 2nd Party	The 3rd Party (Implementing Agency)
Address: No. 500, TB Jayah Mw, Colombo 10.	Address: No.311 A, Jayanthipura Road Battaramulla	Address: No.230, P.O.Box 1138, Bauddhaloka Mawatha, Colombo 7
Fax No: 011-2676846	Fax No: 11-2883355	Fax No: 11-2505890
Telephone No: 011-2676844	Telephone No: 11-2888585	Telephone No: 11-2584984

IN WITNESS WHEREOF, the undersigned, being duly authorized to do so, have executed this Memorandum of Understanding in two (2) counterparts, each of which shall be deemed an original, and which together shall constitute one and the same instrument.

1st Party

Secretary,
Ministry of Mahaweli Development and Environment

Secretary
Ministry of Mahaweli Development and Environment

Witness

1. Signature
   Name Eng.(Ms.)C.H.Devendra
   N.I.C. No. Additional Secretary (Technical)
   Address Ministry of Mahaweli Development
   No:500, T.B.Jayah Mawatha,
   Colombo - 10. 586122700V
2. Signature
   Name Eng. K.R. Neil Bandara
   N.I.C. No. Program Director
   Address Mahaweli Water Security Investment Program
   No: 493 1/1, T.B. Jayah Mawatha,
   Colombo - 10. 541190155V

2nd Party

Director General,
Department of Wildlife Conservation

M. G. C. SOORIYABANDARA
Director General
Department of Wild Life Conservation
No. 811/A, Jayanthipura Road,
Battaramulla.

Witness

1. Signature
   Name Manjula Amararathna
   N.I.C. No. Director (Operations)
   Address Department of Wildlife Conservation
   No. 811/A, Jayanthipura Road,
   Battaramulla.
2. Signature
   Name DR. U. K. L. PEIRIS
   N.I.C. No. Deputy Director (Research & Training)
   Address Department of Wildlife Conservation
   No. 811/A, Jayanthipura Road,
   Battaramulla.
   652911034V

3rd Party

Director General of Irrigation,
Irrigation Department

Eng. S. Mohanarajah
Director General of Irrigation
Irrigation Department
Bauddhaloka Mawatha,
Colombo 07.

Witness

1. Signature
   Name Eng. (Mrs.) I. D. S. Samarasuriya
   N.I.C. No. 617172160V
   Address Director of Irrigation (Engineering Materials)
   Engineering Materials Division
   Irrigation Department
   Colombo 07
2. Signature
   Name Eng. W.G.R. Wijerathna
   N.I.C. No. 620240855V
   Address PMU - MWSIP
   No.493/1, T.B. Jayah Mw
   Colombo 10.

Page 5 of 5

Attachment 1

මධ්‍යම පරිසර අධිකාරිය

மத்திய சுற்றாடல் அதிகாரசபை

Central Environmental Authority

"Parisara Piyasa", 104, Denzil Kobbekaduwa Mawatha, Battaramulla, Sri Lanka.

Web : www.cea.lk

Your Ref.

Our Ref. 08/EIA/WATER/07/2012

Date 23 February 2016

Director General
Irrigation Department
Bauddhaloka Mawatha
Colombo 07.

PROPOSED NORTH WESTERN PROVINCE (NWP) CANAL PROJECT

This is to inform you that the Central Environmental Authority (CEA), after study of the Environmental Impact Assessment Report (EIAR) of the proposed NWP Canal Project dated June 2015, the comments received from the public and your responses to such comments dated January 2016 and additional information submitted on 29.01.2016 and 09.02.2016 as clarifications for the queries raised by the Technical Evaluation Committee appointed by the CEA, has decided, in terms of regulation 13 of the National Environmental (Procedure for approval of projects) Regulations, No. 1 of 1993 to grant approval for the implementation of the above project subject to the following terms and conditions.

1. GENERAL CONDITIONS

1.1 This environmental approval is valid for implementation of the Proposed NWP Canal Project as described in the EIAR dated June 2015 submitted by the Irrigation Department (ID).

1.2 This approval is granted on the basis that all information provided by the ID in the EIAR dated June 2015 and the addendum dated January 2016 are true and accurate.

1.3 This approval is valid for a period of 3 years from the date of issue of this letter, unless upon application in writing to this Authority within thirty days prior to the expiry date, the validity period is extended.

1.4 The ID where necessary should obtain fresh approvals in respect of any alterations that would be made to the initial project proposal submitted to CEA as per the EIAR dated June 2015.

Chairman	Tel. : 2872361, 2872348 Fax : 2872347	Director General	Tel. : 2872359 Fax : 2872608	Gen. Office	Tel. : 2872278, 2873447, 2873448 7877277-280	Complaint Unit : [illegible], 2888999
Deputy Director General	HRD Admin & Finance Division Tel. : [illegible] Fax : [illegible]	Envt. Pollution Control Division Tel. : [illegible] Fax : [illegible]	Envt. Mgt & Assess. Division Tel. : [illegible] Fax : [illegible]	Envt. Edu. & Awareness Division Tel. : [illegible] Fax : [illegible]		
Directors Tel. Fax	2872607 (Admin), 7877290 (Finance) 2872301 (HRD), 7877288 (Planning) 2872601 (Admin), 2865984 (Finance)	2873432 (EPC) 2872036 (Lab) 2882335 (WM)	2872346 (NRM), 2876643 (EIA) 2887263 (R&D) Fax : 2872296	2867266 (EEA) Fax : 2872609 Media Unit : 2873443	[illegible] (Legal) (Western Province) Tel. : [illegible] Fax : [illegible]	

Ministry of Mahaweli Development & Environment

1.5 The ID is bound to ensure that these terms and conditions are adhered to and shall have full control over a third party that may be involved in project implementation. The CEA should have access to the contract documents pertaining to environmental aspects, entered into by the ID and any outside contractors. The conditions in this letter should be included in the contract documents, so that the contractor or sub-contractor is held responsible for carrying them out during construction and on completion of the work.

The ID would be held responsible for the breach of any such conditions by any contractor or sub-contractor.

1.6 The ID shall intimate to CEA the date of commencement of the project activities/construction activities, inclusive of a phased implementation schedule.

1.7 A copy of this approval letter and the EIAR should be kept at the project site at all times for purpose of perusal by concerned agencies.

1.8 It is the duty of the ID to inform the CEA of any adverse environmental impacts which may arise during project implementation which is not anticipated at this stage. In such an event, relevant guidelines and necessary mitigatory measures should be implemented as directed by the CEA. The ID should ensure that such impacts are properly assessed and addressed even at a later stage of project implementation.

1.9 The ID should co-ordinate closely with planning agencies, relevant Provincial and Local Authorities, Divisional Secretaries and other Government Departments to resolve any conflict with existing and future development plans of the area.

1.10 Relevant Local Authorities in the project area should be kept informed regarding the project activities and should have written approval of the same.

1.11 Necessary approval of the Department of Wildlife Conservation (DWC)/Forest Department (FD) should be obtained for the release of lands belonging to DWC / FD for the project activities prior to commencement of construction activities. Trees in the project area should be enumerated and removed with the consultation of DWC / FD through the State Timber Corporation.

1.12 Costs to be incurred in giving effect to the implementation of the terms and conditions of this letter should be borne by the ID as project implementation costs.

1.13 Any additional conditions stipulated by the CEA as and when required shall be strictly adhered to.

Page 2 of 10

2 HYDROLOGICAL ASPECTS

2.1 In years and times of water-stress the allocation of water among competing users will become a sensitive issue likely to raise socio-political problems. The ID shall formulate at the outset a set of transparent guidelines to be adopted during such times of water-stress using the Water Management Secretariat of the Mahaweli Authority of Sri Lanka in consultation with other stakeholders. It is suggested that the guidelines recognize the prior rights of the existing users in allocating scarce resource in order to avoid problems.

The guidelines prepared in this regard should be submitted to the CEA prior to commencing operational activities.

2.2 There is a risk of illicit cultivation taking place on either side of the contour canal using water being conveyed by the project and if this happens intended irrigable areas further downstream may suffer by reduced inflow. The ID shall identify and map such lands along the canal which can come under illicit cultivation by methods such as syphoning or pumping of water from the canal. The ID shall formulate a plan, which will prevent such an outcome during the lifetime of the project by using already available legislations and administrative channels in place. Cost of these mitigation, management and monitoring measures shall be borne by the project.

The ID shall submit the formulated plan to the CEA for approval.

2.3 During non- irrigation period adequate volume should be released from the bottom outlet of the Nalanda Reservoir for the sustenance of downstream ecology in the affected river stretch as indicated in Section 4.1 of the EIAR.

2.4 Adequate water should be provided to the farmers and villagers in the area who depend on seepage and drainage water within the affected river stretch for their day to day activities.

2.5 Any dewatering of ground water table within the project area including the tunneling section/s should be monitored during construction phase. In the event any dewatering occurs as a result of any project activity, the ID shall take action to mitigate or compensate the affected parties for any loss in respect of their agricultural productivity in relation to these lands.

2.6 Necessary measures should be taken to mitigate water pollution due to contaminant leakage from machinery and workers' sites during the construction phase.

3. ECOLOGICAL ASPECTS

3.1. A comprehensive Wildlife Management Plan (WMP) together with a monitoring programme should be prepared by the ID in consultation with the DWC prior to commencing construction activities of the project.

This plan should mainly address the following;

- Identification and declaration of additional area as protected areas to provide connectivity between remaining forest areas for migration of wild animals.
- Identification and implementation of habitat enrichment programmes
- Implementation of animal rescue programmes
- Identification and prediction of Human Elephant Conflict areas and requirement of electric fencing
- Community based mechanism for maintenance of electric fences
- Budgetary allocation for implementation of the WMP.
- Schedule of implementation of the WMP

3.2 A 100 meter reservation area from the FSL of the Mahakirula tank or any additional area should be demarcated and declared as a protected area.

3.3 Adequate reservation for canals should be demarcated and managed properly avoiding encroachments.

3.4 Reforestation/enrichment planting should be carried out within the above reservation areas in close consultation with the FD using native tree species.

3.5 Reforestation programme should be carried out in any other suitable areas in the upper catchment of Hakwatuna oya basin and degraded areas of Kahalla Pallekele Sanctuary in close consultation with the FD / DWC using native tree species. Suitable lands for reforestation / regeneration should be identified in consultation with the FD.

3.6 Reforestation / enrichment areas should be clearly marked on a map and submitted to the CEA, FD and DWC together with the replanting schedule.

3.7 Existing protected areas and proposed protected areas should be clearly mapped and submitted to CEA, DWC and FD. No project activities should be allowed within these areas.

3.8 The Wildlife / elephant corridor connected to the Hakwatuna wewa and its catchment should be established by relocating families enabling wildlife movements.

3.9 Wildlife movements should not be disturbed due to the construction of reservoirs and canals within the Sanctuary and wildlife influenced areas.

3.10 Proposed canals should be covered to avoid any disturbance for wildlife movements within the sanctuary and wildlife influenced areas.

3.11 Other than the irrigation canals and reservoirs, no other buildings such as offices, quarters etc. should be constructed within the sanctuary. Temporary labour camps should not be constructed within remaining forest areas.

3.12 No roads or any other permanent structures should be constructed within the Sanctuary without the prior approval of DWC.

3.13 Necessary infrastructure should be established in identified locations to mitigate the human wildlife conflict and to enhance nature based tourism as recommended by the DWC.

3.14 Existing electric fence should be relocated to increase the wildlife habitats in the sanctuary.

3.15 Precautions should be taken to reduce construction impacts on existing natural systems such as forest areas, streams and tanks and wild animals within these habitats.

3.16 Minimum number of trees should be cut during construction. Trees should be preserved as far as possible within the reservoir filled area. Trees may be removed only in cases where it is absolutely essential. The ID should take required action to remove such trees in consultation with the DWC / FD.

3.17 Abandoned quarry sites and burrow pits should be rehabilitated and suitable replanting programmes implemented in these areas in consultation with the FD / DWC.

3.18 Low noise generating measures should be adopted in carrying out blasting activities within wildlife influenced areas. Necessary guidelines should be obtained from DWC in this regard.

4 LAND STABILITY AND SOIL EROSION ASPECTS

4.1 Excavation blasting operations and removal of existing rock / soil should be done in accordance with proper engineering designs. Height and angle of cutting slopes should be designed with proper geological and geotechnical details to avoid ground instability and slope failures.

4.2 Earth retaining structures should be applied wherever required to prevent initiation of local failure.

4.3 Adequate erosion management measures shall be exercised during construction in order to prevent siltation of surface water bodies at downstream areas, neighboring marsh / paddy lands during construction.

4.4 Uprooting the trees should be done with appropriate equipment to minimize the damage to the soil

4.5 Natural water paths and valleys should be kept free from any obstruction through any kind of construction or disposal of soil/rocks etc. All efforts should be made during construction period to avoid adverse impacts on existing drainage system / natural storm paths of the project area.

4.6 Soil removed during the preparation of ground for construction of project components should not be dumped at any edge of waters or disposed into surrounding environment without proper protection measures to prevent soil erosions.

4.7 Exposed areas should be kept suitably protected to prevent erosion or emission of dusts during dry periods.

4.8 Earth work should be carried out during low rainfall season to minimize soil erosion.

5 DISPOSAL OF EXCAVATED MATERIAL

5.1 Excavated materials as far as possible should be used in the constructions of road works and other construction sites which are associated with the project. Care must be taken by the way of adequate safeguards been put in place to prevent erosion and washing away of any of this material into the water ways.

5.2 Tunnel muck and excess soil should be properly dumped to suitable dumping sites. The details regarding such disposal sites should be submitted to CEA and approvals obtained.

5.3 Soil / debris removed during the preparation of ground for construction of project components should not be disposed / dumped into neighboring forest areas.

6. SOCIAL ASPECTS

61 A detailed socio economic survey should be carried out covering the proposed development area in order to identify affected families, sub families, agricultural lands and business enterprises in order to serve as baseline data. The data should be used in the preparation of a socio infrastructure plan. This data will also help to identify new encroachments in the area.

6.2 Suitable relocation sites should be identified in close proximity to the existing dwellings considering the preference of affected families.

6.3 A detailed resettlement plan and compensation package should be prepared inclusive of relocation sites. All compensation should be paid on the basis of the principals contained in the National Involuntary Resettlement Policy. The resettlement plan and the compensation package so prepared should be submitted to the Ministry of Lands for approval prior to commencing construction activities.

6.4 Acquisition of land and payment of compensation should be expedited in order to minimize the uncertainty of people.

6.5 Since many plots of home gardens provide part of household food and other requirements and income, the compensation package should take into account crops and income obtained from these plots of lands. This should be in addition to compensation of land.

6.6 The payment of compensation should not be delayed and should be paid.

6.7 In the case of cultivated paddy land coming under the tenant farmer system, compensation should be paid to both the landowner and the tenant farmer.

6.8 The ID should initiate a consultative dialogue with the persons likely to be affected by the project with immediate effect. They should be kept informed well in advance, regarding the project components and also the compensation packages as well as the proposed date of commencement of project activities.

6.9 The ID should be responsible for necessary compensation, in case there are impacts to existing water usage during construction phase of the project.

6.10 Any damages to the existing roads due to implementation of project activities should be re-routed or modified appropriately in order to avoid impacts on existing transportation system of the project area.

7. EXTRACTION OF CONSTRUCTION MATERIAL

7.1 Quarrying of rock, sand soil and other material for construction activities should be done at sites selected in consultation with and approval of the GS&MB. Approvals from the FD / DWC or other concerned agencies should be obtained wherever required.

7.2 Required licenses / permits for the operation of quarry sites / metal crushers, concrete batching plants, asphalt plants etc. should be obtained from the CEA / relevant Local Authority.

7.3 Blasting operations should be carried out only during the day time between 06.00 – 18.00 hrs. after proper trials supervised by the necessary authorities.

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8 RESTORATION / REHABILITATION OF CONSTRUCTIONS SITES

8.1 Borrow pits and temporary transport routes should be rehabilitated with required measures.

8.2 Temporary used areas shall be restored properly and post-construction unusable material shall be disposed of in consultation with the relevant Local Authorities. The land used for temporary establishments shall be restored up to the level of satisfactions.

8.3 Rehabilitation of construction site(s) and spoil dump areas should be completed prior to commissioning of the operational activities. The disturbed areas due to constructions of labor camps spoil areas stockpile areas workshops office etc. shall be rehabilitated and replanted with suitable tree species.

9 WASTE DISPOSAL

9.1 Measures should be taken to prevent discharge of cement, cement mix, fuel oil, lubricants, waste oil, polythene and other waste materials into water bodies during construction and operation period. Oil separation devices should be installed where required.

9.2 Proper sanitary facilities should be provided for the work force involved in the construction activities.

10 ARCHAEOLOGICAL ASPECTS

The approvals from the Department of Archaeology should be obtained prior to commencement of the project. If any archeological remnants are encountered within the project area suitable measures should be adapted to conserve in consultation with the Archeology Department.

11 NOISE AND VIBRATION

11.1 All constructional activities shall be carried out in such a way, so as not to cause nuisance to the wildlife and neighborhood. The noise level during construction shall not exceed 75 dB (A) from 06.00 hrs to 21.00 hrs and 50 dB (A) from 21.00 hrs to 06.00 hrs to be measured at the boundary of the site.

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11.2 Appropriate mitigatory measures should be adopted in order to maintain the vibration levels generated by construction activities, operation of machineries and equipment, and vehicle transport within the interim standards stipulated by the CEA.

11.3 Blasting operation if any should be carried out with the approval of the GS&MB, and the CEA.

12 TRANSPORTATION OF MATERIAL AND MACHINERY

12.1 Suitable action should be taken to identify the routes of transport and to mitigate traffic issues during construction and operational periods. Required approvals should be obtained from relevant traffic authorities.

12.2 Transport, loading and unloading of materials shall be carried out in such a way as not to cause nuisance to the surrounding environment.

12.3 Construction material should be adequately covered during transportation to avoid wind induced dust and spillage.

12.4 The vehicles and the machinery used in the project should be maintained regularly in order to avoid smoke emissions.

13 SAFETY / EMERGENCIES

The ID shall draw up an Emergency Preparedness Plan inclusive of dam failures and other contingencies such as issues associated with floods, tunneling etc. The ID should ensure that all relevant personnel are trained and aware of their responsibilities in executing the plan. Copies of the plan shall be placed at suitable locations and consulted on a regular basis.

14 ENVIRONMENTAL MANAGEMENT PLAN

14.1 The ID shall forward to the CEA a detailed Environmental Management Plan (EMP) incorporating the mitigatory measures proposed precisely and the monitoring plan. It should contain the significant impacts of the project, site specific mitigation measures to be implemented for each significant impact, schedule of implementation of mitigation measures, parameters to be monitored with intervals/frequencies and the responsible agencies for implementation of the EMP. The EMP should be approved by the monitoring committee.

14.2 A monitoring committee consisting of representatives of FD, CEA, DWC, MASL, GS&MB, Department of Agrarian Development, Department of Archaeology, District Secretary/Matale /Kurunegala, Divisional Secretary, Divisional Secretariat, Dambulla / Galewela / Polpitigama / Mahawa / Ehetuwewa / Galgamuwa and any other member deemed necessary will be appointed by the CEA to monitor implementation of EMP by the ID.

14.3 Periodic compliance report should be submitted by the ID on progress of the implementation of the EMP.

14.4 Suitably trained qualified officer/s who would be responsible for implementation of the EMP shall be assigned.

14.5 This Officer(s) shall act as the contact person(s) for members of the public and shall liaise with local organizations.

14.6 All costs incurred by the monitoring committee appointed by the CEA to oversee implementation of the EMP shall be borne by the ID.

Prof. Lal Mervin Dharmasiri
Chairman
CENTRAL ENVIRONMENTAL AUTHORITY

CC: Secretary / Ministry of Mahweli Development and Environment
Conservator General of Forest / Forest Department
Director General / Dept. of Wildlife Conservation
Director General / National Building Research Organization
Director General / Department Agrarian Development
Director General / Department of Archeology
Director General / Department of Agriculture
Director General/Geological Survey's and Mines Bureau
Director General/Mahaweli Authority of Sri Lanka
District Secretary, Matale/Kurunegala
Divisional Secretary, Dambulla/Galewela/Polpithigama/ Maho/ Ehetuwewa/ Galgamuwa
Chairman, Pradeshiya Sabha, Dambulla/Galewela/Polpithigama/ Maho/ Galgamuwa
Director / Central Province / CEA
Director /North Western Province / CEA
Deputy Director / North Central Province /CEA

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Attachment 2

Attachment 3.a

The Executive Summary on Wildlife Management Plan, Including Human Elephant Conflict Management and Mitigation, for the North Western Province Canal Project (WMP)

The attachment-3 is a document, which (is having 556 pages) was submitted to Mahaweli Water Security Investment Program (MWSIP) by International Union for Conservation of Nature (IUCN) in December 2017 based on a study undertaken under a consultancy contract agreement (*No. MMDE / MWSIP / ADB / NWPCP / 3267-3268-SRI / Consult / HECM / NCB / 2016 / 005*) with MWSIP.

The WMP has now been submitted to Central Environmental Authority by the MWSIP for their concurrence.

This attachment consists of the "Executive Summary" of the WMP submitted in December 2017.

Executive Summary

This document presents the Wildlife Management Plan, including Human Elephant Conflict Management, for the North Western Province Canal Project (NWPCP). This work was carried out from August 2016 to October 2017.

The North Western Province Canal Project (NWPCP) involves a trans-basin diversion of water from the Mahaweli River to the Hakwatuna Oya and Upper Mi Oya Basins.

Whilst the proposed NWPCP will enhance the water availability for agriculture, thereby increasing agricultural production, as well as improving the socio-economic status of communities, the project will also have significant short and long-term environmental impacts, especially on the wildlife that inhabits the project affected area. Based on the findings of the EIA study conducted for the NWP canal project, three major impacts on wildlife were identified: 1) Loss of habitat for flora and fauna; 2) Habitat fragmentation and loss of critical species and 3) Escalation of Human-Elephant Conflict (HEC).

One of the conditions imposed by the project approving agency — the Central Environmental Authority (CEA) (08/EIA/WATER/07/2012 dated 23/02/2016) — during project approval, was to prepare and implement a Wildlife Management Plan including Human-Elephant Conflict Management (WMPHEC), with a special emphasis on mitigation of human-elephant conflict in the area. The project proponent, through an open competitive bidding process, in turn, contracted IUCN, Sri Lanka Country Office to prepare the said plan. The objective of the WMPHEC for NWP canal project is to provide site-specific management prescriptions for the three significant wildlife impacts anticipated because of the implementation of the project.

The study area for the current assignment was categorised into three focus areas.

1. The Command area: It is in these areas that there is likely to be an escalation of human-elephant conflict. These areas comprise the cascade areas of Mi Oya, Madiyawa Ela, Yapahuwa (from the feeder canal to Yapahuwa), Kala Oya, as well as the section of Kahalla Forest Reserve around Hakwatuna Oya Reservoir.
2. Habitat enrichment/restoration of protected areas and identification of additional of areas for possible annexure to existing protected area: In the NWPCP, restoration will be confined to areas within Kahalla-Pallekele Sanctuary. It is here that activities related to restoration, replanting, enrichment will be carried out. In addition, areas with potential for annexure as protected areas around this sanctuary as well as around other protected areas will be identified.
3. The Canal trace: It is here that there will be a direct impact on species. Therefore, biodiversity-related activities were confined to 500 m on either side of the canal trace.

Initially, baseline data were collected.

A literature review of the impacts of irrigation development on the flora and fauna and related mitigatory measures, as well as a review of current levels of HEC in the NWPCP region were carried out. At a district level, HEC was highest in Kurunegala; the highest house and property damage was in Ampara; and the highest number of elephant deaths was recorded from Anuradhapura. At the divisional secretariat level in Kurunegala, the highest number of human deaths, elephant deaths, as well as house and property damage were recorded from Galgamuwa; Galgamuwa, Ehetuwewa, Mahawa, Ambanpola, Polpitigama and Nikaweratiya

were represented in all three human-elephant conflict indicators. Of these, Galgamuwa and Ehetuwewa clearly had a much higher level of conflict than the others.

The *physical baseline* revealed that the project area lies in the Central and Northwestern provinces and forms part of the strongly dissected northern spine of the central highlands. The project area lies across central drainage divide separating Kala Oya, Mi Oya and Deduru Oya drainage basins from the broad low lying Mahaweli Basin. The command area falls within two river basins namely Deduru Oya and Mi Oya.

Reddish-brown earths are the main soil type with widest distribution followed by low humic gley soils. The project area is represented by two main agro ecological zones, namely DL1b and IL3. The project area lies in the Dry and Intermediate Zones, with average annual rainfall between 1000 - 2000 mm and an average temperature ranging from 25°C to 28°C.

The project area falls within three river basins, namely Mi Oya, Deduru Oya and Kala Oya. These three rivers record very low flows during the period June-August. Under the NWPCP 130 MCM of water will be transferred to the project area from the Mahaweli River. The groundwater aquifers in the project area are regolith aquifers, which are highly dependent on the small tank cascades and their water levels.

Sociological baseline studies revealed that the NWPCP area comprises nine Divisional Secretary (DS) Divisions within the three districts of Kurunegala, Matale and Anuradhapura. Within these nine DS divisions are 113 *Grama Niladhari* (GN) Divisions. Of these GNDs, 92 are in the Kurunegala District and 20 in the Matale district. The remaining is GN division is in the Anuradhapura district.

The NWPCP area is spread over 2,453 km^2 and out of this 1242 km^2 or 50% of project area is within the Kurunegala district. Of the populations of Kurunegala, Matale and Anuradhapura, 4.9%, 4.8% and 1%, respectively, are in the NWPCP area. Population density — an important factor for the identification of issues related to elephant conflict — was highest in Mahawa and Galgamuwa in the Kurunegala district, and Galewela in the Matale district. An average of 54% of the working population of the project is engaged in the agriculture sector.

Biological baseline studies revealed that there was a total of 433 species of vascular plants, including 310 native species, of which 21 are endemic to Sri Lanka. The remaining 90 species were exotics. Further, 317 species recorded are known to have medicinal value. This total also included four nationally Endangered, 21 nationally Vulnerable species and 24 Near Threatened species were observed in the NWPCP area.

A total of 135 invertebrate species (from selected invertebrate groups) and 279 vertebrates, including 381 native, 16 migrants and 17 exotic species were observed in the NWPCP area. This included 63 species that are endemic to Sri Lanka and two Critically Endangered, 16 Endangered, 17 Vulnerable and 34 Near Threatened species.

Critical Species are defined as any species that is (i) Critically Endangered or Endangered (ii) Endemic and (iii) or a Restricted range species. By this definition, 98 species found in the NWPCP were identified as critical species.

Fifteen known invasive alien plants were recorded in the surveyed area. Of these, eight are listed in the national list of priority invasive alien flora, and three are listed as potential invasive alien species. Another four species are considered to be species of concern, if they spread further.

The major ecosystems of the project area were: dry-mixed evergreen forests; moist-mixed evergreen forests; arid-mixed evergreen forests (scrublands); riverine evergreen forests; dry

grasslands; streams and rivers; reservoirs and ponds; agricultural ecosystems (paddy lands, horticultural farms, small crop holdings, crop plantations, home gardens *chena* lands.

There are two protected areas within the NWPCP area, Galgiriyakanda Forest reserve and Kahalla-Pallekele Sanctuary.

The human-elephant conflict baseline revealed that people and elephants co-exist in the same landscape over much of the northwest. There were no elephants south of the NWPCP area, while the NWPCP area was part of contiguous elephant habitat in the northwest.

In total, 12 elephants have been tracked in the northwest by Centre for Conservation and Research, in collaboration with the Department of Wildlife Conservation. The home ranges of all tracked elephants in the northwest were entirely outside any protected areas of the DWC. Elephants used areas with forest, scrub and fallow *chena* throughout the year and largely avoided human settlements. The use of paddy fields by elephants was extensive during the period when they were not cultivated, as elephants used them to move from one forest patch to another without conflict with people.

There were 71 farmer associations which used irrigation water from 195 tanks for cultivation.

Currently, most of the paddy fields that will be supplied with water under the NWPCP are cultivated only in the *Maha* season for about four months of the year. Elephants use these paddy fields annually for about eight months. With implementation of the NWPCP, it is expected that all the paddy fields supplied with water will be cultivated both during the *Yala* and *Maha* seasons. This will prevent elephants from using the fields in the dry season as they do now. The loss of fodder and obstruction of movement routes in the dry season will be very detrimental to the elephant population, as it represents the loss of a critical resource. Elephants will be compelled to look for alternative resources to survive, likely resulting in greater crop raiding.

HEC occurred almost over the entire northwest area. The intensity of HEC was high over most of the area of HEC prevalence. People in the NWPCP area were found to be dependent on an agro-economy, and hence, are prone to be impacted greatly by HEC.

Most of the people in NWPCP area did home garden cultivation and paddy cultivation. Most of them currently cultivated paddy only in the *Maha* season. With the provision of water by the NWPCP it can be expected that those who currently cultivate only the *Maha* season will also engage in *Yala* season cultivation. Most of the farmers were landowners, while some cultivated land leased for cultivation and a small proportion cultivated both their land and leased land. Currently most of the people identify damage from animals as the leading obstacle to improving their livelihood and farming, and that lack of water was, in many cases considered to be of a lesser priority. Elephants are currently present in the neighbourhood of two thirds of the people in the NWPCP area, and most of them already viewed elephants as a major problem.

The pattern of human-elephant conflict in the NWPCP area reflected the general patterns observed elsewhere in Sri Lanka, with adult males being responsible for most crop damage incidents and for all property damage and human death incidents. The fact that female groups also caused crop damages indicates a very high level of human-elephant conflict that has been persisting for a long period of time and/or the inadequacy of crop guarding in the area.

Guarding and chasing elephants was the single most used method for prevention of damages to villages and paddy fields.

Current institutional efforts at HEC mitigation include limiting elephants to a fenced area, chasing and driving elephants, translocation, distribution of elephant thunders and enclosure electric fences. Some of these activities have resulted in the further spread and escalation of HEC and have been very detrimental to elephant conservation. In contrast, recent changes in the approach as exemplified by 'exclosure' fencing whereby electric fences are used to prevent crop raiding and entry into villages by elephants have been much more successful.

The vision of the Wildlife Management Plan, with special reference to the mitigation of Human-Elephant Conflict, is to ensure the conservation of wildlife and ecosystems. Its mission is to assure the conservation of wildlife and ecosystems through the implementation of mitigatory measures.

The objectives of this plan are to

1. Address the issue pertaining to loss of wildlife habitat due to the project, by a) expanding the existing protected area network by annexing all available natural/semi-natural areas, as well as taking steps to link, through corridors, the scattered natural forests in the area and b) enhancing the carrying capacity of the existing protected areas through habitat improvement within these protected areas;
2. Mitigate the direct negative impacts arising due to the project interventions on wildlife, during both construction and operation phase; and
3. Provide a set of site specific reasonable and acceptable solutions to the human-elephant conflict that will arise in the area that will receive irrigation under the project.

There are three management components of this plan:

1. *The segment from Lenadora Diversion up to Mahakithula tunnel* where the objectives are
   - The reduction of loss of critical species through translocation o transplantation of critical species that may be present in the canal trace;
   - Prevention of death or injury to wildlife by reducing the probability of animal falling into the canal during construction stage and allowing appropriat escape routes for animals fallen into the canal during operation phase; and
   - Facilitating free movement of animals across the canal.
2. *Kahalla-Pallekelle Sanctuary* where the objectives are
   - Enhancing the carrying capacity of the sanctuary by carrying out habit restoration activities within the sanctuary;
   - Enhancing the extent of the sanctuary by annexing any natural forests ne the sanctuary; and
   - Facilitating free movement of animals by establishing corridors within a outside the sanctuary.
3. *The Command area* where the objectives are
   - Mitigation of human-elephant conflict in the command area;
   - Enhancing habitat quality and quantity by restoring catchments of the ta that receive irrigation water under the project; and
   - Facilitating free movement of megafauna and thereby reducing human-wil conflict.

Improving the current status of the existing PAs Identification of habitats with the potential to be enriched through assisted regeneration includes a) identifying habitats to be restored/enriched; b) managing invasive species; c) improving of water holes enhance the carrying capacity of protected areas; d) identifying areas that can be annexed to existing PAs; e) identifying areas that can provide connectivity between remaining forest areas including already identified elephant corridors to be established for mitigation of HEC; and f) identifying sensitive and vulnerable ecosystems (critical habitats) in the area.

Areas to be restored were identified as) areas to be restored as habitats for fauna; b) tank restoration; and c) establishing a buffer strip along the canal trace. A map of areas to be restored was developed and diagrams of how to restore and detailed lists of species to be used in specific areas were provided.

Among the *invasive alien species* noted, there were 15 plant species and one animal species. Of the plants, eight species are listed in the national list of priority IAS, and another three as potential invasive alien species. Among these the Giant Mimosa (*Mimosa pigra*) is of special concern as it already shows a considerable spread in the Mahaweli region and a heavy infestation of this species was observed around the first segment of the NWP canal. Therefore, priority attention must be given to managing *Mimosa pigra* within the NWPCP area. The single IAS fauna species (the Giant African snail) is also on the national priority list. Specific locations of each species were plotted on a 2 X 2 km map, and species-specific prescriptions for management are given. An annex proving details of IAS management is also provided.

For the *improvement of water holes to enhance the carrying capacity of PAs*, it was noted that there are 300+ tanks in the command area of the NWPC project, and that assessing them under the current assignment would be beyond its purview. It was recommended that once the implementation of the WMPHEC commences, 50 of 300+ tanks are identified, using two criteria: tank size, and condition of the tank reservation. For these 50 tanks three restoration interventions are recommended 1) repair and vegetative protection of the bunds; 2) vegetative restoration of the wind break of trees (*gasgommana*) and filter (*kattakaduwa*) of these tanks and 3) partial desiltation only if needed.

Areas that can be annexed to existing PAs were identified through Google Earth and ground-truthing, a GIS map developed that showed 33.81 km^2 can be annexed to the Kahalla-Pallekele Sanctuary and 22.51 km^2 to forest reserves under the jurisdiction of the Forest Department.

Areas that can provide connectivity between remaining forest areas including already identified elephant corridors to be established for mitigation of HEC is discussed under the general section on HEC mitigation.

Sensitive and vulnerable ecosystems (critical habitats[1]) were identified by using predictive modelling with MaxEnt software. Several critical habitats predicted by MaxEnt are already captured within the combined protected area network of the DWC and FD. Yet others are within the areas proposed for annexure. It should also be noted that the critical habitats identified from the study justify the DWC's proposal of connecting Kahalla-Pallekele to Hakwatuna Oya through a corridor. Even though the HEC mitigation section does not

[1] Critical habitats include areas with high biodiversity value, including areas with the following criteria: (i) habitat of significant importance to Critically Endangered and/or Endangered species, endemic and/or restricted-range species, and globally significant concentrations of migratory species, and/or congregatory species; (ii) areas with regionally unique and/or highly threatened ecosystems; and (iii) areas which are associated with key evolutionary processes'.

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recommend this connection as an elephant corridor, the MaxEnt predictions appear to support its establishment as important for other endangered and/or endemic fauna.

Mitigating direct negative impacts on wildlife identified needs over and above mitigation measures proposed in the environment management plan of the project design. These included structural measures for the mitigation of impacts on wildlife and developing a rescue programme to translocate/ transplant identified animal and plant species from locations that will be affected by project activities.

Structural measures proposed were a) Animal Safe Escape Structures —stepped trapezoidal concrete structures; b) Bathing Point Structures — used for the dual purpose of bathing and safe escape; c) Eco overpasses — for small animals to pass over the canal; and Stream bed restoration — after cut and cover to restore the stream functionality.

Site-specific mitigation measures for specific sections and contract packages were provided with the approximate structure location (chainage value in km+m) in tabular format, as well as in GIS maps.

Developing a rescue programme to translocate/transplant identified animal and plant species from locations that will be affected by project activities focused on prioritising the 25 and 63 endemic flora and fauna species, respectively, as well as 27 and 35 threatened flora and fauna species, respectively found in the area. These threatened and endemic species need to be examined in the context of their national distribution and were shortlisted, using three filters for flora and four for fauna, respectively. Only species that required intervention — ***priority species*** — will be rescued/collected and released/transplanted before the commencement of NWPCP activities. According to the prioritisation scheme used three priority flora species were selected for rescue in the NWPCP area. In addition, a *Capparis* species was recorded, which may be a new species, yet unknown taxonomically. Therefore, this species was also recommended for collection. Eleven species emerged as priority fauna. Methods for collection (flora) and rescue (fauna), as well as locations for transplanting/ translocation were detailed.

Given that the NWPC project area is in district where HEC is the highest in the island, special attention was paid to **Mitigation of Human-Elephant Conflict.** Initially, evaluation of electric fences in the project area; evaluation of other barriers such as bio-fences and ditches; evaluation of elephant translocation, drives and chasing, and distribution of elephant thunders; and evaluation of feasibility of establishing identified elephant corridors were carried out.

For *the evaluation of electric fences in the project area* — 29 segments amounting to 259 km and 46% of the DWC fences in place — were assessed. There was a preponderance of the defects observed in the DWC enclosure fences — such as fallen posts, wire defects consisting of the live wire touching the ground or the protective arm, tree branches touching the live wire, plants touching the live wire — showed clearly that they were largely dysfunctional. Combined direct or indirect evidence of elephant presence on the 'wrong' side of the fence was observed in 25 of the 29 segments. Elephant GPS tracking data shows that the DWC enclosure fences have little relation to elephant use of areas and that they are not effective in limiting elephants to within them as intended.

A total of 22.8 km of community fences were assessed and, in contrast, the village fences were much better maintained and there were no major faults or fence breaks. Elephant GPS tracking data showed that community-based village fences have little impact on elephant use of elephant habitat and that they are very effective in preventing elephant intrusion into villages as intended.

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Both the fence assessment and a questionnaire survey indicate the lack of success of enclosure fencing constructed by the DWC as a HEC mitigation measure. Therefore, this cannot be considered a viable HEC mitigation method for the NWPCP. In contrast, both fence assessment and people's views indicated the effectiveness of community based fencing as a HEC mitigation measure. Therefore, community-based fencing should be adopted as the main HEC mitigation measure under the NWPCP.

Evaluation of other barriers such as bio-fences and ditches showed that they too were not recommended as HEC mitigation measures. Elephant are pachyderms, with thick skins, not easily damaged by the thorns of bio-fences. In fact, in some areas of the island, preferred food plants of elephants are thorny species. Hence an elephant will simply walk through what is a formidable thorny barrier for us. Elephant-proof trenches fail due to erosion and caving-in of the sidewalls filling up the trench, enabling elephants to cross it. Elephants and other animals such as cattle accelerate this process in their attempts to cross the trench. The sides of trenches can be stabilised with concrete, stones and tar/asphalt, but this increases the cost significantly.

Evaluation of elephant translocation, drives and chasing, and distribution of elephant thunders revealed that GPS Radio tracking of such translocated elephants has shown that none of them remained in the National Parks they were released to: some returned to their home range where they were captured; some wandered over extensive areas, wandering into villages and towns and causing widespread HEC. Others left the park they were released in, but settled down close by and created HEC in the new area. A case study of a translocated elephant was used to illustrate these points. Since 2016 with the completion of the 'Elephant Holding Ground' in Horowpothana, instead of releasing in National Parks, elephants translocated from all over Sri Lanka including the project area, have been released to the holding ground. The Horowpotana holding ground cannot hold many more elephants. Therefore, translocation of 'problem elephants' does not help mitigate HEC but results in its wider spread and intensification and is detrimental to elephant conservation.

Elephant drives have been undertaken in the project area on a regular basis for decades. No data on the details of drives conducted in the project area was available from the DWC. However, through three case studies, it was illustrated how driven animals, break fences and return to their original home range.

The distribution of elephant thunders promotes confrontation with elephants. Continued confrontation leads to increased aggression of elephants towards people, leading to escalation of conflict.

Evaluation of feasibility of establishing identified elephant corridors showed that the only identified elephant corridor in the project area is the one linking Hakwatuna Oya with Kahalle-Pallekele. As its establishment has already been identified as a condition for project approval, no evaluation was conducted on it.

The feasibility of community-based electric fencing as a HEC mitigation measure to be implemented through the NWPCP noted that community-based fencing as a HEC mitigation takes two forms: a) seasonal paddy field electric fencing and b) permanent village electric fencing. The difference between electric fencing implemented by a government agency and community-based fencing is that the community-based fences are built, maintained and owned entirely by communities. Analyses of the results of a questionnaire survey showed that while knowledge of community-based fencing is not comprehensive across the NWPCP area, a large number of residents have some awareness of it. Most persons who are aware of community fencing and believe in its effectiveness are willing to contribute labour and financially towards obtaining same. The feasibility of implementing

community-based electric fencing as a human-elephant conflict mitigation measure in the NWPCP area is very high.

In relation to **HEC management under the NWPCP** the following recommendations were provided.

1. *Ensure that the maximum number of seasons paddy fields are cultivated annually is two (Yala and Maha)*: With the implementation of the NWPCP two seasons of cultivation of the full command areas of all tanks will be possible. This will limit elephant use of paddy field areas to around four months of the year in-between the two cultivation seasons. If any cultivation in addition to the two seasons is carried out with paddy or other crops in these paddy lands, elephants will be completely denied use of these areas throughout the year. This will greatly jeopardise their survival and lead to severe escalation of HEC to unmanageable levels.

2. *Prevent cultivation of permanent crops such as coconut within paddy fields*: The additional water availability over a longer period of the year, is likely to encourage farmers to cultivate crops such as coconuts and banana in sections of the paddy fields. As above, such cultivation will lead to disruption of the temporal partitioning of resources between elephants and people and lead to more conflict.

3. *Provide connectivity for larger patches of elephant habitat throughout the year by establishing permanent corridors*: Currently the movements of the elephants in the project area are restricted during the *Maha* season from October to February as almost all the paddy fields are cultivated. Given that implementation of the NWPCP will create conditions very detrimental to the survival of elephants in the project area, some relief may be provided to the elephants through establishing a few permanent corridors linking the major habitat patches. While benefitting elephants, this would also help reduce HEC as the elephants will be able to more fully utilise the available elephant habitat than if they were restricted to single habitat patches. Two provisional corridors are recommended, based on radio-tracking data of elephants that is available for only part of the project area.

   Currently, elephants very extensively use the Galgamuwa Forest Department teak plantation area to the west of the Padeniya-Anuradhapura Road and the areas surrounding the Maha-Galgamuwa, Palukadawala, Ataragalla, Ambakola-wewa and Mediyawa tanks to the east of the Padeniya-Anuradhapura Road. The proposed corridor 1 will keep these two areas connected.

   Currently, elephants cross the Padeniya-Anuradhapura main road and the railway line to access the main paddy tracts of the Palukadawala, Ataragalla, Ambakola wewa and Mediyawa tanks during the periods the paddy fields are not cultivated. Many fatal accidents have occurred both on the road and the railway line with elephants being hit when they were crossing. Corridor 2 is proposed where there are road and railway bridges across the Mi oya, which can provide elephants with an underpass corridor to the paddy fields without having to cross either the road or the railway line.

4. *Ensure that current elephant habitats remain in their present state*: Elephant habitats consist of areas of natural vegetation cover — such as scrub, secondary forest, tank reservations, tank beds — that elephants currently use. Planned and unplanned development activities that have occurred over the past few decades in the northwest in general, and the NWPCP area, in particular, have resulted in a severe decrease of elephant habitat.

- *Declaring current elephant habitat patches as Forest Department Reserves and Managed Elephant Ranges under the DWC*: The implementation of the NWPCP will result in elephants being unable to use an extensive area of paddy land, amounting to over 5,000 hectares that they currently use during the non-cultivation season. Current elephant habitat is mainly under the jurisdiction of the Forest Department, with some private lands, including temple lands. All forest lands that are under the Forest Department should be demarcated and declared as Forest Reserves and *chena* lands declared under a category that allows such management.

  In addition, the landscapes that elephants use should be declared as a Managed Elephant Range (MER). The declaration of an area as a MER does not change any land ownership (National Policy for Conservation and Management of Wild Elephants). It will impose restrictions on further development incompatible with elephant presence but current land use and development compatible with elephant presence can continue.

- *Establishing a reservoir water management regimen that will perpetuate the emergence of reservoir bed grasslands in the dry season*: In all the larger reservoirs in the NWPCP area such as Galgamuwa maha wewa, Palukadawala, Ataragalle, Ambakolawewa and Mediyawa, release of water for cultivation in the dry season for *Yala* cultivation annually decreases water levels. The drawdown of water exposes the reservoir beds, which turn into grasslands. Elephants extensively use these grass fields in the dry season and they are a critical resource. Therefore, it is recommended that creation of dry season grasslands in reservoir beds is maximised in the NWPCP area through regulation of water levels.

- *Assisting the Forest Department to regulate chena cultivation*: Elephants are 'edge species' that thrive in 'forest edge' habitat rather than undisturbed forest. Chena cultivation creates extensive forest edges by creating a heterogeneous habitat. The practice of chena cultivation creates and maintains high-density elephant habitat in the lowland dry zone of Sri Lanka. Therefore, continuing regulated chena cultivation in lands where chena cultivation is currently being practised would benefit elephant conservation and HEC mitigation. Therefore, it is recommended that the project implementation agency consult the Forest Department and assist develop and implement regulated chena cultivation within Forest Department lands of the project area, where chena cultivation is currently carried out.

5. *Prevent elephants from raiding of paddy fields by setting up seasonal paddy field fencing for all paddy fields under the NWPCP*: Raiding of paddy fields by elephants is one of the main causes of HEC and is widespread in the NWPCP. It is recommended that electric fences protecting seasonal cultivations such as paddy should be deployed seasonally. As part of the HEC mitigation responsibility of the NWPCP it is recommended that the project implementation agency have consultations with the relevant Agricultural Extension Services Department officers and in collaboration with them develop and implement a system of paddy field fences for all paddy fields supplied with water under the NWPCP.

6. *Prevent raiding of villages by elephants*: Elephants enter villages to raid stored paddy and home gardens. The possibility of human injury and death is increased where elephants come into villages. As part of the HEC mitigation responsibility of the NWPCP it is recommended that the project implementation agency have consultations and coordinate with the relevant Divisional Secretariats and assist develop and implement a system of village fencing within the project area.

7. Develop and implement an insurance scheme for crop damages caused by elephants: Escalation of conflict with elephants is very likely in the project area and surroundings despite implementing appropriate mitigation measures. Therefore, in addition to the proposed mitigation methods, a crop insurance scheme specifically addressing damage by elephants would be desirable.

In relation to **identified mechanisms for effective compensation of people impacted by HEC,** as noted above, crop compensation is not recommended as a suitable option to be implemented through the NWPCP. Instead, it is proposed that the NWPCP implementing agency develops and implements an insurance scheme for crop and property damage due to elephants.

Identified awareness and communication needs for mitigating HEC: Awareness is a key component of effective mitigation of HEC and the questionnaire survey showed a lack of knowledge among the population in the NWPCP area on effective HEC mitigation. It is recommended that an awareness campaign be conducted for increasing knowledge of the populace on effective HEC mitigation methods and for facilitation of HEC mitigation efforts undertaken by the NWPCP. Target groups, types of media and content are detailed.

In relation to **identified efficient institutional arrangements required for managing HEC**, with regard to elephant-related activities, the two main collaborating institutions are the Forest Department and the Wildlife Conservation Department. In addition, it is recommended that a close liaison be established with ESCAMP, which is implemented through the Forest and Wildlife Departments. For a community fencing programme, the main stakeholders in should be a) communities that require protection from raiding by elephants; b) Development agencies – in this case the NWPCP implementation agency; and c) Other relevant government agencies such as DAD and the Divisional Secretariats, with oversight by the DWC.

An activity framework for implementation of the WMPHEC, roles, responsibilities and budgets are detailed, with the total budget of implementation amounting to LKR 2,111,620,000.

A **framework for monitoring and evaluation** was also presented. Three types of monitoring — internal, independent and external — are recommended to ensure efficient feedback loops. The first involves the Project Director and Environmental Officer. The second is an independent expert with both wildlife management and monitoring and evaluation expertise who should be hired by the MWSIP to assess the progress of implementation, independent of the PMU and report, quarterly, back directly to the MWSIP. The third is an overall external monitoring committee chaired by a senior representative of the CEA comprising senior officers from the DWC, FD, DI, DAD and two senior academics with wildlife management experience.

Consultations and Skills Transfer Programmes: The initial opportunities were in the field to learn data collection and about rescue/release methodology. The second opportunity was during the preparatory process of the management plan.

The head office, regional and field officers of DWC, ID, FD, CEA, NWPEA, DSDs, DAD were consulted in the planning process in the run up to the preparation of the draft. Ten consultative meetings.

Lessons learned were that **conservation and development are not necessarily mutually exclusive**. When the proposed recommendations are incorporated into long-term management, development in the area will surely be sustainable. *It was recommended that*

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in future development projects, it should be ensured that conservation-related issues are integrated into planning, so that development becomes sustainable.

Buy-in from all stakeholders was achieved through participatory preparation of the plan. This approach was instrumental is ensuring the buy-in from all stakeholders (including national and subnational authorities, professionals on WMP and civil society) for the plan. This multi-disciplinary and multi-sectoral participation created for a platform, for those who do not usually have such an opportunity, to discuss controversial issues related to HEC and to reach agreements for solutions. *It was recommended that for future development projects, it should be ensured that management is multi-disciplinary and multi-sectoral, in order to achieve a balance between development and conservation.*

For the first time, the proposed siting of elephant corridors and the identification of critical habitats for protection, are based on scientific data and analyses. Radio-collaring of elephants — that yielded information on their movements — provided solid, scientific information on the proposed siting of elephant corridors. The use of MaxEnt software to predict the critical habitats within the study area, was another pioneer effort in Sri Lanka. The engagement of an accredited agency such as IUCN with a team of qualified and experienced scientists and managers has allowed for an objective and professional approach to address a controversial issue such as HEC mitigation. It should be ensured that, in the future, management of protected areas include science-based decision-making.

The success of the NWPC project and the welfare of both people and wildlife in the project area is heavily dependent on the commitment of the agencies mandated to implement, as a priority, the WMPHEC. The proponent's commitment to WMPHEC plan has been demonstrated already by the accommodation of some of the early recommendations proposed into the detailed designs of the project. However, it is essential that the WMPHEC is implemented immediately and completed as far as possible before the commencement NWPCP construction activities. This is vital, as the area is already facing severe HEC issues. Implementing the NWPC project without the full and timely implementation of WMPHEC may result in far reaching negative consequences to both people and wildlife. *It should be ensured that for the immediate and complete implementation of the WMPHEC, it is made legally essential, that will aid the regulatory authorities ensure full compliance.*

Aggravation of HEC in the project area is mainly due to weak enforcement by regulatory authorities (such as FD, DWC, DS, ID, and DAD) and politically motivated legalisation of illegal activities — such as encroachment — or inaction against them. For successful implementation of the WMPHEC not only has the enforcement of laws need to be stronger, but also there has to be communication and collaboration between government agencies and local government authorities. It is recommended that a concerted effort be made to create awareness about environment-related laws (that is, what can and cannot be done in a protected area), conducted by the DWC and FD for local authorities and other relevant government agencies like the Land Use and Policy Planning Department. Once this is effected, convene multisector meetings to discuss issues and iron out problems.

Interaction between the project design team and the WMPHEC expert team was essential for plan preparation. The interaction with the project design team and the WMPHEC expert team provided better understanding of the engineering issues related to some of the engineering interventions proposed. This interaction allowed for development of appropriate measures without compromising conservation needs or design principles. It should be ensured that such collaboration is integrated into future projects.

The process of the WMPHEC preparation and the scientific data produced, has enabled the DWC to see the ineffectiveness and counter-productivity of some of its long-term HEC management practices. Under the WMPHEC, the evaluation of HEC mitigation measures currently used showed that most of these methods (such as translocations, distribution of elephant thunders, bio-fences, ditches) are unsuccessful and often aggravate issues. Electric, enclosure fences between FD and DWC protected areas were common but also found to be ineffective. The recommended community fences (village fences and paddy fences) to be implemented by other agencies, with DWC oversight has been accepted by the DWC staff. It is recommended that the implementation of the WMPHEC recommendations should be ensured to serve as a springboard for an institutional revision of the approach to HEC mitigation. It is recommended that current enclosure fences be gradually repositioned as needed.

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Annex 4: List of 523 Trees for the Section 1 up to Ranwedivawa Tunnel Portal (from 5+250 Km to 9+060 Km)

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மகாவலி நீர்ப் பாதுகாப்புக்கான முதலீட்டுத் திட்டம்
Mahaweli Water Security Investment Program

මහවැලි සංවර්ධන හා පරිසර අමාත්‍යාංශය
மகாவலி அபிவிருத்தி மற்றும் சுற்றாடல் அமைச்சு
Ministry of Mahaweli Development & Environment

திட்ட முகாமைத்துவப் பிரிவு
Program Management Unit

MWSIP

No. 493 1/1, P. de S. Kularatne Mawatha, Colombo 10. No. 493 1/1, C. D. Jayah Mawatha, Colombo 10.
Program Director: 0112 678811 Consultant: 0112 General Office: 0112 678810 Office Fax: 0112 678810 - pdadbproject@gmail.com

My No: MMDE/MWSIP/PMU/NWPCP /Gen
Your No: MWSIP - PMDSC
Date: 19th June 2018

497, C.D. Jayah Mawatha, Colombo 10
Received Incoming By: ASIC
Scan: Taken Today
Date: 20 JUN 2018
Action By: APE
Copies to: APE, LNSL
Primary File Location: 7.23
Copy to Files:

Project Director
Project Implementation Unit-NWPCP

p/s arrange the 'EMP'

List of 523 Trees for the Section 1 up to Ranwediyawa Tunnel Portal (from 5+250 Km to 9+060 Km)

This is further my even number letter dated 18/01/2018, which was addressed to PMDSC with a copy to you on the same subject.

Please find herewith attached a copy of the PMDSC letter reference 7.23_L02105 dated 11/06/2018 including the list of 523 trees identified to be removed.

As discussed over the phone, please collect additional information like; the location of each tree along the canal trace, tree number and whether located in Government/ Private land from the RE of PMDSC and submit to the Divisional Secretary for further action in order to avoid potential delays.

Meantime, it is proposed if Cabinet approval is granted allowing the trees located in the acquired lands to be given to respective land owners a special request shall be made from DS to exempt trees in private land from the process of tree removal through Sate timber Corporation.

Eng. K. R. Neil Bandara
Program Director
Mahaweli Water Security Investment Program
Ministry of Mahaweli Development & Environment

CC: Team Leader, PMDSC - Please provide necessary additional information to PD-PIU.

PIU Office : (UEDP)
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Annex 5: Environment section bi-annual plan July- December 2018

Environment section bi-annual plan July- December 2018

No	Task Name	Start Date	finished date	July	Aug	Sep	Oct	Nov	Dec
	Wildlife Management plan implementation	01.07.2018	Continue in 2019						
1	Ground truthing for Reforestation are a	25.07.2018	24.08.2018						
2	Implementation of reforestation work in KPS	25.08.2018	Continue in 2019						
3	selected 50 tanks for habitat enrichment	01.07.2018	30.09.2018						
4	Management of AIS	01.08.2018	Continue in 2019						
5	Other activities in WMP action plan	01.07.2018	Continue in 2019						
6	**Establishment of Hakwatunaoya Elephant corridor**	01/07.2018	Continue in 2019						
7	**GRC Meetings**	07.07.2018	Continue in 2019						
8	**Environment & Safety inspection for ICB2 & NCB1**	01.07.2018	Continue in 2019						
	ICB2								
9	FD clearance for Pibidunugama & Nilagama Forest Areas	01.07.2018	01.10.2018						
10	Archeological clearance for Tunnel Ranwediyawa & Nilagama	07.07.2018	31.07.2018						
11	Baseline Environmental Quality Monitoring	01.10.2018	30.10.2018						
12	Ground water level monitoring on tunnel area	01.07.2018	Continue in 2019						
13	Rescue of priority plants & Animals	01.11.2018	Continue in 2019						
14	Tree Removing	01.07.2018	31.12.2018						
15	Progress & site meeting	01.07.2018	Continue in 2019						
	NCB1								
16	Reforestation program for NCB1	01.07.208	Continue in 2019						
17	tree removing (Stage 2)	01.07.2018	30.08.2018						
18	Progress & site meetings	01.07.2018	Continue in 2019						

Prepared by SEO/NWPCP