

# Environmental Monitoring Report

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Semi-Annual Report no. 4  
For the period covered July 2019–June 2020  
Project Number: 47381-002  
July 2020

## SRI: Mahaweli Water Security Investment Program – Tranche 1

Minipe Left Bank Canal Rehabilitation Project (MLBCRP)

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

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# Mahaweli Water Security Investment Program

## Annual Environmental Monitoring Report (AEMR) No. 04 for Minipe Left Bank Canal Rehabilitation Project (MLBCRP) – July 2019 to June 2020



**Ministry of Mahaweli Agriculture  
Irrigation and Rural Development  
Sri Lanka**



**ADB**

July 2020

**Final Report**

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**AEMR No. 04 for MLBCRP**

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# 1 INTRODUCTION

## 1.1 Scope of the Report

1. This Annual Environmental Monitoring Report (AEMR) No. 4 is prepared to update the progress with respect to environmental safeguard compliance of Minipe Left Bank Canal Rehabilitation Project (MLBCRP) including the Minipe anicut raising by 3.5 m and some improvements to the Right Bank canal structures at the anicut.

2. This AEMR for MLBCRP is prepared addressing the following aspects, based on the available information for the monitoring period from July 2019 to June 2020, which fulfils the Asian Development Bank (ADB) requirement to submit a AEMR to ADB and Central Environmental Authority (CEA) for the “Category B” projects as documented in FAM<sup>1</sup> and EARF<sup>2</sup>:

- (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) Environment Qualitative / Quantitative monitoring data.
- (iv) Monitoring results compared against previously established benchmarks and compliance status (e.g., obtaining necessary approvals for establishment of certain facilities, timeliness, and adequacy of environmental mitigation measures; and training, capacity building, etc.).
- (v) Records on disclosure of monitoring information to affected communities.
- (vi) Identification of key issues, or grievances from affected people, or recommendations for improvement.
- (vii) Proposed items of focus for the next reporting period and due date.

3. 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 Initial Environmental Examination Report (IEER<sup>3</sup>) including Addendum to the IEER<sup>4</sup> and updated Environmental Management Plan (EMP)<sup>5</sup> No. 13.1 of the IEER approval No. CEA/CPO/KY/07/929/12 issued by CEA on 16 October 2015, renewed approvals (dated on 03.01.2019 by Letter Ref. Ref. CEA/CPO/KY/07/929/2012, and on 08.11.2019 by Letter Ref. CEA/CPO/KY/07/929/2012 issued by CEA provincial office for Central Province) confirming all the conditions remain unchanged of the original approval by CEA.

4. This AEMR for MLBCRP is prepared by the Environmental Specialist (ES) of Program Management Design and Supervision Consultant (PMDSC) based on the monthly monitoring and progress reports received from the Environmental Monitoring Specialist (EMS) of PMDSC, and the updates which were received from the Environmental Specialist (ES) of PMU and Senior Environmental Officer (SEO) for PIU of MLBCRP. Further, the report contains the observations and records of the Resident Engineer (RE) for MLBCRP, and the ES of PMDSC made as per the site visits attended once a month, including records of monthly environmental meetings, and records of the random visits take place when significant environmental incidents are reported.

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

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

<sup>3</sup> Initial Environmental Examination Report (IEER) for Proposed Raising of the Minipe Anicut, and Rehabilitation of Minipe Left Bank Canal Project in Kandy District (April 2015) by the Irrigation Department

<sup>4</sup> Addendum to Initial Environment Examination Report (IEER) including the revised Environmental Management Plan (EMP) for Minipe anicut raising and LB canal rehabilitation in April 2016

<sup>5</sup> Updated Environmental Management Plan (EMP) by Program Management Design Supervision Consultant (PMDSC) incorporating design changes highlighted in the addendum to IEER (June 2016) and approved by CEA Provincial Office, Kandy on 11.01.2017

## 1.2 Overall Progress of MLBCRP as of June 2020

5. There are six (06) active construction packages where construction is in progress, which are MLBCRP-NCB<sup>6</sup>-1 to NCB-5 involved in the left bank canal rehabilitation work, and MLBCRP-ICB<sup>7</sup>-1 engaged with the Minipe anicut raising and improvements to the Right Bank canal structures at the anicut area.

6. An overview to the MLBCRP six contract packages is given in **Table 1-1**, and the summary of the progress by end June 2020 is described in the following sections. Of the six contracts awarded, two contract packages of MLBCRP-NCB-4 was complete and NCB-5 substantially complete and ready to hand over by end June 2020.

**Table 1-1: Overview of the construction packages in the MLBCRP**

<b>MLBCRP-NCB-1</b>	Contract No.	MWSIP/MMDE/ADB/MLBCRP/NCB-1/3267-3268-SRI/NCB/2015/004
	Contractor	M/s. Edward and Christie
	Commencement Date	13 October 2016
	Value of Contract	LKR 568,605,950.69 (incl. VAT)
	Original Completion Date	13 October 2018
	Updated Completion Date	05 October 2020
<b>MLBCRP-NCB-2</b>	Contract No.	MMDE/MWSIP/ADB/MLBCRP/NCB-2/3267-3268/SRI/NCB/2016/010
	Contractor	M/s. Gamini Construction
	Commencement Date	26 April 2017
	Value of Contract	LKR 343,067,496.59 (incl. VAT)
	Original Completion Date	24 April 2019
	Updated Completion Date	30 October 2020
<b>MLBCRP-NCB-3</b>	Contract No.	MMDE/MWSIP/ADB/MLBCRP/NCB-3/3267-3268/SRI/NCB/2016/012
	Contractor	M/s. Nawaloka Construction
	Commencement Date	28 April 2017
	Value of Contract	LKR 829,038,115.52 (incl. VAT)
	Original Completion Date	26 April 2019
	Updated Completion Date	30 April 2020
<b>MLBCRP-NCB-4</b>	Contract No.	MMDE/MWSIP/ADB/MLBCRP/NCB-4/3267-3268/SRI/NCB/2016/017
	Contractor	M/s. Gamini Construction
	Commencement Date	26 April 2017
	Value of Contract	LKR 246,986,203.92 (incl. VAT)

<sup>6</sup> NCB means National Contract Bidding

<sup>7</sup> ICB means International Contract Bidding



	Original Completion Date	24 April 2019
	Updated Completion Date	22 December 2019
<b>MLBCRP NCB -5</b>	Contract No.	MMDE/MWSIP/ADB/MLBCRP/NCB-5/3267-3268/SRI/NCB/2016/019
	Contractor	Dockyard General Engineering (Pvt) Ltd
	Commencement Date	07 February 2018
	Value of Contract	LKR 425,500,000.00 (incl. VAT)
	Original Completion Date	12 February 2020
	Updated Completion Date	Finishing on time
<b>MLBCRP ICB -1</b>	Contract No.	MMDE/MWSIP/ADB/MLBCRP/ICB-1/3267-3268/SRI/ICB/2016/031
	Contractor	China Gezhouba Group Company Ltd.
	Commencement Date	10 May 2018
	Value of Contract	LKR 2,144,521,484.08 (Incl. VAT)
	Original Completion Date	12 November 2020
	Updated Completion Date	-

### 1.2.1 MLBCRP-NCB-1

7. MLBCRP-NCB-1 package was awarded to rehabilitate the LB canal from 0+000 km to 30+140 km, comprising Stage 1 of the MLBCRP. The original completion date of 13 October 2018 was not achieved by Edward & Christie, the Contractor, due to problems dealing with water issues, and also due to the need to include some additional work in addition to the original scope of work by the employer. Extension of Time (EOT) was approved by the Employer, and hence the target completion date was set as 05 October 2020.

8. Actual physical progress is recorded as 81% by end June 2020, and **Figure 1-1** shows the graphical representation of the overall progress of the MLBCRP-NCB-1 package.

### 1.2.2 MLBCRP-NCB-2

9. M/S Gamini Construction is the contractor for the Minipe LB canal Stage 2 rehabilitation work from chainage 30+140 km to 49+820 km, traversing mainly through residential areas. The present overall physical progress by end June is recorded as 72%, which is far behind the schedule, and hence the MLBCRP-NCB-3 contract was unable to achieve the target completed date 24 April 2019. The updated completion date is set as 30 October 2020 including Extension of Time (EOT), but the Engineer's forecast for the probable completion is by 30 April 2021, due to the unsatisfactory progress of the Contractor, and lack of Contractor's preparedness to attend work during the water closure period.

10. **Figure 1-2** shows the graphical representation of the overall progress of the MLBCRP-NCB-2 package by end June 2020.

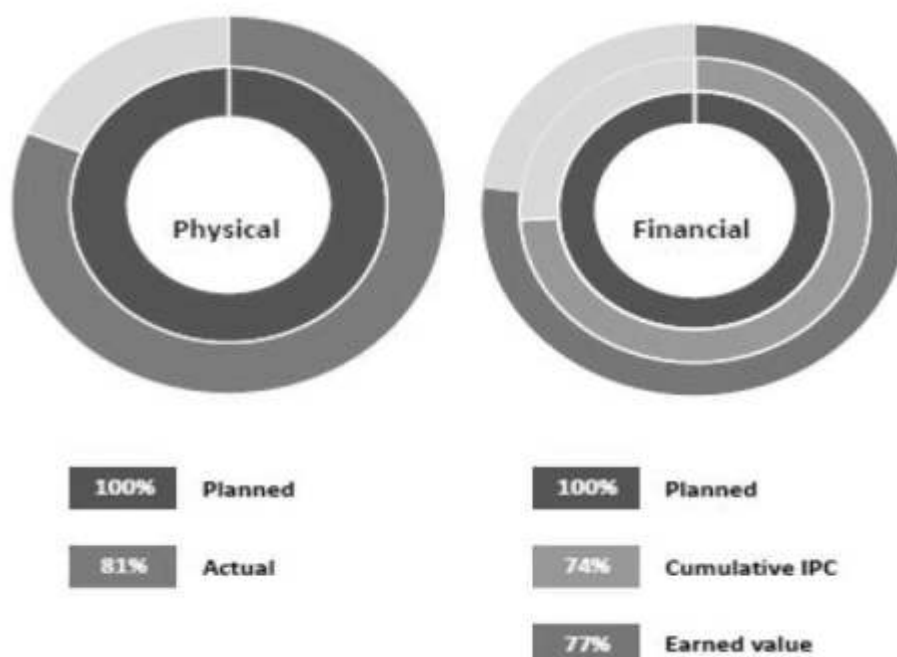


Figure 1-1: Overall package progress of MLBCRP-NCB-1 as of end June 2020

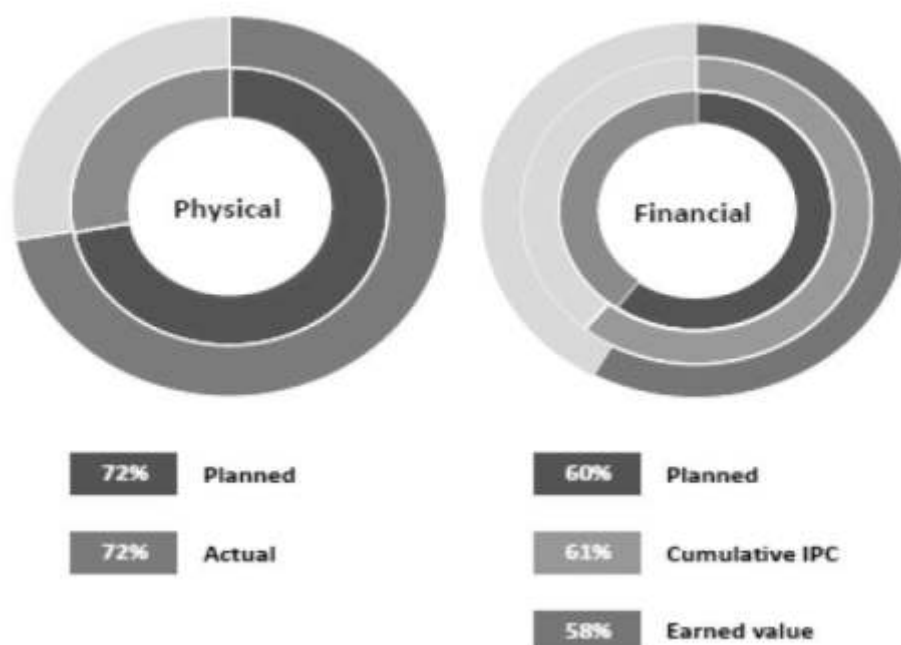


Figure 1-2: Overall package progress of MLBCRP-NCB-2 as of end June 2020

### 1.2.3 MLBCRP-NCB-3

11. Construction work under the MLBCRP-NCB-3 contract package is conducted by the M/s Nawaloka Construction and shows the lowest actual physical progress of 68% by end June 2020, out of all 5 NCB packages

in the Minipe construction program. Due to the unclear financial situation of the Contractor's preparedness to execute possible balance work such as canal lining, construction of definition walls, retaining walls, construction of water regulating structures of LB canal, bund road construction in feeder canals etc. is unsatisfactory as per the Engineer's record and hence the target completion date was delayed from 26 April 2019 to 30 April 2020 granted by an EOT. However, considering the current progress and lack of resources of the M/s Nawaloka construction due to financial issues, Engineer's forecast to complete the works to 30 April 2021.

12. **Figure 1-3** shows the breakdown of progress achieved under each key work item of the scope of work of the MLBCRP-NCB-3 package by end June 2020.

	Target	Achieved
1 Canal Lining	100%	66%
2 Definition Walls & Drainage Inlets	100%	78%
3 Cross Regulators	100%	37%
4 Retaining Walls	100%	69%
5 Turnout Structures	100%	40%
6 Canal Spill & Silt Ejector	100%	0%
7 Improvements to Bridges & Foot Bridges	100%	43%
8 Feeder Canal 1	100%	86%
9 Feeder Canal 2	100%	91%

**Figure 1-3: Breakdown of progress achieved by MLBCRP-NCB-3 as of end June 2020**

#### 1.2.4 MLBCRP-NCB-4

13. M/s Gamini Construction engaged with the MLBCRP-NCB-4 package construction work has almost completed the scope of work related to the package, showing the overall physical progress of 99% by end June 2020. Testing and commissioning completed and handing over process including submission of O&M manuals as built drawings, defects repairs in the embedded parts are in progress.

14. **Figure 1-4** shows the graphical representation of the overall progress of the MLBCRP-NCB-4 package by end June 2020.

#### 1.2.5 MLBCRP-NCB-5

15. MLBCRP-NCB-5 contract package was awarded to Dockyard General Engineering (Pvt) Ltd on 07 February 2018 to rehabilitate electrification of Radial gated structures at 08 locations and improvements to cross regulator structures at 03 locations, improvements to 09 vertical gate structures, construction of 07 control rooms in the Minipe Left Bank Canal (MLBC).

16. Actual overall physical progress is recorded as 96% by end June 2020, and the target completion date by April 2020 could not be achieved due to Covid-19 situation. **Figure 1-5** shows the graphical representation of the overall progress of the MLBCRP-NCB-4 package by end June 2020.

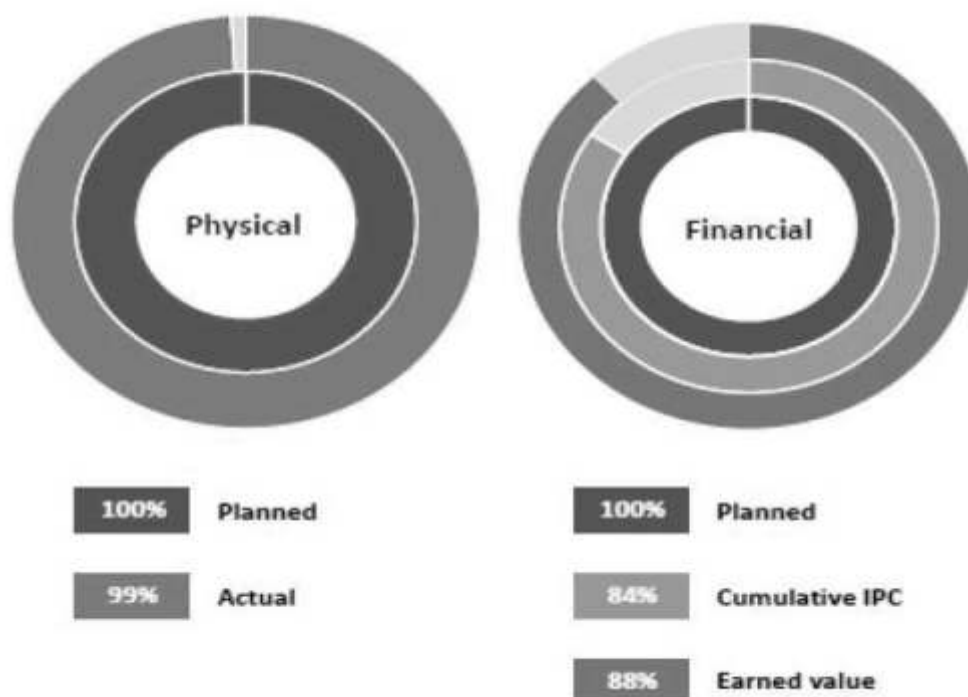


Figure 1-4: Overall package progress of MLBCRP-NCB-4 as of end June 2020

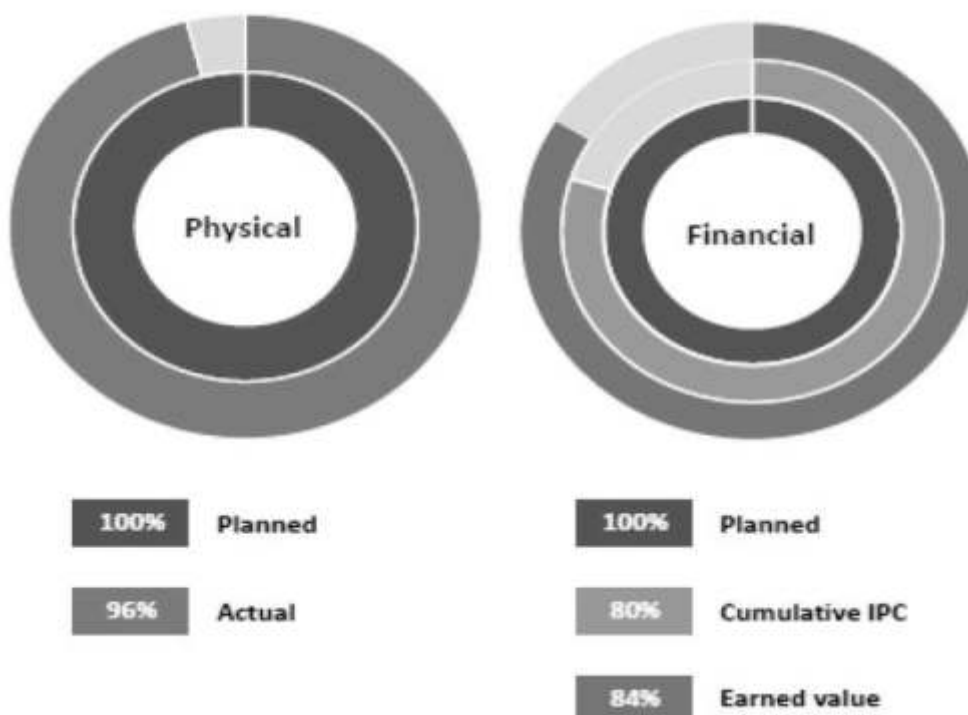
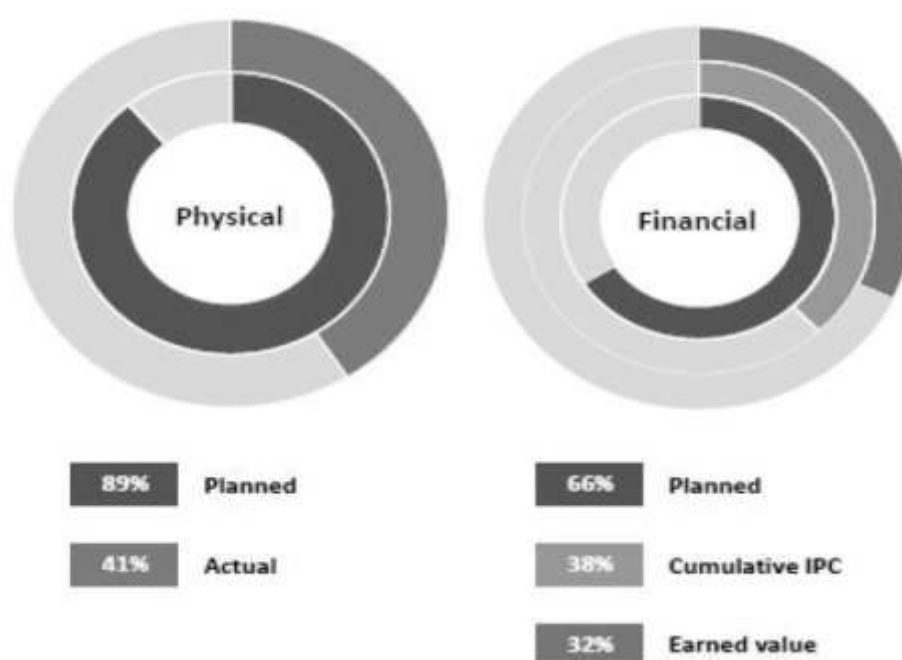


Figure 1-5: Overall package progress of MLBCRP-NCB-5 as of end June 2020

### 1.2.6 MLBCRP-ICB-1

17. MLBCRP-ICB-1 package is for heightening of the existing Minipe anicut by about 3.5 m and constructing water control facilities at the anicut related to LB and RB canal water issuance. China Gezhouba Group Co Ltd (CGGC) commenced construction on 10 May 2018, and the overall physical progress by end June 2020 is reported as 41%. Original completion date is set as 12 November 2020, but Engineer predicts the realistic completion date as 31 March 2022, considering the slow progress up to date and the lack of preparedness for the upcoming floods, unless the Contractor makes major modifications to his management, physical and financial resources.

18. **Figure 1-6** shows the graphical representation of the overall progress of the MLBCRP-NCB-4 package by end June 2020.



**Figure 1-6: Overall package progress of MLBCRP-ICB-1 as of end June 2020**

## 1.3 Environmental sensitivity of the MLBCRP area

19. **Annex 1** of this AEMR provides the general layout map of the project area indicating the land use and the sub-project boundaries of each construction packages.

20. The entire LB canal is associated with man modified environment which includes residential and agricultural areas, except the left hand side (LHS) of the LB canal from about 57+500 km which is bound to the ecologically sensitive habitats of proposed extension of the Wasgamuwa National Park (NP), and Wasgamuwa NP falls under the jurisdiction of Department of Wildlife Conservation (DWC). Minipe anicut is located entirely within the Victoria Randenigala (VRR) Sanctuary.

21. Water issue during the construction period was managed by the Irrigation Department and it was a sensitive aspect, which sometimes affected the construction progress. Further, maintaining environmental flow to the Wasgamuwa National Park is another requirement to comply with as per the CEA and DWC conditional approval, during the construction period. Most of the contractors working in LB canal rehabilitation work except NCB 5 were not prepared to work dealing with water due to the low cost bids, and similarly CGGC working in MLBCRP-ICB-1 was also affected twice during the reporting period due to non-exceptional floods damaging their inadequately prepared coffer damming arrangements, with rising water level in the Rantambe reservoir.

## 2 CHANGES IN PROJECT SCOPE AND ADJUSTED SAFEGUARD MEASURES

### 2.1 Scope change due to Covid-19 pandemic situation

22. The project scope was mainly related to the Covid-19 pandemic situation faced by Sri Lanka, and hence the construction sites were effectively abandoned from late March to early May 2020. Site closure period with the limited staff anticipated several environmental impacts, where the construction packages fall within environmentally sensitive areas (residential, wildlife, forest protected areas etc.) related to all six packages under MLBCRP.

23. Considering the anticipated impacts, PMDSC prepared an Environmental Emergency Action Plan (EEAP)<sup>8</sup> (Refer **Annex 2**) and shared with the contractors, directing them to submit their site-specific environmental action plan for the regular site maintenance to prevent any environmental risks. In addition, site-specific environmental monitoring was carried by the Environmental Monitoring Specialists (EMS) at regular intervals by arranging special permission (curfew passes) during the lockdown period, through the ministry for site visits, adopting required safety arrangements. EMS produced regular monitoring records to update Resident Engineer (RE) on significant environmental issues.

24. Obtaining startup plans from the contractors was arranged, incorporating environmental safeguard requirements from early May 2020, and to facilitate the Contractors, PMDSC issued on 21 May 2020 a Guidance Note on Updating Contractor's Environmental Management Plan (CEMP) adhering to the ADB requirements and guidelines (Refer **Annex 3**).

### 2.2 Package specific scope changes

25. In the NCB packages of MLBCRP, major construction activities were limited only during the water closure period (August to November 2019) during the reporting period. March and April 2020 also canal was closed as it was the harvesting period, but the contractors were unable to continue their work due to Covid-19 risks and restrictions.

26. In MLBCRP-ICB-1 package, a total of 28 trees were identified to cut which were not identified during the IEE stage. A separate tree enumeration was conducted, and the approvals were obtained contacting DWC for tree felling. The trees were identified for felling which would be disturbed for the activities such as construction of temporary access road, and field office, construction of the visitor center, and the areas disturbed due to the extended weir, and RB gabion wall. **Table 2-1** describe the list of additional trees to be felled.

**Table 2-1: Additional tree list be affected during the construction of temporary access road, field office & visitor centre and trees below RB gabion wall under MLBCRP-ICB-1**

**Abbreviations: TS – Taxonomic Status, N – Native, E – Endemic, I – Introduced, NCS – National Conservation Status, VU – Vulnerable, NT – Near Threatened**

No	Family	Scientific Name	Common Name	TS	NCS	GBH (cm)
<b>Construction of temporary access road &amp; field office</b>						
1	Moraceae	<i>Ficus racemosa</i>	Attikka (Dimbul)	N		430
2	Rubiaceae	<i>Haldina cordifolia</i>	Kolon	N		160
3	Rubiaceae	<i>Haldina cordifolia</i>	Kolon	N		210
4	Fabaceae	<i>Tamarindus indica</i>	Siyabala	I		140
5	Ulmaceae	<i>Holoptelea integrifolia</i>	Dadakirilla / Goda-kirilla	N		100*

<sup>8</sup> Environmental Emergency Action Plan (EEAP) prepared by PMDSC and submitted to PMU on 28 March 2020 and report addressing ADB and PMU comments were issued to the contractors in early April 2020.

No	Family	Scientific Name	Common Name	TS	NCS	GBH (cm)
6	Moraceae	<i>Ficus benghalensis</i>	Nuga	N		150*
7	Fabaceae	<i>Samanea saman</i>	Para Mara	I		100
8	Fabaceae	<i>Samanea saman</i>	Para Mara	I		150,100,100*
9	Moraceae	<i>Ficus racemosa</i>	Attikka (Dimbul)	N		150,100,75,60*
10	Malvaceae	<i>Ceiba pentandra</i>	Kotta	I		230
11	Fabaceae	<i>Tamarindus indica</i>	Siyabala	I		270
12	Fabaceae	<i>Tamarindus indica</i>	Siyabala	I		260
<b>Construction of visitor centre</b>						
1	Fabaceae	<i>Tamarindus indica</i>	Siyabala	I		250
2	Fabaceae	<i>Samanea saman</i>	Para Mara	I		450
3	Rubiaceae	<i>Haldina cordifolia</i>	Kolon	N		140
<b>Trees below RB gabion wall</b>						
1	Anacardiaceae	<i>Mangifera indica</i>	Amba / Mango	I		235
2	Combretaceae	<i>Terminalia arjuna</i>	Kumbuk	N		87
3	Ulmaceae	<i>Holoptelea integrifolia</i>	Dadakirilla	N		48
4	Fabaceae	<i>Cassia siamea</i>	Waa	N		85
5	Fabaceae	<i>Bauhinia racemosa</i>	Maila	N		90
6	Fabaceae	<i>Samanea saman</i>	Para Mara	I		320
7	Fabaceae	<i>Samanea saman</i>	Para Mara	I		55
8	Fabaceae	<i>Samanea saman</i>	Para Mara	I		50
9	Fabaceae	<i>Samanea saman</i>	Para Mara	I		90
	Fabaceae	<i>Samanea saman</i>	Para Mara	I		140
10	Rutaceae	<i>Chloroxylon swietenia</i>	Buruta	N	VU	67, 69*
11	Fabaceae	<i>Samanea saman</i>	Para Mara	I		110
12	Fabaceae	<i>Samanea saman</i>	Para Mara	I		160
13	Fabaceae	<i>Samanea saman</i>	Para Mara	I		270, 190*

\*Branches of same tree

### 3 ENVIRONMENTAL MONITORING IN MLBCRP

#### 3.1 Organizational set up for MLBCRP Environmental Monitoring & Reporting

27. The Resident Engineer (RE) of the MLBCRP manages all six contract packages, and the Assistant Resident Engineer (ARE) is mainly look after the MLBCRP-ICB-1 contract. Hence RE and ARE of the PMDSC assume primary responsibility for ensuring the implementation of Contractor's Environmental Management Plan (CEMP) through the respective contractor. The relevant activities will be guided by the ES and EMS of PMDSC.

28. The environmental monitoring of all MLBCRP packages, including review of Method Statements, attending relevant meetings, and all package specific additional surveys on active and future packages under MLBCRP are handled by the EMS of PMDSC located in the RE office in Hasalaka. In addition, overall guidance for the Contractor's Environmental Officer (EO) to identify issues through self-monitoring, attending required mitigation measures, obtaining required license and approvals, awareness and training for the environmental related aspects, are handled by the EMS under the coordination and assistance by the ES-PMDSC.

29. The environmental issues, non-compliance status observed by EMS during his routine site monitoring, as well as through the public complaints, is informed to the RE for subsequent communication to the Contractor to attend to the required corrective actions with the guidance of EMS and ES of PMDSC.

30. The Contractor is guided to implement required mitigation measures in the updated EMP for the generic environmental issues, and for the site-specific issues, comments are made on the submitted Method Statements (MS), Environmental Incident Reports (EIR), Non-Compliance Report (NCR), and through letters. In addition, periodical environment meetings, joint inspections are being used to deliver verbal instructions where necessary by PMDSC, PIU and PMU.

#### 3.2 Monitoring Records in MLBCRP (July 2019 to June 2020)

31. The construction activities were limited during the monitoring period due to only one water closure period was available (from August to November 2019) to continue work in the LB canal area, and the second water closure period from March to May 2020 was unattended due to Covid-19 pandemic situation.

32. Following sections summarize the contractor's environmental safeguard compliance status as per the monitoring records of EMS during his monitoring visits, and meetings held with the contractor's representatives.

##### 3.2.1 MLBCRP-ICB-1

33. MLBCRP-ICB-1 area related to Minipe anicut raising and related work were continued except during November 2019 to January 2020 period due to the annual river flood and rainy conditions. Most of the environmental issues related to MLBCRP-ICB-1 arose due to inadequate attention by the Contractor (CGGC) to implementing best engineering practices such as erosion control, dust control, and "housekeeping" in the batching plant area.

34. **Table 3-1** summarizes the Environmental Non-compliance Records (E-NCR) or Environmental Incidents recorded during reporting period from July 2019 to June 2020.
















**Table 3-1: Summary of Environmental Non-compliances recorded during the reporting period**





#	Issue	Date of Record	Corrective Actions taken and progress summary with the dates
i.	Washing away part of coffer dam due to flood & other damages to the anicut site – Minipe. As a result of above incidents, contamination of downstream water due to silt, oil & other debris etc. and erosion of the coffer dam are apparent.	02.12.2019	<ul style="list-style-type: none"> <li>Reinstated coffer dam with adequate erosion protection &amp; toe of retaining wall to reduce possible damage from another flood event.</li> <li>Alarm system and communication network with upstream reservoirs for emergency preparedness was established.</li> <li>Checked the water quality through the CEA laboratory to understand the level of water contamination due to the issue, in the immediate D/S area from the anicut where the critical flora species inhabit as well as the D/S river stretch and start of LB canal. It was recommended by PMDSC to select SW2 &amp; SW3 sample locations in the Baseline report done by ITI (19-07-2018) and one location upstream to anicut. The key parameters checked as recommended by PMDSC included Temperature, pH, EC, TDS, Turbidity, Oil and Grease, total N, E-coli. (SW3 location is in Riverine forest near Minipe causeway while SW2 is in LB canal before the regulator)</li> <li>The sample collection was recommended immediately after the flood incident, but the sample collected on 17 February 2020 (Refer Annex 4 for the test report).</li> <li>As per the test results, analysed for domestic/ drinking water quality standards established by CEA, turbidity exceeds (by 6 times, 10 times, 20 times in the 3 sample locations) compared to the standard limit of 5 NTU, but other parameters are within the acceptable limits. Faecal coliform present in the sampled water, although it is within the desirable limits.</li> </ul>
ii.	The sediment washed off negatively impact the downstream water users, sensitive aquatic habitats, including the wildlife inhabiting in the tail end of the LB canal (Wasgamuwa NP) Remaining construction related debris between anicut & causeway. Possible soil erosion & siltation during rehabilitation of coffer dam.	14.01.2020	<ul style="list-style-type: none"> <li>Removed all debris remained in the area. Also removed small pieces of polythene retained on trees at immediate D/S area of the anicut.</li> <li>Erosion protection measures were adopted in the coffer dam, but not in the downstream area with silt traps</li> </ul>
iii.	Some batch concrete mixture washing activity traced at unapproved disposal site which was previously stopped by the Consultant / ADB	27.02.2020	<ul style="list-style-type: none"> <li>The Contractor was strictly advised to restore the site immediately &amp; not to use the site for any construction related activity.</li> <li>The site was restored next day after the incident</li> </ul>
iv.	A branch of a tree located by the side of LB canal has been removed by the Contractor without informing the Engineer	10.03.2020	<ul style="list-style-type: none"> <li>An EIR issued to the Contractor. The Contractor agreed to inform the Consultant in future activities</li> </ul>
v.	Presence of debris (boulders, soil & concrete etc.) on closed LB canal section observed as a result of demolition of LB retaining wall	21.04.2020	<ul style="list-style-type: none"> <li>The contractor was advised to use those material to construct temporary access road needed to access LB head regulator / silt ejector area during reconstruction period with adequate measures for soil erosion &amp; flood impact.</li> </ul>

#	Issue	Date of Record	Corrective Actions taken and progress summary with the dates
			<ul style="list-style-type: none"> <li>Later those material can be used for back-filling of temporary bypass canal.</li> </ul>
vi.	Open burning of debris reported in the middle of the riverbed, D/ S to anicut inside the wildlife protected area	25.06.2020	<ul style="list-style-type: none"> <li>The Contractor was strictly advised not to repeat the offence, which is violating condition of the environmental approval and to restore the site immediately.</li> <li>EIR issued on the incident</li> </ul>

35. **Figure 3-2** provide the photographic evidences related to the environmental issues notified related to MLBCRP-ICB-1 site.

	
Environmental Monitoring Committee (EMC) of CEA and other key stakeholder agencies visited the site on 10 October 2019 to renew the environmental approval	Flood damage in December 2019
	
Some batch concrete mixture washing at unapproved disposal site	Rehabilitated the coffer dam (Completed in February) with erosion protection
	
Cutting a branch of a tree without informing the Engineer	Presence of debris (boulders, soil & concrete etc.) on closed LB canal section

<ul style="list-style-type: none"> <li>Felling of 21 trees below the LB retaining wall completed and branches of 4 trees removed. STC removed main logs from the site by the end of June 2020</li> <li>Approval for felling of 26 trees and removing branches of 4 trees were granted by DWC on 03 April 2019, through the letter Ref. Wajee/6/12/545-ii. These trees were identified in the IEE and prior to receiving the approval, DWC carried out a separate joint inspection with the Contractor and the Engineer. The most wanted trees were identified for removal as per the design and construction plan</li> </ul>	 
 	
Open burning of debris reported in the middle of the riverbed, D/ S to anicut	Silt material deposited on the sensitive ecosystem inhabiting Cryptocoryne plant
	
No proper waste disposal method implemented (Sept 2019)	Concreting work is carried out without adopting required mitigation to avoid contamination of the water

	
No dust barriers around the stockpile inside the anicut construction area	The sedimentation / retention pond system is excavated deeply, and not interconnected as described in the original MS to drain clear water into the soakage pond.
	
No dust covers to protect the public and neighbourhood in the batching plant area	Stagnant water with algal blooms which are possible mosquito breeding






**Figure 3-1: Photographic evidences for the environmental monitoring findings during the reporting period**



### 3.2.2 MLBCRP NCB packages



36. There was no major issues reported as most of the rehabilitation work was within the existing LB canal, and the reported issues were not significant and are reversible. **Table 3-2** summarizes the environmental monitoring findings recorded during reporting period in other NCB packages.

**Table 3-2: Environmental Monitoring findings in NCB packages of MLBCRP**

Package	Incident	Corrective Action
NCB-1	<ul style="list-style-type: none"> <li>Feb 2020 - EPL of batching plant has expired on 22nd February 2020</li> </ul>	<ul style="list-style-type: none"> <li>Letter issued to remind the renewal of EPL on 20 May 2020</li> <li>According to The Contractor, they are not going to use the plant further</li> </ul>

Package	Incident	Corrective Action
NCB-2	<ul style="list-style-type: none"> <li>Oct 2019 - Sludge disposal arrangement in the sedimentation tanks &amp; keep the area free from debris</li> </ul> 	<ul style="list-style-type: none"> <li>Made arrangement with a cement brick producer to dispose sludge. Area around batching plant cleaned.</li> </ul> 
	<ul style="list-style-type: none"> <li>Nov 2019 - CEA noted that current truck washing area was improperly managed</li> </ul> 	<ul style="list-style-type: none"> <li>Brought truck washing area to-wards sedimentation tank area &amp; restored previous washing area</li> </ul> 
	<ul style="list-style-type: none"> <li>Sep 2019 - At 62 + 775 gabion wall damaged by elephants</li> </ul> 	<ul style="list-style-type: none"> <li>The location identified as resting place for Elephants and decided to limit reconstruction work to facilitate elephants.</li> </ul>
NCB-3	<ul style="list-style-type: none"> <li>E-NCR issued on 1st November 2019 regarding following issues               <ol style="list-style-type: none"> <li>Stockpiles along the canal bank without proper environmental safeguard measures, and coffer damming with loose soil in the canal bed without applying standard methods.</li> <li>Batching plant area – no proper method implemented to dispose sludge, and the sedimentation tank in the batching plant not functioning properly which cause increase of alkalinity in soil and water in the adjacent areas.</li> <li>Oil spill from a construction vehicle (crane) on the road &amp; near the canal bank unattended for months.</li> <li>No environmental officer on site.</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>Most of previously identified environmental issues were unattended by the Contractor &amp; continuing work with rough negligence.</li> </ul>

Package	Incident	Corrective Action
		
	<ul style="list-style-type: none"> <li>Dec 2019 - Damage to elephant fence reported due to construction activities from 62+350 to 63+250 km</li> </ul> 	<ul style="list-style-type: none"> <li>The Contractor rectified the damaged fence.</li> </ul>
	<ul style="list-style-type: none"> <li>Jan 2020 - EPL of batching plant has expired on 31<sup>st</sup> December 2019</li> </ul>	<ul style="list-style-type: none"> <li>Letter issued to remind the renewal of EPL on 20 May 2020</li> <li>EPL renewed On 28 May 2020</li> </ul>
NCB-4	<ul style="list-style-type: none"> <li>Since the construction work was over, there were no records of noticeable issues were found related to package NCB-4.</li> <li>Site restoration plans were reviewed and the site was prepared for handing over</li> <li>Final inspection pending for site handing over.</li> </ul>	N/A
NCB-5	<ul style="list-style-type: none"> <li>Oct 2019 - Disposal of concrete chips</li> </ul>	<ul style="list-style-type: none"> <li>Handover those chips to a local concrete product manufacturer</li> </ul>

Package	Incident	Corrective Action
	<ul style="list-style-type: none"><li>Aug to Oct 2020 - Bumble bee colonies found beneath the bridge of Halaka Oya which was obstruction to installation work of RGS.</li></ul> 	<ul style="list-style-type: none"><li>Bumble bee colonies safely relocated with the help of a conservation NGO, "Bigu Sampath Surakimu"</li></ul> 

## 4 PROGRESS OF REFORESTATION IN MLBCRP

37. Total of 91 ha was reforested under the MLBCRP through the contractors, including 5 ha through ICB-1 package. All the lands reforested under the NCB contract packages (86 ha) have been handed over to the PD-PIU in MLBCRP area by the end of April 2020.

**Table 4-1: Summary of the reforested lands and extents under MLBCRP**

Package	Site Location	Extent (ha)	Final Inspection date	Handed over date
NCB 1	Alukumbura & Asamodagamyaya lands (Canal Reserv.) and Sangabhodhi school land	1.006	22.10.2019	30.12.2019
NCB 2	Udawela, Ulpothagama & R. Premadasa school lands	1.2121	30.12.2019	07.01.2020
NCB 3	15 land plots (14 along canal reservation & 1 at Maraka Wewa)	15.0	24.10.2019	09.12.2019
NCB 4	Amuneyaya FD land (PSO 2)	62.5	09.01.2020	07.02.2020
	Lediayangala Primary School and Gamburuoya FD land (PSO 1)	1.43	19.02.2020	27.05.2020
	Handungamuwa, Medakanda, and Weheragalayaya school lands and Ladiyangala ID land (PSO 3)	4.86	02.03.2020	27.05.2020
ICB 1	Asamodagamyaya in VRR sanctuary under DWC	5.00	June 2020	Not yet
	Total	91.008		

38. However, PD-PIU has recommended that PD-PMU will need to arrange finance for the maintenance of those lands through the relevant landowners of Irrigation Department, and schools.

39. **Table 4-1** summarizes the details related to the reforestation progress in the MLBCRP area which was carried out through the contractors under the Provisional Sum items allocated for the implementation of additional environmental mitigation measures as recommended in the IEER.

**Table 4-2: Progress achieved on reforestation under MLBCRP**






Contract Package	Progress
ICB-1	<ul style="list-style-type: none"> <li>▪ It was decided to limit reforestation through contractor for 5 ha (which is started at Asamodagamyaya) and to utilize balance budget to reforest in VRR sanctuary areas through FD, due to the low rates of the FD compared to the contractors (Ref. letter from PD-PIU on 03.01.2020).</li> <li>▪ But later, PMU/PIU decided to implement the balance reforestation work under the MLBCRP ICB 1 contractor and advised PMDSC to reforest another 60 ha of the lands in the Theripeha located within the VRR sanctuary under the jurisdiction of DWC. PSO preparation followed by the site visits to the area by PMDSC is in progress, and planning to initiate planting in September 2020.</li> <li>▪ Tree planting work of Asamodagamyaya land started on 02-01-2020. About 2,100 plants planted by end of January 2020, and CGGC informed Engineer that planting of total 2,500 was completed by 14 Feb 2020.</li> <li>▪ The plant maintenance work has been started from 10 Feb 2020</li> <li>▪ 2 EMS made a joint site inspection with the reforestation sub-contractor, on 27 and 28 Feb 2020 to the planted areas to update the progress and following findings been made:               <ul style="list-style-type: none"> <li>a) The plan was to enrich tank upstream / catchment areas more, but CGGC has planted trees at the D/S of tank bund, and highland areas along the elephant fence clearing existing trees, which cannot be accepted, as the survival/ sustainability of the plants in such area is uncertain. Normally larger trees do not encourage in such areas, and during O&amp;M have to cut the trees along the elephant fence, toe of the dam as could hinder the function of those.</li> </ul> </li> </ul>

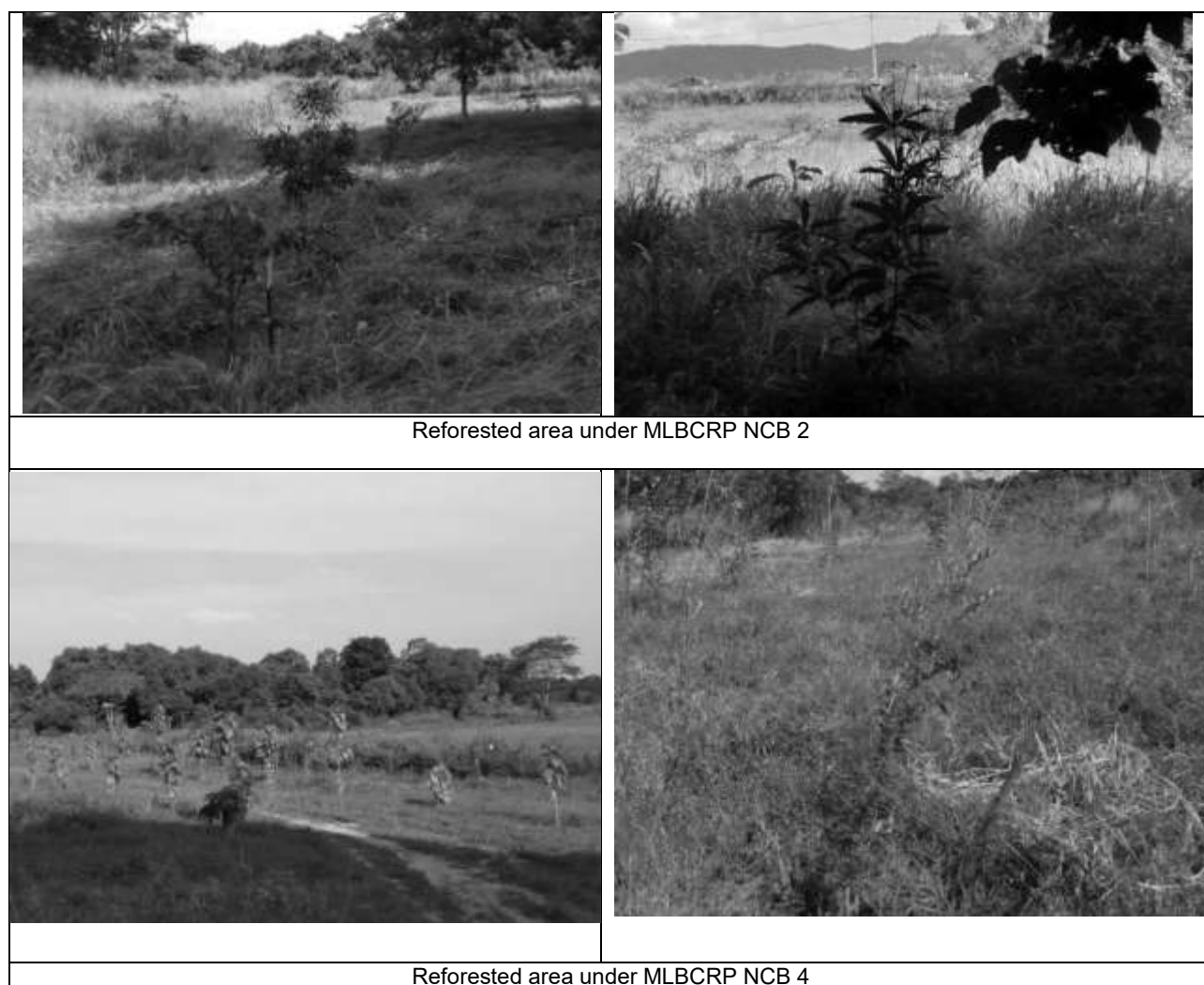


	<p>b) Noted that the species diversity is low and some water loving plants like Kubuk had been planted in highland areas</p> <ul style="list-style-type: none"> <li>As per the monitoring visit made in end May 2020, it was reported that the maintenance of the site was not satisfactory and informed the contractor (Refer PMDSC-ML-Site/ICB 1/CGGC/547 on 17.06.2020 and PMDSC-ML-Site/ICB 1/CGGC/529 on 21.05.2020), and the sub-contractor responded that it was due to the movement restrictions imposed by government due to Covid 19. But in June 2020, the gap filling had been done for the damaged plants, and maintenance by weeding and watering is in progress.</li> </ul>
NCB 1	<ul style="list-style-type: none"> <li>Reforestation land handed over to PIU – Letter ref: PMDSC-ML-Site/NCB-1/PIU/167 dated 30 Dec 2020</li> <li>PD-PIU had been informed by the Sri Sangabodhi School that they need some gardening equipment to maintain the reforested area under NCB 1 contract, and it was informed to Engineer on 05 March 2020 to make arrangement to purchase such using the remaining PSO budget. Pending decision from Engineer until PMU approval is granted.</li> </ul>
NCB-2	<ul style="list-style-type: none"> <li>The reforestation final report as per the PMDSC requirements was submitted by the Contractor on 17 October 2019 (Letter Ref. MLBCRP: N2-In-L808) and survey plan as per RE's surveyor's requirements was submitted through letter MLBCRP: N4-In-L438 on 2019.12.09</li> <li>Reforestation Joint Inspection completed based on above plans by end Dec 2019. The joint inspection for final monitoring was completed by 30 Dec 2019. Summary details of the lands are as follows: <ul style="list-style-type: none"> <li>a) Udawela Bandaranayake school -154 plants available out of 165 planted</li> <li>b) Ulpothagama primary school – 183 plants available out of 206 planted</li> <li>c) R. Premadasa National school – 80 plants available out of 91 planted</li> </ul> </li> <li>Reforestation land handed over to PIU – Letter ref: PMDSC-ML-Site/NCB-2/PIU/117 dated 07 Jan 2020</li> </ul>
NCB-4	<ul style="list-style-type: none"> <li>Joint inspection for final monitoring was completed on 09 Jan 2020, with the participation of Forest Department, relevant PMDSC, PMU and contractor's staff. Inspection revealed that the growth of the plants is hindered due to lack of proper maintenance / weeding from FD side due to their administrative constraints.</li> <li>Based on the sample survey carried out in Jan 2020, the survival rate of the plants by was estimated as approximately 60 %. Service agreement between the NCB 4 contractor and FD was terminated, and land handed over to the Employer (as per PSO 2) through letter Ref. PMDSC-ML-Site/NCB-2/PIU/080 dated 07 Feb 2020.</li> <li>Reforestation Joint Inspection completed on 02 March 2020 for PSO 3 and sites handed over to employer on 27 May 2020 with the complete set of documents including survey plans.</li> </ul>
NCB 3	<ul style="list-style-type: none"> <li>Reforestation Joint Inspection completed in Nov 2019, and the final monitoring report prepared by PMDSC with recommendations, along with the report from the Contractor, survey plans indicating planted areas, and plant locations including species handed over to PIU on 09 Dec 2019.</li> <li>PD-PIU has officially shared the draft MoU and informed the Director Irrigation of Kandy to support the O&amp;M of these reforested areas of 15 ha for next 1.5 years signing MoU on 04 October 2019.</li> </ul>

40. Some photographic evidences related to reforestation activities in the MLBCRP area are shown in the **Figure 4-1**.

Joint inspection for NCB 3 reforestation lands with DWC & PIU officials	Joint inspection for NCB 1 reforestation lands
Gamburuoya reforestation land of FD - NCB 4	Joint inspection for NCB 2 reforestation lands
Initial visit to Asamodagamyaya Reforestation land to commence survey work	Asamodagamyaya tree planting work start-up ceremony with public awareness

	
Asamodagamyaya Reforestation land by June 2020	
	
Initial visit to Theripaha Reforestation land –Nov 2019	Reforested area under MLBCRP NCB 3
	
MLBCRP-NCB-1 site at Morayaya School	



**Figure 4-1: Photographic records related to reforestation activities conducted during the reporting period**

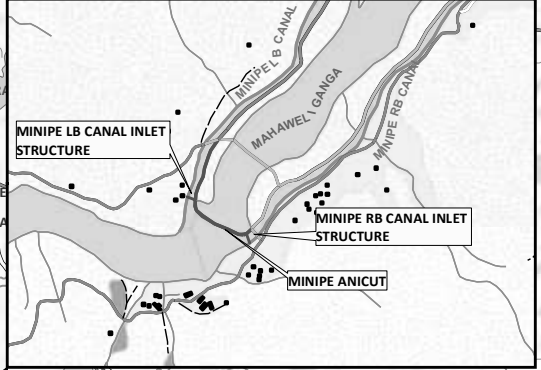
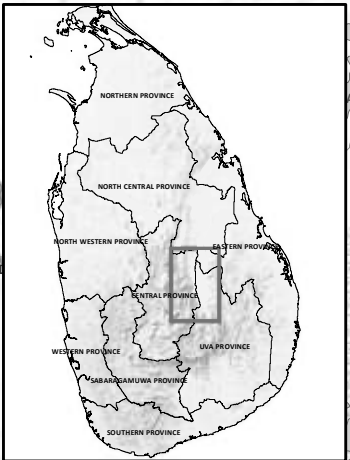
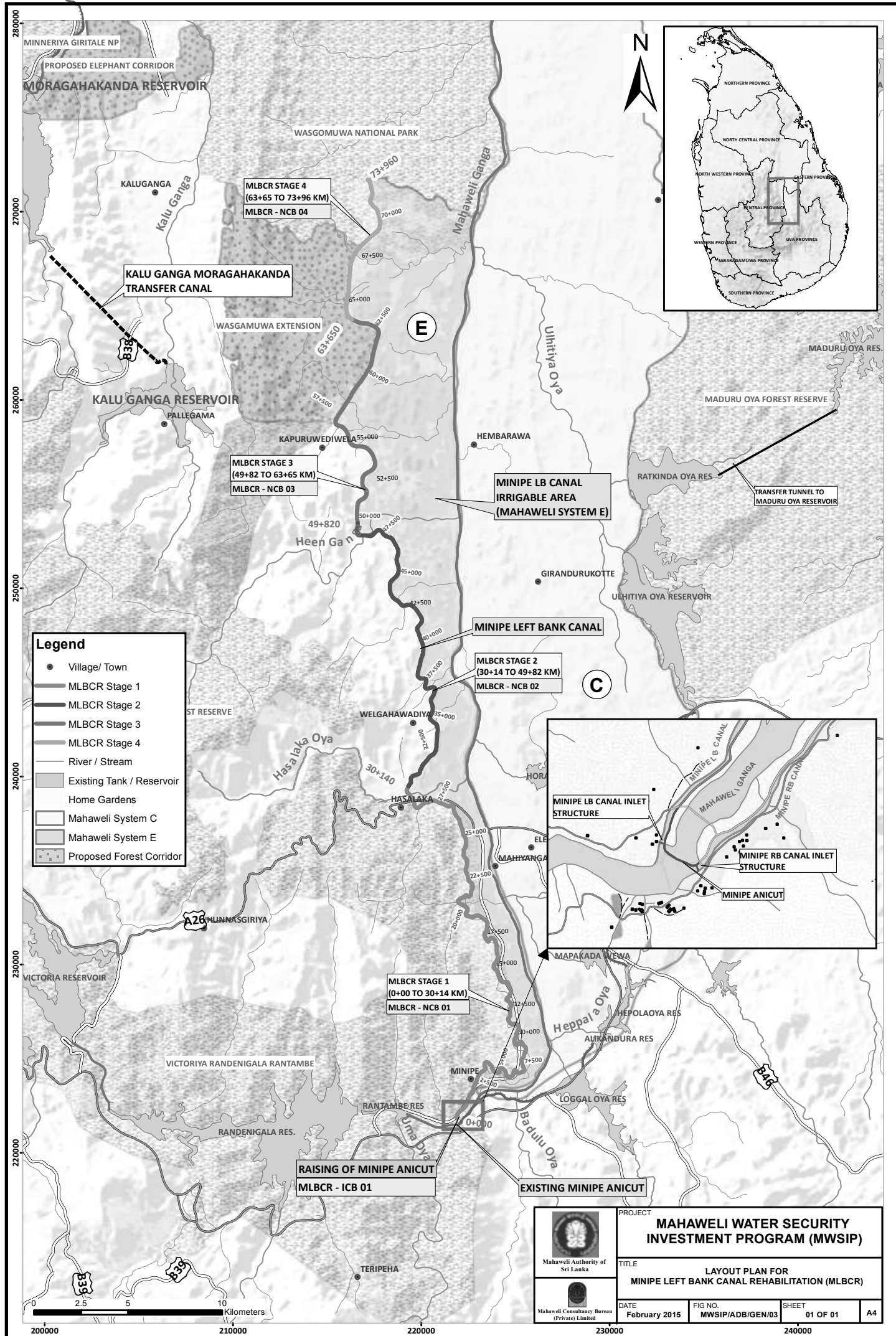
## **5 PLANNED ACTIVITIES FOR NEXT YEAR (JULY 2020 – JUNE 2021)**

41. In addition to the routine contract management and supervision activities under Task 3, following additional activities is planned under the PMDSC for next year in MLBCRP area:

- (i) Prepare the environmental completion reports for MLBCR-NCB-4 and NCB 5, and other packages if completed as scheduled
- (ii) Preparation of supplementary report for the IEE on the new work proposed related to RB spill
- (iii) Issue Provisional Sum Order (PSO) for MLBCRP-ICB-1 to implement reforestation in the identified 80 ha in Theripehe area, which comes under the Wildlife protected area of VRR sanctuary
- (iv) Initiate habitat restoration in the Minipe anicut area
- (v) Complete environmental quality monitoring in the MLBCRP area compared with the baseline measurements

## **Annex 1:**

### **General land use map of the MLBCRP area**



**Legend**

- Village/ Town
- MLBCR Stage 1
- MLBCR Stage 2
- MLBCR Stage 3
- MLBCR Stage 4
- River / Stream
- Existing Tank / Reservoir
- Home Gardens
- Mahaweli System C
- Mahaweli System E
- Proposed Forest Corridor

  
Mahaweli Authority of  
Sri Lanka

  
Mahaweli Consultancy Bureau  
(Private) Limited

**PROJECT**  
**MAHAWELI WATER SECURITY  
INVESTMENT PROGRAM (MWSIP)**

**TITLE**  
**LAYOUT PLAN FOR  
MINIPE LEFT BANK CANAL REHABILITATION (MLBCR)**

**DATE**  
February 2015

**FIG NO.**  
MWSIP/ADB/GEN/03

**SHEET**  
01 OF 01

**A4**

## **Annex 2:**

# **Environmental Emergency Action Plan (EEAP)**



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**NIRAS**

PROGRAM MANAGEMENT, DESIGN AND SUPERVISION CONSULTANT

# Mahaweli Water Security Investment Program

## Emergency Environment Action Plan for Construction Site Closure due to COVID-19 Outbreak



**Ministry of Mahaweli  
Development and Environment  
Sri Lanka**



April 2020

**Revised Draft Report**

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# Contingency Environment Action Plan

Project Number      H.503409  
Subject                Project Report  
Project Director      Dr. Beau Freeman  
Country                Sri Lanka

Project Title:      **Mahaweli Water Security Investment Program**

Client                Ministry of Mahaweli Authority for Development and Environment

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# 1 INTRODUCTION

1. With the GoSL decision to restrict movements of the public as a measure to control spreading of COVID-19 disease, the construction sites were immediately closed from 20 March 2020. The sudden site closure resulted in various environmental issues due to lack of site maintenance, and inability to carry out monitoring by the contractors' and the Engineer's staff. The enforcement of curfew and travel restrictions out of the district boundaries created a difficult situation with regard to arranging staff for the regular supervision and monitoring work.
2. An emergency environmental incident is a sudden and immediate threat to the wellbeing of the physical, social, and biological environment associated with the construction sites under MWSIP, and this action plan will address the key areas that need attention to manage adverse consequences.
3. However, keeping the minimum required staff (with necessary approvals from GoSL, which will be assisted by PMDSC and Client on request) to ensure due maintenance of site safety and security including environmental emergency management is a Contract obligation of the Contractor. The Contractor's method for managing such emergency is presented in the "Emergency Response Plan", approved by the Engineer/ Consultant.
4. With complete site closure, no routine construction, material transportation, operation of plant or machineries will be permitted, and no full staff with the workforce will be available at the sites. With the site isolation unauthorized and unforeseen releases of hazardous, polluting substances, as well as entry of unpermitted people into the wildlife / forest protected areas for poaching, hunting and making wildfires, potential "Health & Safety risks" to the public, such as "spread of COVID-19" from limited staff mobilized by Project, road accident at barricaded canal crossing or detour location or collapsing excavated canal banks, risking property/ life and wild animals (elephants) entering into villages from the gates managed by the Project can happen. These actions can cause immediate, unacceptable short-term or long-term threats to the environment and persons in the surrounding area.

## 1.1 Purpose

5. Environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts, due to the regular project implementation cycle not being in place. The ongoing COVID-19 Outbreak led GoSL to limit the exposure of people to the virus by enforcing curfew and travel restrictions inside the country as well as internationally. As a result, site operations were temporarily stopped.
6. Hence, as a part of ADB SPS (2009) it is required to prepare an action plan considering the potential emergency risks at similar accidental, emergency situations. This Contingency Environment Action Plan will include (i) Environmental Management System (EMS) in place; (ii) anticipated environmental risks; (iii) emergency environment response actions.
7. This document, hence, will ensure providing due guidance and support the Contractors to avoid, minimize, control and mitigate environmental incidents under the emergency context. A separate report addressing health and safety risks similar to this action plan is being prepared by PMDSC.

## 1.2 Scope

8. The purpose of this action plan is to document the procedures and actions to be implemented during an emergency situation, to manage the potential environmental risks in the construction sites.

9. This emergency Environment Action Plan will be a supplement to the site specific EMPs, with the aims to:

- i. Ensure that all specific environmental measures as listed in the EMP/ CEMP are in place at the site level;
- ii. Facilitate with environmental compliance requirements as per the GoSL Environmental regulations, and ADB SPS (2009);
- iii. Support the contractors and the PMDSC contract supervision and management following occurrence of any emergency situation or sudden site closure;
- iv. Provide a Framework for MWSIP to prepare for and respond to emergency environmental incidents, communicate with the appropriate parties in the event of emergency environment incidents, investigate cause, and mitigate the environment incident as required without permitting it to become a disaster.



## 2 ENVIRONMENT MANAGEMENT SYSTEM TO BE IN PLACE

10. The existing Organization and Environmental Management system is described in Figure 2-1. However, with the travel restrictions, the full-scale environment management and monitoring system cannot be fully practised.

11. Since the GoSL advised to both public and private sector to work from home with the enforcement of curfew, the safeguards cell in the Program Management Unit (PMU), and Program Implementation Unit (PIU) are not active. The environmental team of the Program Management Design Supervision Consultant (PMDSC) is subject to restrictions of movement following the government's decision on working at home, but will be partially activated coordinating with contractors to attend to required mitigatory work and actions required to manage high and moderate risk situations. Permissions for curfew waivers for key staff are currently being agreed with the PMU.

12. The two counterpart personnel of Environmental Specialist in PMU, and Senior Environmental Officer (SEO) assigned to the Project Director (PD) of PIU will be available remotely or on site as required to assist and make required coordination between key stakeholder agencies and counterpart staff at the village level.

13. PMDSC's obligations include administering and supervising the contracts, under the Team Leader (TL) and Chief Resident Engineer (CRE), though respective Resident Engineers (RE) assigned to each contract package with a selected team of staff to work intermittently. The RE assumes primary responsibility for ensuring the environmental safeguard management at the site level, and the relevant activities will be guided and facilitated by the Environmental Specialist (ES) of PMDSC and 3 Environmental Monitoring Specialists (EMS) of the PMDSC assigned for the 3 project areas, Minipe, Upper Elahera Cana, and North Western Province.

14. Table 2.1 summarizes the roles and responsibilities during the emergency situation to manage the possible environmental risks in the site levels, including contact details of the relevant key personnel.

**Table 2-1: Key PMU/PIU and PMDSC staff relating to safeguard compliance**

Entity	Position	Name / Contact details	Role and responsibilities at the emergency period
PMDSC	<ul style="list-style-type: none"> <li>Environmental Specialists (ES)</li> </ul>	Name: Dr. Anusha Kasige Contact details: +94777589470	<ul style="list-style-type: none"> <li>The overall coordination with the 3 EMS to manage site monitoring</li> <li>Notify outside authorities if assistance required through PMU/PIU environmental team (through TL of PMDSC)</li> <li>Responsibility for coordinating actions among the PMDSC team in accordance with the environmental needs of the situation</li> </ul>

Entity	Position	Name / Contact details	Role and responsibilities at the emergency period
			<ul style="list-style-type: none"> <li>• Status update to the TL and CRE of PMDSC copying to respective REs</li> </ul>
	<ul style="list-style-type: none"> <li>• Environmental Monitoring Specialist (EMS) for NWPCP</li> </ul>	Name: Nalinda Peries Contact details: +94773250897	<ul style="list-style-type: none"> <li>• PMDSC to obtain an inventory of key environmental/ social and safety issues observed with respect to each contract along with mitigation measures that have been adopted/ are in place.</li> <li>• EMS with environment / safety officer of the Contractor to assess each such action and decide on issues/ project sites which would need special focus (e.g.. cut slope sections which could collapse in an event of rain/ flood, open cut sections through wildlife areas)</li> <li>• Obtain Contractors overall plan for managing site &amp; time specific potential environmental hazards as per Emergency redress plan, Method statements and Compliance requirements.</li> <li>• Periodical site monitoring to oversee the situation</li> <li>• Report, record and update on any environmental issue to RE/ES PMDSC</li> <li>• Coordinate with the Contractor to manage the situation</li> <li>• Take overall responsibility for implementing relevant mitigation actions through the contractor / responsible party of the emergency response work force</li> <li>• Supervise the actions of the Emergency Response Team to ensure all environmental aspects are out of danger/risk.</li> <li>• Notify PMU/PIU if assistance required</li> </ul>
	<ul style="list-style-type: none"> <li>• EMS - UECP</li> </ul>	Name: R. M. Premawardena Contact details: +94773693762	
	<ul style="list-style-type: none"> <li>• EMS - MLBCRP</li> </ul>	Name: Sucharitha Kannangara Contact details: +94717113477	
PMU	<ul style="list-style-type: none"> <li>• Environmental Specialist</li> <li>• Social and Resettlement Specialist</li> </ul>	Name: P. Moonamale Contact details: +94771035020	<ul style="list-style-type: none"> <li>• Facilitate and ensure compliance with SPS (2009), all government rules and regulations regarding permits as well as any other relevant approvals required for works for which they are responsible</li> </ul>

Entity	Position	Name / Contact details	Role and responsibilities at the emergency period
			<ul style="list-style-type: none"> <li>• Liaise with the environmental agencies and seeking their help to solve the environment-related issues</li> </ul>
PIU	<ul style="list-style-type: none"> <li>• Senior Environmental Officer (SEO) - NWPCP</li> </ul>	Name: Rohana Bandara Contact details: +94718323227	<ul style="list-style-type: none"> <li>• Conduct ongoing consultation with the community</li> <li>• Grievance Redress Mechanism (GRM) to be modified to solve the environmental issues during the site closure period and monitor that it is operated satisfactorily coordinating with the relevant stakeholder groups and community</li> <li>• Liaise with the environmental agencies and seek their help to solve the environment-related issues</li> <li>• Assist with Engineer to the Contractor to disseminate warnings and information as required to ensure all people in the immediate area have been warned and evacuated either by alarms or by word of mouth.</li> </ul>
	<ul style="list-style-type: none"> <li>• SEO - UECP</li> </ul>	Name: Sanjeewa Kosgolla Contact details: +94774403117	
	<ul style="list-style-type: none"> <li>• SEO - MLBCRP</li> </ul>	Name: Gayani Herath Contact details: +94702698328	

**15.** In addition to the above, key personnel, essentially the Contractor's Representative are to be engaged with site monitoring and attend to required corrective actions to mitigate the key issues. Project Manager (PM) of the Contractor is specified as the focal point from contractors' organisations who has the authority to manage resources under the respective contractors, and PM shall be assisted by the EO of each contractor to engage with implementing emergency environment action plan.

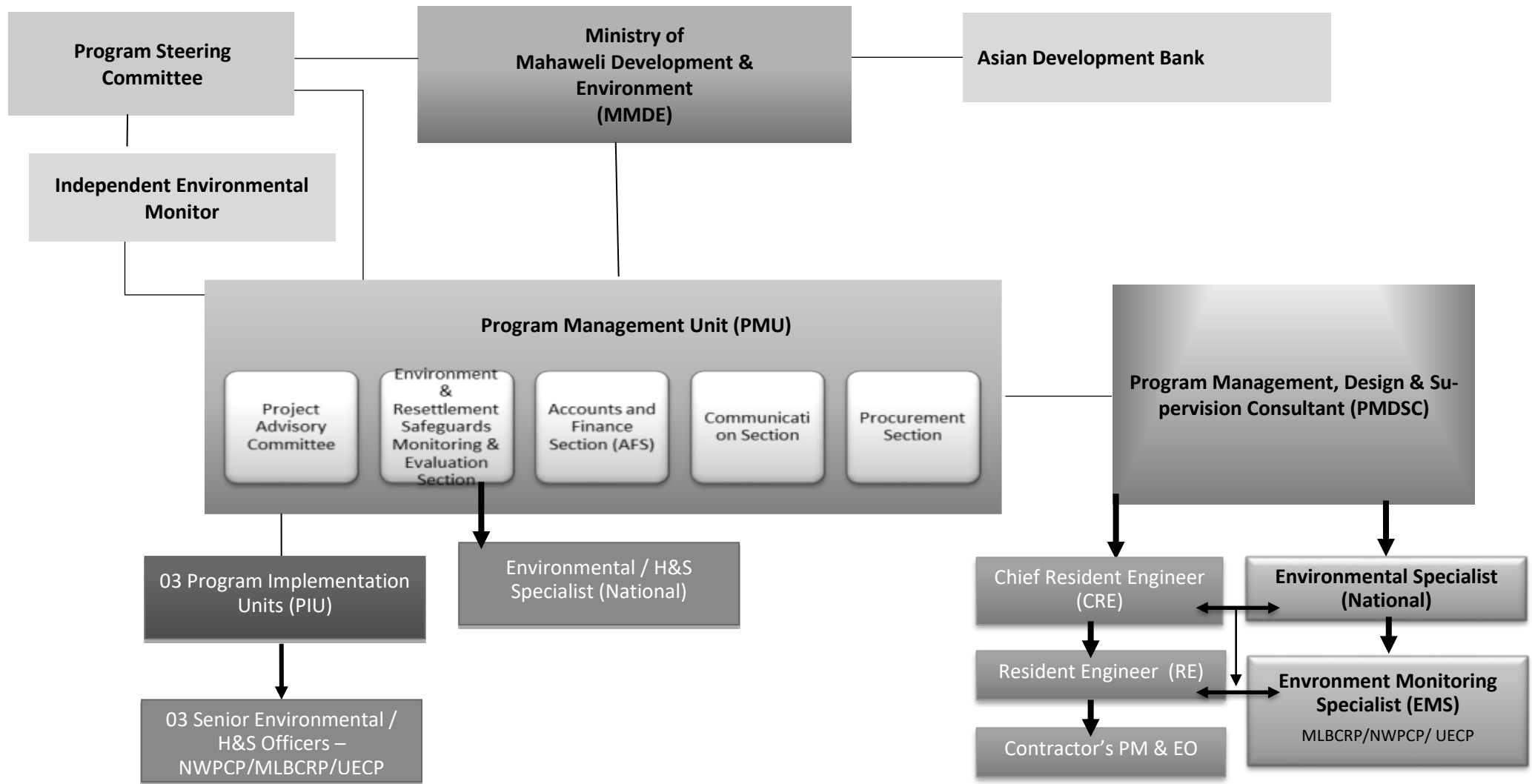


Figure 2-1: MWSIP Environmental Management Organization Chart

### 3 ANTICIPATED ENVIRONMENTAL RISKS DURING SITE CLOSURE

#### 3.1 Legal status and Responsible Stakeholder Agencies

16. Summary of the required compliance status in line with the ADB SPS (2009) and conditions and recommendations given in the Environmental Approvals issued by Central Environment Authority (CEA) and other stakeholder agencies, such as Department of Wildlife Conservation (DWC) and Forest Department (FD) adhering to the National Environment Act (NEA) and relevant environmental regulations, policies and frameworks described in the respective Environment Impact Assessment Reports (EIAR) prepared for NWPCP and UECP, Initial Environment Impact Assessment reports (IEER) for MLBCRP under MWSIP, and the relevant package specific updated EMPs.

17. Information about the key stakeholder agencies based on the land ownership where the contract packages are located is important for decision making and implementing actions in addition to the requirements of the Central Environment Authority (CEA). Table 3-1 summarizes those key agencies that need to be informed at the emergency period through the PMU or PIU.

**Table 3-1: Environmental Risk Level and Key Stakeholder Agencies to be contact at Emergency**

Construction package	Ownership of the project area	Level of Environmental sensitivity	Environment Risk level
MLBCRP-ICB-1	<ul style="list-style-type: none"> <li>DWC</li> <li>ID, CEB, DS Hasalaka, MASL are the other stakeholder agencies involved in management</li> </ul>	<ul style="list-style-type: none"> <li>Located in a protected area (Victoria Randenigala Rantambe – VRR sanctuary), with wildlife movements to a certain extent under the jurisdiction of FFPO</li> <li>High risk due to safety of cofferdam / breached anicut, temporary deep cut for the bypass canal</li> <li>High risk due to presence of explosive magazine / oil tanks etc.</li> <li>Elephant fence is maintained by DWC established around the site</li> <li>Public road, few residential houses located around the site</li> </ul>	HIGH

MLBCRP packages	NCB	<ul style="list-style-type: none"> <li>ID</li> <li>Relevant DS, GN and PS authorities</li> </ul>	<ul style="list-style-type: none"> <li>Residential area – Socially sensitive</li> <li>NCB-4 package overlaps with the wildlife protected area (National park)</li> </ul>	MODERATE
NWPCP-NCB-1		<ul style="list-style-type: none"> <li>ID</li> <li>Relevant DS, GN and PS authorities</li> </ul>	<ul style="list-style-type: none"> <li>Wemedilla tank and canal area is within a residential area with rural community</li> </ul>	MODERATE
NWPCP-ICB-2		<ul style="list-style-type: none"> <li>DWC &amp; FD</li> <li>Relevant DS, GN and PS authorities</li> </ul>	<ul style="list-style-type: none"> <li>About 3 km of the canal is associated with the Kahalla Palkelele Sanctuary and Forest Reserve with significant amount of wildlife movements</li> <li>Risk of wildfires during dry weather conditions</li> <li>Risk of poachers, hunters entering into protected areas</li> <li>If the fence is damaged, elephants will invade villages</li> <li>Elephant fence &amp; gates maintained through security personnel</li> <li>Residential, with rural community at a risk</li> </ul>	HIGH
UECP-ICB-1		<ul style="list-style-type: none"> <li>DWC &amp; FD</li> <li>MASL</li> </ul>	<ul style="list-style-type: none"> <li>Entire canal with excavated, open sections is within the Elehera Giritala sanctuary and Forest reserve with significant amount of wildlife movements</li> <li>Risk of falling animals into excavated sections</li> <li>Presence of explosives</li> <li>Risk of poachers, hunters entering into protected areas</li> <li>Risk of wildfires during dry weather conditions</li> </ul>	HIGH
UECP-ICB-2B		<ul style="list-style-type: none"> <li>FD / DWC</li> <li>MASL</li> </ul>	<ul style="list-style-type: none"> <li>The project area is within the protected forest reserves associated with</li> </ul>	HIGH

		Knuckles Forest range and wildlife sanctuary <ul style="list-style-type: none"> <li>▪ Sensitive stream network</li> <li>▪ Presence of explosives</li> <li>▪ Risk of poachers, hunters entering into protected areas</li> <li>▪ Possibility of wildlife fires</li> </ul>	
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ID- Irrigation Department, FD- Forest Department; DWC – Department Wildlife Conservation; DS – Divisional Secretary; GN – Grama Niladhari; RDA – Roads Development Authority; FFPO – Fauna Flora Protection Ordinance; CEB – Ceylon Electricity Board; MASL – Mahaweli Authority; PS – Pradeshiya Sabha

### 3.2 Anticipated Environmental Risks at the emergency situation

18. The main causes for the possible risks are summarized in Table 3-2 below for the active packages under MWSIP, depend on the site locality.

19. Limiting or eliminating such causes will help to reduce the probable environmental risk during this emergency period, engaging limited number of workforces for implementation and monitoring.

**Table 3-2: Overall Risk Assessment for the active packages under MWSIP at the emergency situation**

Project Area Cause	MLBCRP	NWPCP	UECP
Lack of regular maintenance of the sites (oil spills, contamination with other chemicals, hazardous waste material)	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Lack of sufficient security arrangements	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Lack of dust controlling and regular watering (material stockpile areas, access roads, construction sites associated with residential /public areas etc.)	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Unlawful behaviors of the contractors (operating sites without notice to Engineer, nonpayment for the regular staff attend routine maintenance etc.)	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Lack of proper slope protection in the excavated section, or canals under construction	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Lack of appropriate erosion control, silt traps measures	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Loss of pipeline integrity, and lack of proper site drainage arrangements	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Hindrance to natural drainage and surface runoff and possible local flooding, property damages during heavy rains	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Not managing large stockpiles (lack of strengthened base of stockpile, no proper drainage arrangements, no dust covers etc.)	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Improper waste management	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Unmanaged explosives, magazines, stores with flammable chemicals etc. during hot weather conditions	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Lack of maintenance of electric and other fencing causes aggravation of Human Wildlife Conflicts	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Lack of proper communication procedures adopted during emergency site closure	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Lack of ground water management procedures / dewatering etc. in the deep excavated sections, which cause possible ground water depletion, community unrest due to well water level lowering during dry weather conditions	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Contractor and the site are not prepared for natural disasters (flood, wildfires etc.)	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Major facility faults (batching plant, chemical stores, waste treatment facilities, coffer dams etc.)	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B
Non-routine reforestation site maintenance	ICB 1 NCBs	ICB 2 NCB 1	ICB 1 ICB 2B

**High – H; Moderate – M; Low – L; Not Applicable – N/A**

20. The site closure will prevent from the spreading of deadly COVID-19 disease, and community, and the work force is protected from the risk of contamination with the virus. However, at any active labour camps with gangs, the labour force is at a risk, and unrest in the community in the area is likely, due to the movements of labour in the village areas.



## 4 EMERGENCY ENVIRONMENT RESPONSE PLAN

### 4.1 Emergency Response Actions

21. The measures provided in the sections below apply to all environmental incident scenarios. These measures will be executed in response to an environmental emergency to:

- i. Reduce the threat to human life or injury
- ii. Protect against environmental damage; and
- iii. Preserve infrastructure, product, equipment and natural resources

22. Accordingly, following “Emergency Response Action” the responsibilities of the relevant parties are shown in **Table 4-1**;

**Table 4-1: Responsibilities of Parties**

No.	Responsibilities
I	<p>Contractor shall:</p> <ul style="list-style-type: none"> <li>▪ Plan the proper site closure at emergency (i.e. due placement of safety infrastructures, notification, safe parking of equipment fleet &amp; storage of material and organize minimum required staff for regular site monitoring and maintenance with preparedness to follow GoSL special guidelines under the context and CEMP, Health Safety Plan and to duly activate the “Emergency Response Plan” protocols in case of emergency,</li> <li>▪ Submit the same plan (may be a draft to be updated later) to Engineer and establish communication links during closure,</li> <li>▪ Seek necessary assistance as required from Engineer/ Employer (like curfew permit)</li> </ul>
II	<p>Engineer shall:</p> <ul style="list-style-type: none"> <li>▪ Obtain the “emergency site closure plan” of the Contractor and communicate with Employer to facilitate to Contractor as necessary,</li> <li>▪ Ensure “site closure with complying to Contract obligations” (securing Employers obligations towards ADB and GoSL),</li> <li>▪ Organize for monitoring arrangements on Contractor’s site management at closure period and submit to Employer,</li> <li>▪ Establish communication link at closure period with Contractor and Employer</li> </ul>
III	<p>Employer shall:</p> <ul style="list-style-type: none"> <li>▪ Obtain both Contractor’s and Engineer’s emergency closure plan, facilitate liaising with GoSL Agencies to execute same and monitoring implantation (may be drafts to be updated later),</li> <li>▪ Organize to facilitate the same plans with mobilizing necessary human/ other resources,</li> <li>▪ Establish communication links with key GoSL stakeholder agencies at site closure,</li> <li>▪ Ensure preparedness to activate “Grievance Redress Mechanism” as suitable,</li> <li>▪ Disseminate necessary information as per the “emergency site closure plan” of Contractor to the potentially vulnerable communities in addition to relevant GoSL Authorities etc.</li> </ul>

23. More specific actions related to each construction site will be dependent on the type and location of the emergency environmental incident and may be managed by referring to the updated Environmental Management Plan (EMP).

#### 4.1.1 Emergency response actions to be undertaken by the Contractor

24. Emergency is an unforeseen situation that threatens the employees under each contract, or the public due to disrupts or shuts down site operations which causes environmental damage.

25. Hence, the priority action required from the contractor is to submit the updated plan based on the “Emergency Response plan” that deals with all types of environmental issues specific to the construction areas.

26. The environmental risk assessment carried out to prepare the CEMP based on your construction program and detail construction activities will provide a guideline to determine the content of the emergency action plan, and must include a minimum of the details shown in :**Table 4-2.**

**Table 4-2: Actions to be Taken**

Category	Action to be Taken
Environment Risk and required mitigations	<ul style="list-style-type: none"> <li>• Obtain an inventory of key environment/ social and safety issues observed with respect to each contract along with mitigation measures that had been adopted/ in place referring to updated EMP/CEMP and particular MS approved by Engineer</li> <li>• assess each such action and decide on issues/ project sites which would need special focus (E.g. cut slope sections which could collapse in an even of rain/ flood, risk on animals due to open cut sections through wildlife areas etc.)</li> </ul>
Site closure plan	<ul style="list-style-type: none"> <li>• Plan for the proper site closure at emergency (i.e. due placement of safety infrastructures, due arrangement for stream diversions, drainage arrangements, personnel for security, relevant notification, safe parking of equipment fleet &amp; storage of material in line with the Health Safety Plan, “Emergency Response Plan” etc.</li> <li>• Environmental management system to be in place, including procedures for employees who remain to perform or shut down critical plant operations, operate fire extinguishers, or perform other essential services that cannot be shut down</li> <li>• The site lay out plan with above relevant details and also indicating active and shut down areas, traffic plan for public during site closure, emergency escape procedures, indicating route maps, refuge areas</li> </ul>
Monitoring & Maintenance mechanism	<ul style="list-style-type: none"> <li>• Plan to organize minimum required staff for regular site monitoring and maintenance indicating list of names of the responsible personnel, with preparedness to follow GoSL special guidelines under the context of Covid 19</li> </ul>
Communication and reporting procedure	<ul style="list-style-type: none"> <li>• Updated list of key personnel such as the plant managers, EHS officers in order of priority, to notify in the event of an emergency during off-duty hours</li> </ul>

Category	Action to be Taken
	<ul style="list-style-type: none"> <li>• Display for public when the site is located in a residential or public area;</li> <li>• An alternative communications centre to be used in the event of a fire or explosion; and a secure on- or offsite location to store originals or duplicate copies of documents, emergency contact lists, and other essential records</li> <li>• Reporting procedure (same as before using updating Environment issue log, grievance log and share with the engineer/EMS through e-mail; daily, weekly, monthly reporting as applicable through e-mail, phone etc.)</li> </ul>
Availability of other resources to response at emergency situations	Refer section 4.2 of EEAP

#### 4.1.2 Role of Engineer / PMDSC at the emergency situation

27. ES and EMS of the Environmental team will be alert on the situation, and random site visits shall be made to monitor the site conditions, and update to the CRE, RE to inform the PMU/PIU safeguard cell;

28. Community consultation and contacts with the contractor's Environment Officer will be maintained regularly to obtain any information related to possible environmental risks;

29. Reporting and communication procedure will be followed as described in this action plan.

#### 4.1.3 General response to an emergency environmental incident

30. General response measures are outlined in Table 4-1.

**Table 4-3: General response measures to be adopted at an emergency environmental incident**

(1) Evacuate	<ul style="list-style-type: none"> <li>▪ All Non-essential people</li> <li>▪ Any critical / endangered fauna/flora species on the life threat</li> <li>▪ Any critical natural resources</li> </ul>
(2) Eliminate	<ul style="list-style-type: none"> <li>▪ Sources of ignition, sparks etc.</li> </ul>
(3) Stop and Coordinate	<ul style="list-style-type: none"> <li>▪ Stop Source of the incident (e.g. spill) and coordinate shut down of relevant equipment, if possible</li> </ul>
(4) Notify	<ul style="list-style-type: none"> <li>▪ Internal and external notifications               <ul style="list-style-type: none"> <li>(a) All emergency environmental incidents must be reported to the RE immediately, and RE to notify the CRE, ES/EMS of PMDSC, PIU/PMU</li> <li>(b) Contractor's EO to attend regular environmental incident reporting and inform the ES/EMS to monitor</li> <li>(c) ES/EMS will Carry out Environment Incident Reporting (EIR) following the normal procedures after visiting the site and notify to the RE to instruct the Emergency Task force of the contractor to implement</li> </ul> </li> </ul>
(5) Identify	<ul style="list-style-type: none"> <li>▪ Identify appropriate mitigatory measures following applicable safety precautions, regulatory requirements and relevant stakeholder agencies to inform etc.</li> </ul>

(6) Mitigate / isolate	<ul style="list-style-type: none"> <li>Adopt applicable mitigatory measures to manage the situation</li> <li>If unable to mitigate, set up perimeter to isolate the area and barricade until permanent mitigations are adopted</li> </ul>
(7) Evaluate	
(8) Document	
(9) Investigate and remediate	

## 4.2 Resources for Response Action

### 4.2.1 Key contact list

31. Table 2-1 summarizes the key contacts of the environmental task force active during the emergency situation. In addition, the key contact list of the key relevant response personnel from the PMDSC, PMU, Contractor's staff to be circulated among the MWSIP members and notified / displayed at all the sites.

### 4.2.2 Emergency equipment

- Necessary emergency response equipment, such as water bowsers, sandbags, extinguishers, barricade tape, alarms etc. as determined from the risk assessment of the individual sites must be available to respond to emergency environmental incidents. EMS coordinate with contractors to see such equipment are available under the emergency equipment list.
- All emergency equipment must be (a) well placed, installed in accordance with the manufacturer's instructions, relevant standards; (b) readily accessible and within a reasonable distance from the source of hazard, (c) and have appropriate signage and lighting
- Emergency equipment inventory shall be regularly inspected, tested and maintained in accordance with relevant legislative requirements
- Relevant personnel will be trained, and competent to use the emergency equipment

## 4.3 Environmental Monitoring

32. Environmental monitoring will be conducted in response to an emergency environmental incident. The specific aspects of the environmental monitoring shall be determined by the Environmental Monitoring Specialist (EMS) and ES of PMDSC depending on the location, nature, significance of the environmental issue with inputs from counterpart staff of PIU and PMU, who may also consult relevant Government Authorities as necessary. The plan shall be implemented on emergency basis with the approval of PMU .

33. More robust sampling, analysis will be conducted in the post incident investigation, assessment, and, if required, remediation activities. This will include implementation of environmental monitoring programs (e.g., when contaminants have been released to land or water) with the participation of relevant authorities and organizations recognized by CEA.

## 4.4 Communication

34. Depending on the significance of the environmental incident, the required level of communication will vary, and communication protocols are set forth under PMDSC Environmental management system with the coordination of the employer, PMU and PIU, as shown in Table 4-2. PMDSC Communication specialist will be made aware by the ES-PMDSC on any environmental emergency situation.

35. Internal communication, within the MWSIP Environment team will be done regardless of the level of environment significance of the issue.

**Table 4-4: Communications Protocol**

Category	Required Action
Internal Notifications	<ul style="list-style-type: none"> <li>▪ The observer recorded of the environmental incident should notify to the RE and EMS of PMDSC immediately over the phone or e-mail.</li> <li>▪ All emergency environmental incidents shall be recorded in a form of “Environment Incident Record” by ES/EMS of PMDSC and inform to RE, and RE to inform contractor, PMU, PIU</li> <li>▪ Contractor to register all environmental incidents in the Environmental issue log and share with the RE and RE to inform PMDSC Environment team</li> </ul>
Regulatory notifications & reporting  Stakeholder notifications	<ul style="list-style-type: none"> <li>▪ Notifications to the regulatory bodies (CEA, GSMB etc.), relevant stakeholder agencies (DWC, FD, Local Government Authorities etc) including ADB (financing agency) will be submitted through the employer (PMU, PIU) once the incident is reported by the Engineer/PMDSC to the employer</li> <li>▪ Follow-up reporting regarding the incident details, impacts, in a form of corrective action plan shall be prepared by the employer (PMU/PIU) with the assistance of the PMDSC</li> <li>▪ Compensations on the damages and the corrective actions shall be implemented through the contractor as per the contractual requirements, and if it's a violation of the GoSL regulations (FFPO or Forest Ordinance) penalties will be charged through the department legal provisions after notifying to the Employer</li> </ul>
Community notifications (to and from)	<ul style="list-style-type: none"> <li>▪ Community notifications occur both ways. If any environmental risk, emergency situation observed by the community, community will inform the project through the GRM, or notify to the SEO of PIU, EMS of PMDSC, Contractor's EO</li> <li>▪ If any environmental hazard, or risk which have an impact on the community, Contractor jointly with the PIU and GS of GND, under the guidance of PMDSC ES/EMS will be communicated to the relevant community, residents, villagers by means of notices, verbally etc.</li> </ul>

## **Annex 3:**

# **Guidance Note on updating Contractor's Environmental Management Plan (CEMP)**

**MAHAWELI WATER SECURITY INVESTMENT PROGRAM****Subject: GUIDELINE FOR UPDATING CEMP**

Date: 21 May 2020

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**Annex 1 - ADB directions related to the application at the workplace to prevent Covid 19****Annex 2 - CEMP guidance note issued at contract mobilization****Annex 3 – WHO guidelines for public health and social measures in the workplace in the context of COVID-19**



# 1 Why CEMP Needs to be Updated

1. “Contractor’s Environmental Management Plan” (CEMP) is a 'live' document that are reviewed and updated at regular intervals throughout the project life cycle by the contractor, to ensure that CEMP includes all required mitigatory measures as per the ongoing construction program, as well as it address all regulatory compliance requirements.
2. The amendments to the CEMP will be required at following circumstances:
  - (i) When country or project area experience an emergency situation due to a natural disaster, communicable disease outbreak like Covid 19, conflict situation where the workers, or the surrounding community is vulnerable to any health or environmental hazard (ADB SPS (2009));
  - (ii) If any design change, deviation of the project footprint, or change of construction methodology etc.
  - (iii) If the license, permits are expired for the key construction related activities (mining / blasting, operation of Contractor’s facilities like batching plant, disposal areas,
  - (iv) Where unanticipated environmental impacts become apparent during project period (ADB SPS (2009));
  - (v) When the work program and scheduled construction period is outdated;
  - (vi) If additional construction work is included for the construction program which were not originally planned etc.
  - (vii) If the Central Environmental Authority (CEA), ADB or any other stakeholder agency identify the requirement of revising or updating the EMP by PMDSC, subsequently the contractor requires to update the CEMP based on the content updated in the EMP

# 2 Directions by ADB SPS (2009)

3. ADB Safeguard Policy Statement (SPS) 2009 is one of the key governing documents in the MWSIP, as the project is funded by ADB, and hence comply with the directions of the ADB safeguard policies is a mandate for all the contracts.
4. Safeguard policies are generally understood to be operational policies that seek to avoid, minimize, or mitigate adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the development projects.
5. With the outbreak of Covid 19 pandemic in Sri Lanka, it was considered as an unanticipated environmental impact which arises the need of updating the safeguard documents indicating relevant emergency responses, mitigation measures prior to start up the site work.
6. Hence, following are the ADB directions related to the CEMP update, as well as adopting required safeguard management measures in the worksite and project affected areas responding the emergency situation.

Reference to SPS (2009)	Directives related to ESS
Appendix 1, Para 23	<ul style="list-style-type: none"><li>▪ Where unanticipated environmental impacts become apparent during project implementation, the borrower will update respective safeguard documents (EIA and EMP, CEMP etc.) to assess the potential impacts...and outline mitigation measures.</li></ul>
SPS Environment Policy Principal 10	<ul style="list-style-type: none"><li>▪ Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease.</li></ul>

Reference to SPS (2009)	Directives related to ESS
	<ul style="list-style-type: none"> <li>Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.</li> </ul>

7. Accordingly, when updating the CEMP;

- (i) Identify and assess the risks and potential impacts on the environment and safety aspects,
- (ii) Establish preventive measures and include in the safeguard plans (CEMP, Emergency Preparedness and Response Plan, Health & Safety Plan etc.) to address the identified risks and impacts, mitigation measures, monitoring plans including monitoring checklists to be adopted as per the H&S and environmental safeguard requirements (i.e. Daily checklist introduced to verify the health status of the workers and not affected with Covid 19)
- (iii) Disclose the plans to the affected communities through governing bodies (PMDSC, PIU/PMU etc.)

8. Refer **Annex 1** which indicate ADB directions related to the application at the workplace to prevent Covid 19.

### 3 How to revise or update the CEMP

9. The purpose of a CEMP is to outline how to avoid, minimise or mitigate environmental risks results due to project activities on the direct and indirect project affected areas. The general Guideline for the preparation of CEMP is included in the Environment Impact Assessment (EIA) for NWPCP<sup>1</sup> and UECP<sup>2</sup> or Initial Environment Examination (IEE) for Minipe<sup>3</sup> as well as in the pamphlet issued to the contractors for their easy reference (Refer **Annex 2**) prepared addressing both ADB<sup>4</sup> and CEA requirements.
10. The amendments to the CEMP need to be attended depending on the requirement as explained under the paragraph 2, referring to the sample Table mentioned below:

	Requirement for the CEMP update	What needs to be included and sections to be amended
(i)	When country or project area experience an emergency situation due to a natural disaster, communicable disease outbreak or conflict situation	<p>Update the CEMP:</p> <ul style="list-style-type: none"> <li>Include “<b>Site specific Emergency preparedness and response measures</b>” under separate Chapter, that needs to be followed based on the specific emergency situation (i.e. Covid 19 referring to the Contractor’s Health &amp; Safety plan) as well as referring to the ADB SPS (2009) requirements highlighted in the Section 2 of this guidance note.</li> <li>Revise “<b>Risk Assessment Matrix</b>”, indicating any unanticipated environmental impacts / risk that can be arise due to the aforesaid emergency situation, identifying required mitigations, additional facilities such as contract camps, health, safety facilities, Public health and social measures in</li> </ul>

<sup>1</sup> Refer Chapter 09 Section (iii) of EIAR for NWPCP (June 2015)

<sup>2</sup> Refer Section 9.2 of EIAR for UECP (June 2015)

<sup>3</sup> Refer Part H of IEER for MLBCRP (April 2015)

<sup>4</sup> Environment Management for Construction Handbook, prepared by Safeguard Unit Central & West Asia Department of ADB

	Requirement for the CEMP update	What needs to be included and sections to be amended
		<p>the construction site, area of influence in the context of Covid 19 as per WHO guidelines<sup>5</sup> (Refer Annex 3) etc;</p> <ul style="list-style-type: none"> <li>▪ Include or revise the existing <b>“Monitoring program”</b> to verify that the CEMP is implemented effectively at site level <b>with the necessary supporting documents (daily checklist for H&amp;S aspects, periodical monitoring checklist use to monitor day today site environmental management etc.)</b></li> <li>▪ Update <b>“applicable key environmental regulations, approval requirements, institutional arrangements”</b> as per the updated date, also including any additional approval requirements as per the “emergency situation”</li> <li>▪ Include <b>“Updated Construction Program”</b> as per the update date of CEMP</li> </ul>
(ii)	<p>When any design change, deviation of the project footprint, or change of construction methodology;</p> <p>License, permits are expired;</p> <p>Work program is extended due to additional work, or inability of completing the work during the agreed construction period</p>	<p>Update the CEMP:</p> <ul style="list-style-type: none"> <li>▪ Revise <b>“Risk Assessment Matrix”</b>, indicating any unanticipated environmental impacts / risk that can be arise due to the aforesaid design change, change of footprint or construction methodology;</li> <li>▪ Indicate any required mitigations, additional facilities such as disposal areas, material requirements, additional stream diversions, access roads, fencing arrangements, facilitating wildlife movements etc;</li> <li>▪ Update regulatory requirements, construction program up to date as required.</li> </ul>
(iii)	<p>If the Central Environmental Authority (CEA), ADB or any other stakeholder agency identify the requirement of revising or updating the EMP by PMDSC</p>	<p>Contractor requires to update the CEMP based on the content updated in the EMP, and as per the requirements highlighted by the relevant stakeholder agency</p>

## 4 Whom to approve and implement CEMP

11. Preparation of CEMP and approval from the Engineer / Project Manager of PMDSC is a contractual requirement which is recommended in the approved EIA for NWPCP and UECP or IEE for Minipe and for all the contract packages including National Competitive Bidding (NCB) and International Competitive Bidding (ICB) contracts prior to commence the site work, including establishment of contractor facilities, site clearing, site preparation and carry out all construction work.
12. All ICB contracts includes BOQ item in Bill No.01 under the General requirements to make partial payment (preferably 40 %) as decided by the RE, ES – PMDSC depending on the acceptability of the first draft of the CEMP prior to commence the construction work. The balance shall be paid as 10 % for each acceptable updated version of CEMP including the required amendments up to maximum 6 revisions.
13. The implementation of CEMP, complying with all required GoSL and ADB environmental requirements, regulations and safeguard policies is an obligation of the respective contractor, through a qualified, dedicated Environmental Officer.

<sup>5</sup> Considerations for public health and social measures in the workplace in the context of COVID-19 (10 May 2020), WHO

# COVID 19 - PANDEMIC APPLICATION OF INTERNATIONAL GOOD PRACTICE OHS AT THE WORKPLACE

Webinar by SDSS supported by HSG, OGC & PPFD  
(14/05/2020)

# What Are the Issues?



What support do DMCs need?

Health & Safety Plans

What is our duty of care?



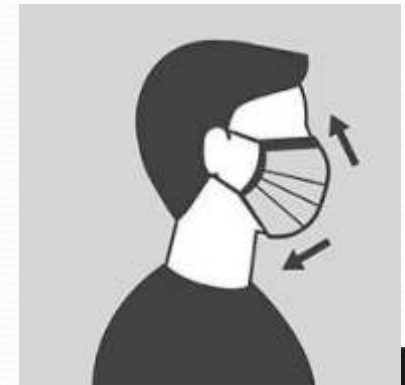
Update of H&S Plans  
- Physical distancing  
Hand washing,  
enhanced worker  
screening etc.  
Site specific plans  
needed



Management of risks to  
workers, community,  
vulnerable groups



Unanticipated Risks -  
Potential infection and  
spread of virus



# What does the SPS Say?

- ❑ **SPS Environment Policy Principle 10:**
  - **Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease.**
  - Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.
  
- ❑ **Appendix 1, para 23:** Where **unanticipated environmental impacts** become apparent during project implementation, the borrower will update the **EIA and EMP** to assess the potential impacts...and outline mitigation measures.



**COVID 19 impacts are unanticipated impacts**

# What does the SPS Say?....

## 10. Health and Safety

### a. Occupational Health and Safety

40. The borrower/client will provide workers<sup>12</sup> with a safe and healthy working environment, taking into account risks inherent to the particular sector and specific classes of hazards in the borrower's/client's work areas, including physical, chemical, biological, and radiological hazards. The borrower/client will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by (i) identifying and minimizing, so far as reasonably practicable, the causes of potential hazards to workers; (ii) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) providing appropriate equipment to minimize risks and requiring and enforcing its use; (iv) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; (v) documenting and reporting occupational accidents, diseases, and incidents; and (vi) having emergency prevention, preparedness, and response arrangements in place.

41. The borrower/client will apply preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's *Environment, Health and Safety Guidelines* (footnote 7).



Environmental, Health, and Safety (EHS) Guidelines  
GENERAL EHS GUIDELINES: INTRODUCTION



Environmental, Health, and Safety  
General Guidelines



# What does the SPS Say?.....

## b. Community Health and Safety

42. The borrower/client will identify and assess the risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the project, and will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts. These measures will favor the prevention

43. The borrower/client will inform affected communities of significant potential hazards in a culturally appropriate manner. The borrower/client will be prepared to respond to accidental and emergency situations. This preparation will include response planning document(s) that addresses the training, resources, responsibilities, communications, procedures, and other aspects required to respond effectively to emergencies associated with project hazards. Appropriate information about emergency preparedness and response activities, resources, and responsibilities will be disclosed to affected communities.



		Severity/Consequence		
		Slightly harmful (1)	Harmful (2)	Extremely harmful (3)
Likelihood	Highly unlikely (1)	Trivial risk (Score 1)	Tolerable risk (Score 2)	Moderate risk (Score 3)
	Unlikely (2)	Tolerable risk (Score 2)	Moderate risk (Score 4)	Substantial risk (Score 6)
	Likely (3)	Moderate risk (Score 3)	Substantial risk (Score 6)	Intolerable risk (Score 9)

Workplace Risk Assessment is Key

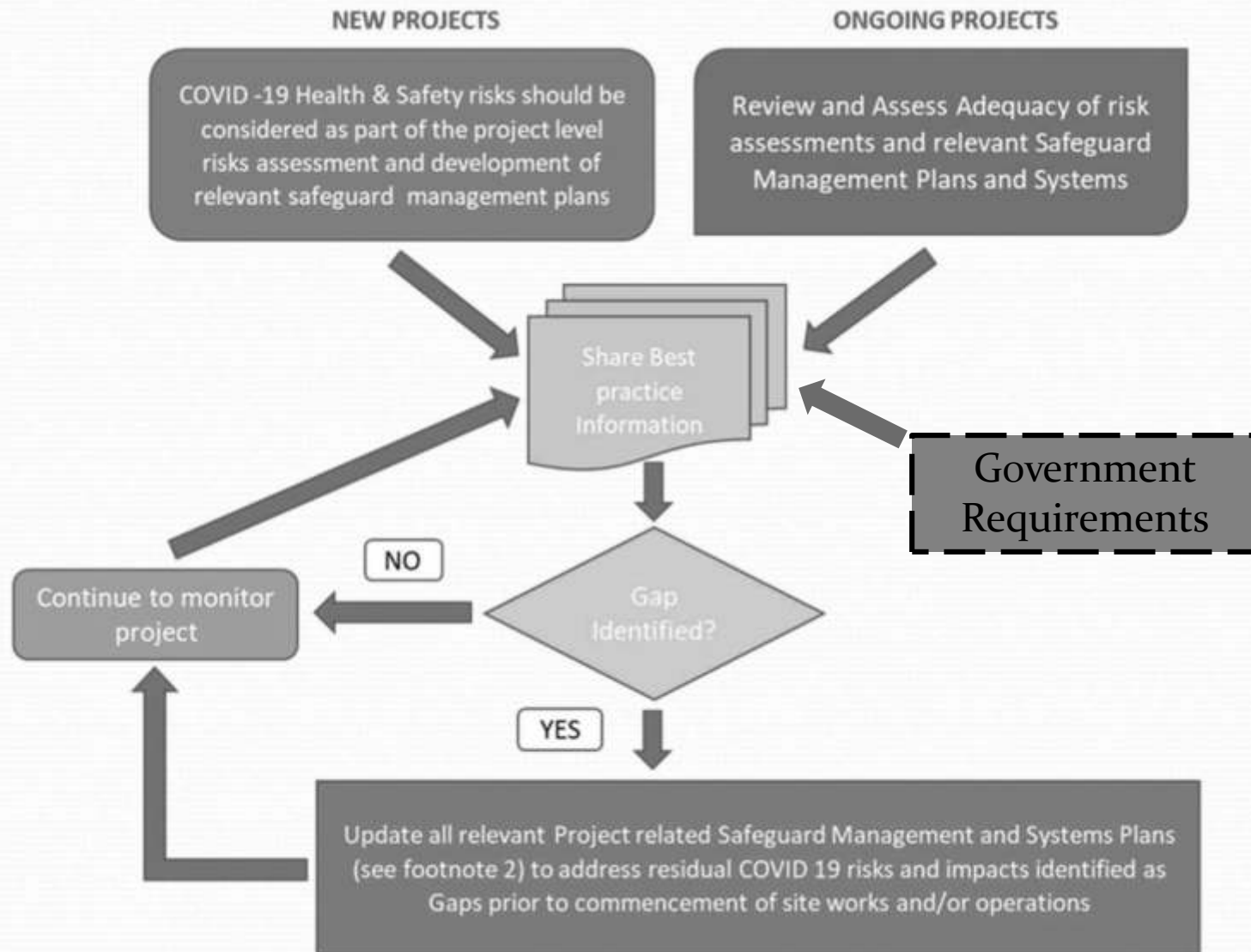
What is the hazard- COVID 19 Virus

What is the likely of spreading at the workplace - **High**

What is the severity of impact should the hazard occur - **High**



# What Needs to be done?....



# Safeguard Management Plans

Adopt A Risk Based Approach

Environment Management Plan  
[EMP]

Construction EMP

Operations  
EMP

Health and Safety Management Plans

Site Specific H&S  
Plan

Work Specific H&S  
Plan

Operations  
Maintenance H&S  
Plan

What about Category “C” rated Projects??

- Endorsed by ADB at Project approval.
- Will require high level update by PMU–
- Note Disclosure Requirements following update

It is very important to ensure that these Plans have been updated by the **Contractor/ Sup Engineer**

CAP and H&S Plan may be required following review & Risk Assessment

# Options To Consider.....

**Depends on the stage of project implementation and nature of works**

## EMP

- High level update
- PMU may lack the capacity to update
- Utility in addressing COVID 19 may be limited.
- ESIA/Addendum may be required

## Corrective Action Plan (CAP)

- High Level update as well
- CAP Technically brings EMP into compliance due to COVID 19 unanticipated impacts
- Comparatively easier to update and disclose
- Regular Monitoring Report to assess effectiveness of implementation

## PMU

Either route may be okay from the safeguard perspective but may depend on legal, nature and stage of project implementation

Needs to be cascaded by PMU to Contractor Level

## Health and Safety Management Plan

Site specific H&S Plan

Work Specific H&S Plan

Operations Maintenance H&S Plan

## Contractor/Engineer

Maybe called different names. Critically important PMU ensures its been updated as part of EMP obligation

# COVID Good Practices At Workplace

## Preventive measures

- Physical Distancing
- Respiratory and Hand Hygiene



## Detection measures

- Enhanced worker screening protocols
- Continuous monitoring at workplace

## Response Measures

- Workers with COVID symptoms
- Workplaces reported to have been contaminated by infected persons

The New Normal at the workplace

ADB

# Hand Hygiene



- Regular and thorough handwashing with soap and water or hand hygiene with alcohol-based hand-rub
  - before starting work, before eating, frequently during the work shift, especially after contact with co-workers or customers,
  - after going to the bathroom, after contact with secretions, excretions and body fluids, after contact with potentially contaminated objects (gloves, clothing, masks, used tissues, waste), and immediately after removing gloves and other protective equipment but before touching eyes, nose, or mouth.
- Hand hygiene stations, such as hand washing and hand rub dispensers, should be put in prominent places around the workplace and be made accessible to all staff, contractors, clients or customers, and visitors along with communication materials to promote hand hygiene.

# Respiratory Hygiene



- Promote respiratory etiquette by all people at the workplace. Ensure that medical face masks and paper tissues are available at the workplace, for those who develop a runny nose or cough at work, along with bins with lids for hygienic disposal.
- Develop a policy on wearing a mask or a face covering in line with national or local guidance. Masks may carry some risks if not used properly.
- If a worker is sick, they should not come to work. If a member of staff or a worker feels unwell while at work, provide a medical mask so that they may get home safely.
- Where masks are used, whether in line with government policy or by personal choice, it is very important to ensure safe and proper use, care and disposal.

# Physical distancing



- Keep a distance of at least 1 meter between people and avoid direct physical contact with other persons (i.e. hugging, touching, shaking hands), strict control over external access, queue management (marking on the floor, barriers)
- Reduce density of people in the building (no more than 1 person per every 10 square metres), physical spacing at least 1 meter apart for work stations and common spaces, such as entrances/exits, lifts, pantries/canteens, stairs, where congregation or queuing of employees or visitors/clients might occur.
- Minimize the need for physical meetings, e.g. by using teleconferencing facilities
- Avoid crowding by staggering working hours to reduce congregation of employees at common spaces such as entrances or exits
- Implement or enhance shift or split-team arrangements, or teleworking
- Defer or suspend workplace events that involve close and prolonged contact among participants, including social gatherings.



# Reduce and manage work-related travels



- Cancel or postpone non-essential travel to areas with community transmission of COVID-19
- Provide hand sanitizer to workers who must travel, advise workers to comply with instructions from local authorities where they are travelling, as well as information on whom to contact if they feel ill while travelling.
- Workers returning from an area where COVID-19 transmission is occurring should monitor themselves for symptoms for 14 days and take their temperature twice a day; if they are feeling unwell, they should stay at home, self-isolate, and contact a medical professional.



# Regular environmental cleaning and disinfection



- Cleaning (soap, water, and mechanical action) to remove dirt, debris, and other materials from surfaces. Disinfection of dirty surfaces and objects only after cleaning
- Most common disinfectants – sodium hypochlorite (bleach) of surface at concentration 0.1% or alcohol at least 70% concentration for surfaces which can be damaged by sodium hypochlorite.
- Priority disinfection of high-touch surfaces - commonly used areas, door and window handles, light switches, kitchen and food preparation areas, bathroom surfaces, toilets and taps, touchscreen personal devices, personal computer keyboards, and work surfaces.
- Disinfectant solutions must always be prepared and used according to the manufacturer's instructions, including instructions to protect the safety and health of disinfection workers, use of personal protective equipment, and avoiding mixing different chemical disinfectants.
- Spraying or fogging of disinfectants in indoor workplaces and large-scale spraying or fumigation outdoors is not generally recommended.
- Spraying and fogging of people with disinfectants (such as in a tunnel, cabinet, or chamber) is not recommended under any circumstances.

# Risk communication, training, and education



- Provide posters, videos, and electronic message boards to increase awareness of COVID-19 among workers and promote safe individual practices at the workplace, engage workers in providing feedback on the preventive measures and their effectiveness.
- Provide regular information about the risk of COVID-19 using official sources, such as government agencies and WHO, and emphasize the effectiveness of adopting protective measures and counteracting rumours and misinformation.
- Special attention should be given to reaching out to and engaging vulnerable and marginalized groups of workers, such as those in the informal economy and migrant workers, domestic workers, subcontracted and self-employed workers, and those working under digital labour platforms.

# Management of people with COVID-19 or their contacts



- Workers who are unwell or who develop symptoms consistent with COVID-19 to stay at home, self-isolate, and contact a medical professional or the local COVID-19 information line for advice on testing and referral (consider telemedicine and flexible sick leave policy).
- All workers to self-monitor their health, possibly with the use of questionnaires, and take their body temperature regularly.
- Thermal screening at the workplace to be considered only in the context of a combination of measures for prevention and control of COVID-19 at the workplace and along with risk communication.
- Standard operating procedures to be prepared to manage a person who becomes sick at the workplace and is suspected of having COVID-19, including isolation, contact tracing and disinfection.
- People who were in close contact at the workplace with persons with laboratory-confirmed COVID-19 should be quarantined for 14 days from the last time of the contact in accordance with WHO recommendations.

# Additional measures for workplaces and jobs at medium risk



- Enhanced cleaning and disinfection of objects and surfaces that are touched regularly, including all shared rooms, surfaces, floors, bathrooms, and changing rooms;
- Where the physical distancing of at least 1 metre cannot be implemented in full in relation to a particular activity, workplaces should.
  - ✓ consider whether that activity needs to continue, and if so,
  - ✓ take all the mitigating actions possible to reduce the risk of transmission through work organization and engineering control
- Enhanced hand hygiene – hand washing with soap and water or use of alcohol-based hand rub
  - ✓ before entering and after leaving enclosed machinery, vehicles, confined spaces
  - ✓ before putting on and after taking off personal protective equipment;
- Personal protective equipment and training on its proper use
- Increased ventilation rate, through natural aeration or artificial ventilation, preferably without re-circulation of the air.

# Additional measures for workplaces and jobs at high risk



- Assess the possibility of suspending the activity;
- Adherence to hygiene before and after contact with any known or suspected case of COVID-19, before and after using PPE;
- Use of medical mask, disposable gown, gloves, and eye protection for workers who must work in the homes of people who are suspected or known to have COVID-19.
- Use the protective equipment when in contact with the sick person, or respiratory secretions, body fluids, and potentially contaminated waste;
- Training of workers in infection prevention and control practices and use of personal protective equipment;
- Avoid assigning tasks with high risk to workers who have pre-existing medical conditions, are pregnant, or older than 60 years of age.



# Rights, duties, and responsibilities of workers and employers



- Collaborate with health authorities in the prevention and control of COVID-19.
- Employers to provide engineering and administrative controls and PPE for occupational safety and health and infection prevention and control at no expenditure on the part of workers.
- Workers to follow established measures for occupational safety and health and infection prevention and control procedures
- Co-operation between management and workers and their representatives is an essential element of workplace-related prevention measures
- COVID-19 and other diseases, if contracted through occupational exposure, could be considered as occupational diseases.

# Plan of action



- Develop action plan for prevention and mitigation of COVID-19 as part of the business continuity plan, risks and epidemiology
- Protecting health, safety, and security in re-opening, closing, and modifying workplaces and work arrangements.
- Re-opening of workplaces to be carefully planned in advance and all possible risks for health and safety properly controlled.
- Monitor compliance and update regularly
- Address other occupational health and safety risk - ergonomic problems, heavy workloads and long working hours, remote working, psychosocial risks, poisonings, etc.
- Occupational health services to strengthen their capacity for infection prevention and control, medical surveillance, and psychosocial support.
- Consult workers and their representatives in developing and implementing action plans
- Local authorities and local public health authorities to provide risk communication and community engagement for non-organized groups of workers (domestic workers, workers in the informal economy, digital labour platforms)
- No discrimination in the access of workers to protective measures for prevention of COVID-19 - refugee and migrant workers should have equal access to PPE and support services
- Prevent social stigma of workers suspected of being infected, infected with, or recovered from COVID-19.

# Recommendation.....

## 1. Portfolio Review and Identify projects with high exposure risks to COVID 19

- ❖ Project sites with large workforce on site.
- ❖ Project sites with large labor force on site and host/surrounding communities
- ❖ Project sites with large worker accommodations on site or within host/surrounding communities.

### Low exposure risk

jobs or work tasks without frequent, close contact with the general public and other co-workers, visitors, clients or customers, or contractors, and that do not require contact with people known to be or suspected of being infected with COVID-19.

### Medium exposure risk

jobs or work tasks with close (< 1 m) frequent contact with the general public, or other co-workers, visitors, clients or customers, or contractors, but that do not require contact with people known to be or suspected of being infected with COVID-19.

### High exposure risk

jobs or work tasks with high potential for close contact with people who are known or suspected of having COVID-19, as well as contact with objects and surfaces possibly contaminated with the virus.

## 2. Notify the PMU EA/IA/PIU in charge of the identified Projects about the need to review and prepare/update H&S Plans ahead of commencement of site works.





# Support.....Need to work together



## Strengthening Safeguard Implementation in ADB Projects – SSIAP TA - 53125

**Technical Support :** OHS Consultant currently onboarding. Will provide support with development of Sector specific Guidance documents to help manage OHS issues on our projects including COVID 19.



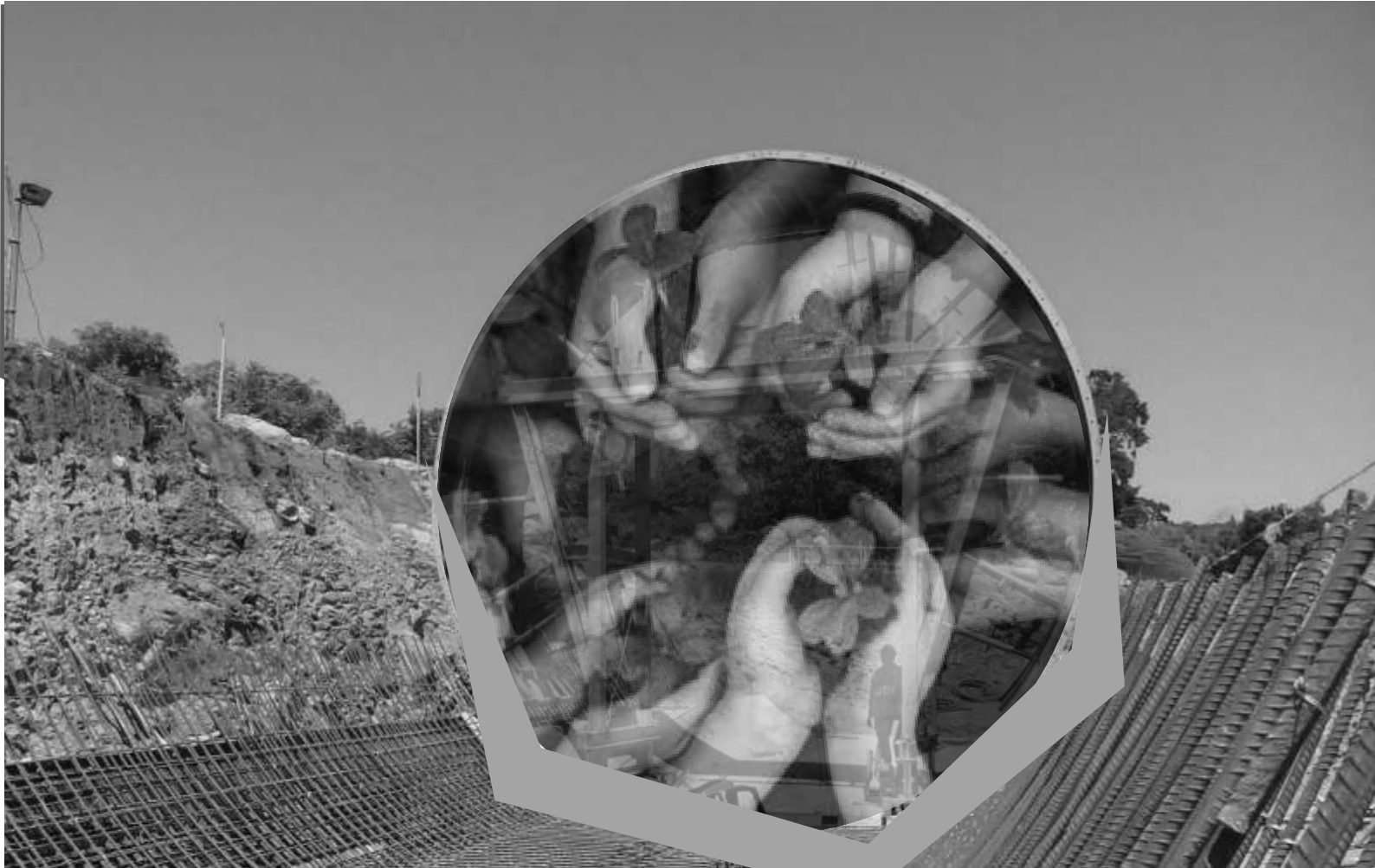
**Training and Webinar :** We recognize some PMU's may need support to translate the International best practice guidance and information notes/posters into their local languages.



**Reasonable Budget Support :** We recognize some PMU's may need support to translate the International best practice guidance and information notes/posters into their local languages.







## Guide for the preparation of Contractor's Environmental Management Plan (CEMP)



# MWSIP



# Mahaweli

Water Security Investment Program

## is a Sustainable Development Effort



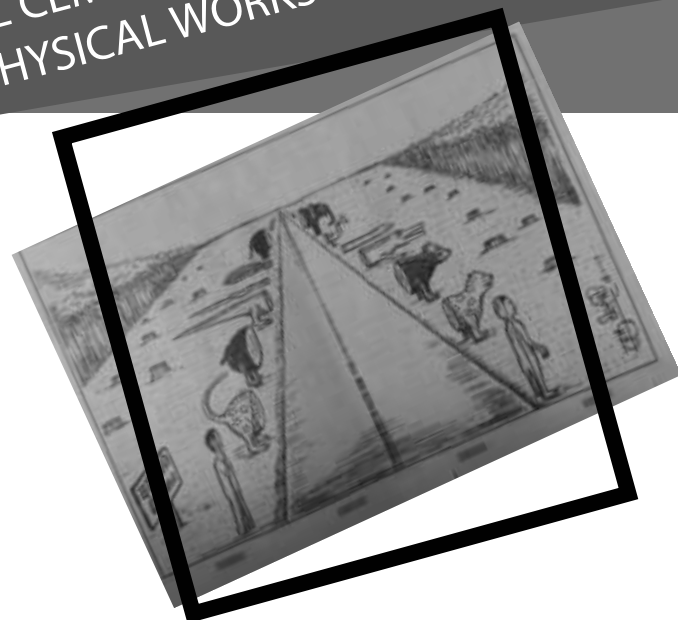
# CEMPs & Constructions

**"UNTIL CEMP IS APPROVED,  
NO PHYSICAL WORKS ON SITE"!**

CEMP is a site specific environmental management Plan which is applied to the actual site where construction activities will occur. CEMP is a contractual obligation, and within 56 days after the commencement date, submit the draft CEMP to the Resident Engineer (Project Manager) for review with a copy to PD-PIU (Employer)

Within 28 days after receiving the Draft CEMP, Environmental Specialist / Environmental Monitoring Specialist (PMDSC) shall review the Draft CEMP and Engineer (Project Manager) will notify the contractor of any requests for amendments. The contractor shall in cooperate the amendments requested and shall issue the final CEMP for the contract which shall be binding of the Contractor.

**"UNTIL CEMP IS APPROVED NO  
PHYSICAL WORKS ON SITE"!**



Most common failures of environmental management are the start of the construction before the necessary CEMP has been prepared.

When this happens, the construction team has no guidance as to what environmental management measures are required, and so there is a high probability that environmental damage will occur.

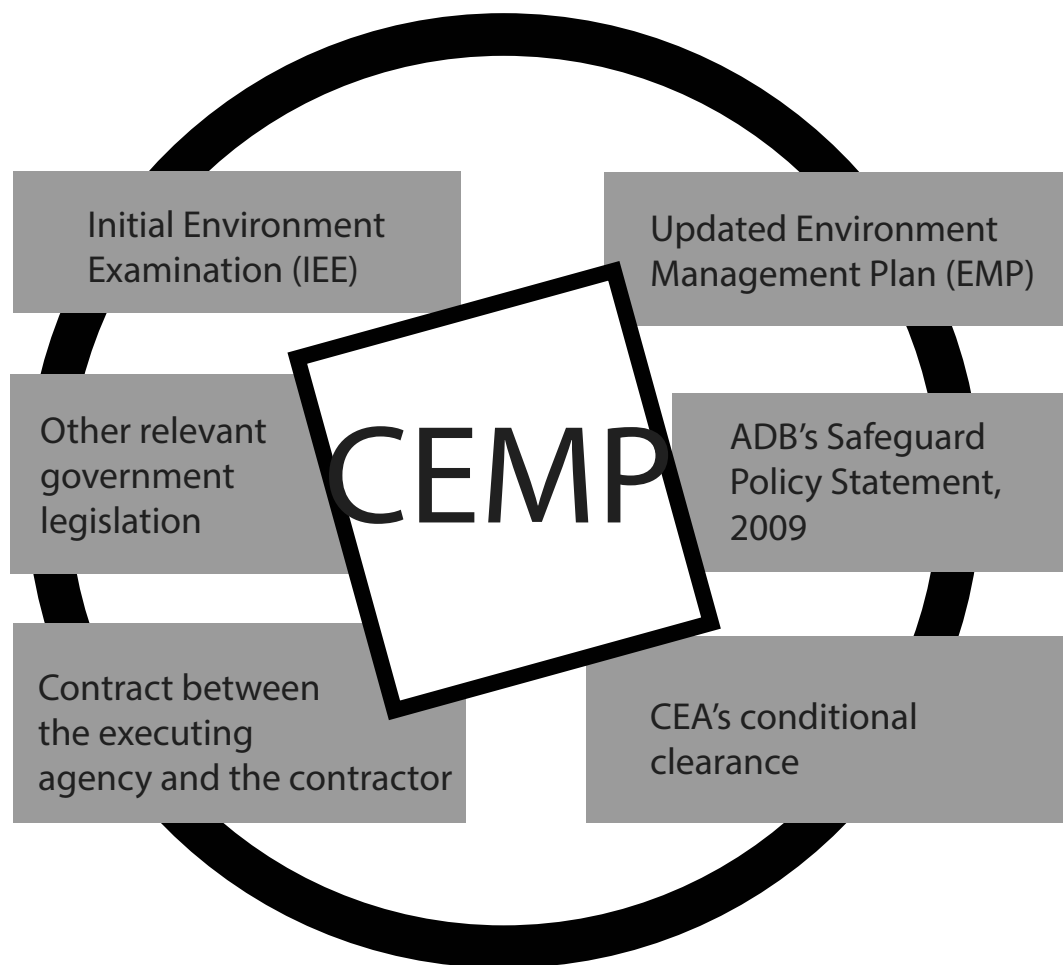
Difficult to retrofit the environmental management requirements after the construction activities have started. Proper planning therefore essential beforehand.

CEMP preparator and the implanter needs to have sense of nature and knowledge in biological components associate with the environment. So, BIOLOGIST is always preferred as the Environmental Officer of the Contractor who prepares and implement CEMP where project activities associated with sensitive ecosystems.



"UNTIL CEMP IS APPROVED,  
NO PHYSICAL WORKS ON SITE"!

## Governing Documents




# Steps to Prepare a CEMP

## First..

EO of the contractor to be well familiarized about the project area, project activities and construction plan.

## Then..

- 
- Define boundaries (footprint – then decide if it is one EMP or multiple EMPs)
  - Identify sensitive Receivers & environment values (IEE, EMP and site visits)
  - Specify construction activity (surveying, site clearing, soil stripping, earth movement, preparing concrete mix, pouring concrete etc, )
  - Carry out Risk Assessment - Identify risks and mitigation measures.
  - Assignment of environmental management measures to implement CEMP ensuring that Env team in contractor's party are carried out all measures
  - Preparation of site plans
  - Preparation of environmental work plans
  - Self-Monitoring by the Contractor

### Definition of project boundaries?

Define footprint of the construction activities, other contractor's facility locations, disposal areas, borrow areas (if any), worker camp areas, machinery yards, access roads, transportation routes of borrow, disposal material etc.)

Define footprint of the construction activities, other contractor's facility locations, disposal areas, borrow areas (if any), worker camp areas, machinery yards, access roads, transportation routes of borrow, disposal material etc.)

### Identification of environmental values and sensitive receptors of the site and its surrounds

Once the site boundaries are defined, the sensitive receptors and the environmental values of the area need to be confirmed. The EIA/IEE document and the updated EMP shall often provide the necessary information. Such information can be presented as an overlay of the engineering drawings or maps

Define boundaries (footprint – then decide if it is one EMP or multiple EMPs)

Identify sensitive Receivers & environment values (IEE, EMP and site visits)

Specify construction activity (surveying, site clearing, soil stripping, earth movement, preparing concrete mix, pouring concrete etc.)

Carry out Risk Assessment - Identify risks and mitigation measures.

Assignment of environmental management measures to implement CEMP ensuring that Env team in contractor's party are carried out all measures

Preparation of site plans

Preparation of environmental work plans

Self-Monitoring by the Contractor

### Specifying Construction activities

Based on the construction plan/schedule prepared, it is important to mention what the various phases of work are for each site, as different phases includes different activities and thus different environmental management requirements (ex. Site surveying, vegetation clearance, soil stripping and earth movement, excavation, coffer damming, electric elephant fencing, concrete work, blasting, painting, spraying, storing and using chemicals and hazardous substances etc.)

### Environmental Work plans

The completed CEMP shall provide the details of all the environmental management requirements for all stages of the construction process. If the work is undertaken as individual work teams, the environmental work plans need to be prepared separately targeting each work team for respective work activities (e.g. clearing, excavation, concrete work, back filling, painting, sand blasting, coffer damming etc).

### Preparing Risk Assessment Matrix

Risk Assessment and Environmental management measures based on the construction activities.

Risk is assessed as the likelihood that the activity will have an effect on the environment as well as the consequence of the effect occurring. Hence, it is often described as "Risk = Likelihood x Consequence"



# Sample for Risk Assessment matrix

Construction activity	Issues to consider	Likelihood that the site or sensitive receptors will be affected?	Consequence of the site or sensitive receptors being affected?	Risk Score: (Consequence X Likelihood) High: 15-25 Medium: 6-10 Low : 1-5	Environmental management measures
		Score <sup>1</sup>	Score <sup>2</sup>	Score <sup>3</sup>	
Soil stripping	Damage to vegetation beyond vegetation limits	3	5	15 (High)	Limits of clearing marked with highly visible means; Monitor area for fauna prior to clearing operation; avoid spreading invasive species through proper decomposing/disposal techniques of debris; manage waste identifying proper disposal plans; burning of vegetative parts prohibited within wildlife protected areas
	Erosion of exposed areas and sediment carried into adjacent streams	3	3	9 (Medium)	Erect silt traps/fences around the perimeter of the working area; sedimentation ponds
	Loss of top soil	3	2	6 (Medium)	Stockpiles to get protective covering

Likelihood	Definition	Score
Certain	Will occur during the activity at a frequency greater than every week of the preventive measures are not taken	5
Likely	Likely to occur more than once or twice during the activity, but less than weekly, if preventive measures are not taken	3
Unlikely	May occur once or twice during the activity if preventive measures are not taken	2
Rare	Unlikely to occur during the activity	1

Consequence	Definition	Score
Catastrophic	Unprecedented damage or impacts involving the environment or surrounding communities (i.e widespread effect on ecosystem, with deaths of fauna/flora)	5
Major	Major damage to the environment or to surrounding communities	3
Moderate	Limited adverse impacts on the environment or on surrounding communities (i.e. short term minor changes in the ecosystem)	2
Minor	No or minimal adverse environmental or social impacts (i.e little noticeable effect on ecosystem)	1

Likelihood	Consequence			
	Catastrophic	Major	Moderate	Minor
Certain	25	15	10	5
Likely	15	9	6	3
Unlikely	10	6	4	2
Minor	5	3	2	1

# How to include site plans

completed risk matrix provides a detailed assessment of the environmental management requirements for a construction site. The identified environmental management requirements need to be included in a site plan. The site plans range from simple line drawings to marked-up engineering drawings, to detailed overlays on aerial photographs. A site plan must cover the extent of the construction activity and should contain;

- Indication of North, and scale;
- Existing and planned supporting infrastructure (e.g., access roads, water ways, electricity supply etc.);
- Location of planned work;
- Drainage system;
- Location of sensitive receptors (e.g. animal crossings etc.)

The environmental management measures are then overlaid onto the site plan. This can be done by hand or by using computer graphics / symbols depending on what is available. ADB will not consider a CEMP to be complete unless a site plan accompanies the risk assessment matrix.



# Sample Content of CEMP

- 
- 1.0 Introduction
    - 1.1 Overview to CEMP
    - 1.2 Scope of construction package
    - 1.3 Project duration
    - 1.4 Definition of project boundaries
  - 2.0 Contractor's Organization in environmental management
    - 2.1 Environmental Policy
    - 2.2 Environment management system
    - 2.3 Applicable key environmental legislations and governing documents
  - 3.0 Risk Assessment
    - 3.1 Environmentally sensitive areas
    - 3.2 Construction activities
    - 3.3 Environmental Issues and impacts
    - 3.4 Environmental management strategies and mitigation
    - 3.5 Risk Assessment Matrix including site plans
    - 3.6 Site restoration plans
    - 3.7 Required approvals for each activity (provide in a table including project activity, timing, approving agency, type of licence/approval etc.)
  - 4.0 CEMP Implementation, Monitoring, evaluation and reporting
    - 4.1 Construction plan
    - 4.2 Environmental responsibilities and Work plan
    - 4.3 Reporting and documentation
  - 5.0 Management Review
    - 5.1 CEMP review/updates
    - 5.2 Stakeholder and communication management
      - 5.2.1 Internal communication
      - 5.2.2 External Communication
      - 5.2.3 Complaints management
      - 5.2.4 Grievance Redress mechanism
  - 6.0 Annexes

**Reports expected from the contractor to monitor that CEMP is properly implemented;**

- 1. Environmental Method Statement (EMS)
- 2. Monthly Environmental Progress Report
- 3. Duly updated Environmental Issue Log and Grievance Log



Mahaweli Water Security Investment Program (MWSIP)  
Ministry of Mahaweli Development & Environment

# Considerations for public health and social measures in the workplace in the context of COVID-19

## Annex to Considerations in adjusting public health and social measures in the context of COVID-19

10 May 2020



### Background

In response to COVID-19, countries across the globe have implemented a range of public health and social measures, including movement restrictions, partial closure or closure of schools and businesses, quarantine in specific geographic areas and international travel restrictions. As the local epidemiology of the disease changes, countries will adjust (i.e. loosen or reinstate) these measures accordingly. As transmission intensity declines, some countries will begin to gradually re-open workplaces to maintain economic activity. This requires establishing protective measures, including directives and capacity to promote and enable standard COVID-19 prevention in terms of physical distancing, hand washing, respiratory etiquette and, potentially, thermal monitoring, as well as monitoring compliance with these measures.<sup>i</sup>

On 16 April 2020, WHO published interim guidance that provides advice on adjusting PHSM,<sup>i</sup> while managing the risk of resurgence of cases. A series of annexes was developed to help guide countries through adjusting various public health measures in different contexts. This annex is for those involved in developing policies and standard operating procedures to prevent the transmission of COVID-19 in the workplace, including employers, workers and their representatives, labour unions and business associations, local public health and labour authorities, and occupational safety and health practitioners. This document offers general guidance for non-healthcare workplaces and workers in those settings.<sup>ii</sup> Additional protective measures may be necessary for specialized workplaces. Specific recommendations for protection of the health and safety of some frontline public workers are also included in the existing WHO guidance for the accommodation sector,<sup>2</sup> detention centers,<sup>3</sup> schools,<sup>4</sup> food businesses,<sup>5</sup> aviation sector,<sup>6</sup> water, sanitation, and waste management,<sup>7</sup> camps,<sup>8</sup> and construction.<sup>9</sup>

### Workplace risk assessment

COVID-19 is transmitted primarily through respiratory droplets or contact with contaminated surfaces.<sup>10</sup> Work-related exposure can occur anytime at the workplace, during work-related travel to an area with local community transmission, as well as on the way to and from the workplace.<sup>11</sup>

The risk of work-related exposure to COVID-19 depends on the probability of coming into close (less than 1 metre) or frequent contact with people who may be infected with COVID-19 and through contact with contaminated surfaces and objects. The following risk levels may be useful in carrying out a workplace risk assessment for exposure to COVID-19 and planning for preventive measures in non-healthcare workplaces. In these risk categories, persons referred to as 'known to be or suspected of being infected with COVID-19' generally refers to persons who have already had a positive test or diagnosis.<sup>iii</sup> Although such persons should be cared for in isolation, some occupations may still have a higher risk of exposure (e.g. home care workers, personal service providers where necessary, pharmacy front-line staff).

*Low exposure risk* – jobs or work tasks without frequent, close contact with the general public and other co-workers, visitors, clients or customers, or contractors, and that do not require contact with people known to be or suspected of being infected with COVID-19. Workers in this category have minimal occupational contact with the public and other co-workers.

*Medium exposure risk* – jobs or work tasks with close, frequent contact with the general public, or other co-workers, visitors, clients or customers, or contractors, but that do not require contact with people known to be or suspected of being infected with COVID-19. In areas where COVID-19 cases continue to be reported, this risk level may be applicable to workers who have work-related frequent and close contact with the general public, visitors, or customers in high-population-density work environments (e.g. food markets, bus stations, public transport, and other work activities where physical distancing of at least 1 metre may be difficult to observe), or work tasks that require close and frequent contact between co-workers. In areas without community transmission of COVID-19, this scenario may include frequent contact with persons returning from areas with community transmission.

*High exposure risk* – jobs or work tasks with high potential for close contact with people who are known or suspected of having COVID-19, as well as contact with objects and surfaces possibly contaminated with the virus. Examples of such

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<sup>i</sup> [Considerations in adjusting public health and social measures in the context of COVID-19 \(Interim Guidance\) \(WHO 2020\)](#).

<sup>iii</sup> For the purposes of this guidance the term "workplace" covers all places where workers need to be or to go by reason of their work.

<sup>iii</sup> While the general public may include pre-symptomatic or asymptomatic persons who may be infected but have not (yet) developed obvious signs or symptoms. In this case, the likelihood of exposure of a worker will very much depend on the local COVID-19 situation. Physical distancing measures in the workplace therefore protect workers from direct contact any person who may or may not have COVID-19, whether they are aware of it or not.

exposure scenarios outside of health facilities include the transportation of persons known or suspected to have COVID-19 in enclosed vehicles without separation between the driver and the passenger, providing domestic services or home care for people with COVID-19, and contact with dead bodies of persons who were known or suspected of having COVID-19 at the time of their death.

In the same work setting there may be jobs with different levels of risk, and different jobs or work tasks may have similar levels of exposure. Therefore, the risk assessment should be carried out for each specific work setting and each job or group of jobs. For each risk assessment, it is prudent to consider the environment, the task, the threat, if any (e.g. for frontline staff), and resources available, such as personal protective equipment.

Some workers may be at higher risk of developing severe COVID-19 illness because of age or pre-existing medical conditions; this should be considered in the risk assessment for individuals. Essential public services, such as security and police, food retail, accommodation, public transport, deliveries, water and sanitation, and frontline workers may be at an increased risk of exposure to occupational hazards for health and safety.

Employers and managers, in consultation with workers, should carry out and regularly update the risk assessment for work-related exposure to COVID-19, preferably with support of occupational health services.

## Preventive measures

Decisions on closing or re-opening of workplaces and suspension or downscaling of work activities should be made in light of the risk assessment, the capacity to implement preventive measures, and recommendations of national authorities for adjusting public health and social measures in the context of COVID-19.

### Measures for all workplaces

Universal measures for preventing transmission of COVID-19 that apply to all workplaces and all people at the workplace, such as employers, managers, workers, contractors, customers and visitors, include the following:

#### *Hand hygiene*

- Regular and thorough handwashing with soap and water or hand hygiene with alcohol-based hand-rub before starting work, before eating, frequently during the work shift, especially after contact with co-workers or customers, after going to the bathroom, after contact with secretions, excretions and body fluids, after contact with potentially contaminated objects (gloves, clothing, masks, used tissues, waste), and immediately after removing gloves and other protective equipment but before touching eyes, nose, or mouth.
- Hand hygiene stations, such as hand washing and hand rub dispensers, should be put in prominent places around the workplace and be made accessible to all staff, contractors, clients or customers, and visitors along with communication materials to promote hand hygiene.<sup>12</sup>

#### *Respiratory hygiene*

- Promote respiratory etiquette by all people at the workplace. Ensure that medical face masks and paper tissues are available at the workplace, for those who develop a runny nose or cough at work, along with bins with lids for hygienic disposal.<sup>13</sup>
- Develop a policy on wearing a mask or a face covering in line with national or local guidance. Masks may carry some risks if not used properly.<sup>14</sup> If a worker is sick, they should not come to work. If a member of staff or a worker feels unwell while at work, provide a medical mask so that they may get home safely. Where masks are used, whether in line with government policy or by personal choice, it is very important to ensure safe and proper use, care and disposal.

#### *Physical distancing*

- Introduce measures to keep a distance of at least 1 metre between people and avoid direct physical contact with other persons (i.e. hugging, touching, shaking hands), strict control over external access, queue management (marking on the floor, barriers)
- Reduce density of people in the building (no more than 1 person per every 10 square metres),<sup>15,iv</sup> physical spacing at least 1 metre apart for work stations and common spaces, such as entrances/exits, lifts, pantries/canteens, stairs, where congregation or queuing of employees or visitors/clients might occur.
- Minimize the need for physical meetings, e.g. by using teleconferencing facilities
- Avoid crowding by staggering working hours to reduce congregation of employees at common spaces such as entrances or exits
- Implement or enhance shift or split-team arrangements, or teleworking

<sup>iv</sup> If a person observes the WHO recommended at least 1-meter physical distance from others, this converts to approximately 10 square meter area around them.

- Defer or suspend workplace events that involve close and prolonged contact among participants, including social gatherings.

#### *Reduce and manage work-related travels*

- Cancel or postpone non-essential travel to areas with community transmission of COVID-19, provide hand sanitizer to workers who must travel, advise workers to comply with instructions from local authorities where they are travelling, as well as information on whom to contact if they feel ill while travelling.
- Workers returning from an area where COVID-19 transmission is occurring should monitor themselves for symptoms for 14 days and take their temperature twice a day; if they are feeling unwell, they should stay at home, self-isolate, and contact a medical professional.

#### *Regular environmental cleaning and disinfection*

- Cleaning, using soap or a neutral detergent, water, and mechanical action (brushing, scrubbing) removes dirt, debris, and other materials from surfaces. After the cleaning process is completed, disinfection is used to inactivate (i.e. kill) pathogens and other microorganisms on surfaces.
- Selection of disinfectants<sup>v</sup> should align with the local authorities' requirements for market approval, including any regulations applicable to specific sectors.
- High-touch surfaces should be identified for priority disinfection (commonly used areas, door and window handles, light switches, kitchen and food preparation areas, bathroom surfaces, toilets and taps, touchscreen personal devices, personal computer keyboards, and work surfaces).
- Disinfectant solutions must always be prepared and used according to the manufacturer's instructions, including instructions to protect the safety and health of disinfection workers, use of personal protective equipment, and avoiding mixing different chemical disinfectants.
- In indoor workplaces, routine application of disinfectants to environmental surfaces via spraying or fogging is generally not recommended because it is ineffective at removing contaminants outside of direct spray zones and can cause eye, respiratory, and skin irritation and other toxic effects.
- In outdoor workplaces, there is currently insufficient evidence to support recommendations for large-scale spraying or fumigation.
- Spraying of people with disinfectants (such as in a tunnel, cabinet, or chamber) is not recommended under any circumstances.<sup>16</sup>

#### *Risk communication, training, and education*

- Provide posters, videos, and electronic message boards to increase awareness of COVID-19 among workers and promote safe individual practices at the workplace, engage workers in providing feedback on the preventive measures and their effectiveness.
- Provide regular information about the risk of COVID-19 using official sources, such as government agencies and WHO, and emphasize the effectiveness of adopting protective measures and counteracting rumours and misinformation.<sup>17</sup>
- Special attention should be given to reaching out to and engaging vulnerable and marginalized groups of workers, such as those in the informal economy and migrant workers, domestic workers, subcontracted and self-employed workers, and those working under digital labour platforms.<sup>18</sup>

#### *Management of people with COVID-19 or their contacts*

- Workers who are unwell or who develop symptoms consistent with COVID-19 should be urged to stay at home, self-isolate, and contact a medical professional or the local COVID-19 information line for advice on testing and referral.<sup>19</sup>
- Where local community transmission is high, and work continues, allow for a telemedicine consultation where available, or consider waiving the requirement for a medical note for workers who are sick so that they may stay home.
- All workers should be urged to self-monitor their health, possibly with the use of questionnaires, and take their body temperature regularly.
- Thermal screening at the workplace should be considered only in the context of a combination of measures for prevention and control of COVID-19 at the workplace and along with risk communication.
- Standard operating procedures should be prepared to manage a person who becomes sick at the workplace and is suspected of having COVID-19, including placing the person in an isolation room, limiting the number of people in contact, using personal protective equipment, and performing follow-up cleaning and disinfection.
- It is important to contact the local health authorities and to keep attendance and meeting records in order to facilitate or undertake contact-tracing.

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<sup>v</sup> For example, sodium hypochlorite (bleach) may be used for disinfection of surfaces in workplaces at concentration 0.1% (1,000 ppm) and alcohol with at least 70% concentration for surfaces which can be damaged by sodium hypochlorite.

- People who were in close contact at the workplace with persons with laboratory-confirmed COVID-19 should be quarantined for 14 days from the last time of the contact in accordance with WHO recommendations.<sup>20</sup>

### **Specific measures for workplaces and jobs at medium risk**

In addition to the above measures, for workplaces and jobs assessed to be at medium risk, the following measures should be put in place:

- Enhanced cleaning and disinfection of objects and surfaces that are touched regularly, including all shared rooms, surfaces, floors, bathrooms, and changing rooms;
- Where the physical distancing of at least 1 metre cannot be implemented in full in relation to a particular activity, workplaces should consider whether that activity needs to continue, and if so, take all the mitigating actions possible to reduce the risk of transmission between workers, clients or customers, contractors, and visitors; such as staggered activities, minimizing face-to-face and skin-to-skin contacts, placing workers to work side-by-side or facing away from each other rather than face-to-face, assign staff to the same shift teams to limit social interaction, installing plexiglass barriers at all points of regular interaction and cleaning them regularly;
- Enhanced hand hygiene – regular hand washing with soap and water or use of alcohol-based hand rub, including before entering and after leaving enclosed machinery, vehicles, confined spaces, and before putting on and after taking off personal protective equipment;
- Provide personal protective equipment and training on its proper use – e.g. masks, disposable gowns, disposable gloves or heavy-duty gloves that can be disinfected. Provide face or eye protection (medical mask, face shields, or goggles) during cleaning procedures that generate splashes (e.g. washing surfaces).
- Increased ventilation rate, through natural aeration or artificial ventilation, preferably without re-circulation of the air.

### **Specific measures for workplaces and jobs at high risk**

In addition to the measures above, for high-risk work activities and jobs, the following measures should be implemented:

- Assess the possibility of suspending the activity;
- Adherence to hygiene before and after contact with any known or suspected case of COVID-19, before and after using PPE;
- Use of medical mask, disposable gown, gloves, and eye protection for workers who must work in the homes of people who are suspected or known to have COVID-19. Use the protective equipment when in contact with the sick person, or respiratory secretions, body fluids, and potentially contaminated waste;
- Training of workers in infection prevention and control practices and use of personal protective equipment;
- Avoid assigning tasks with high risk to workers who have pre-existing medical conditions, are pregnant, or older than 60 years of age.

### **Rights, duties, and responsibilities of workers and employers**

Employers, workers, and their organizations should collaborate with health authorities in the prevention and control of COVID-19. The employers, in consultation with workers and their representatives, should take preventive and protective measures, such as engineering and administrative controls and provision of personal protective equipment and clothing for occupational safety and health and infection prevention and control. Such measures at the workplace must not involve any expenditure on the part of workers.

Workers shall follow established occupational safety and health and infection prevention and control procedures, avoid exposing others to health and safety risks, participate in related training provided by the employer and report immediately to their supervisor any situation which they have reasonable justification to believe presents an imminent and serious danger to their life or health.<sup>21</sup>

Co-operation between management and workers and their representatives must be an essential element of workplace-related prevention measures (such as through workers' safety delegates, safety and health committees, and collaboration with providing information and training) and respecting the right and duties of workers and employers in occupational safety and health.<sup>22</sup>

COVID-19 and other diseases, if contracted through occupational exposure, could be considered as occupational diseases.<sup>23</sup>

### **Plan of action**

Workplaces should develop action plans for prevention and mitigation of COVID-19 as part of the business continuity plan and according to the results of the risks assessment and the epidemiological situation.<sup>24</sup> The plan should also include measures for protecting health, safety, and security in re-opening, closing, and modifying workplaces and work arrangements. Re-opening of workplaces should be carefully planned in advance and all possible risks for health and safety should be properly assessed and controlled.



The action plan and preventive measures put in place should be monitored and updated in case of changes in local epidemiological trends, new cases of COVID-19 at the workplace, or lack of compliance by workers, visitors, and clients or customers.

The large-scale public health and social measures introduced by countries in response to COVID-19 may also amplify some other risks for health, safety, and wellbeing at work due to alternative work arrangements, job insecurity, sudden loss of income, social isolation, and fear of contagion. Actions on prevention and mitigation of COVID-19 should be implemented together with actions for addressing other occupational safety and health risks such as ergonomic problems, heavy workloads and long working hours, remote working, psychosocial risks, poisonings, and others.<sup>25</sup> Occupational health services should strengthen their capacity to carry out risk assessment, infection prevention and control, and medical surveillance and organize mental health and psychosocial support in the context of COVID-19.

In developing and implementing action plans for prevention and mitigation of COVID-19 workers and their representatives should be properly consulted and all workers should be informed about the measures introduced, using specific risk communication and community engagement approaches.

Local authorities and local public health authorities can provide up to date information and facts, support community engagement activities, and offer specific recommendations on the prevention of COVID-19 among other groups of workers, such as domestic workers, workers in the informal economy, digital labour platforms, or others.

There must be no discrimination in the access of workers to protective measures for prevention of COVID-19. Refugee and migrant workers should have equal access to personal protective equipment as well as to COVID-19 prevention, treatment and care, referral, rehabilitation, social protection, and occupational health services, including mental health and psychosocial support.<sup>26</sup> Special efforts should be taken to prevent social stigma of workers suspected of being infected, infected with, or recovered from COVID-19.<sup>27</sup>

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## Acknowledgments

This document was developed in consultation with ILO's LabAdmin/OSH Branch.

WHO continues to monitor the situation closely for any changes that may affect this interim guidance. Should any factors change, WHO will issue an update. Otherwise, this interim guidance document will expire 2 years after the date of publication.

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## **Annex 4:**

# **Water quality Results in the Minipe anicut area**

No. C.G.G.C.-MINIPE-ICB-1/RE/1049

Date: 21<sup>st</sup> May 2020

To: Mr. V.H.K. Samaratunga  
PMDSC Resident Engineer (PMDSC-RE)  
Address: Irrigation Engineer Premises,  
Hasalaka, Sri Lanka.

**Project:** Heightening of Minnie Anicut Including Water Control and Measurement  
Facilities for Left Bank and Right Bank Canals

**Subject:** Submission of river water quality test report.

**Refer:** PMDSC-ML-Site/ICB-1/CGGC/445,28/01/2020.

Dear Sir

We herewith submit a copy the test report CEA/CPO/KY/Other/19/LAB 513 dated 04/03/2020 provided by the CEA provincial laboratory, Polgolla in respect of Mahaweli river water relevant to Minnie anicut site for information.

Your prompt attention and understanding in this regard is highly appreciated.

Yours faithfully,



Eng. A.M.U.B. Alahakoon.  
Acting Project Manager / Planning Engineer  
China Gezhouba Group Company Limited  
Tel: 055 22 560 37  
Email: gzmnpmb@126.com

MWSIP - PMDSC	
MINIPE SITE OFFICE - HASALAKE	
Registered incoming by:	
Seen:	8
Date:	22 MAY 2020
Action by:	RE-CE, EMS.
Copies to:	
Copy to Files:	

Attachment: 1. copy of report Ref. No CEA/CPO/KY/Other/19/LAB 513 dated 04/03/2020

Copy: Mr.S.D.Madiwaka (PD-PIU)

**Contract:** Heightening of Minipe Anicut including Water Control and Measurement Facilities for Left Bank and Right Bank Canals.

**Address:** Unit B7, 7th Floor, Condominium Building, 189, Dr Danister De Silva Mawatha, Colombo 9.

**Email:** gzmnpmb@126.com 1 / 1

### TEST REPORT

Issued Date : 04/03/2020  
Location : Minipe Anicut Project,  
Minipe Anicut,  
Rantembe.  
Reference No : CEA/CPO/KY/Other/19/LAB 513  
Laboratory No : 67 - 69/20/CLS

PROVINCIAL LABORATORY  
CENTRAL ENVIRONMENTAL AUTHORITY,  
CENTRAL PROVINCIAL OFFICE  
POLGOLLA  
Tel: 081-2494884, 081-7877277  
Fax: 081-2494884  
E-Mail: [ceacpo@gmail.com](mailto:ceacpo@gmail.com)



148  
05/03/20

**Sampling Locations:**

ID Number	Sampling Location	Laboratory Ref. No:
M1	Minipe anicut spill basin	67/20/CLS
M2	Riverine forest near Minipe causeway	68/20/CLS
M3	Beside Randenigala road	69/20/CLS

Type of Sample /Sampling : Grab

Name of the requester or client : Environmental Officer,  
China Gezhouba Group Company Ltd,  
Minipe Anicut,  
Rantembe.

Sampling carried out by : Dilini Punchihewa (Laboratory Assistant)

Inspected by : P.A. Kotabewatta (Chemist)  
Dilini Punchihewa (Laboratory Assistant)

Date of sample collected : 17/02/2020

Time of Sample Collected : M 1 – 10.34 hr  
M 2 – 11.00 hr  
M 3 – 11.10 hr

Witness : Mr: R.M. Amarasekara (Environmental Officer)

Weather condition : Sunny

Reference : Standard methods for the examination of water and  
wastewater- APHA 21<sup>st</sup> Edition, 2005

17/2  
05/03/20



Attachment - 01

# Water Quality of Minipe anicut - February, 2020

Analytical Results									
Test Method Laboratory No	pH	EC (µS/cm)	Turbidity (NTU)	Temperature (°C)	Dissolved Oxygen (mg L <sup>-1</sup> )	TSS (mg L <sup>-1</sup> )	NO <sub>3</sub> <sup>-</sup> as N (mg L <sup>-1</sup> )	Total Coliform (MPN/100mL)	Faecal Coliform (MPN/100mL)
	APHA 4500-H <sup>+</sup> B	APHA 2510 B	APHA 2130 B	APHA 2550 B	APHA 4500-O C	APHA 2540 D	APHA 418 D	APHA 9221 B	APHA 9221 E
67/20/CLS	7.6	0.11	57	26.7	6.1	4	2.08	330	130
68/20/CLS	7.4	0.13	112	26.2	7.1	4	2.13	490	170
69/20/CLS	7.6	0.11	34	26.0	5.6	4	2.15	230	130
Category A	6.0 – 8.5	-	5	-	6 (minimum)	25	10	10,000	500 (desirable) 1000 (maximum)
Category E	6.0 – 8.5	700	-	-	3 (minimum)	2,100	-	-	-

This report refers specially to the sample tested.

## Conclusion -

The physico chemical properties of the surface water were compared against the ambient water quality standards of the gazette notification (No: 2148/20 of 5<sup>th</sup> November, 2019) under the section 32 of the National Environmental act, No. 47 of 1980. [Category A - (Water source for simple treatment and for drinking), Category E (Suitable for irrigation and agricultural activities)].

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