

Environmental Monitoring Report

Project Number: 43319-033

Loan 2983-CAM (COL), Loan 8265-CAM (SCF)

Grant 0334-CAM (UEIF), Grant 0335-CAM (SCF)

Semi-Annual Environmental Monitoring Report (July to December 2022)

January 2023

Cambodia: Greater Mekong Subregion Southern Economic Corridor Towns Development Project

Neak Loeung Flood Control Subproject

Prepared by the Ministry of Public Works and Transport for the Asian Development Bank.

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Environmental Monitoring Report

The 11th Semi-Annual Environmental Monitoring Report
(July to December 2022)

January 2023

CAMBODIA: Greater Mekong Sub Region Corridor Towns Development Project

(GMS: Southern Economic Corridor Towns Development Project)

LOAN 2983(SF)/8265(SCF), GRANTS 0334(UEIF)/0335(SCF)-CAM

Sub-projects of Neak Loeung Flood Control

Prepared by:

Project Management Unit of the Ministry of Public Works and Transport (PMU/MPWT).

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ABBREVIATIONS

ADB	-	Asian Development Bank
CEMP	-	Construction of Environmental Management Plan
CSCS	-	Consultancy Services for Construction Supervision
EA	-	Executing Agency
ECO	-	Environmental Control Officer
EMC	-	Environmental Monitoring Consultant
EMP	-	Environmental Management Plan
EMR	-	Environmental Monitoring Report
ESMU	-	Environmental and Social Management Unit
GMS	-	Greater Mekong Sub region
IEE	-	Initial Environmental Examination
MRF	-	Material Recovery Facility
MPWT	-	Ministry of Public Works and Transport
MOE	-	Ministry of Environment
PDPWT	-	Provincial Department of Public Works and Transport
PMU	-	Project Management Unit
PIU	-	Project Implementation Unit
PISCD	-	Project Implementation Support and Capacity Development
PPE	-	Personal Protective Equipment
SPS	-	ADB Safeguard Policy Statement (2009)
WWTP	-	Wastewater Treatment Plant
UXO	-	Unexploded Ordnance

I. EXECUTIVE SUMMARY

Introduction:

1. This report is the 11th Semi-annual Environment Monitoring Report (SEMR) covering the period of July to December 2022 of Southern Economic Corridor Towns Development Project (SECTDP) which has been continuous updated from the 10th SEMR, and prepared to fulfill the safeguard policy requirement of ADB; the Project is Category B for environmental safeguards. This report is prepared by the Project's Environmental Safeguard Consultant.

2. The report provides information on environmental progress and concerns for the implementation stage of the sub-project. For this report presents supervision of construction work activities, the progress of the civil works of the sub project and consultant's role for the required task as defined in the scope of work of the supplementary assistance. Additionally, construction works of six (6) sub projects contracts were finished and handed over completely in 2020 as the following: 1) CW 01a: Construction of additional works for 3 MRFs building (completed on 25 April 2020); 2) Construction of MRFs Building at Battambang, Bavet & Poipet (completed on 24 August 2018) ; 3) CW5: Improvement of Urban Road Section at Bavet (completed on 30 July , 2020 and the defects liability period ended on 30 July 2021); 4) CW06: Battambang Storm Drainage (completed and handed over to Employer on 31 December 2019 and the defects liability period ended on 31 December 2020); 5) CW 07: Poipet Storm Drainage (completed on 31 July, 2020, and handed over to the Employer on 14 August 2020 and defects liability period ended on 31 July 2021); 6) CW 08: Bavet Storm Drainage (completed on 22 November 2020 and the defects liability period ended on November 2021 as the details indicated in Table 1). CW 10: Neak Loeung Flood Control subproject was awarded on 14 December 2020 and construction works started on 5 April 2021.

3. The findings are based on the reviewing of: 1) monthly engineering progress reports from Consultancy Services for Construction Supervision (CSCS), the monthly reports from July to December, 2022; 2) The Quarterly reports from Project Implementation Support and Capacity Development Consultants (PISCD); 3) monthly progress reports submitted by the Contractors; and 4) visual findings obtained during the site visit of site-specific monitoring by the Environmental Safeguards Consultant of the PMU, and PISCD Environmental Specialist.

Table 1: Project Overview, Snapshot of Project Progress

Project Number and Title:	Loan 2983–CAM(SF); Loan 8265 – CAM(SCF); Grant 0334 – CAM(UEIF); Grant 0335–CAM(SCF), GMS: Southern Economic Corridor Towns Development Project	
Safeguards Category	Environment	B
Reporting period:	01 July to 31 December 2022	
Last report date:	January - June 2022 (July 2022)	
Key sub-project activities since last report:	<p><u>Completed and Handed Over Contracts:</u> As of 31 December 2022, the subprojects have completed and handed over contracts as below: I- The construction of additional works for 3MRFs (CW01a) was completed on 25 April 2020,</p>	

	<p>II- Construction of MRFs Building at BTB, Bavet, and Poipet, the general civil works was completed on 24 August 2018;</p> <p>III- CW05: Subproject Improvement of Urban Road Section at Bavet was completed the project on 30 July 2020 and the defects liability period ended on 30 July 2021;</p> <p>IV- CW06: Battambang Storm Drainage subproject was completed and handed over to the Employer on 31 December 2019 and the defects liability period ended on 31 December 2020;</p> <p>V- CW07: Poipet Storm Drainage subproject was completed on 31 July 2020, and handed over to the Employer on 14 August 2020; and the defects liability period ended on 31 July 2021; and</p> <p>VI- CW08: Bavet Storm Drainage subproject was completed on 22 November 2020. And the defects liability period ended on 22 November 2021.</p> <p><u>Ongoing Contracts:</u> During this period, Neak Loeung Flood Control Subproject (CW10) was contracted an award on 14 December 2020 and commencement of civil work since 05 April 2021. The overall physical progress is 76% of the civil work as of 31 December 2022.</p>
Report prepared by:	PMU under technical support from Environmental Safeguard Consultant
Report checked by:	PMU-MPWT

Summary of Construction Progress:

4. As of 31 December 2022: CW10: Construction of Neak Loeung Flood Control Dike is at overall physical progress of 76%.

Summary of EMP Implementation:

5. Construction works have been implementing in accordance with the provisions of the EMP such as reviewing of monitoring report format, regulatory compliance action plan and camp layout review and preparation of site camp and approval by local authority. The Contractor's Construction Environmental Monitoring Plan (CEMP) is successfully being implemented by the Contractor through the PISCD (Environmental Expert) engaged by executive agency with the approval of PMU.

6. The field monitoring found that some of the mitigation measures are being implemented by the contractor are:

- COVID-19 prevention measures have been implemented in camp sites and construction site in Neak Loeung Flood Control (CW10);
- Approved borrow pit/quarry areas of subproject have been used;
- Sprinkling of water on access roads is ongoing carried out regularly at Neak Loeung Flood Control during compaction works and it helps to control dust,
- Workers, and staffs at work site have been using PPE for health and safety reason at working site,

- Facilities at workers' camp site such as proper accommodation rooms, kitchen, gender-segregated toilets, gender-segregated shower rooms, septic tank, proper electricity connection, potable water, waste bins, fire extinguisher, first aid kits and safety kits (COVID-19 prevention) are in place properly.
- Hiring of unskilled workers including women were observed at Neak Loeung Flood construction sites.
- Traffic signs have been using at constructing site, roads connecting to the constructing site and flagmen have been working to manage the traffic.
- Project signboards and GRM signboards are at campsite, constructing site and commune hall properly.

Summary of Monitoring Activities:

7. The following activities were undertaken for the six (6) months (July – December 2022):

Role	Activity	Number
PIU	Consultation visit	3 times
CSCS	Monthly reports	6 reports
PISCD	Site inspections	4 times
PMU	Monitoring	5 times
PMU-PIC environment	Monitoring	2 times
ADB	Mission	1 time

8. Table 2 shows environmental quality monitoring results and they were conducted on 27 July 2022 as compensation to the previous reporting period because contractor missed conduct the monitoring test in the previous reporting from January – June 2022..

Table 2: Summary of Environmental Quality Monitoring Jul – Dec. 2022

Neak Loeung Flood Control Subproject (CW10)				
Issued Monitored	Location	Actual Jul. - Dec. 2022	Results of Environmental Quality	National Standard
Air Quality	Two locations: - P0530763/1242189 - P0532526/1244023	27 Jul 2022	The results of air quality, noise level and vibration level examination are met with the ambient air quality, noise and vibration standard of Cambodia (Table 15, 16 & 17).	CO (<20), NO ₂ (<0.1), SO ₂ (<0.3), PM ₁₀ (<0.05), PM _{2.5} (<0.025), Pb (<0.005)
Noise	Two locations: - P0530763/1242189 - P0532526/1244023	27 Jul 2022		Day time (75), Evening (70), Night (50)
Vibration	Two locations: - P0530763/1242189 - P0532526/1244023	27 Jul 2022		Day time (65), Night time (60)

Surface Water	Two locations: - P0531353/1241996 - P0531022/1242066	27 Jul 2022	Based on the results indicated that all parameters are met with the standards of the water quality standard of Cambodia, It can conclude that the water qualities of 2 stations are in good quality (Table 18).	pH (6.5-8.5), DO (>3), TSS (<100), BOD ₅ (<6), COD (<8),
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Summary of Occupational Health and Safety Issues

9. Construction of Neak Loeung Flood Control subproject (CW10) was observed:
- All workers and staff are using PPE properly at constructing site, e.g. The workers wear face-mask all the time.
 - Workers are checked the temperature in every day to comply with COVID-19 prevention measures. As the result, there is no case of COVID-19 infection in this reporting period.
 - The safety signages, first aid kit, and fire extinguishers are in place properly.

Summary of Consultation Activities:

10. The training on Environmental Monitoring, GRM and COVID-19 prevention was not conducted during this reporting period as it was already conducted once in period reporting period (22 September 2021).

11. During the site monitoring on 05 and 16 December 2022, PMU Environmental Safeguards Consultant and PMU Project Manager met and consulted with Mr. Sreng Long (Director), Mr. Hum Visal (Site Engineer), Mr. Orng Leang Meng (Environmental and health safety staff), workers, truck drivers and some local people about the safeguards performance for this subproject.

Summary of Key Issues/Complaints, GRM and Actions in Response to Complaint:

12. There is no any issue and complaint encountered during the reporting period of July – December 2022.

Conclusion:

13. In conclusion, by the end of December 2022, the Neak Loeung Flood Control subproject (CW-10) has implemented mitigation measures stating in Environmental Management Plan (EMP) and Construction Environmental Management Plan (CEMP) properly. The contractor should continue the implementation of the Environmental Monitoring Plan, perform self-monitoring including the preparation of monthly environmental monitoring report submitting submitted on time to PMU/MPWT and the PISCD.
14. The actions recommendations during previous monitoring period (the 10th EMR) have been implemented.

- i) Conducting environmental quality monitoring by contractor according to EMP/CEMP (It will report in next reporting period-Jan-Jun 2023);
- ii) Keep implementing COVID-19 prevention measures strictly both at camp site and constructing site;
- iii) Keep good performance of implementation of the EMP/CEMP for the Neak Loeung Flood Control subproject.

15. During this reporting period, environmental mitigation measures have been implemented properly based on EMP/CEMP. The health and safety plan regarding to the prevention of COVID-19 has been strictly monitored and restricted at the camp site, and construction site. And project information and GRM signboards are in places properly.

16. There are several follow-up activities for next reporting period are described as below:
- Conducting environmental quality monitoring by contractor according to EMP/CEMP as soon as possible in between January and February 2023;
 - Keep implementing COVID-19 prevention measures strictly both at camp site and constructing site;
 - Ensure all workers are properly equipped with sufficient PPEs.
 - Keep good performance of Implementation of the EMP/CEMP for Neak Loeung Subproject.

II. PROJECT OVERVIEW, GENERAL SAFEGUARD MATTERS

1. Project Overview

17. The project will improve urban infrastructure and service delivery has been progressing the civil works of the three subprojects of the said towns (Bavet, Battambang, and Poipet) over the period of 4 years (2017 to 2021), and the Neak Loeung Flood Control Subproject (CW-10) has been contracted an award and under construction.

18. As of December 31, 2022, construction works of six (6) sub projects contracts were finished and handed over completely in 2020 as the following 1) CW 01a: Construction of additional works for 3 MRFs building (completed on 25 April 2020); 2) Construction of MRFs Building at Battambang, Bavet & Poipet (completed on 24 August 2018); 3) CW5: Improvement of Urban Road Section at Bavet (completed on 30 July 2020 and the defects liability period ended on 30 July 2021); 4) CW06: Battambang Storm Drain (completed and handed over to Employer on 31 December 2019 and the defects liability period ended on 31 December 2020); 5) CW 07: Poipet Storm Drainage (completed on 31 July 2020 and , and handed over to the Employer on 14 August 2020 and defects liability period ended on 31 July 2021); 6) CW 08: Bavet Storm Drainage (completed on 22 November 2020 and the defects liability period ended on 22 November 2021). The campsites for these subprojects were cleaned up and returned to owners as it states in the SEMR for July-December 2020. On the other hand, CW 10: Neak Loeung Flood Control subproject was contracted an award on 14 December 2020 and commenced construction works since on 05 April, 2021.

19. **Impact and Outcome:** The impact has been improved living environment in Project towns. The outcome has been improved municipal service delivery and urban infrastructures in the Project towns.

2. Project Progress

2.1 Contract Signed

20. In this period, Subproject for Neak Loeung Flood Control has been contracted on 14 December 2020 and commencement of civil work has started since 05 April 2021 as showing in the table below:

Table 3: Contract Signed

Contract Signed					
Package No.	Sub Project	Contract Period (days)	Date of start work	Date of completion	Contractors
CW10	Neak Loeung Flood Control	911	05-Apr-2021	30-July-23	M.T.A Construction Co., Ltd

Source: Monthly progress report (August, 2021) of CSCS

2.2 Civil Work Progress against Schedules of 31 December 2022:

21. The overall progress of physical infrastructure subprojects is considered on time despite there is a minor delay in contract award for CW-10 and updated Detailed Resettlement Plan.

Table 4: Civil Work Progress (%) against Schedules

Progress as of 31 December 2022	CW-10	Total
Planned (%)	78 %	100
Actual (%)	76 %	97.4
(%)	-2 %	-2.6

3. Safeguard Plans Implementation Arrangements & Documentation

3.1 Roles and Responsibilities in EMP Implementation and Monitoring

22. The environmental management plan (EMP) defines the institutions and responsibilities for environmental safeguards and EMP implementation as follows:

- 1) Ministry of Public Works and Transport (MPWT/PMU) is the executing agency (EA) of the subprojects;
- 2) The Provincial Department of Public Works and Transport (PDPWT/PIU) at the provincial level is the implementing agency (IA) of the subprojects;
- 3) The project management unit (PMU) formed by the EA oversees implementation of the subproject of Neak Loeung flood control;
- 4) A PMU environmental control officer (ECO) is identified;
- 5) The ECO will form part of the environmental and social management unit (ESMU) for the subproject.

23. The roles and responsibilities for EMP implementation and monitoring are described in Table 4:

Table 5: The roles and responsibilities of the different in EMP implementation and monitoring

Agency	Roles/ Responsibilities
The EA/PMU	- Overall responsibility for subproject implementation and establishment of the subproject Management Unit (PMU);

	<ul style="list-style-type: none"> - Approve medium term and annual rolling plans for subproject implementation; - Ensure compliance of Loan Covenants; - Approve procurement plans, bidding documents including EMP, bid evaluation and contract awards; - Submit regular quarterly and annual subproject reports to ADB; - Ensure compliance of subproject implementation with ADB's social and environmental policies and guidelines;
The IA/PIU	<ul style="list-style-type: none"> - Coordinate and monitor subproject activities of the PIU; - Support PIU in carrying out the approved annual rolling plans including EMP related activities; - Coordinate and provide capacity development program for PIU; - Obtain necessary approvals from respective departments prior to awarding of civil works contracts; - Support PIU in the implementation of EMPs; - Coordinate regular reporting of PIU to EA on EMP implementation; - Undertake regular quality control inspection of subproject facilities; - Manage the handover of subproject facilities to agencies responsible for operation and maintenance. - Prepare and submit regular quarterly and annual subproject reports; - Supervise civil works contractors; - Ensure that EMPs are incorporated in the detailed designs and included in civil works contracts; - Ensure EMP implementation; submit regular monitoring reports to IA and EA; and - Monitor EMP implementation
Contractor	<ul style="list-style-type: none"> - Preparation of CEMP, and conduct monitoring environmental items basically and follow-up all activities at the project sites, camp site, and other material yards. - Daily/Weekly and monthly monitoring - Health, Safety and Environment (HSE) report Monthly - Provide sufficient funding and human resources for implementation of the EMP - Ensure proper and timely implementation of required pre-construction and construction mitigation measures in the EMP - Implement additional environmental mitigation measures, as necessary.
Project Implementation Support and Capacity Development Consultant (PISCD)	<ul style="list-style-type: none"> - Review and update the IEE reports and EMPs; - Ensure that environment management plans (EMP) and related environmental considerations are factored in detailed designs and technical engineering of the urban infrastructure subprojects under the Project; - Conducts environmental safeguards due diligence assessments; - Assess the capacity development needs of Project Staff on environment safeguards measures and recommend appropriate capacity building interventions and training programs, including the preparation of TOR for independent environment monitoring, as may be necessary; - Ensure that environment safeguards measures are adequately considered in the bidding documents and in the evaluation criteria for selection and awarding of contracts for civil works, goods and services; - Coordinates, advise, assist on environment related concerns during the Project implementation and recommend appropriate

	action plans, and assist in monitoring implementation of environmental safeguards, including the impact environmental measure on urban sector development.
Consultancy Services for Construction Supervision (CSCS)	<ul style="list-style-type: none"> - Provided overall responsibility of conducting all the project work - Review the contractor's method statement and work program to ensure conformity with the Environment Management Plan (EMP) - Other safeguard regulations (including resettlement, gender and other social safeguard issues).
Environmental Monitoring Consultant (EMC)	<ul style="list-style-type: none"> - Review environmental indicators; - Verify the compliance with statutory requirements prior to construction, e.g. government approvals, permitting, certificates set by government; - Assess reports of internal monitoring determine if adverse environmental impacts are being mitigated properly; - Monitor the implementation of individual management plans; - Conduct periodic site inspections to ensure that measures in the EMPs are being implemented; - Determine the overall performance of the EMP; - Formulate necessary measures/actions to resolve problems to improve EMP implementation; - Prepare external monitoring reports (Semi-annual of Environmental Monitoring Report) submit to PMU and ADB; and - Prepare the completion report will highlight important findings, lesson, best practices to be considered and/or replicated in future similar undertakings.

24. The following table confirms the status of the key roles for EMP implementation:

Table 6: Status of Environmental Safeguards Roles

Role	Status and Issues
PISCD Environmental Specialist	Date started – April 2018 – Full Time
CSCS	Work commenced on Feb. 15, 2018 – full time
PIU – Safeguards Team/officer	PIU Safeguards Team for Neak Loeung Flood Control sub-project is in place.
PMU- Environmental Control Officer (ECO)	Date started: Feb. 2013 (date of loan sign), counterpart time
Environmental and Social Management Unit (ESMU)	2 staffs were identified for the project and started working together with PMU since loan effective in April 2013.
Contractor – Environmental staff for Neak Loeung sub-project	Start the work since 29 June 2021

25. **Contractors:** has willingness to implement environmental safeguards mitigation measures to ensure that the EMP/CEMP of the sub-project are complied with.

26. **PISCD and CSCS:** are continually providing support to the PMU/PIU and the Contractors through close inspection of implementation of the environmental management measures and daily compliance at site. The PSCD regularly submits reports to PMU on monitoring of EMP implementation and compliance of Contractors, which serve as the bases for PIU to provide close guidance at site.

27. **PMU:** Aside from assigning technicians for each package, the PMU have also assigned staff to monitor the EMP implementation for the whole Project. The PMU leaders and staff in charge of each package, have been aware of responsibilities of the implementation of environmental impacts mitigation measures of each package. The PMU staffs are in close coordination with the PIU, thus compliance to the update EMP is gradually improving.

3.2 Monitoring and reporting System on Environmental Safeguards

28. Project staff (PMU, PIU), and the Contractors were oriented at the beginning of the subproject implementation on environmental compliances including procedures for monitoring and reporting as well. PIU established a system with support of PISCD to monitor on environmental safeguards of the subproject including identify the indicators was set out in the monitoring plan of the EMP.

3.3 ADB Approvals

29. The IEE and separated EMP for the Neak Loeung Flood Control Subproject (CW10) were updated and submitted to ADB in January 2020. ADB issued a NOL for the updated IEE and EMP on 03 February 2020.

30. Additionally, ADB provided NOL for commencement on civil works for CW10 on 05 April 2021. The following table confirms the status of the Borrower's Environmental Management Plan for the sub-projects:

Table 7: Status of IEE/EMP report for the subproject

Report Type	PMU Submitted	Submitted to MOE	ADB provided NOL
IEE&EMP report of Neak Loeung Flood Control	PMU submitted the letter to MOE on May 08, 2019	<ul style="list-style-type: none"> - MOE confirmed on 21 Aug. 2019 - EMP was approved on 13 April 2020 	03 February 2020

3.4 CEMP Approvals

31. As of December 2021, CEMP for Neak Loeung Flood Control Subproject has been approved on 15 March 2021 (Table 8).

Table 8: CEMP Approvals Status

CW Package	Role	Status and Issues	Further Updated Needed?
CW10	Neak Loeung Flood Control Subproject	- Approved by PMU 15 March 2021	- No

III. ENVIRONMENTAL PERFORMANCE MONITORING

32. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the entire subproject. Select indicators of major components of the environment that will be affected primarily by the

construction phase are drawn from the mitigation and monitoring plans and summarized in the Table 9.

33. This section presents the compliance status of Environmental Management and Monitoring Plan of the subproject under implementation stage.

1. Status of EMP Implementation (Pre-Construction)

34. The subproject requires to specify in the EMP with respect to: (i) design measures and public disclosure; (ii) project boundaries/location and change alignment; (iii) environmentally responsible procurement; (iv) allocation, staff mobilization and environmental capacity development; (v) unexploded ordnances if necessary; (vi) updating EMP, and reporting.

2. Compliance with EMP during Construction – Neak Loeurng Flood Control subproject

35. The following table summarizes the compliance with EMP mitigation measures for flood control sub-project at Neak Loeurng. The table uses the EMP requirements from the EMP specific to the subproject.

Table 9: Neak Loeung Flood Control EMP Compliance – July-December 2022

	EMP Requirement	Compliance during this reporting period (Yes, No, Partial or Not Applicable)	Reasons for Not Full Compliance	Further Action to Take	Date for Action	Who will Implement Action
1	Management of Worker camps	Yes		None		
2	Land clearing (loss of trees, vegetation, and landscape)	Yes		None		
3	Traffic Management	Yes		None		
4	Solid and Liquid Construction Waste Management	Yes		None		
5	Erosion Control	Yes		None		
6	Air, noise pollution and vibration control	Yes		None		
7	Utility and Power disruption	Yes		None		
8	Public and workers' health and safety	Yes		None		
9	Civil works – water quality & aquatic resources	Yes		None		
10	Cultural heritage/ property damage/ chance finds	Yes		None		
11	Extraction from quarries or borrow pits	Yes		None		
12	closure of construction sites	Not Applicable		Construction is still going on		

36. For all 'Partial' or 'No' compliance issues in the table above, the actions needed to solve the compliance issues are in the table below:

Table 10: Neak Loeung Flood Control EMP Compliance Actions Needed

	EMP Requirement	Reasons for Not Full Compliance	Further Action to Take	Date for Action	Who will Implement Action
	No need	-	-	-	-

37. The table below follows up on issues from previous Environmental Monitoring Reports for this subproject. This table confirms that the action was completed or that the action is outstanding.

Table 11: Neak Loeung Flood Control – Follow Up on Outstanding Issues from Previous Reports

Issue	Required Action	Responsibility and Timing	Resolution
None			

3. Health and Safety Performance Monitoring

38. Site inspection during this period (July to December 2022) was carried out on 05 and 16 December 2022, the health and safety measures have been implementing properly according to the plan in order to prevent accidents and health hazards. Based on interviewed with some workers they confirmed that PPEs (gear, helmets, jackets, boots etc.) has been provided by Contractor. Also, the hygienic conditions and facilities such as availability of sufficient drinking water, electricity, first aid, fire extinguisher, mosquito nets etc. of site camps at Neak Loeung were also monitoring. COVID-19 prevention measures have been implemented strictly and all workers are not allowed to have contact with local people or go outside the construction site and campsite as there are many cases of COVID-19 infection at Neak Loeung. Also, facial masks, alcohol/soap are provided to workers and daily temperature control is done for every worker to ensure the safety. During this reporting period, there is no case of COVID-19 infection.

Table 12: Neak Loeung Subproject (Flood Control) EHS Compliance –July - December 2022

	EHS Requirement	Compliance during this reporting period (Yes, No, Partial or Not Applicable)	Reasons for Not Full Compliance	Further Action to Take	Date for Action	Who will Implement Action
1	Workers wearing PPE	Yes		None		
2	First Aid Kits Available	Yes		None		
3	Fire Extinguishers Available	Yes		None		
4	COVID-19 Prevention Kits (Mask, Alcohol, Temperature Meter)	Yes		None		
5	Training on EMP, GRM	N/A	The training was conducted before starting the construction	N/A		

39. For all 'Partial' or 'No' compliance issues in the EHS Compliance tables above, the

actions needed to solve the compliance issues are in the table below

Table 13: All Subprojects EHS Compliance - Actions Needed

Subproject		EMP EHS Requirement	Reasons for Not Full Compliance	Further Action to Take	Date for Action	Who will Implement Action
None						

40. The table below follows up on issues from previous Environmental Monitoring Reports for this all subproject regarding Health and Safety. This table confirms that the action was completed or that the action is outstanding.

Table 14: Health and Safety - Follow Up on Outstanding Issues from Previous Reports

Issue & Subproject Location	Required Action	Responsibility and Timing	Resolution
None			

4. Environment Effect Monitoring

41. Regular site visit is carried out to monitor by Environmental Safeguards Consultant of PISCD whether the contractor has implemented mitigation measures in the respective EMP properly. If any non-compliance was observed, the PISCD will inform and proposes suitable measure/s to rectify those issues. During this period (July – December 2022), site visit was made to the contract package of Neak Loeung Flood Control subproject on 05 and 16 December 2022. Environmental quality monitoring (air quality, noise, vibration and surface water quality) was conducted on 27 July 2022 as it is required for a period from January-June 2022. However, the contractor did not conduct environmental monitoring for a reporting period from July to December 2022. After getting an instruction by PMU Environmental Safeguards Consultant, the contractor promises to conduct environmental quality monitoring in early 2023.

42. Result of air quality at two sites are indicating in the Table 15 and are met with ambient air quality standard of Cambodia. The detail results are described in Annex 4.

Table 15: Results of air quality monitoring

No.	Parameter	Unit	Results		Standard
			Location 1 P0530763/1242189	Location 2 P0532526/1244023	
1	Carbon Monoxide (CO)	mg/m ³	2.455	3.2621	<20
2	Nitrogen Dioxide (NO ₂)	mg/m ³	0.007	0.014	<0.10
3	Sulfur Dioxide (SO ₂)	mg/m ³	0.018	0.012	<0.30
4	Methane (CH ₄)	mg/m ³	ND	ND	-
5	PM ₁₀	mg/m ³	0.058	0.031	<0.05
6	PM _{2.5}	mg/m ³	0.036	0.014	<0.025
7	Lead (Pb)	mg/m ³	ND	ND	<0.005

43. Based on results of noise level indicating in Table 16, noise level of both sites is met

with noise standard of Cambodia. The detail results are described in Annex 4.

Table 16: Results of noise level

Location	Survey Period (in average)	Noise Level dB (A)			
		LAeq	Standard (Leq)	Lmax	Lmin
P0530903/1242067	6:00-18:00	54.32	75	64.67	40.68
	18:00-22:00	49.27	70	58.74	37.74
	22:00-6:00	46.21	50	51.86	37.52
P0532526/1244023	6:00-18:00	64.82	75	72.21	51.34
	18:00-22:00	60.41	70	69.32	49.11
	22:00-6:00	49.60	50	65.26	46.79

44. Based on results of vibration level indicating Table 17, vibration level of both sites is met with vibration of Cambodia. The detail results are described in Annex 4.

Table 17: Results of vibration level

Location	Survey Period	Vibration Level dB			
		LAeq	Standard (Leq)	Lmax	Lmin
P0530903/1242067	6:00-18:00	33.6	65	42.9	16.9
	18:00-6:00	27.1	60	35.2	15.4
P0532526/1244023	6:00-18:00	31.8	65	41.8	17.7
	18:00-6:00	27.2	60	33.1	16.5

45. Based on the results of surface water quality indicating in Table 18, all parameters are met the standards of the water quality standard of Cambodia. It can conclude that the water quality of 2 stations are in good quality. The details are described in Annex 4.

Table 18: Results of surface water quality

No.	Parameter	Unit	Results		Standard
			Location 1 P0531353/124199 6	Location 2 P0531022/1242 066	
1	pH	-	7.12	7.10	6.5-8.5
2	Dissolved Oxygen (DO)	mg/L	5.8	6.60	>3
3	Turbidity	NTU	8.00	78.00	-
4	Total Dissolved Solid (TDS)	mg/L	116.00	198.00	-
5	Total Suspended Solid	mg/L	13.00	28.00	<100
6	Biochemical Oxygen Demand (BOD5)	mg/L	2.04	2.26	<6
7	Chemical Oxygen Demand (COD)Mn	mg/L	5.17	4.96	<8
8	Total Coli form	MPN/100ml	1.5x10 ³	2.9x10 ³	-

IV. PUBLIC CONSULTATION, INFORMATION DISCLOSURE, CAPACITY BUILDING

4.1 Consultation

46. During the time period from July to December 2022, informal communication with some local people and local authorities were done individually by the contractor to inform about sub-project and schedule of the civil work. The monitoring was conducted on 05 and 16 December

2022 by PMU Environmental Safeguards Consultant. The camp site and construction site were visited and monitored to check the safeguards compliance with EMP of the sub-project. Mr. Sreng Long (Director), Mr. Hum Visal (Site Engineer), Mr. Orng Leang Meng (Environmental and health safety staff), workers and truck drivers were met and discussed during the site monitoring.

4.2 Training

47. During the reporting period, training course on Environmental Management and Monitoring, GRM's Implementation and COVID-19 Prevention was not conducted by PISCD because it was conducted once on 22 September 2021.

V. GRIEVANCE REDRESS MECHANISM

48. Based on site inspection and review monthly progress reports from July to December 2022, there is no complaint or grievance at the Neak Loeung Flood Control sub-project. During site visit of CSCS, PMU and PISCD consultants on 16 December 2022, the villager requested to excavate the small drainage next to the dike of food control to drain the stagnant water for farm land of banana, the contractor agreed to do it for villagers' request, photos of activities are presented in Annex 1.

Summary:

- Number of new grievances, if any, since last monitoring period: None
- Number of grievances resolved: None
- Number of outstanding grievances: None

Table 19: Type of grievance redress by the relevant stakeholders within the project areas

Type of Grievance	Details (Date, person, address, contact details, etc.)	Required Action, Responsibility and Timing	Resolution
Old Issues from Previous Reports			
None			
New Issues from This Report			
None			

VI. CONCLUSION

49. For this reporting period from July – December 2022, the civil work progress of the Neak Loeung Flood Control (CW10) sub-project is 76% while target is 78%.






50. Environmental safeguard compliance has been implementing and maintaining momentum, recognizing the implementation of a critical aspect of Southern Economic Corridor Towns Development Project. Environmental mitigation measures related to the Neak Loeung Flood Control (CW10) sub-project have been implementing in line with Environmental Safeguard Framework. The site monitoring conducted by PMU-Environmental Safeguards Consultant noted that the contractor has implemented the mitigation measures following the







EMP/CEMP such as workers using proper PPEs, traffic signs and flagmen in place, proper implementation of COVID-19 prevention measures (daily temperature control, regular hand sanitation, wearing mask, workers not allow to go out site the camp and construction site, only female chef to buy foods to cook for workers), facilities of camp site (proper worker's rooms, availability of clean water and electricity with proper set-up, proper workers' eating place, segregated male and female toilets and shower rooms, concrete floor on the ground to avoid muddy in rainy season, proper oil and fuel storage and so on) in good condition.

51. Recommendations for improvement over the next six-month from January – June 2023 are described as the following:

- 1) Conducting environmental quality monitoring by contractor according to EMP/CEMP as soon as possible in between January and February 2023;
- 2) Keep implementing COVID-19 prevention measures strictly both at camp site and constructing site.
- 3) Keep good performance of implementation of the EMP/CEMP for Neak Loeung Subproject.

Annex 1: Field Photographs During Site visit at Neak Loeung Sub-project (CW10)

	
<p>Eating place for workers and staffs (05 December 2022)</p>	<p>Eating place for workers and staffs (05 December 2022)</p>
	
<p>Cooking place (05 December 2022)</p>	<p>First aid box, fire extinguisher, and electricity breaker box (05 December 2022)</p>
	
<p>Rooms for workers (05 December 2022)</p>	<p>Bag for plastic bottles (05 December 2022)</p>

	
<p>Organic waste bin and recycle waste bin (05 December 2022)</p>	<p>Workers' rooms (05 December 2022)</p>
	
<p>COVID-19 Poster (05 December 2022)</p>	<p>Petroleum storage room at campsite (05 December 2022)</p>
	
<p>Female shower room at campsite (05 December 2022)</p>	<p>Female and male toilets at campsite (05 December 2022)</p>



Male shower room at campsite
(05 December 2022)



PMU Environmental Safeguards Consultant
conducting site monitoring (05 December 2022)



GRM signboard at commune hall
(05 December 2022)



Project and GRM signboards at construction site
(05 December 2022)



Constructing retention pond (05 December 2022)



PMU Environmental Safeguards Consultant
conducting site monitoring (05 December 2022)

	
<p>Constructing foundation of pumping station (05 December 2022)</p>	<p>Safety barrier at constructing site (05 December 2022)</p>
	
<p>Worker wearing PPE during working hours (05 December 2022)</p>	<p>Water spraying for dust control (05 December 2022)</p>
	
<p>Site discussion with local people (16 December 2022)</p>	<p>Local people requesting for excavating the drainage (16 December 2022)</p>



Excavating a small drainage requested by local farmer (16 December 2022)

Annex 2: Environmental Monitoring Checklist (CW10)

CAM: GMS No. 1 – Southern Economic Corridor Towns Development Project

Project name: CAN: GMS No. 1 - Southern Economic Corridor Town Development Project
 Project site: Neak Loeng Flood Control Subproject
 Environmental monitoring sheet, monitoring date: 05 Dec 2022

No.	Description	Location	Appropriate Facilities/ Protection method	Degree of environmental condition				
				1	2	3	4	5
1	Leaks and spills of hazardous material	Fuel storage area	safety sign				✓	
			far from watercourse >20m				✓	
			far from drain channel >10m				✓	
			concrete flooring				✓	
			concrete curb or wall				✓	
2	Erosion	Construction sites	leakage				✓	
			spilling				✓	
			soil type				✓	
			side slope				✓	
			compaction				✓	
3	Borrow pit/quarry	Borrow/quarries area	re-vegetation				✓	
			embankment				✓	
			retention pond				✓	
			shape (rectangular)				✓	
			wall slope				✓	
4	Water quality	At borrow pit	depth (m)				✓	
			fence				✓	
			At quarry site	slope			✓	
			depth (m)			✓		
			fence			✓		
5	Air quality	Project site	laden sedimentation				✓	
			floating solid waste				✓	
			floating liquid waste				✓	
			dust				✓	
			spray water				✓	
6	Noise	Access road	dust				✓	
			cover on materials				✓	
			spray water				✓	
			any complain				✓	
			Site close to settlement				✓	
7	Waste management	Project site	liquid waste			✓		
			solid waste/garbage			✓		
			human waste			✓		
			hazardous waste			✓		
		Worker camp	liquid waste			✓		
			solid waste/garbage			✓		
			human waste			✓		
		Storage area	liquid waste			✓		
			solid waste/garbage			✓		
			human waste			✓		
8	Drainage	Project site	hazardous waste			✓		
			arrangement			✓		
			functioning			✓		
			Worker camp	arrangement			✓	
			functioning			✓		
9	Damage road/culvert/bridge	Storage area	arrangement			✓		
			functioning			✓		
			Access road	pavement			✓	
			foundation			✓		
			Culvert and bridge along access road	pavement			✓	
10	Traffic	Access road	structure			✓		
			congestion			✓		
			accident			✓		
			Level crossing	safety sign			✓	
			barrier			✓		
11	Safety	Project site	pavement condition			✓		
			accident			✓		
			safety sign			✓		
			tool/equipment			✓		
			education/training			✓		
12	Community perception	Quarry/workshop	safety sign			✓		
			tool/equipment			✓		
			education/training			✓		
			Project site	conflict with local people			✓	
			any complain from people			✓		
Camp/quarry	conflict with local people			✓				
	any complain from people			✓				

Note: 5 - excellence; 4 - very good; 3 - good; 2 - poor; 1 - very poor
 Updated EMP for Neak Loeng Flood Control Dike

Annex 3: COVID-19 Health and Safety Plan Checklist

N.o	Preventing measures to COVID-19, some measures are needed to be implemented as below:	Yes	No
1	Dissemination about COVID-19 prevention and mitigation measures to staff and workers through orientation or distributing leaflet/poster at information/safety board at each construction and camp site;	✓	
2	Daily checking temperature of staff and workers prior starting the works;	✓	
3	Staff and workers have to wear masks all the time and properly;	✓	
4	Do not share personal items or supplies such as phones, pens, notebooks, tools, etc.;	✓	
5	Avoid common physical greetings, such as handshakes;	✓	
6	Maintain a minimum physical distance of one metre from others if possible;		
7	Wash hands often with soap and water for at least 20 seconds after using the washroom, before handling food, after blowing nose, coughing, or sneezing, and before smoking. If hands are not visibly soiled, and soap and water are unavailable, alcohol-based hand sanitizer can be used;	✓	
8	All offices and jobsites implement additional cleaning measures of common areas. All door handles, railings, ladders, switches, controls, eating surfaces, shared tools and equipment, taps, toilets, and personal workstation areas are wiped down at least twice a day with a disinfectant, such as disinfectant wipes. Individuals are responsible for cleaning and disinfecting their workstations;	✓	
9	Commonly touched surfaces on vehicles and equipment are thoroughly cleaned and disinfected at the end of shifts and between users;	✓	
10	Coughing or sneezing into a tissue or the bend of your arm, not your hand; And dispose of any tissues you have used as soon as possible in a lined waste basket and wash your hands afterwards;	✓	
11	Complying with any instructions announced by Ministry of Health accordingly	✓	

Annex4: Results of Air Quality, Noise, Vibration and Surface Water Quality



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គនាយកដ្ឋានគាំពារបរិស្ថាន
មន្ទីរពិសោធន៍
LABORATORY

លេខ/N° : ១២៧-៤.....ព.ស

ព្រឹត្តិប័ត្រវិភាគ
ANALYSIS REPORT

ប្រភពសំណាក/Sample Source: **ក្រុមហ៊ុន MTA Construction Co., Ltd**
 កន្លែងយកសំណាក/Survey Point: **ANV-1, គណៈកម្មាធិការគ្រប់គ្រងជំនន់ គម្រោង Neak Loeung Flood Control Subproject របស់ ក្រុមហ៊ុនសាងសង់ និង ដឹកជញ្ជូន**
 ស្ថិតក្នុងភូមិព្រែកតាស់ ឃុំអ្នកលឿង ស្រុកពាមរក៍ ខេត្តព្រៃវែង, UTM 48 P 0530763 / 1242189
 ថ្ងៃយកសំណាក/Sampling date: July 27, 2022
 រយៈពេល/Sampling Period: 09:00 AM to 09:00 AM next day

ល.រ No	ប៉ារ៉ាម៉ែត្រ Parameter	ឯកតា Unit	លទ្ធផល Result	ស្តង់ដារ Standard	វិធីសាស្ត្រវិភាគ Reference Method
1	Carbon Monoxide (CO)	mg /m ³	2.455	<20 (8 ម៉ោង)	Method Carbon Monoxide Passive Dosimeter
2	Nitrogen Dioxide (NO ₂)	mg /m ³	0.007	<0.10 (24 ម៉ោង)	Method Saltzman [ISO 6768:1998(E)]
3	Sulfur Dioxide (SO ₂)	mg /m ³	0.018	<0.30 (24 ម៉ោង)	Method Pararosaniline [ISO 6767:1990(E)]
4	Methane (CH ₄)	mg /m ³	ND	-	Method Portable CH ₄ gas Detector
5	PM10	mg /m ³	0.058	<0.05 (24 ម៉ោង)	Method Weight Concentration Measuring
6	PM2.5	mg /m ³	0.036	<0.025 (24 ម៉ោង)	Method Weight Concentration Measuring
7	Lead (Pb)	mg /m ³	ND	<0.005 (24 ម៉ោង)	Method 3500-Pb C (HNO ₃ , HCl Digestion)

សំគាល់:
 1- ព័ត៌មាន និង ស្ថានភាពសម្រាប់ពិនិត្យគុណភាពខ្យល់ សម្រាប់គម្រោងអភិវឌ្ឍន៍វិស័យហេដ្ឋារចនាសម្ព័ន្ធ និង ទេសចរណ៍ (ឧបសគ្គនៃប្រកាសលេខ១២០ ប្រ.ក.ប.ស ចុះថ្ងៃទី ១១ ខែ មេសា ឆ្នាំ២០១៨)
 2- ខ្យល់មានល្បឿន ០.៣ m/s ដល់ ៣.៥ m/s

ចេញអោយនៅ ថ្ងៃទី ០៧ ខែ សីហា ឆ្នាំ២០២២

បានឃើញនៅថ្ងៃទី ០៧ ខែ សីហា ឆ្នាំ២០២២

អនុនាយក:
Was seen on date:
Director General




ប្រធានអគ្គនាយកដ្ឋាន

ចេញអោយនៅ ថ្ងៃទី ០៧ ខែ សីហា ឆ្នាំ២០២២

ប្រធានអគ្គនាយកដ្ឋាន
Date of Issue:
Director



លោក ឌី

ចេញអោយនៅ ថ្ងៃទី ០៧ ខែ សីហា ឆ្នាំ២០២២

អ្នកវិភាគ
Analyzer



អ៊ុំ វិណា

ប្រធានអគ្គនាយកដ្ឋាន

11th Semi-Annual Environmental Monitoring Report
July – December 2022



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គនាយកដ្ឋានគាំពារបរិស្ថាន
មន្ទីរពិសោធន៍
LABORATORY

លេខ/N° : ១២៧ ព.ស

ព្រឹត្តិប័ត្រវិភាគ
ANALYSIS REPORT

ប្រភពសំណាក/Sample Source: ក្រុមហ៊ុន MTA Construction Co., Ltd

កន្លែងយកសំណាក/Survey Point: ANV-1, គម្រោងសំប្លែងទឹកជំនន់ ក្រសែង Neak Loeung Flood Control Subproject វស្សា ក្រសួងសាធារណការ និងដឹកជញ្ជូន

ស្ថិតក្នុងភូមិព្រែកតាស័ ឃុំអូរល្បើង ស្រុកតាមក់ ខេត្តព្រៃវែង, UTM 48 P 0530763 / 1242189

ថ្ងៃយកសំណាក/Sampling date: July 27, 2022

រយៈពេល/Sampling Period: 09:00 AM to 09:00 AM next day

Survey Period		Noise Level dB(A)				Remarks
		LAeq	Standard (Leq)	Lmax	Lmin	
Day	6:00 - 7:00	56.9	75	67.5	44.5	
	7:00 - 8:00	57.9		69.8	46.2	
	8:00 - 9:00	63.6		70.9	47.6	
	9:00 - 10:00	62.8		72.9	47.0	
	10:00 - 11:00	58.5		68.3	45.9	
	11:00 - 12:00	60.9		71.3	45.8	
	12:00 - 13:00	57.6		67.2	45.2	
	13:00 - 14:00	51.3		67.7	34.2	
	14:00 - 15:00	62.6		77.9	48.6	
	15:00 - 16:00	62.5		78.5	48.7	
	16:00 - 17:00	61.3		68.1	43.7	
	17:00 - 18:00	56.5		65.9	44.4	
Evening	18:00 - 19:00	53.5	70	62.8	41.5	
	19:00 - 20:00	52.0		64.1	40.1	
	20:00 - 21:00	52.6		64.3	41.1	
	21:00 - 22:00	51.2		65.2	39.5	
Night	22:00 - 23:00	47.2	50	57.5	39.2	
	23:00 - 00:00	47.0		56.6	37.7	
	00:00 - 1:00	48.5		57.1	40.1	
	1:00 - 2:00	48.0		57.2	40.1	
	2:00 - 3:00	49.4		55.3	41.8	
	3:00 - 4:00	49.0		54.2	41.0	
	4:00 - 5:00	50.2		57.3	40.3	
5:00 - 6:00		50.3		58.5	41.4	
24 hours Average		54.6		64.8	42.7	

សំគាល់: ប៉ាន់បំពុល និងស្ទង់ជាសហប្រតិបត្តិការរវាង សម្រាប់ប្រភេទអវិជ្ជមាននៃសំឡេងប្រភេទប្រកាសលេខ១២០ ប្រ.ក.ប.ស្ត ចុះថ្ងៃទី ១១ ខែ មេសា ឆ្នាំ២០១៨ (Sound Level Meter NL-42NK)

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

បានឃើញនៅថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ប្រធានមន្ទីរពិសោធន៍

អ្នកវិភាគ

Date of Issue:

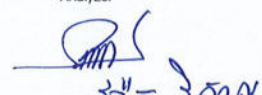
Analyzer

Director

អនុនាយក:
Was seen on date:
Director-General


ហ៊ុក សុខាភិប័ត្ត


លោក ជេ


វ៉ាត វិភាគ



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គនាយកដ្ឋានគាំពារបរិស្ថាន
មន្ទីរពិសោធន៍
LABORATORY

លេខ/N° : ១២៨/.....ព.ស

ព្រឹត្តិប័ត្រវិភាគ

ANALYSIS REPORT

ប្រភពសំណាក/Sample Source: **ក្រុមហ៊ុន MTA Construction Co., Ltd**

កន្លែងយកសំណាក/Survey Point: **ANV-1, កម្រិតកំពូលទឹកជ្រោះ គម្រោង Neak Loeung Flood Control Subproject វិស័យ ក្រសួងសាធារណការ និងដឹកជញ្ជូន**

ស្ថិតក្នុងភូមិព្រែកតាស័ ឃុំប្រកលៀង ស្រុកពាមរក៍ ខេត្តព្រៃវែង, UTM 48 P 0530763 / 1242189

ថ្ងៃយកសំណាក/Sampling date: July 27, 2022

រយៈពេល/Sampling Period: 09:00 AM to 09:00 AM next day

Time	Survey Period	Vibration Level dB				Remarks
		Leq	Standard(Leq)	Lmax	Lmin	
Day	6:00 - 7:00	35.3	65	44.6	16.1	
	7:00 - 8:00	33.6		40.2	16.0	
	8:00 - 9:00	37.2		47.4	16.4	
	9:00 - 10:00	37.5		43.8	17.1	
	10:00 - 11:00	26.7		41.0	17.0	
	11:00 - 12:00	35.7		48.1	16.3	
	12:00 - 13:00	35.2		43.1	15.9	
	13:00 - 14:00	32.3		38.1	16.3	
	14:00 - 15:00	36.1		44.2	16.2	
	15:00 - 16:00	35.5		42.6	16.5	
	16:00 - 17:00	35.3		40.3	17.5	
	17:00 - 18:00	28.7		40.8	16.9	
Night	18:00 - 19:00	28.2	60	38.5	16.0	
	19:00 - 20:00	39.0		42.2	16.3	
	20:00 - 21:00	26.5		38.9	15.9	
	21:00 - 22:00	21.8		35.8	15.5	
	22:00 - 23:00	22.1		38.1	15.1	
	23:00 - 00:00	21.1		38.5	16.0	
	00:00 - 1:00	20.5		28.3	16.6	
	1:00 - 2:00	28.7		36.8	15.2	
	2:00 - 3:00	28.4		31.6	15.2	
	3:00 - 4:00	28.3		35.6	15.4	
	4:00 - 5:00	28.9		32.3	15.3	
	5:00 - 6:00	22.9		41.6	15.6	
24 hours Average		30.2		39.7	16.1	

សំគាល់: ព័ត៌មាន និងស្ថានភាពប្រកបដោយភាពជឿជាក់ ត្រូវបានប្រើប្រាស់ក្នុងការវាយតម្លៃ និងទស្សន៍ទាយ (ឧបសគ្គនៃប្រភេទការសង្កេត ប្រ.ក.ប.ស ចុះថ្ងៃទី ១១ ខែ មេសា ឆ្នាំ២០១៨), Vibration Level Meter VM - 53A

ចេញអាយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ចេញអាយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

បានឃើញនៅថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ប្រធានមន្ទីរពិសោធន៍

អ្នកវិភាគ

Date of Issue:

Analyzer

Director



លោក រដ្ឋ

វ៉ាត វិណា

ជូត សុខាភិប័ត្ត



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គនាយកដ្ឋានគាំពារបរិស្ថាន
មន្ទីរពិសោធន៍
LABORATORY

លេខ/N° : ១៧៨/.....ព.ស

ព្រឹត្តិប័ត្រវិភាគ

ANALYSIS REPORT

ប្រភពសំណាក/Sample Source: **ក្រុមហ៊ុន MTA Construction Co., Ltd**

កន្លែងយកសំណាក/Survey Point: **ANV-2, គុណភាពខ្យល់ក្នុងទីតាំង គម្រោង Neak Loeng Flood Control Subproject I ប្រសូលនាគោល និងជីកជម្រក**

ស្ថិតក្នុងភូមិព្រែកតាសំ ឃុំអូរលៀង ស្រុកពាមរក៍ ខេត្តព្រៃវែង, UTM 48 P 0532526 / 1244023

ថ្ងៃយកសំណាក/Sampling date: July 27, 2022

រយៈពេល/Sampling Period: 10:30 AM to 10:30 AM next day

ល.រ No	ចំណងជំនាញ Parameter	ឯកតា Unit	លទ្ធផល Result	ស្តង់ដារ Standard	វិធីសាស្ត្រវិភាគ Reference Method
1	Carbon Monoxide (CO)	mg /m ³	3.2621	<20 (8 ម៉ោង)	Method Carbon Monoxide Passive Dosimeter
2	Nitrogen Dioxide (NO ₂)	mg /m ³	0.014	<0.10 (24 ម៉ោង)	Method Saltzman [ISO 6768:1998(E)]
3	Sulfur Dioxide (SO ₂)	mg /m ³	0.012	<0.30 (24 ម៉ោង)	Method Pararosaniline [ISO 6767:1990(E)]
4	Methane (CH ₄)	mg /m ³	ND	-	Method Portable CH ₄ gas Detector
5	PM10	mg /m ³	0.031	<0.05 (24 ម៉ោង)	Method Weight Concentration Measuring
6	PM2.5	mg /m ³	0.014	<0.025 (24 ម៉ោង)	Method Weight Concentration Measuring
7	Lead (Pb)	mg /m ³	ND	<0.005 (24 ម៉ោង)	Method 3500-Pb C (HNO ₃ , HCl Digestion)
សំគាល់: 1- ពិបាកមើល និងស្តង់ដារសម្រាប់ពិនិត្យគុណភាពខ្យល់ សម្រាប់គម្រោងអភិវឌ្ឍន៍វិស័យហេដ្ឋារចនាសម្ព័ន្ធ និងទេសចរណ៍ (ឧបសគ្គនៃប្រកាសលេខ១២០ ប្រ.រ.ប.ស្ត ចុះថ្ងៃទី ១១ ខែ មេសា ឆ្នាំ២០១៨) 2- ខ្យល់មានល្បឿន 0.3 m/s ដល់ 3.0 m/s					

បានឃើញនៅថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

អនុនាយក:

Was seen on date:

Director General



ប្រឹក្សា-សុខាភិបាល

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ប្រធានមន្ទីរពិសោធន៍

Date of Issue:

Director


លោក វណ្ណ

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

អ្នកវិភាគ

Analyzer

វណ្ណ វណ្ណ



ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គនាយកដ្ឋានគាំពារបរិស្ថាន

មជ្ឈិមសាងសង់

LABORATORY

លេខ/N° : ១៦៨-.....ព.ស

ព្រឹត្តិប័ត្រវិនិច្ឆ័យ

ANALYSIS REPORT

ប្រភពសំណាក/Sample Source: **ក្រុមហ៊ុន MTA Construction Co., Ltd**

កន្លែងយកសំណាក/Survey Point: ANV-2, កម្រិតសំឡេងក្នុងទីតាំង គម្រោង Neak Loeung Flood Control Subproject I/US ក្រសួងសាងសង់ និងការពារបរិស្ថាន
ស្ថិតក្នុងភូមិព្រែកតាស់ ឃុំអូរកៀង ស្រុកពាមរក៍ ខេត្តព្រៃវែង, UTM 48 P 0532526 / 1244023

ថ្ងៃយកសំណាក/Sampling date: July 27, 2022

រយៈពេល/Sampling Period: 10:30 AM to 10:30 AM next day

Survey Period		Noise Level dB(A)				Remarks
		L _{Aeq}	Standard (Leq)	L _{max}	L _{min}	
Day	6:00 - 7:00	59.3	75	65.8	49.5	
	7:00 - 8:00	60.3		68.2	46.6	
	8:00 - 9:00	62.4		69.5	49.6	
	9:00 - 10:00	62.5		72.3	51.0	
	10:00 - 11:00	57.5		63.4	50.5	
	11:00 - 12:00	57.2		69.3	50.3	
	12:00 - 13:00	57.5		69.1	50.3	
	13:00 - 14:00	58.9		68.5	51.2	
	14:00 - 15:00	58.4		65.6	50.7	
	15:00 - 16:00	57.4		66.6	48.6	
Evening	16:00 - 17:00	58.4	70	68.5	50.2	
	17:00 - 18:00	58.9		69.1	50.0	
	18:00 - 19:00	57.0		65.4	46.3	
	19:00 - 20:00	55.5		61.5	46.6	
Night	20:00 - 21:00	56.3	50	58.5	45.5	
	21:00 - 22:00	57.2		69.5	47.3	
	22:00 - 23:00	53.7		59.5	48.6	
	23:00 - 00:00	53.8		58.6	49.7	
	00:00 - 1:00	52.7		59.5	44.7	
	1:00 - 2:00	50.7		57.6	43.6	
	2:00 - 3:00	50.5		53.6	42.7	
	3:00 - 4:00	51.6		53.6	42.5	
	4:00 - 5:00	51.6		53.2	39.4	
	5:00 - 6:00	53.1		57.5	41.5	
	24 hours Average			56.4	63.5	

សំគាល់: ព្រំដែន និងស្ទង់ជាសម្រាប់កម្រិតសំឡេង សម្រាប់គម្រោងអាជីវកម្មដែលមានប្រភពសំឡេង និងទស្សនៈប្រើប្រាស់ប្រភេទទូទៅ ប្រ.ស.ស ចុះថ្ងៃទី ១១ ខែ មេសា ឆ្នាំ២០១៨ (Sound Level Meter NL-42BK)

បានឃើញនៅថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

អគ្គនាយក:

Was seen on date:
Director General

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ប្រធានមជ្ឈិមសាងសង់


Date of Issue:

Director

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

អ្នកវិភាគ

Analyzer



ហ៊ុក សុខាភិប័ត្ត



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គនាយកដ្ឋានគាំពារបរិស្ថាន
មជ្ឈមណ្ឌលសាងសង់
LABORATORY

លេខ/N° : ១៦៩ ៧៧ ព.ស

ព្រឹត្តិប័ត្រវិភាគ

ANALYSIS REPORT

ប្រភពសំណាក/Sample Source: **ក្រុមហ៊ុន MTA Construction Co., Ltd**

កន្លែងយកសំណាក/Survey Point: **ANV-2, កម្រិតត្រួតពិនិត្យទីតាំង គម្រោង Neak Loeung Flood Control Subproject វិស័យ ក្រសួងសាធារណការ និងដឹកជញ្ជូន**

ស្ថិតក្នុងកម្រិតស្រុកសៀង ស្រុកពោធិ៍ ខេត្តព្រៃវែង, UTM 48 P 0532526 / 1244023

ថ្ងៃយកសំណាក/Sampling date: **July 27, 2022**

រយៈពេល/Sampling Period: **10:30 AM to 10:30 AM next day**

Time	Survey Period	Vibration Level dB				Remarks
		Leq	Standard (Leq)	Lmax	Lmin	
Day	6:00 - 7:00	35.3	65	43.5	17.2	
	7:00 - 8:00	33.6		39.1	17.1	
	8:00 - 9:00	27.2		46.3	17.5	
	9:00 - 10:00	37.5		42.7	18.2	
	10:00 - 11:00	26.7		39.9	18.1	
	11:00 - 12:00	35.7		47.0	17.4	
	12:00 - 13:00	35.2		42.0	17.0	
	13:00 - 14:00	26.3		37.0	17.4	
	14:00 - 15:00	32.1		43.1	17.3	
	15:00 - 16:00	35.5		41.5	17.6	
	16:00 - 17:00	27.3		39.2	18.6	
	17:00 - 18:00	27.7		39.7	18.0	
Night	18:00 - 19:00	27.2	60	37.4	17.1	
	19:00 - 20:00	33.0		41.1	17.4	
	20:00 - 21:00	26.5		37.8	17.0	
	21:00 - 22:00	21.8		34.7	16.6	
	22:00 - 23:00	22.1		37.0	16.2	
	23:00 - 00:00	21.1		37.4	17.1	
	00:00 - 1:00	20.5		27.2	17.7	
	1:00 - 2:00	28.7		35.7	16.3	
	2:00 - 3:00	28.4		30.5	16.3	
	3:00 - 4:00	28.3		24.5	16.5	
	4:00 - 5:00	28.9		31.2	16.4	
	5:00 - 6:00	27.9		40.5	16.7	
24 hours Average		28.9		38.2	17.2	

សំគាល់: ព្រឹត្តិប័ត្រ និងតារាងទិន្នន័យសម្រាប់កម្រិតស្រុកសៀង ស្រុកពោធិ៍ ខេត្តព្រៃវែង និងទីតាំងសំណាក (ឧបសគ្គនៃប្រកាសលេខ១២០ ប្រ.ប.ស ចុះថ្ងៃទី ១១ ខែ មេសា ឆ្នាំ២០១៨), Vibration Level Meter VM - 53A

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

បានឃើញនៅថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ប្រធានមជ្ឈមណ្ឌល

អ្នកវិភាគ

Date of Issue:

Analyzer

Director



អគ្គនាយក

Was seen on date:

Director General

តេក ឌី

វ៉ា វិណា

ប្រឹក្សាសុខាភិបាល



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គនាយកដ្ឋានគាំពារបរិស្ថាន
មន្ទីរពិសោធន៍
LABORATORY

លេខ/N° : ១៦៨/.....ព.ស

ព្រឹត្តិប័ត្រវិភាគ
ANALYSIS REPORT

ប្រភពសំណាក/Sample Source : ក្រុមហ៊ុន MTA Construction Co., Ltd ថ្ងៃ ខែ ឆ្នាំទទួលសំណាក/Date: July 27, 2022 ប្រភេទសំណាក/Type of Sample: SW-01, ទឹកប្រឡាយ គម្រោង Neak Loeung Flood Control Subproject វស្សា ក្រសួងសាធារណការ និងដឹកជញ្ជូន ស្ថិតក្នុងភូមិព្រែកតាស់ ឃុំអ្នកលៀង ស្រុកពាយ័ក ខេត្តព្រៃវែង, UTM 48 P 0531353 / 1241996						
លរ No	ព័រ៉ាម៉ែត្រ Parameter	ខ្នាត Unit	លទ្ធផល Result	បត្រាង Standards		វិធីសាស្ត្រវិភាគ Reference Method
				សំបង់ទឹកសាបា លេខប្រភេទទី១	សំបង់ទឹកសាបា លេខប្រភេទទី២	
1	pH, Lab	-	7.12	6.5-8.5	6.5-8.5	Method pH Meter
2	Dissolved Oxygen(DO), Lab	mg/L	5.80	>3	>4	Method DO Meter
3	Turbidity, Lab	NTU	8.00	-	-	Method Digital Turbidimeter
4	Total Dissolved Solid(TDS), Lab	mg/L	116.00	-	-	Method TDS Meter
5	Total Suspended Solid (TSS)	mg/L	13.00	<100	<100	Method 2540 D
6	Biochemical Oxygen Demand(BOD)5	mg/L	2.04	<8	<6	Method 5210 B
7	Chemical Oxygen Demand (COD)Mn	mg/L	5.17	<10	<8	Method JIS K 0102
8	Total Coli form	MPN/100ml	1.5X10 ³	-	-	Method NF T90-413

សំគាល់: 1- ការយកសំណាក ការរក្សាទុក និងការដឹកជញ្ជូនសំណាកមកមន្ទីរពិសោធន៍ មន្ទីរបរិស្ថានខេត្តត្បូងឃ្មុំ អនុវត្តដោយខ្លួនឯង
 2- Standards គឺជាស្ថាប័នដើមនៃការវិភាគសំណាក: សម្រាប់សិប្បកម្ម ឧស្សាហកម្ម និងសម្រាប់ការពារស្ថានភាពបរិស្ថាន (ស្ថិតក្នុងប្រភេទទី១ តាមធនធានទឹក និង ប្រភេទទី២ នៃ ទឹកផ្ទៃក្នុង)
 3- ND Mean Not Detected (Lower than LDL), (-) Mean No Value
 4- គោលបំណងនៃការវិភាគ គឺដើម្បីតាមដានគុណភាពទឹក

បានឃើញនៅថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

អគ្គនាយក:

Was seen on date:

Director General

ប៊ុន សុខាភិវឌ្ឍ

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ប្រធានមន្ទីរពិសោធន៍

Date of Issue:

Director

វេណី វង្ស

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

អ្នកវិភាគ

Analyzer

វ៉ាត វណ្ណ



ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

អគ្គនាយកដ្ឋានគាំពារបរិស្ថាន
មន្ទីរពិសោធន៍
LABORATORY

លេខ/No : ១៦៨-.....ព.ស


ព្រឹត្តិប័ត្រវិភាគ
ANALYSIS REPORT

ប្រភពសំណាក/Sample Source : ក្រុមហ៊ុន MTA Construction Co., Ltd ថ្ងៃ ខែ ឆ្នាំទទួលសំណាក/Date: July 27, 2022 ប្រភេទសំណាក/Type of Sample: SW-02, ទឹកប្រឡាយ គម្រោង Neak Loeung Flood Control Subproject វស្សា ក្រសួងសាធារណការ និងដឹកជញ្ជូន ស្ថិតក្នុងភូមិព្រែកកាស់ ឃុំអ្នកលៀង ស្រុកតាមរក៍ ខេត្តព្រៃវែង, UTM 48 P 0531022 / 1242066						
ល.រ No	ឈ្មោះប៉ារ៉ាម៉ែត្រ Parameter	ឯកតា Unit	លទ្ធផល Result	បង្គោល Standards		វិធីសាស្ត្រវិភាគ Reference Method
				សំណុំទឹកសាបា រោងប្រឡាយទី១	សំណុំទឹកសាបា រោងប្រឡាយទី២	
1	pH, Lab	-	7.10	6.5-8.5	6.5-8.5	Method pH Meter
2	Dissolved Oxygen(DO), Lab	mg/L	6.60	>3	>4	Method DO Meter
3	Turbidity, Lab	NTU	78.00	-	-	Method Digital Turbidimeter
4	Total Dissolved Solid(TDS), Lab	mg/L	198.00	-	-	Method TDS Meter
5	Total Suspended Solid (TSS)	mg/L	28.00	<100	<100	Method 2540 D
6	Biochemical Oxygen Demand(BOD)5	mg/L	2.26	<8	<6	Method 5210 B
7	Chemical Oxygen Demand (COD)Mn	mg/L	4.96	<10	<8	Method JIS K 0102
8	Total Coli form	MPN/100ml	2.9X10 ³	-	-	Method NF T90-413


សំគាល់: 1- ការយកសំណាក ការរក្សាទុក និងការដឹកជញ្ជូនសំណាកមកមន្ទីរពិសោធន៍ មន្ទីរបរិស្ថានខេត្តត្បូងឃ្មុំ អនុវត្តដោយខ្លួនឯង
 2- Standards ស្ថិតក្នុងសៀវភៅបង្គោលជាតិសំណុំទឹកសាបា: សម្រាប់ការប្រើប្រាស់នៅក្នុងប្រព័ន្ធធារាសាស្ត្រ និងសម្រាប់ការព្យាបាលទឹកស្ទឹង (ស្តង់ដារប្រភេទទី២ តាមបង្គោលប្រភេទទី១ អនុវត្តតាមបង្គោលប្រភេទទី២ ចុះថ្ងៃទី ២៩ ខែ វិច្ឆិកា ឆ្នាំ២០១៩)
 3- ND Mean Not Detected (Lower than LDL), (-) Mean No Value
 4- គោលបំណងនៃការវិភាគ ពិនិត្យតាមដានគុណភាពទឹក

បានឃើញនៅថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

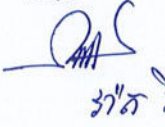
អនុនាយកៈ
Was seen on date:
Director General



ប្រធានមន្ទីរពិសោធន៍
Date of Issue:
Director



អ្នកវិភាគ
Analyzer



ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ចេញអោយនៅ ថ្ងៃទី ០៣ ខែ សីហា ឆ្នាំ២០២២

ប្រធានមន្ទីរពិសោធន៍

អ្នកវិភាគ

ប្រធានមន្ទីរពិសោធន៍
ប្រធានមន្ទីរពិសោធន៍