

Bi-annual Environmental Monitoring Report

Bi-annual Environmental Monitoring Report
(E-35, Hassanabdal – Havelian Expressway, Package –I & II)

Jul - Dec 2015,

PAK: National Trade Corridor Highway Investment
Program (NTCHIP) Tranche - II

NOTES

- (i) The fiscal year (FY) of the Government of the Islamic Republic of Pakistan and its agencies ends on 30 June.
- (ii) In this report, "\$" refers to US dollars.

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Bi-annual Environmental Monitoring Report

CONSTRUCTION OF HASSANABDAL (BURHAN)- HAVELIAN (SAMLAILA) EXPRESSWAY SECTION OF E35

July-December 2015

Islamic Republic of Pakistan

Financed by: Asian Development Bank and Government of the Pakistan

Project Number: 3121-PAK

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For: **National Highway Authority HQ Islamabad**

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Asian Development Bank

LIST OF ABBREVIATIONS

| | |
|------------|---|
| ADB | Asian Development Bank |
| BEPR | Biannual Environmental Progress Report |
| BMP | Best Management Practices |
| CGGC-AM JV | China Gehzouba Group Company-Amin Jan Associate Joint Venture |
| CO | Carbon monoxide |
| dB | deci Bell |
| DCO | District Coordination Officer |
| DCP | Dry Chemical Powder |
| DPO | District Police Officer |
| DCS | Design Supervision Consultant |
| DTR | Daily Time Register |
| EC | European Community |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| EPRM | Environmental Progress Review Meeting |
| EPA | Environmental Protection Agency |
| GFP | Grievance Focal Person |
| GRC | Grievance Redressal Committee |
| GRM | Grievance Redressal Mechanism |
| HSE | Health, Safety and Environment |
| KKH | Karakoram Highway |
| LAC | Land Acquisition Collector |
| Leq | Loudness equivalent |
| MVEs | Motor Vehicle Examiners |
| ND | Not detectable |
| NEQS | National Environmental Quality Standards |
| NGVS | No Guideline Values |
| NHA | National Highway Authority |
| NO2 | Nitrogen dioxide |
| NOC | No Objection Certificate |
| PAPs | Project Affected Persons |
| PRM | Progress Review Meeting. |
| ROW | Right Of Way |
| SC | Supervision Consultants |
| SPS | Safeguards Policy Statement |
| SO2 | Sulfur dioxide |
| SSMC | Social Safeguards Management Consultant |
| SSEMP | Site Specific Environmental Management Plan |
| TDS | Total Dissolved Solids |
| PEPA | Pakistan Environmental Protection Action |
| PM | Particulate Matter |
| PPE | Personal Protective Equipment |
| VECs | Valued Environmental Components |
| WHO | World Health Organization |

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1. INTRODUCTION;

This is second Biannual Environmental Progress Report of Project “Construction of Hassanabdal (Burhan)-Havelian (Samlaila) Expressway Section of E-35 This BEPR provides the overall status of implementation of Environmental Safeguards including ADB Environmental Policies, EIA, EMP/SSEMP and Environmental NOC received from EPA. SSEMP and subcomponents of SSEMP such as Borrow areas Management, Temporary Traffic Management under Item 607 of Contract, Solid Waste Management and Instrumental Monitoring of Environmental Parameters etc. of the Package 1, 2 and 3 of E35 for July to December 2015. Main emphasis was given to ADB Environmental Safeguards, Mitigation Measures of Site Specific EMP and Contractual Provision (Clauses) such as 4.18-Protection of Environments, 4.8-Safety Procedures, 6.4-Labour Law, 6.5-Working Hours, 6.6-Facilities for Staff and Labours, 6.7-Health and Safety, 6.6- Facilities for Staff and Labours, 6.15-Measures against Insect and Pest Nuisance, & 6.21-Child Labours and Specifications SP Item 706-Temporary Traffic Control Management

Package 3 is started on 14th December 2015 and in 15 days of December 2015; the Engineer has issued letters for mobilization of Environmental Staff and Preparation of Site Specific Environmental Management Plan (SSEMP).

1.1. Project Background

The existing Hassanabdal – Mansehra Road is an important part of the entire communication network of Khyber Pukhtunkhwa and Northern Areas which links with Azad Jammu & Kashmir, Kaghan Valley and China via “Karakoram Highway (KKH)”. Existing Hassanabdal - Mansehra Road is a two-lane single carriageway road with a width of 7.3 meters. Heavy traffic load has been observed on this road since last ten years. To support sustained growth and increase competitiveness, Government of Pakistan (GOP) has taken a strategic approach to the transportation and has launched a major initiative to improve the trade and transport logistics chain in KPK and Punjab. National Highway Authority (NHA) planned to construct Hassanabdal - Mansehra Expressway (E-35) as a part of “National Trade Corridor (NTC)” Project. The proposed project is financed by the “Asian Development Bank (ADB)” and Government of Pakistan.

This Express Highway project is entitled as “Hassanabdal – Havelian section of E-35” is a new highway alignment which starts from Burhan Interchange of Islamabad-Peshawar Motorway (M-1) and finally alignment is ended at Havelian near Hazara University of Hazara Campus. This Project will connect and facilitate three districts namely Attack, Haripur and Abbottabad. It curves away to north-west of existing N-35 passing near Shin Gali and Jabbar and then curves back passing near Kuldarra, Chhaprian & Kalu Pind and finally crosses existing N-35 at Jarikas. From here, it again curves away to north-east of existing N-35 crossing Hattar and Khanpur Roads at Kot Najeebullah and Chichian respectively. Finally, the alignment ends at Havelian near Hazara University, Havelian Campus. Total length of the E-35 Phase-1 alignment (Hassanabdal - Havelian Section) is 58.6 Km with total Right of Way (ROW) of 80m for first 2 Packages and 60m ROW for Package 3.

The design speed of the Expressway E35 is 100 Km/hr. The new expressway is intended to provide a safe, quick and more efficient passage to KKH/ Northern areas and China via KKH.

The new expressway E35 is intended to provide a safe, quick and more efficient passage to KKH/ Northern areas and China via KKH. It will be a limited access, four-lane dual carriageway facility with six lanes structures. It is located in mostly plain and partly hilly terrain.

Express Highway project (58.6 km) is envisaged to be implemented in three packages presented as follows;

Package-I : 20.3 Km (Burhan - Jarikas)

Package-II : 19.2 Km (Jarikas - Sarai Saleh)

Package-III : 19.1 Km (Sarai Saleh - Havelian)

Currently all packages have been commenced for construction. Express Highway (E-35) the construction of Express Highway E35 Burhan to Havelian is a Project under the “Pakistan National Trade Corridor Highway Investment Program–Tranche 2 (Hassanabdal–Havelian Section)” of the Government of Pakistan sponsored/ funded by the Asian Development Bank (ADB). The National Highway Authority is the Client of the Project and the key responsible Government Department.

1.1.1. Package 1

Section of Package-I of E35 starts from 5km from Burhan Interchange towards Peshawar Motorway and ended at Jarikas with total 20.40km length. The proposed Express Highway Package-I of E-35 Project comprises the construction of four lane carriageway from Burhan to Jarikas. Main carriageway will be supported with inner shoulders of 1.00m and outer sides 2.50m. The outer shoulder of each carriageway will be 2.500 meter wide.

1.1.2. Package 2

Section of Package-II of E35 starts from 2 km from Jarikas toward Link road N-35 Crossing Hattar Haripur & Khanpur Road and ends at Sarai Saleh with 19.211 km length. The proposed Express Highway Package-II of E-35 Project comprises the construction of four lane carriageway from Jarikas to Sarai Saleh. The carriageway will include shoulders at inner 1.00m and outer sides 2.50m. The outer shoulder of each carriageway will be 2.500 meter wide. The proposed Express Highway will be divided in three construction packages.

1.1.3. Package 3

Section of Package III of E35 start from Sarai Saleh and finally ended at Havelian near Hazara University, Havelian Campus. Right of Way of this section is 60 meters and total four land carriage way with 2.5 outer shoulders and 1 meter inner shoulders. This is last section of Phase I of E35 Project. Contractor is M/s LIMAK Turkey in association and joint venture of ZKB –Zaheer Khan & Brother Construction Company Pakistan. The Engineer has issued work commencement letter to contractor on 14th December 2015. Environmental Specialist of ZKB is mobilized on 24th December 2015. Meeting is held with him regarding Environmental Safeguards implementation on 31st December 2015 in presence of NHA Environment Section. Meeting was led by NHA Director Environment. Contractor is advised for preparation and submission of Site Specific Environmental Management Plan. Official letters are issued for immediate action.

1.2. Mobilization of Supervisory Consultant M/s Dohwa and Associated JVs

The Lead Design Review & Construction Supervision Consultant is M/s DOHWA Engineering Co. Ltd in association with M/s Engineering & Management Services (Pvt) Ltd., Pakistan, and M/s Prime Engineering & Testing Consultants (Pvt) Ltd. Consultant was mobilized on 4th February 2015 by NHA HQ Islamabad.

1.3. Mobilization of Contractor M/s CGGC and LIMAK and Associated JVs on site

The Project's Construction Contractor for Package 1 & 2 is M/s China Gezhouba Group Company Limited in association with M/s Ghulam Rasool Company (GRC) and M/s Amin Jan Construction Company. Contractor CGGC and Associated JVs were mobilized on 5th March 2015. The Engineer had issued commencement letter to contractor for construction work. Contractor for Package 3 is LIMAK from Turkey in association with local (National) contractor M/s ZKB Construction. Contractor for Package is mobilized on 14th December 2015.

1.4. Environmental Impact Assessment (EIA) and Environmental Approval from EPA

As per requirement of ADB Environmental Safeguard Policy Statement June 2009 and Pakistan Environmental Protection Act (PEPA) 1997 and IEE and EIA Regulation 2000, NHA has carried out Environmental Impact Assessment (EIA) and got approval from ADB and Environmental Protection Agency (EPA). NHA has issued the Environmental NOC/Approval, received from EPA for all three Packages to the Engineer. The Engineer's Environmental Specialist has carefully reviewed this Environmental Approval and accordingly advising the Contractor for Compliance. There were twelve conditions/terms/actions issued with approval for project proponent to implement and follow-up during the construction and operational phase of project. Details of terms and conditions are as follows;

| Environmental Terms/Conditions of NOC of Project issued by EPA | Status of Compliance |
|--|---|
| The proponent will adopt all precautionary and mitigation measures identified in EIA Report as well as any unanticipated impacts during the construction and operational phase of project. | EIA and EMP stipulated with contract are followed on site on both packages. Contract Clause 4.18 is about EIA and Environmental Safeguards implementation. SSEMP is prepared, approved and implementation is in progress. Traffic Management, establishment of camp 500 m away from residential areas, waste water treatment septic tank and soakage pits, solid waste collection and proper disposal, first aid for workers at camp site, fire protection at camp and plants, borrow areas management, disposal areas management, environmental and HSE orientations, TBT, and trainings. As Contractor M/s GRC and M/s AM are local and have less experience in environmental safeguards therefore overall environmental performance is partially compliance. |
| The Proponent must submit bi-annual monitoring compliance report to EPA for review. | Submission of Biannual Environmental Progress report (March-June 2015 in accordance with requirement of Project Environmental Approval duly submitted by the Engineer to information of EPA KPK with letter No. 2(4) GM (E-35)/NHA/2015/362 dated 31 st August 2015. |
| Land acquisition and resettlement plan must be submitted to this Agency before starting the physical work. | Land Acquisition and Resettlement Plans of Package 1 & 2 are submitted to NHA and forwarded to EPA with letter No. Dohwa/NHA/E-35/2015/902 dated 17 th September 2015. |

| | |
|---|---|
| Afforestation plan must be provided to this Agency before the physical work is started on the site. | Afforestation plan will be finalized with NHA next year as during construction period plantation or preparing platform/area for plantation will be affected due to work progress. |
| Proper retaining and breast wall should be constructed where needed. | This requirement is already included in scope of work of project. Retaining and breast walls will be constructed. |
| Camp site must be located at least 500 meters away from the residential area. This measure is followed for all camps and plants facilities package 1. | Camps are well away from residential areas. All Camps sites are located away more 500m from residential areas. |
| Regular sprinkling of water for the control of dust pollution during the construction phase must be maintained. | There are several water sprinklers on project for water sprinkling on project carriage way and other access and approach roads. Dust pollution issue is resolved to maximum level. |
| Proper culverts must be constructed for the rainy water. | There are total 59 Box Culverts on package 1 and 34 on Package 2 and 28 on Package 3 included in scope of work to fulfill this requirement. Work on these box culverts is in progress. More than 35 Box Culverts are completed. |
| Number of affected business, houses, trees, agricultural land/crops and their compensation plan must be provided to the Agency before starting the physical work. | LARP of Package 1 & 2 already covered these requirements of Environmental NOC issued by EPA. LARPs of Package 1 & 2 have been sent to EPA. (Task Completed) |
| Non-technical jobs must be provided to the local people in the area. | Already complied with requirements of Environmental approval (about 50% labours and some technical staff are from local project area. |
| Preference should be given to the local people in technical jobs | Contractor has appointed some technical staff from local community. |

1.5. Site Specific Environmental Management Plan (SSEMP) of Package 1, 2 & 3

Pursuant to requirement of Project Contract document clause 4.18, Consultancy ToR of Engineer, EIA requirement the Site Specific Environmental Management Plans have been prepared with the intention of fulfilling the requirements of the environmental clearance conditions of the Package-I: - Burhan to Jarikas Section and Package 2 Jarikas to Sarai Saleh of Hassanabdal-Havelian Section of as part of National Trade Corridor (NTC) Projects from the Asian Development Bank. Final SSEMP of both packages have been submitted by NHA to Asian Development Bank in May 2015. Final and approved Site Specific Environmental Management Plan (SSEMP) of both packages is under implementation.

Contractor has followed and implement ADB Environmental Safeguards June 2009, Contract Clauses 6.6; Facilities for Staff and Labours 6.7, Health & Safety, 6.21 Child Labour, 6.4; Labour Law, and 6.5 working hours and 607.-Temporary Traffic management during construction phase of project.

Contractor on Package 3 is recently mobilized on site in mid of December 2015. Meetings held with Project Manager (PM), General Manager (GM) and Environmental Specialist Mr. Shaukat Zaman in last 2 weeks of December 2015 for preparation and submission of Site Specific Environmental Management Plan (SSEMP) for Package 3. It is conveyed that contractor cannot start work prior and without approval of Site Specific EMP. Contractor LIMAK-ZKB has applied for approval of base

camp and batching plant with submission of layout plan of base camp and concrete batching plant. The Engineer has not issued approval as SSEMP is not approved.

1.5.1. Summary of environmental, health and safety plans of E35 Project

| Names and Type of Plans | Package-1 | Package 2 | Package 3 |
|-----------------------------|------------------------------------|------------------------------------|----------------------------|
| Site Specific EMP | Submitted and Approved | Submitted and Approved | To be submitted |
| Base Camp Layout Plan | Submitted and Approved | Submitted and Approved | Submitted and under review |
| Batching Plant Layout Plan | (3) Provisionally approved | (2) Provisionally approved | Submitted and under review |
| Solid Waste Management Plan | Submitted and Approved | Submitted and Approved | To be submitted |
| Traffic Management Plan | Submitted and under implementation | Submitted and under implementation | To be submitted |
| Borrow areas Management | Provisionally approved | Provisionally approved | To be submitted |

1.6. Project Data

| | | | |
|-----------------------------------|---|--|--|
| Project Name | Construction of Hassanabdal (Burhan)-Havelian (Samlaila) Expressway Section of E-35 | | |
| Employer | National Highway Authority | | |
| Project Location | Districts Attock (Punjab) and Haripur (KPK) | | |
| Project Start Date | March 5,2015 (Package 1 & 2) and 14 th December 2015 for Package 3 | | |
| Project stipulated End Date | March 4,2017 | | |
| Project Funding Source | ADB Loan No. 3121-PAK | | |
| | GOP | | |
| Feasibility and Design Consultant | NESPAK | | |
| Project Features | | | |
| Packages Details | Package 1 | Package 2 | Package 3 |
| Length in KMs | 20.400 | 19.211 | 19.500 |
| Flyovers | 3 | 4 | 02 |
| Bridges | 12 | 6 | 13 |
| Underpass | 8 | 9 | 6 |
| Box Culverts | 53 | 36 | 19 and pipe culverts 28. |
| General | 4 Lane Fenced Expressway with 100 Km/hr speed design | 4 Lane Fenced Expressway with 100 Km/hr speed design | 4 Lane Fenced Expressway with 100 Km/hr speed design |
| Employer's Representative | GM (E-35) NHA | | |

| | | |
|--|---|---------------------------------------|
| Engineer/Team Leader | Kang, Ik-Man | |
| Appointment of Engineer | 1(9)/GM(E-35)/NHA/2015/05 dated 13 th February 2015 | |
| Consultant | DOHWA ENGINEERING CO. LTD in association with EMS & PRIME ENGINEERING | |
| Consultant's Mobilization Date | 4 th February 2015 | |
| Design Review | Six (06) weeks from 4 th February 2015 to 22 nd March 2015 | |
| Construction Contracts | Contractor | Contract Price |
| Package 1 | M/s CGGC – GRC JV | Rs.7,376,968,486 |
| Package 2 | M/s CGGC – AM Associates JV | Rs. 6,775,233,160 |
| Package 3 | M.s LIMARK-ZKB Associates JVs | Rs. 8,188,128,880 |
| Construction Contract Commencement Date | March 5,2015 | Construction Contract Completion Date |
| Defect Liability Period | 365 days | March 4,2017 |

1.7. Organizational Chart of Consultant staff



2. PHYSICAL WORK PROGRESS OF CONSTRUCTION CONTRACTS

Construction Phase of project is already started as the Engineer has issued the commencement letter to contractor M/s CGGC and associated joint venture partners. Currently all 3 packages are active. Package 1 and Package 2 are under construction and physical work progress will be described here with separate headings. Package 3 has yet not started construction work.

2.1. Physical Work Progress of Package 1 by end of December 2015

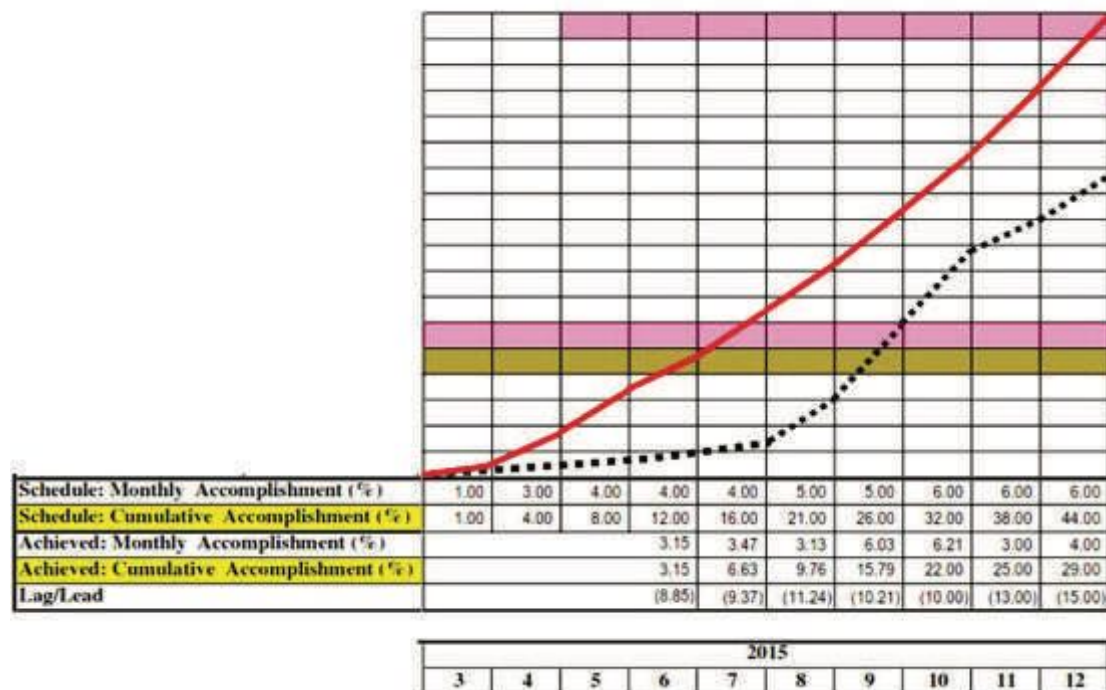
2.1.1. Earth Work on Package 1

| Item No | Description | Total | Completed | Balance | Work in progress at Chainage |
|-----------|--|-----------|-----------|-----------|------------------------------|
| 101 | Clearing and Grubbing (m ²) | 1,501,512 | 1,501,512 | 0 | Completed |
| 104 | Compaction of natural ground (m ²) | 1,501,512 | 1,501,512 | 0 | Completed |
| 106 a,b,c | Road Excavation (Unsuitable/common surplus material) (m ³) | 1,611,909 | 1,226,503 | 385,406 | In progress |
| 108 a,b,c | Formation of Embankment (All Type) (m ³) | 2,630,427 | 1,155,466 | 1,474,961 | In progress |

2.1.2. Structure work on Package 1.

There are total 63 box culverts, 15 underpasses, 15 bridges and 3 flyovers on package 1. Currently 33 box culverts, and 9 underpasses completed and test piles for bridges are under construction.

Physical Work Progress on Package 1 up to end of December 2015



Overall 29.00 % work is completed by end of December 2015 while actual planned work was %. 40.00.

2.2. Physical Work Progress of Package 2 by end of December 2015

2.2.1. Earth work on Package 2 up to end of December 2015

Contractor is working on 4 lanes main carriageway and embankment is under construction. Center line and NSL task are completed while clearing, grubbing, compaction of natural ground, road excavation (unsuitable or common surplus materials) and formation of embankment are in progress. Overall 25.29 % work is completed by end of December 2015 while actual planned work was %. 34.84.

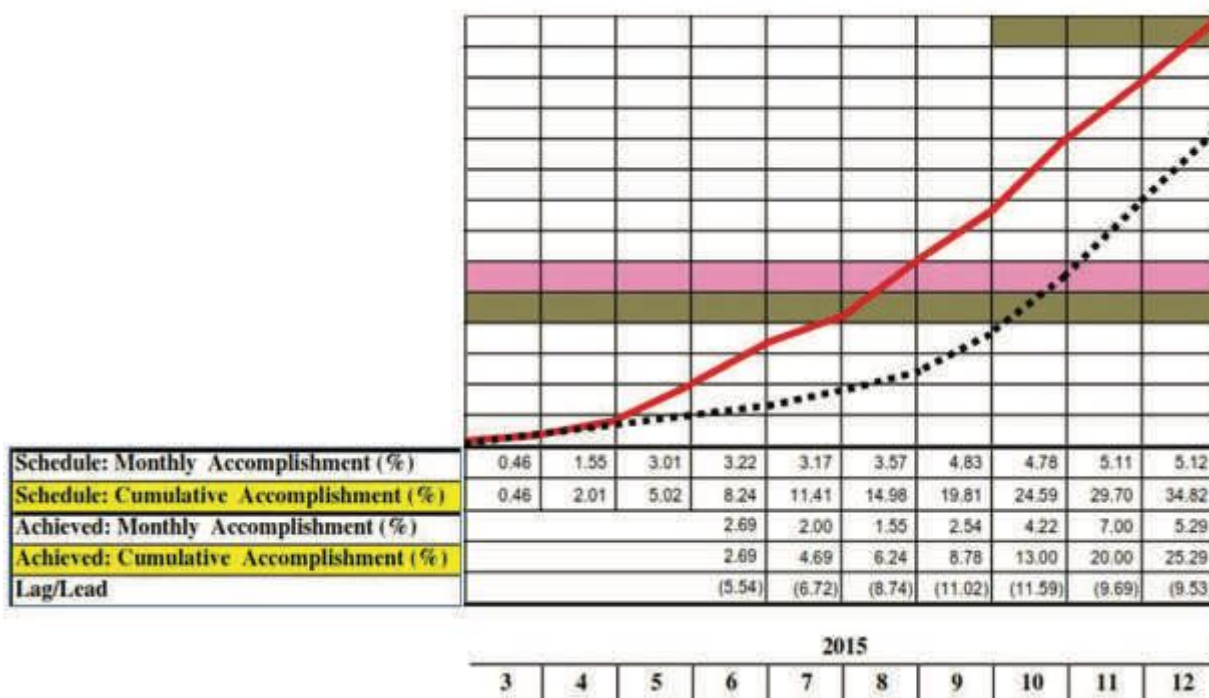
| Item No. | Description | Units | Total Quantity | Completed This Month | Total Completed | Remarks |
|-----------|--|-------|----------------|----------------------|-----------------|-------------|
| - | Center Line | KM | 19.20 | 0.00 | 19.20 | Completed |
| - | NSL | KM | 19.20 | 0.00 | 19.20 | Completed |
| 101 | Clearing and Grubbing | SM | 1127803.0 | 14263.0 | 528900 | In-Progress |
| 104 | Compaction of Natural Ground | SM | 1127803.0 | 7639.0 | 482194 | In-Progress |
| 106 a,b,c | Road Excavation (Unsuitable/common surplus material) | CM | 90000.0 | 0.00 | 46000 | In-Progress |
| 108 a,b,c | Formation of Embankment (All Type) | CM | 2202163.0 | 106107 | 939427 | In-Progress |

2.2.2. Structure work on Package 2

On this package there are 36 box culverts, 9 underpasses, 11 bridges and 4 flyovers. All types of structures are in progress at moments. Details of structures are given below;

- There are total 36 box culverts and out of which 15 are completed and 14 are under construction (in progress),
- There are total 9 underpasses, out of which 5 are completed and 3 are in progress.
- There are 11 bridges and 4 flyovers on package 2. All bridges and flyovers are in progress at moment.

Physical Progress of Work by end of December 2015



2.3. Project Location Map of Construction of Hassanabdal (Burhan)-Havelian (Samlaila) Expressway Section of E-35

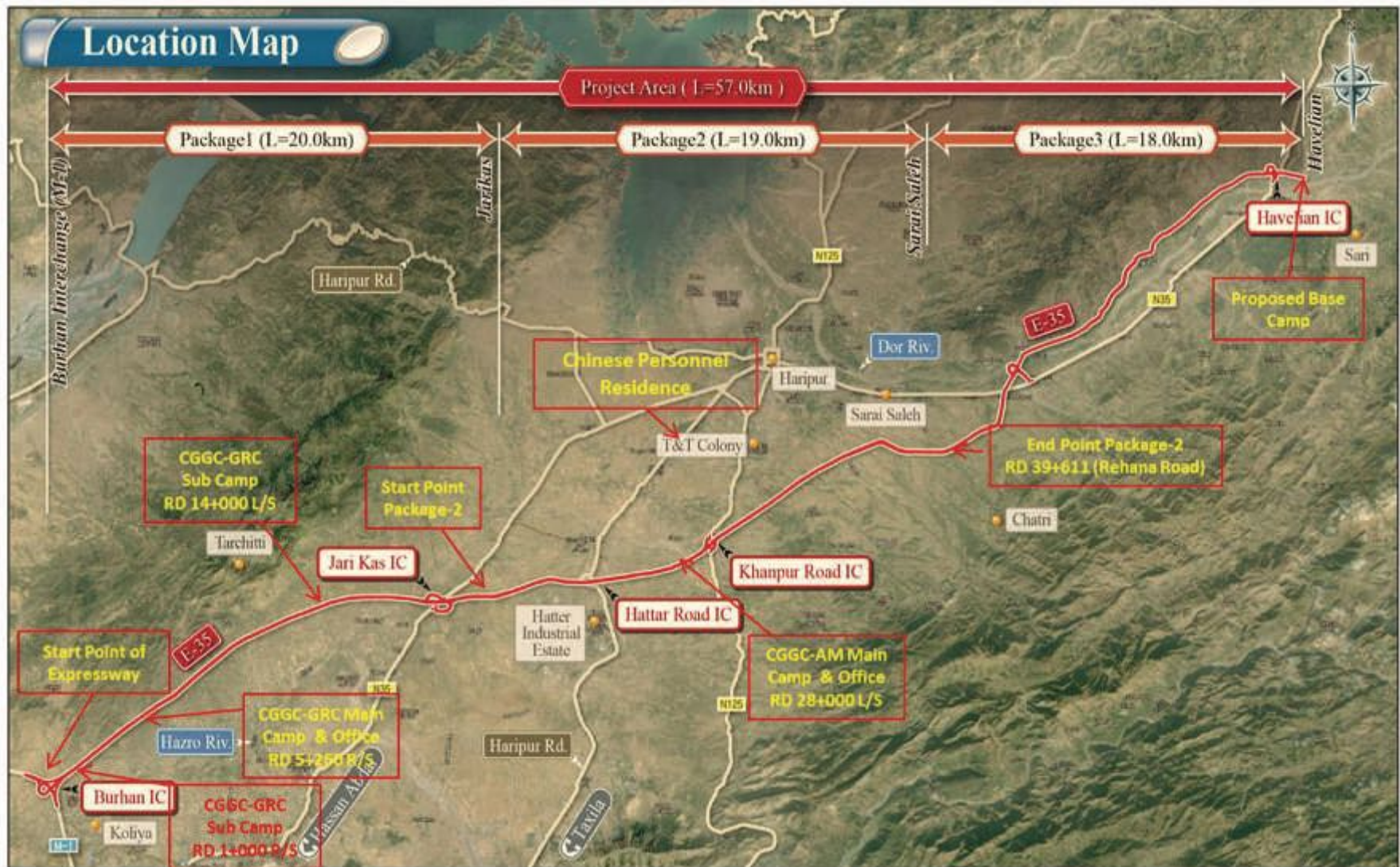


Figure 1 Project Location Map

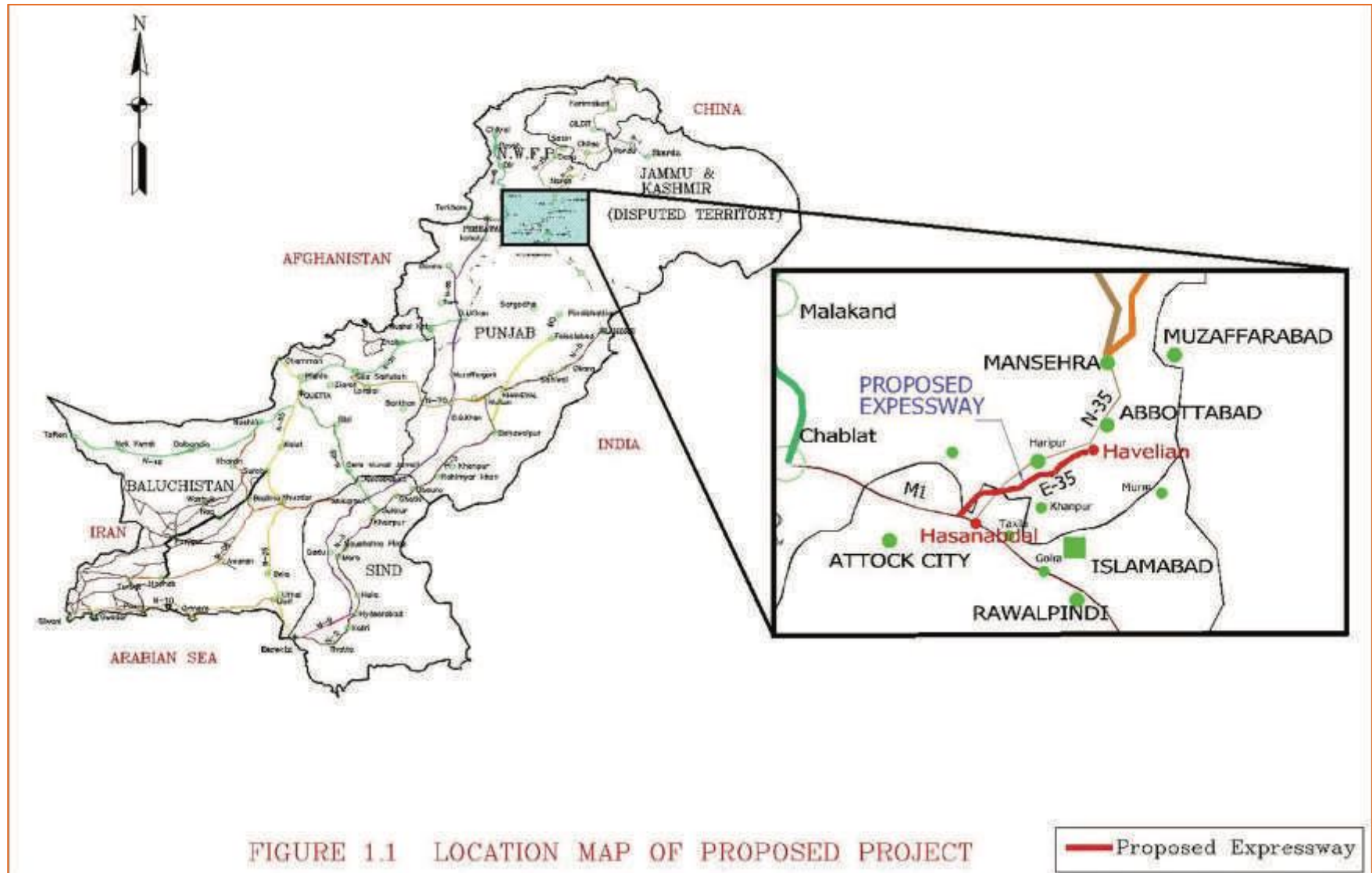


Figure 1.1 Location of Project on Country Map

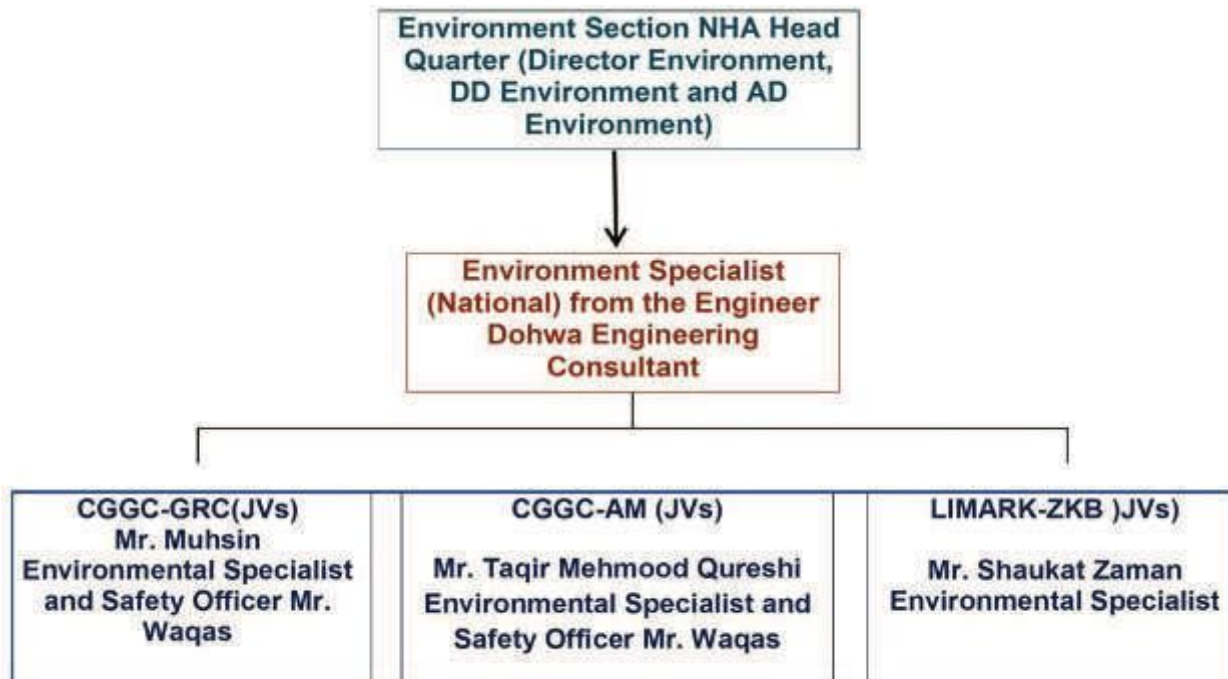
3. STATUS OF ENVIRONMENTAL MANAGEMENT ON PACKAGE 1, 2 & 3

3.1. Institutional Arrangement and Organization Chart for Environmental Safeguards Implementation on Project E35 Phase-I

Institutional arrangement for proper implementation of Environmental Safeguards is important and necessary. National Highway Authority (NHA) and his Environment Section have carried out EIA and prepared EMP and got approval from ADB and EPA in October 2013. EMP is incorporated in Contract of project E35 (all three packages), signed and accepted by Contractor CGGC-GRC & AM (JVs) and LIMAK and ZKB(JVs) for implementation including contractual provisions (Clauses) such as 4.18-Protection of Environments, 4.8-Safety Procedures, 6.4-Labour Law, 6.5- Working Hours, 6.6-Facilities for Staff and Labours, 6.7-Health and Safety, 6.6- Facilities for Staff and Labours, 6.15-Measures against Insect and Pest Nuisance, & 6.21-Child Labours and Specifications SP Item 706-Temporary Traffic Control Management

- China Gezhouba Group Company Limited in association with M/s Ghulam Rasool Company (GRC) and M/s Amin Jan Construction Company. Contractor CGGC and Associated JVs were mobilized on 5th March 2015
- LIMAK in association with local Contractor M/s ZKB were mobilized on 14th December 2015 with official letter for commencement of work at site.

As per requirement of approved EIA and EMP of project and Contract document contractor have appointed environmental specialist on each package for to implement and handle and manage environmental compliance. The Engineer and his representatives (Environmental Specialist) are supervising and monitoring the overall Physical and Environmental Performance of Project's Contractors and responsible of overall contract implementation.



3.2. Environmental Trainings on Package 1 & 2 in reporting period.

First Training session was arranged by Asian Development Bank (ADB) on 23rd April 2015. Consultant staff including the Engineer and Environmental Specialists, NHA Project Director, Deputy Directors, Environment Assistant Directors and Contractor CGGC and JVs and Environmental Specialist of Package 2 have attempted the training session. It was around 5 hours training session held in ADB Country office of Pakistan in Islamabad. Environmental Safeguards of ADB, EIA, SSEMP requirement and EPA requirements were discussed with examples. It was conveyed to Project Management and Environmental Specialists that environmental training and capacity building is a continuous practice in project construction phase and this practice of capacity building will be carried out by Environment Team on project.

In reporting period several Environmental, Health and Safety Trainings sessions and Daily Tool Box Talks were arranged by Environmental Specialists of project. On Package 2 Environmental Specialist was mobilized in May 2015 while on Package 1 Environmental Specialist was mobilized in September 2015. In October and November 2015, the Engineer's Environmental Specialist has delivered detailed training sessions on Package 1 at Base Camps and Plants. Main focus was given to mitigations measures described in SSEMP and current environmental deficiencies on project. On Package 1, Mr. Muhsin Environmental Specialist and his team has delivered short lectures and educate labours.

On Package 2, Mr. Tariq Qureshi Environmental Specialist and HSE Officer Mr. Waqar Khan has started daily tool box talk and initial orientation of workers and staff.

In reporting period meetings of all environmental specialists on project are carried out. The Engineer's Representative Environmental Specialist arranged training for contractor's environmental staff in Burhan office in September 2015 and November 2015. Some details of trainings sessions are provided in report through annexure 3.

Trainings were about the following key Environmental, Health and Safety Components:

- Occupational Health and Safety of Labours and Staff working on site.
- House Keeping and Storage of Fuels and Chemicals.
- Defensive Driving and Traffic Management Requirements of Project
- PPPEs uses and Accident Control at Site.
- Kitchen and Food Safety and Hygienic Control.
- First Aid Facilities and Fire Extinguishers.
- Work at Height and Emergency Response Plan.
- Workshop Area Management and Batching Plant Area Management such as waste water collection, washing yard area for transit mixers.
- Water, Air and Soil Pollution Control and Solid Waste Management at Base Camp.

3.3. Asian Development Bank's Environmental Safeguard Supportive Mission to Project in 3rd September 2015

Environmental Specialist from country office Islamabad of Asian Development Bank has visited and inspected Package 1 & 2 on 3rd September 2015 in company with NHA Director Environment, Project Director, Engineer's Environmental Specialist, Contractor's Project Managers and Construction Managers. Overall the Environmental Safeguards implementation was evaluated and site was checked. NHA and ADB collective advised the project supervision consultant for preparation and implementation of corrective action plan for continuous improvement. Environmental Corrective Action Plan (ECAP) was prepared, accepted by contractor for implementation and implemented.

3.3.1. Corrective Action Plan for Package 1

Corrective Action Plan (CAP) was prepared by the Engineer's Environmental Specialist, shared it with Contractor Project Manager and discussed with GM of GRC on 10th September 2015. This Plan (CAP) was shared with NHA for comments and advise. Final version of this CAP was sent to Asian Development Bank. ADB Environmental Specialist shared comments and advised for implementation. Final version of ECAP was officially handed over to contractor for implementation on 16th September 2015. Contractor has mobilized Environmental Specialist in last week of September 2015. Details of ECAP are as under;

| Task /Issue | Task Deadline | Activities to do/follow | Status of Action |
|--|---------------------------------|---|---|
| Appointment of Environmental Specialist | 20 th September 2015 | Contractor will appoint/deploy an Environmental Specialist on Package 1 as per requirement of Contract stipulated EMP. He will be response of all environmental matters of project but the key staff of project will fully support and coordinate with him. (Mobilized in last week of September 2015) | Completed. Environmental Specialist is on project and implementing Environmental Safeguards. |
| Instrumental monitoring of Environmental Parameters on quarterly basis | 30 th September 2015 | Agreement signed for instrumental monitoring with M/s SEAL Lahore base laboratory and final dates fixed for monitoring of environmental monitoring was 3 rd December 2015. Monitoring is carried out and results are submitted to the Engineer. | Instrumental monitoring is carried on 3 rd December 2015 in supervision of Consultant and Contractor Environmental staff |
| Preparation and submission of Traffic Management Plan | 15 th October 2015 | Temporary Traffic Management (TTM) is key part of project implementation of construction phase. According to Contract Item 706 and its sub components contractor has to provide and manage temporary traffic management during construction phase by using traffic sign boards, cones, reflection tap, hard barrication, flagmen etc. as mention in contract. | Contractor has submitted TMP for Hazara Road (Jarikas Interchange |

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|--|--|--|--|
| for all and each intersection and access routes. | | <p>Contractor will install at least three sign boards on M1 regarding speed limit and work zone of E35 for traffic to word Islamabad.</p> <p>There are several intersection roads coming in RoW of Package 1. Traffic Management Plans for each intersection is required to be prepared and submitted on priority for review and approval and implementation.</p> | area) and newly prepared traffic warning signs are installed by Contractor. TMP of Hazara Road for step -1 (Work area 1 & 2) is approved. |
| Submission of monthly environmental monitoring report | 5 th October 2015 | <ul style="list-style-type: none"> Contractor will prepare and submit monthly environmental progress report to the Engineer by end of each working month. | Contractor has submitted monthly environmental report up to November 2015 |
| Water sprinkling schedule of project access and intersection routes/roads. | 30 th September 2015 | <ul style="list-style-type: none"> Contractor will submit a plan or schedule regarding water sprinkling according to requirement of site. Designated water sprinklers will ensure dust suppression at project approach and access roads. | Contractor has yet not submitted water sprinkling plan but water sprinkling at dusty site is improved. |
| Pending documents of borrow areas (NOCs and lease agreements) | 15 th October 2015 | <ul style="list-style-type: none"> Contractor has utilized borrow areas on package 1. Material test have been carried out and restoration method is not submitted to the Engineer. Contractor will get approval through complete approval documentations and all closed/inactive borrow areas will be restored by contractor. | Contractor has submitted some NOCs of borrow areas and 8 lease agreements are submitted in December 2015 after repeated advises. Restoration is required |
| Ensuring Health and Safety of Labours and Staff (Provision of Personal protective equipments) and First Aid facilities at all site Batching plant) | 10 th October 2015 | <ul style="list-style-type: none"> Contractor has displayed Emergency Response Team with Contact numbers at each plant and camp. Maintain First Aid Clinic at Base Camp, hire or keep an ambulance all time on project site; medical staff will be at base camp for any health hazards/accident and care of labours. First Aid kits will be provided at all batching plants and Asphalt plant and a chart of emergency contact number will be displayed at each site for quick communication and handling or any accident. | Contractor has deployed a paramedical staff at base camp for labours and staff and about 120 first aid cases have been handled by him in November 2015. Ambulance was available for only two days and now demobilized. |
| Construction of Fuel Storage Area at Base Camp 1 & 2. | 30 th September 2015 for Base Camp 1 and 15 th October 2015 for Base Camp 2. | <ul style="list-style-type: none"> Contractor will complete fuel storage area construction at Base Camp-1 of Package 1. Construct fuel storage area base camp 2 at RD 14+400. Fuel will be stored in free leakage drum or tanks on impervious floor and area will be fenced and covered with shelter. Fire Extinguisher will be provided at fuel storage area. | Contractor has arranged big fuels storage tank underground and covered and dispenser is also installed for fuel filling. Fire Extinguishers are available at this location. |

| | | | |
|--|-------------------------------|--|---|
| Traffic Management; Installation of more sign boards, traffic cones, reflecting tap, flagmen and delineators at each intersection where there is high risk of accident. | 10 th October 2015 | <ul style="list-style-type: none"> Contractor will installed four traffic sign boards on each intersection with cones and water sprinkling will be ensured. Contractor will install delineators and hard barrication at all diversion with reflecting tap. Contractor will deploy flagmen at diversion area of active sites. | Work is in progress. Traffic Management is improved than previous status. TMP is also submitted and further advise regarding TMP is issued to Contractor. |
| Provision of Personal Safety Equipments (PSE or PPEs) to all labours at active construction sites. | 30 th October 2015 | <ul style="list-style-type: none"> Contractor will give safety shoes to all workers and labours. Nobody will work without safety shoes. Gloves and high visibility jacket will be provided to workers working at steel fixing and scaffolding site. Long shoes will be provided to workers at concrete site. (Workers doing/filling concrete). Welding and steel cutting bending all workers will wear goggles, gloves and mask. | Improved. Safety shoes are purchased and provided to labours at steel yard areas in base camp 1 but labours at steel yard of base camp 2 have few safety shoes and gloves are still deficient. Welding staff have goggles and gloves. |
| 1. Construction of Solid Waste collection three Chamber Tank at Base Camp 1. | 30 th October 2015 | <ul style="list-style-type: none"> Contractor will construct a three chamber structure for solid waste collection, segregation and disposal at both camps. | Contractor has provided 9 drums for solid waste but three chamber structures is yet not constructed. |

3.4. Asian Development Bank's Social Safeguard Supportive Mission to Project in November 2015

Social Safeguards Team of ADB has visited project on 24th November 2015 along with NHA Officials, Social Safeguards Management Consultant, and Contractor's representatives including Project Management and HSE Team and the Engineer's Environmental Specialist. During the meeting progress of implementation LARP on all three packages were discussed with NHA and Social Safeguards Management Consultant (SSMC). Site visit of Package 1 was carried out by ADB, SSMC, NHA, Dohwa Engineering and Contractor-CGGC-GRC.

3.5. ADB Senior Environmental Specialist site visit to project on 18th December 2015

Senior Environmental Specialist of Asian Development Bank has visited and inspected project (package 1, 2 and 3) on 18th December 2015 in company with Director Environment NHA HQ Islamabad, Project Director E35, Engineer's Environmental Specialist, Contractor's Project Managers and Construction Managers. During the mission Sr. Environmental Specialist of ADB has discussed environmental management practices and safeguards. Further improvements/corrective actions were advised on all three packages. Major instructions were about washing yard areas for heavy machines, and transit mixers, impervious/concrete platform/flooring at batching plants with wash water collection drains and water retention tank. Occupational Health and Safety of Labours and Staff was checked and discussed. Contractor

are advised for development and implementation of T Card System or Employment Card System for all labours and staff. Daily Tool Box Talks are in practice on Package 2 but on Package 1 it is advised to be started and regularly in practice.

3.6. Environmental Progress Review Meeting (EPRM) by NHA Director Environment with Supervision Consultant and Contractor's Environmental Specialists on 31st December 2015

This meeting was especially held for to discuss key observations of ADB and NHA regarding Environmental Safeguards proper implementation and non-compliance correction. All three Contractor's Environmental Specialists have attended this meeting at Burhan Office. NHA Director Environment, Project Director E35, AD Environment and Environmental Specialist of Consultant have discussed all observations and further improvements with Contractor's representatives

- Workshop at Camp and all associated issues with it such as storage of lubricants, use of spills trays, removal of scraps and unwanted materials, labeling and use of PPEs, recycling of waste oil, filters and empty drums etc. Provision of Fire Extinguishers and drainage at workshop area.
- Batching Plant housekeeping, storage of admixture drums, fencing of water retention tanks, labeling/signs of each part/section, provision of concrete platform at concrete pouring/filling section at plant, drainage for waste water, parking and washing area for transit mixers, provision of first aid, provision of PPEs to all staff, removal of scraps, fencing and barrication of plant from camp site, provision of impervious floor at admixture pump area.
- Kitchen, dining hall white wash, insect control spray, use of LPG instead of fuel wood in kitchen, proper lighting and setting arrangement for labours at dining hall with recreation facilities, wash-basins at labour accommodation, heating facilities at dining hall, provision of dish/utensil washing area with proper washing sink under covered/shelter, and provision of waste bins at dining hall.
- Accommodation daily cleanliness, sweeping, provision of waste bins, white wash, provision of sufficient lights, housekeeping and provision of hangers for clothes of labours in living rooms. (Contract Clause 6.6)
- Fuel Storage area management, provision of impervious floor with bunded (4 inches) walls, placement of warning sign boards such as switch off engine, no smoking, and use of mobile is prohibited and labeling sign of fuel storage area etc. Instructions will be in Urdu language.
- First Aid Facilities are provided at base camp and emergency contact numbers are displayed at all three plants but first aid kits are required for active construction sites. At least 5 first aid kits are required for 20km working area. Arrangement of ambulance on permanent basis as per contract clause 6.7.
- According to contract clause 4.18, contractor will utilize borrow areas on written and formal approval of the Engineer. Contractor will restore all borrow areas after utilization. Contractor has yet not submitted lease agreement of borrow areas with layout plans as instructed by

the Engineer.

- Employment of child labours on project is not allowed in accordance with contract clause 6.21. Contractor has employed child labours, recently observed on site. Sheer Khan helper of Mr. Gul Din with age 16 years was driving excavator Kawasaki GSL-902 (III).
- Provision of proper and sufficient Personal Protective Equipments (PPEs) to all labours on Employment Card System by implementing contract clause 6.7 and 4.8. Contractor will follow contract clause 6.10 for record of Contractor's Persons and equipments. Contractor will issue employment card with employment number as instructed in clause.

The Engineer's Environmental Specialist did meetings with Project Managers and then issued official letters to all contractors regarding all points and environmental corrective actions discussed in meeting on 31st December 2015. Contractors have accepted that all issues will be resolved up to 15th January 2016.

4. Environmental Management on Package 1

4.1. Instrumental Monitoring of Environmental Parameters on Package 1

Instrumental monitoring of Environmental parameters have been carried out in December 2015 through M/s SEAL in presence of Environmental Specialist of CGGC-GRC and Environmental Specialist of Consultant. As per instructions of NHA Director Environment HQ, Particulate Matter 10 and Particulate Matter 2.5 both were monitored at three different locations. Results are attached in annexure -1 of report for review. Water Quality Parameters were checked and results revealed that water has no serious contamination and fit for human consumption at all three Plants and 2 Camps. Air Quality PM10 and PM 2.5 and Oxides of N, C and S were monitored at all batching plants. Results revealed that air pollution levels at plants are not highly harmful but care of health of all staff and labours is very important and air quality remains change with day to day construction activities.

Air Quality Monitoring Results of Camp and Batching Plant site at RD 1+000

| Sr. No. | Parameter | Unit | Results | NEQS | Remarks |
|---------|-------------------|----------------------|---------|------|---|
| 1 | PM ₁₀ | (µg/m ³) | 160 | 150 | All values found in compliance with NEQS expect PM ₁₀ for which appropriate mitigation should be taken as recommended in EIA |
| 2 | PM _{2.5} | (µg/m ³) | 11.2 | 15 | |
| 3 | CO | (mg/m ³) | 1.6 | 10 | |
| 4 | NO _x | (µg/m ³) | 4.1 | 80 | |
| 5 | SO _x | (µg/m ³) | 3.6 | 120 | |

Noise Levels Monitoring on Package 1 in December 2015

| Sr. No. | Monitoring point | Min. Noise Level (dB A) | Max. Noise Level (dB A) | Avg. Noise Levels (dBA) | Remarks |
|--|---|-------------------------|-------------------------|-------------------------|---|
| 1 | Near Generator (Camp RD 1+00) | 71.5 | 72.6 | 72.05 | All noise levels are found in compliance with permissible Limit (85 d BA) Although recommended measures as described in EIA may be taken if levels exceed permissible Limits. |
| 2 | Near Batching Plant (Camp RD 1+00) | 68.3 | 69.8 | 69.05 | |
| 3 | Near Pile Area (Camp RD 1+00) | 66.1 | 68.3 | 67.2 | |
| 4 | Near Cranes (Camp RD 1+00) | 68.3 | 71.1 | 69.7 | |
| 5 | Near Generator (RD 5+260) | 81.6 | 84.3 | 82.9 | |
| 6 | Near Batching Plant (RD 5+260) | 74.6 | 75.3 | 74.9 | |
| 7 | Near Steel Cutting (RD 5+260) | 53.4 | 56.9 | 55.1 | |
| 8 | Near Offices (RD 5+260) | 57.9 | 61.1 | 59.5 | |
| 9 | Dump Truck (Camp Road 14+00) | 62.4 | 63.9 | 63.2 | |
| 10 | Near Batching Machine (Camp Road 14+00) | 63.7 | 65.8 | 64.7 | |
| NEQS: National Environmental Quality Standards NGVS: No Guideline Value Set | | | | | |

4.2. Contractor Base Camps Management in reporting period

Contractor has two construction camp sites on package 1. First Camp is located at RD 5+260 along RoW, 600 meters away from residential areas. Second camp is located at RD 14+400 along RoW. Both Camps are in use. Contractor has provided camp first with facilities such as accommodation of permanent workers, and some field staff, Workshop area, Fuel Storage area, Main Store, Kitchen for cooking of food for all staff and workers with dining hall, 26 toilets and washrooms, with septic tanks and soakage pits, new steel yard, scaffolding and concrete framework area. Contractor has mobilized paramedical staff at this base camp and provided a dispensary for labours and staff. Mr. Tanweer is a paramedic retired from Pak Army and has sufficient experience.

Contractor has improved solid waste collection method. Solid Waste collection drums are placed at different location at base camp. Camp is fenced and security check post is available at entrance. Currently about 360 workers are residing in this camp. Contractor is advised to build a recreation area for his labour and staff for good work quality. Dining hall needs TV for labours. Water quality test is carried in December 2015 and found fit for human consumption.

Contractor has provided the following facilities at base camp-1;

- Main Offices of Project Manager with other staff
- Labour Accommodation with dining hall and kitchen.
- 26 Washrooms/Toilets with Septic Tanks.
- Laboratory of contractor
- Main Store with Fuel Storage area with 1500 liters capacity.
- Steel Yard 1 and 2.
- Workshop area.
- Dispensary with paramedical staff and first aid medicines and items such BP Machine, Thermometer, Scissor etc.

- Parking area of vehicles
- Fire Extinguishers at Fuel area, Laboratory, Workshop area and near officers and store.
- Solid waste collection drums.

New Steel Yard area is prepared and steel is shifted to it while first steel is still active but contractor has determined that new steel yard will be maintained in future while first steel yard will be closed and site will be used for store or parking area.

Second construction base camp of contractor established at RD 14+400 has steel yard, store for fuels, kitchen for about 200-250 labours. There was a serious issue of waste water disposal in last few month but now contractor has started work on waste water disposal pipe line. Waste water was stagnant in front of base camp but now by end of November 2015, pipe line was provided for proper disposal of waste water. Contractor has established Construction Manager Office here with his supporting is established. Location of this facility is satisfactory according to EPA Environmental Approval. Contractor has got provisional approval of this site.

Half of Labours are living in tents at this camp. Batching Plant at this location was operational. Empty drums were stocked at batching plant, construction materials were stocked at batching plant site. One big capacity generator is provided at batching plant. Regular visits have been made to batching plant for observations regarding housekeeping, PPEs, provision of designated place to empty drums, solid waste management. Accommodation of about 100 labours is in tents at batching plant. Contractor is advised to provide proper accommodation as per requirement of contract clause 6.6 of GCOC.

4.3. Concrete Batching Plant on Package1

Contractor has installed total three concrete batching plants on Package 1 to date.

4.3.1. Batching Plant at RD 5+260 on Package 1

Concrete Batching Plant at RD 5+260 was operational in reporting for concrete work. Contractor has completed 33 box culverts, 9 Underpass and girders for bridges and flyovers are in progress. Safety of labours at these sites is partially compliance workers. Contractor has provided helmets, safety shoes, and jackets are provided to some workers and staff. First Aid is maintained at base camp for these labours.

4.3.2. Batching Plant at RD 1+000 on Package 1

Contractor has established and erected batching plant-2 at Km 1. Area/Location of batching plant is according to requirement of SSEMP and EIA. It is well away from residential area and close to ROW. Batching plant is operational. Contractor has reconstructed store, accommodation rooms and kitchen at this site. Water retention tank and electric power supply and water supply all are provided and available at site. Water tank is provided with protection wall. Fuel is stored in drums on concrete platform and fire extinguisher is provided here. First aid facilities are not sufficient for number of labours and level of construction.

4.3.3. Installation of Batching Plant # 3 and Camp 2 at RD 14+400 on Package

Contractor has installed this concrete batching plant # 3 at RD 14+400 in June 2015. Capacity of batching plant is 1 cubic meter per batch. Contractor has established camp # 2 at this location for labours working at this plant. In reporting period there were sufficient workers residing and there are total two kitchens at this site. Contractor is using fuel wood at big kitchen. Contractor has provided safety shoes to maximum labours working at steel yard while now labours at steel yard are above 65 and about 15 labours have no safety shoes. Contractor is advised for provision of PPEs to labours at steel yard area.

Contractor has constructed store for stock of fuel, cements, lubricants, wooden sheet for structure work, wooden pieces for scaffolding and extra goods of project site. Fuel (diesel) is stored in drums at camp site. Total 600 litres fuel is stored for daily consumption. Fuel spillages were observed at store area. Store keeper/manager of fuel storage is strictly advised for removal of all spills. Contractor has provided first aid medicines at this site. Three smaller drums are arranged for solid waste collection at kitchen.

4.3.4. Storage and Utilization of admixtures Altra 470 and Big Sea BCS-8G at Plant

Admixtures material is stored in steel tank at batching plant site. Spillage of Admixture was noted/observed at batching plant in November 2015. Chemical's supply pipe and pump were not working properly. Engineer's Environmental Specialist advised CGGC-GRC for correction and control of spillage and loss of chemical. Leakage was corrected by contractor in end of November 2015 but spillage was not properly removed. Contractor was reminded for removal and treatment of spillages. Contractor is advised for daily inspection/check of plant key parts/section. If some fault or problem is noted then it should correct before operation. Contractor is advised for proper concrete platform at all batching plants and washing area for heavy machines. All Chemicals must store on impervious floor and spills are need to treat properly.

4.4. Implementation and follow up of Contractual Provision 6.7 (Health and Safety) on site

Contractor has provided personal protective equipment (PPEs) to maximum labour at steel yards at both camps, few labours on site at active construction sites. First aid facilities have been improved at base camp 1 and 2 but still ambulance is not provided full time as per requirement of contract clause 6.7. Pursuant to contract clause 6.7 Health and Safety, 4.8 Safety Procedures for active construction work and EMP Section 8 Environmental Management and Monitoring Plan (Health and Safety of workers at active construction site and camp) the Engineer has again advised contractor for ensuring safety of their labours and regular monitoring of PPEs.

Occupational health and safety measures are regularly checked on each construction sites. Safety of all workers and staff on site is key responsibility of contractor as per contract clause 6.7. Personal Protective Equipment (PPEs) including helmets, high visibility jacket and safety shoes to labour at steel yard; workshop area and labour at main store and active construction

site are provided by contractor but still many of labours have no safety shoes and gloves while they are working at box culverts and steel fixing and scaffolding.

Further Contractor is advised to ensure measures of controlling insects and pests and associated diseases with such as malarial and dengue etc. under contract clause 6.15 provision. A reminder letter was issued in October 2015. Contractor will do insect and pest control sprays at camps, plants, and all offices on package 1 on monthly basis in supervision of the Engineer's representative and will report to the Engineer. Overall status of health and safety measures are improved than previous worse condition and no serious accident reported on Package 1 except one accident occurred on underpass construction site. Labour was working on top of underpass and he suddenly fell down problem of body dizziness and feeling fainting.

4.5. Traffic Management (Item 706) on Package 1 in reporting period

Contractor has displayed different traffic sign boards such as speed limit sign boards, sign boards related to work type or warning signs for contractor own traffic on project. Contractor has submitted traffic management plan for Jarikas Interchange construction site to the Engineer. Engineer's Representatives have visited the construction site of Jarikas Interchange on Hazara Road at RD 17+890 and advised contractor for next step in traffic management. It was observed that contractor has erected traffic sign boards at this site with instructions for control of speed limit and care at active work zone. Reflecting tap was used on edges of carriageway.

1. Cat eyes with speed breakers are installed on Hazara Road for speed control but shoulder are remain open for overtaking. Contractor will use barriers as mentioned in Specification Item 706 on shoulders or they will proceed for extension of speed breakers up to outer edge of shoulders to control overtaking of traffic and accidents.
2. Contractor has erected traffic management sign boards for warning of speed limit and control but still other traffic sign boards are with same instructions in Urdu language. It will be better and sufficient if contractor can remove steel rods/bars and erect delineator instead of it with reflectors.

Contractor has submitted TMP for work area 1 (North bound) and 2 (southbound) of Hazara road. In step 1 contractor will work on piles on both side of existing Hazara road while in step 2, contractor will work on piles at center of road. Submitted Traffic Management Plan is for step-1. Contractor was advised for submission of complete traffic management plan. Contractor is advised to submit complete traffic management plan before start of work at this site.

4.6. Borrow Areas use for embankment construction on Package-1

Contractor has completed most section of embankment construction and materials are borrowed from borrow areas. Material quality tests of about 23 borrow areas have been carried out by Material Engineers and other representatives including Consultants, Contractor and NHA Officials. Suitable materials are utilized by contractor from these borrow areas but about 12 borrow areas are used while other are not used as contractor has utilized materials cut from RoW (surplus and suitable) Contractor had submitted document of six borrow areas on 15th May 2015. Engineer had issued approval of three borrow areas (Borrow area1 at Rd 0+193, Borrow area 2 at RD 0+257 and Borrow area 3 at RD 1+400) on package 1 with letter No

Dohwa/NHA/E35/2015/217 dated 24th April 2015. Contractor has utilized these borrow areas and as per instruction of Engineer issued with letter No. Dohwa/NHA/E35/2015/291 dated 5th May 2015 all these borrow areas will be restored. Contractor has further utilized other borrow site prior formal approval from the Engineer as lease agreements were not submitted but in December 2015 CGGC-GRC Admin Manger provided 8 borrow areas lease agreements for approval. Material tests results were complied with requirement of contract. Contractor will restore all borrow areas.

4.7. Implementation and follow up of Labour Law and Child Labour Clauses of Contract on Package 1.

Child Labour and Labour Law of Pakistani are incorporated in contract and under implementation on project. It is strictly and strongly instructed to contractor that as per contractual provision no labour with less than 18 years will be involved in construction work or hazardous work site. Child Labours were observed on site in reporting period. The Engineer's Environmental issued official letter for elimination of all such labours.

5. ENVIRONMENTAL MANAGEMENT ON PACKAGE 2

Site Specific EMP is available on site with Environmental Specialist of Contractor. Contractor has recently submitted Waste Management Plan and Traffic Management Plan to the Engineer for review and approval. Waste Management Plan is approved for implementation and TMP is under review and implementation is also started on site. In reporting period Environmental Protection Agency KPK representative has visited project on 25th November 2015 in company with NHA Assistant Director Environment and Engineer's Environmental Specialist. Meeting held with Contractor's representatives in base camp regarding Environmental Management and Health Safety and Environmental safeguards of EPA. Contractor is advised to promote housekeeping and cleanliness at base camp and ensure the regular check on food quality to secure health of workers and staff residing in camp of CGGC-AM (JVs). Currently there is no health hazard at base camp.

In reporting period labours are interviewed and advised by the Engineer that if anybody has any complaint regarding cleanliness and housekeeping and food quality then informs contractor's Environmental Staff and register their complaint is register already maintained at base camp by Project Environmental Staff.

In reporting period contractor was busy in construction of embankment and structures including box culverts, underpasses, bridge girders, bridge piles works. Work on embankment formation was in progress. During this activity dust suppression and traffic management were control. Water sprinkling was carried out. . Work on center line and NSL is completed. During reporting period there were total 576 workers on site from CGGC-AM (JVs) and out of these 576 186 are staff working in office and field while 166 were drivers and machine or plant operators and 220 were skilled labours and helpers.

Instrumental monitoring of environmental parameter was carried out as per advise of the Engineer in December 2015.

5.1. Environmental Progress Review Meeting in December 2015 on Package 2

In reporting period several environmental progress review meetings (EPRM) carried out on site at Contractor Base Camp. Environmental Specialist of Consultant and Contractor have discussed project current environmental issues. Meetings were attended by Contractor's Project Manager of CGGC-AM and Engineer's Representatives such as Material Engineers, Structure Engineers, Highway Engineer, and Environmental Specialist.

- Ensure provision of Personal Protective Equipment (PPEs) to all Staff and Workers on site.
- Installation of sufficient and correct traffic sign boards and tools as per Contract SP 706.
- Instrumental Monitoring of Environmental Parameters as per EMP/SSEMP
- Water sprinkling at active construction site and on access routes.
- Environmental Compliance Monitoring and correction.
- Provision of First Aid Facilities and Fire Extinguishers at camp and Batching Plant.
- Borrow areas restoration and keeping proper record of usage.
- Provision of portable and tested water for drinking and cooking at camp site.
- House-keeping and protection of labours.

5.2. Instrumental Monitoring of Environmental Parameters on Package 2 in July and December 2015

Contractor CGGC-AM (JVs) has carried out instrumental monitoring of environmental parameters such as water quality, air quality, air quality and noise levels as per requirement of Site Specific Environmental Management Plan. Overall results revealed that project construction activities are environment friendly as all results are complied with standards.

Details of first round of instrumental monitoring of environmental parameters are mentioned below:

5.2.1. Drinking Water Quality Analysis Results of Consultant Residency on Package 2

| Drinking Water Quality Analysis Results of Consultant Residency | | | | |
|---|------------------------------|---|---|----------------|
| Sampling Date; 02/06/2015 | | Sampling point; Consultant Residency | Reference No. SEAL/CGGCAM/15/002 DW. | |
| Sr. No. | Parameters | Unit | Results | WHO Guidelines |
| 1 | Temperature | °C | 20.0 | ----- |
| 2 | pH | | 7.10 | 6.5-8.5 |
| 3 | Total Dissolved Solids (TDS) | Mg/l | 367 | 1000 |

| | | | | |
|----|-------------------------------------|-------------------------|-------------|-----------------|
| 4 | Total Suspended Solids (TSS) | Mg/l | 01 | ---- |
| 5 | Chloride | Mg/l | 49 | 250 |
| 6 | Fluoride | Mg/l | 0.4 | 1.5 |
| 7 | Taste | Objectionable/Unobjectn | Unobjectble | Unobjectionable |
| 8 | Odour | Objectionable/Unobjectn | Unobjectble | Unobjectionable |
| 9 | Colour | TCU | 0 | 15 |
| 10 | Iron | Mg/l | 0.01 | 0.3 |
| 11 | Sodium | Mg/l | 39 | 200 |
| 12 | Nitrate | Mg/l | 1.2 | 50 |
| 13 | Nitrite | Mg/l | BDL | 3 |
| 14 | Ammonia | Mg/l | 0 | 1.5 |
| 15 | Hydrogen Sulphide | Mg/l | BDL | 0.05 |
| 16 | Sulphate | Mg/l | 54 | 250 |
| 17 | Lead | Mg/l | BDL | 0.10 |
| 18 | Total Hardness as CaCO ₃ | Mg/l | 160 | 500 |
| 19 | Turbidity | NTU | 0 | 5 |
| 20 | Zinc | Mg/l | 0.4 | 3 |
| 21 | Manganese | Mg/l | BDL | 0.1 |
| 22 | Benzene | Mg/l | BDL | 10-12 |
| 23 | Aluminum | Mg/l | BDL | 0.2 |
| 24 | Molybdenum | Mg/l | BDL | 0.070 |
| 25 | Chromium | Mg/l | BDL | 0.050 |
| 26 | Cadmium | Mg/l | BDL | 0.003 |
| 27 | Boron | Mg/l | BDL | 0.300 |
| 28 | Barium | Mg/l | BDL | 0.700 |
| 29 | Antimony | Mg/l | BDL | 0.005 |
| 30 | Arsenic | Mg/l | BDL | 0.010 |
| 31 | Mercury | Mg/l | BDL | 0.001 |
| 32 | Nickel | Mg/l | BDL | 0.020 |
| 33 | Total Coliform | Number/100ml | 0 | 0 /100ml |
| 34 | E.Coli | Number/100ml | 0 | 0 /100ml |

Drinking water test results revealed that water of Consultant Residency is fit for human consumption and have no contamination.

5.2.2. Drinking Water Quality Analysis Results of Base Camp site on Package 2

| Drinking Water Quality Analysis Results of Base Camp site | | | | |
|---|------------------------------|--------------------------------|--------------------------------------|----------------|
| Sampling Date; 02/06/2015 | | Sampling point; Base Camp site | Reference No. SEAL/CGGCAM/15/001 DW. | |
| Sr. No. | Parameters | Unit | Results | WHO Guidelines |
| 1 | Temperature | °C | 22.0 | ----- |
| 2 | pH | | 7.30 | 6.5-8.5 |
| 3 | Total Dissolved Solids (TDS) | Mg/l | 299 | 1000 |
| 4 | Total Suspended Solids (TSS) | Mg/l | BDL | ---- |
| 5 | Chloride | Mg/l | 44 | 250 |
| 6 | Fluoride | Mg/l | 0.4 | 1.5 |

| | | | | |
|----|-------------------------------------|-------------------------|-------------|-----------------|
| 7 | Taste | Objectionable/Unobjectn | Unobjectble | Unobjectionable |
| 8 | Odour | Objectionable/Unobjectn | Unobjectble | Unobjectionable |
| 9 | Colour | TCU | 0 | 15 |
| 10 | Iron | Mg/l | 0.02 | 0.3 |
| 11 | Sodium | Mg/l | 34 | 200 |
| 12 | Nitrate | Mg/l | 1.2 | 50 |
| 13 | Nitrite | Mg/l | BDL | 3 |
| 14 | Ammonia | Mg/l | 0 | 1.5 |
| 15 | Hydrogen Sulphide | Mg/l | BDL | 0.05 |
| 16 | Sulphate | Mg/l | 46 | 250 |
| 17 | Lead | Mg/l | BDL | 0.10 |
| 18 | Total Hardness as CaCO ₃ | Mg/l | 144 | 500 |
| 19 | Turbidity | NTU | 0 | 5 |
| 20 | Zinc | Mg/l | 0.4 | 3 |
| 21 | Manganese | Mg/l | BDL | 0.1 |
| 22 | Benzene | Mg/l | BDL | 10-12 |
| 23 | Aluminum | Mg/l | BDL | 0.2 |
| 24 | Molybdenum | Mg/l | BDL | 0.070 |
| 25 | Chromium | Mg/l | BDL | 0.050 |
| 26 | Cadmium | Mg/l | BDL | 0.003 |
| 27 | Boron | Mg/l | BDL | 0.300 |
| 28 | Barium | Mg/l | BDL | 0.700 |
| 29 | Antimony | Mg/l | BDL | 0.005 |
| 30 | Arsenic | Mg/l | BDL | 0.010 |
| 31 | Mercury | Mg/l | BDL | 0.001 |
| 32 | Nickel | Mg/l | BDL | 0.020 |
| 33 | Total Coliform | Number/100ml | 0 | 0 /100ml |
| 34 | E.Coli | Number/100ml | 0 | 0 /100ml |

Drinking water test results revealed that water of Contractor's Base Camp is fit for human consumption and have no contamination.

5.2.3. Ambient Air Quality Monitoring results

Ambient air quality monitoring is carried out at three locations (1) near site office (2). Batching Plant at 28+150 (3). Receptor at RD 28+000

Total four parameters have been checked and monitored. Particular Matter PM₁₀, Carbon Mono-Oxide, Nitrogen Oxide and Sulfur Oxide have been checked. Details of air quality are given below:

Air Quality monitoring near site office.

| Sr. No. | Parameters | Unit | Results | NEQs |
|---------|--------------------|-------------------|---------|------|
| 1 | Particulate Matter | Ug/m ³ | 64 | 150 |
| 2 | CO | Ug/m ³ | 1.9 | 10 |

| | | | | |
|---|-----------------|-------------------|-----|-----|
| 3 | NO _x | Ug/m ³ | 3.8 | 80 |
| 4 | SO _x | Ug/m ³ | 2.0 | 120 |

Air Quality monitoring at Batching Plant site.

| Sr. No. | Parameters | Unit | Results | NEQs |
|---------|--------------------|-------------------|---------|------|
| 1 | Particulate Matter | Ug/m ³ | 75 | 150 |
| 2 | CO | Ug/m ³ | 1.8 | 10 |
| 3 | NO _x | Ug/m ³ | 6.0 | 80 |
| 4 | SO _x | Ug/m ³ | 5.8 | 120 |

Air Quality monitoring near receptor at RD 28+000.

| Sr. No. | Parameters | Unit | Results | NEQs |
|---------|--------------------|-------------------|---------|------|
| 1 | Particulate Matter | Ug/m ³ | 71 | 150 |
| 2 | CO | Ug/m ³ | 1.6 | 10 |
| 3 | NO _x | Ug/m ³ | 4.1 | 80 |
| 4 | SO _x | Ug/m ³ | 2.6 | 120 |

Air quality at project site is checked by contractor and results revealed that all parameters are complied with Standards.

5.2.4. Noise Level Monitoring on Package 2 at 5 different locations

| S.No. | Monitoring Point | Min Noise Level | Max Noise Level | Avg. Noise level |
|-------|--------------------|-----------------|-----------------|------------------|
| 1 | Batching Plant | 63.4 dB A | 65.2 dB A | 64.3 dB A |
| 2 | Site Office | 57.2 dB A | 60.8 dB A | 59.0 dB A |
| 3 | Receptor at 28+000 | 60.5 dB A | 64.3 dB A | 62.4 dB A |
| 4 | Foot Sheep Roller | 57.9 dB A | 61.1 dB A | 59.5 dB A |
| 5 | Dumper Truck | 62.4 dB A | 63.9 dB A | 63.2 dB A |

Noise levels at all locations are below standard 75 dB A. (NEQs).

Second round of environmental parameters monitoring was carried out on 3rd December 2015. Contractor has submitted report of second round of instrumental monitoring of environmental parameters to Environmental Specialist of Supervision Consultant. Water Quality of base camp and batching plant at Km 28+200, air quality at batching plants, noise levels at active site, generators, and batching plant were monitored. Particulate matter (PM) 10 was monitored. Monitoring was carried out in supervision of the Engineer's Environmental Specialist. Results of second round are attached in annexure 1. Overall Environmental Parameters were complied with standards and no serious contamination or pollution is detected. As workers are working

continuously in this environment therefore proper PPEs are recommended to use at all active construction sites.

5.3. NHA Director Environment Site Visit on 16th November 2015

In reporting period Director Environment NHA from Head Quarter Islamabad has visited project along with Assistant Directors (ADs) Environment. Contractor Base Camp, Batching plants and active construction sites were visited. During site visit contractor's main store, kitchen, fuel storage area, accommodation and other facilities area of base camp were checked and on spot corrective measures were advised.

- ❖ Ensure Instrumental monitoring of Environmental Parameters in November 2015. Deadline for monitoring was 15th October 2015. Contractor has taken action and monitoring team will come for monitoring on 3rd December 2015.
- ❖ Labours at Steel Yard and at Box culvert construction site and pile load test area have no safety measures. Contractor has provided helmets to most labours but safety shoes were not provided. Contractor is required to ensure implementation of Contract Clause 4.8 Safety Procedures and 6.7 Health & Safety measures.
- ❖ Traffic Management is yet not satisfactory at Hattar Road. Contractor was advised to install at least 6 warning sign boards, use warning lights, delineators and safety cones as per Specification Item 706. Construction is in progress at Hattar Interchange area but safety of labours is not satisfactory as all labours have no PPEs.
- ❖ Empty drums of fuel/chemical are scattered in workshop/batching plant and camp. Contractor is required to collect them in one designated area as advised by the Engineer's Environmental Specialist at site.
- ❖ Construction work on Khanpur road is in progress. Contractor has yet not installed diversion sign boards, speed limit sign boards and safety delineators
- ❖ There are tents inside the Camp. Tents are used for accommodation of labours. According the instruction of Director Environment and Contract Clause 6.6 you are advised to provide proper accommodation and remove all tents.
- ❖ First Aid Facilities at Camps are not sufficient as mentioned in contract clause 6.7. There is no ambulance and no full time nurse on project. According to contractual provision (clause 6.7) contractor will maintain first aid facilities at site including a fulltime nurse/paramedical staff, ambulance, first aid facilities.
- ❖ Waste Water of kitchen is not properly disposed off. Contractor is advised to construct soakage pit and provide pipeline for water disposal.
- ❖ Develop Employment Card and Number system of your staff and workers. PPEs will be issued on base of EMP number.
- ❖ Sufficient lighting is required at toilets at Base Camp (Office and Accommodation).
- ❖ Improve housekeeping and daily cleanliness on daily basis as housekeeping and solid waste management needs further attention of Contractor.

5.4. Contractor's Base Camp site at RD 28+200 on Package 2.

In reporting period contractor has completed remaining section of fabricated accommodation. Total 236 labours are residing in base camp in reporting period. Contractor has provided six solid wastes collection drums at base camp. Now after completion of remaining section of accommodation number of toilets and washroom are 25. Nine fire extinguishers are provided at base camp.

Contractor has constructed fuel storage site at base camp with capacity of about 29000 liters. Fire protection and impervious floor and protection walls are provided at this site. Three men are handling fuel storage area. Environmental Specialist and Contractor's Highway Engineer have played a good role in ensuring the SSEMP Compliance at Base Camp site such as establishment of workshop area, fuel storage site, provision of clear and cool drinking water, first aid facilities. Contractor has provided accommodation to 236 workers at base camp. Waste water is treated through Septic Tank and Soakage pit as per SSEMP requirement.

- Contractor has installed two electric water coolers at Base Camp site for Senior Staff and Labours. Both were checked and found operational.
- Contractor has a first aider/ nurse at camp site with first aid facility. 9 Fire Extinguishers are provided at camp site near kitchen, fuel storage area and store. Housekeeping is improved than previous status at base camp. Kitchen and dining hall are now in good hygienic condition and housekeeping is fine now.
- Contractor has installed safety warning and education sign boards at base camp entrance and inside. Contractor's Project Manager Mr. Jehangir has promoted the implementation of SSEMP in full coordination of Mr. Tariq Qureshi Environmental Specialist and HSE Officer Mr. Waqar Khan. Contractor is further advised to fully support and facilitate Environmental and HSE Staff in implementation of SSEMP as advised by the Engineer.
- Water Quality of Base Camp is checked by Contractor in December 2015. All results were within permissible limit and complied with Standards (WHO Guidelines). Contractor is advised to use clean utensils for food and store them at safe place after feeding and take care of all labours.
- Water quality test and noise levels will be checked again at base camp near labour accommodation. The environmental conditions of the project area remained satisfactory because contractor is trying to minimize the impacts of construction activities on the environment.
- Contractor has provided 4 cooks and 5 helpers at base camp for cooking and facilitation to labours and staff at base camp and office.
- The dust suppression is being done by sprinkling water on active working sites for embankment construction and other construction activities.
- Solid waste is being collected and disposed off in Municipal Solid waste disposal sites. The waste water is being collected and treated by using septic tanks and soakage pits in the camp. Masjid (Muslims' worship building) & Mechanical workshop has been completed.

5.5. Concrete Batching Plants on Package 2 at RD 28+050

There are now three batching plants on Package 2. Work on establishment of batching plant at RD 32+100 is in progress. Contractor has submitted necessary documents for approval to the Engineer in November 2015. The Engineer has reviewed the submitted documents and found

that still overall detailed layout plan of batching plant facility is missing. Contractor is advised for submission of this layout plan on priority for formal approval. Initially the Engineer has issued provisional approval to contractor. Batching Plant is erected and checked by contractor. Associated facilities are yet to be established. Concrete Batching Plant at RD 32+100 has 0.5 Cubic Meter per batch capacity.

5.5.1. Concrete Batching Plants on Package 2 at RD 28+050

Batching Plants were operational in October 2015 for concrete of piles, box culverts and underpasses, girders, piles work etc. Personal Protective Equipments (PPEs) are provided to them and in use at site. Air quality and noise level were checked on 2nd July 2015 by Contractor in first round of instrumental monitoring of environmental parameters. Water source is water bore hole. Contractor has installed water pump and water retention tank and water tank is already constructed at both plants. Water quality test will be carried out in first week of July 2015. Second of monitoring is expected in November 2015. Air Quality will be checked at batching plant during second round of instrumental monitoring.

Contractor is advised to construct a protection barrier around the water tank at batching plant.

5.5.1.1. Storage and Utilization of admixtures

An admixture material is stored in drums at camp site and batching plant site. Site of storage is checked for spills and safety purpose. Storage was satisfactory for the time being but for proper storage contractor will prepare a storage area for chemicals at batching plant site.

5.6. Occupational Health and Safety Measures on Package 2

According to requirement of Contract Clauses 6.7 and 4.8, contractor has deployed paramedical staff and provided a small scale dispensary at base camp. Contractor has further improved first aid facilities in December 2015 after ADB Mission. The Site incharge/Supervisor, HSE Officer and Environmental Specialist are key responsible person of contractor and they have arranged trainings for workers regarding workers safety, active construction site housekeeping, fencing and controlling traffic movements and handling health hazards and emergency and communicating first aid cases during any emergency.

Contractor has arranged first aid facilities and has maintained an emergency response action plan with communication numbers and deployed a HSE Officer Mr. Waqar Khan. Contractor is advised to provide 5 first aid kits on active work sites. Contractor has provided fence/hard barrication around work area and guards or flagmen to ensure safety of community, traffic and workers. Contractor has provided safety cones, reflecting tap and warning sign boards at active construction site at RD 31+100. Overall safety on each site is very important. Contractor has delivered short training session for drivers and site supervisory staff.

5.6.1. Personal Protective Equipment provision to workers and staff on package 2

Safety of all workers and staff on site is key responsibility of contractor as per contract clause 6.7. Personal Protective Equipment (PPEs) including helmets, high visibility jacket and safety shoes to labour at steel yard; workshop area and labour at main store and active construction site are provided by contractor but still some of labours have no safety shoes and gloves while they are working at box culverts and fixing steel and scaffolding. Deficiencies of PPEs is monitored and contractor is instructed to provide safety shoes and gloves to workers at steel fixing area of box culvert and all active construction sites.

5.7. Contractor's Workforce (Employment status)

| | | |
|------------------------------------|--|-----|
| TOTAL STAFF (Office) | | 186 |
| TOTAL OPERATORS/DRIVERS | | 157 |
| SKILLED LABOUR, LABOUR AND HELPERS | | 233 |
| TOTAL WORKFORCE | | 576 |

5.8. Borrow Areas Management on Package 2

Contractor CGGC-AM (JV) has utilized total 11 borrow areas to date. Contractor had submitted document of borrow area to the Engineer site Staff of Package 2. Quality test were performed by Contractor and found that material is suitable for our project. The Engineer has issued the approval on 2nd May 2015 for utilization but further it was advised by Engineer's Environmental Specialist that excavation will be not more than three feet. It was also advised that take No Objection Certificate from resource owner. Contractor has taken NOCs from land owners in reporting period. In reporting period contractor has received NOCs from max borrow areas as advised. Utilization of this borrow area is still in progress. Contractor has started utilization of other borrow areas along ROW at RD 27+588, 31+550, 31+500, 32+200, 27+280, 24+200, 23+600, and 30+900. Now as scope of work is increased with additional 2 lanes and project is now 6 lanes motorway therefore more material will be borrowed from borrow areas. Contractor may identify more borrow areas for to achieve the required target. It was advised to contractor to follow Specification 105.2.2, Contract clause 4.18, and EMP Stipulated. Engineer has already issued instruction for submission.

Contractor has submitted necessary documents for formal approval to the Engineer. Engineer's Environmental Specialist have checked the status of borrow area. Restoration will be most important part of utilization. Approval is yet not issued at final verification visit to borrow areas is required. Restoration of all these borrow areas will be carried by contractor as per instruction the Engineer.

Details of Borrow areas are as under

| Borrow Pit | Location | Offset from | Depth | * Estimated Quantity |
|------------|----------|-------------|-------|----------------------|
|------------|----------|-------------|-------|----------------------|

| No. | | R.O.W | Exploitable (Ft) | (m ³) |
|-----|--------|----------|---------------------|-------------------|
| 1 | 27+620 | 500m R/S | 2 | 2,85,404 |
| 2 | 28+240 | 500m L/S | 2 | 6,63,340 |
| 3 | 28+280 | 500m R/S | 2 | 5,52,332 |
| 4 | 27+598 | 500m B/S | 2 | 5,00,000 |
| 5 | 31+550 | 500m L/S | 1.5 | 5,000 |
| 6 | 31+500 | 500m L/S | 2 | 1,10,000 |
| 7 | 32+200 | 500m R/S | 1 | 30,000 |
| 8 | 27+280 | 500m L/S | 0.5 | 15,000 |
| 9 | 24+200 | 500m R/S | 2 | 1,00,000 |
| 10 | 23+600 | 500m R/S | 3 | 2,00,000 |
| 11 | 30+900 | 500m R/S | 2.5 | 2,25,000 |

5.9. Traffic Management at Khanpur and Hattar Road on Package 2

Contractor has erected traffic sign boards of speed limit on RoW and at intersection areas. Diversion sign boards are displayed on Khanpur road with Red Barriers and flagmen are provided on busy areas such as Hattar Road and Khanpur road with red and green flags. Traffic Management Plan is submitted for review and approval. TMP is under implementation at moment.

Attachments

ANNEXURE 1

INSTRUMENTAL MONITORING OF ENVIRONMENTAL PARAMETERS

Package 1 (3rd December 2015)

Package 2 (July 2015, and December 2015)



RESULTS OF INSTRUMENTAL MONITORING PACKAGE 1

PM10, PM2.5, Water Quality of Camps, Batching Plants, Noise Levels and Oxide of C, N and S



SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

AMBIENT AIR MONITORING REPORT

Client Name: CGGC- GRC JV **Site Location:** E-35 Project Package IKhanpur Road
Monitoring Point: Base Camp, RD **Monitoring Date:** 03-12-2015
Monitoring Time: 5+260 **Reporting Date:** 07-12-2015
Monitoring By: SEAL
Reference No.: SEAL/CGGCGRC/15/02AA

Results:

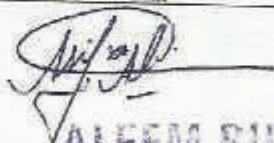
| Sr. No. | Parameter | Unit | Results | NEQS | Remarks |
|---------|-------------------|----------------------|---------|------|--|
| 1 | PM ₁₀ | (µg/m ³) | 140 | 150 | All values found in compliance with NEQS |
| 2 | PM _{2.5} | (µg/m ³) | 12 | 15 | |
| 3 | CO | (mg/m ³) | 1.3 | 10 | |
| 4 | NO _x | (µg/m ³) | 5.7 | 80 | |
| 5 | SO _x | (µg/m ³) | 2.4 | 120 | |

NEQS: National Environmental Quality Standards

Note:

- Quality was assured through self calibration of the instrument.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for any negotiations.

Monitoring Supervisor: M. Asif Rana

Signature of Supervisor: 

Chief Environmentalist with Seal:

ALEEM BUTT
Chief Environmentalist
SEAL

Signature of Chief Environmentalist: 

Date: 07-12-2015



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SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

AMBIENT AIR MONITORING REPORT

Client Name: CGGC- GRC JV **Site Location:** E-35 Project Package Ikhanpur Road
ChachiansokaRajpurHaripur
Monitoring Point: Camp RD 1+000 **Monitoring Date:** 03-12-2015
Reporting Date: 07-12-2015
Time Duration of Monitoring: 1 Hour **Monitoring By:** SEAL
Reference No.: SEAL/CGGCGRC/15/01AA

Results:

| Sr. No. | Parameter | Unit | Results | NEQS | Remarks |
|---------|-------------------|------------------------------|---------|------|---|
| 1 | PM ₁₀ | ($\mu\text{g}/\text{m}^3$) | 160 | 150 | All values found in compliance with NEQS expect PM ₁₀ for which appropriate mitigation should be taken as recommended in EIA |
| 2 | PM _{2.5} | ($\mu\text{g}/\text{m}^3$) | 11.2 | 15 | |
| 3 | CO | (mg/m^3) | 1.6 | 10 | |
| 4 | NO _x | ($\mu\text{g}/\text{m}^3$) | 4.1 | 80 | |
| 5 | SO _x | ($\mu\text{g}/\text{m}^3$) | 3.6 | 120 | |

NEQS: National Environmental Quality Standards

Note:

- Quality was assured through self calibration of the instrument.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for any negotiations.

Monitoring Supervisor: M. Asif Rana

Signature of Supervisor: ALEEM BUTT

Chief Environmentalist with Seal: Chief Environmentalist

Signature of Chief Environmentalist: [Signature]

Date: 07-12-2015



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Fax : 92-213-2014331 Email : karachi@seal.com.pk



SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

DRINKING WATER ANALYSIS REPORT

Client Name: CGGC-GRC JV **Address:** E-35 Project Package I, Base Camp
RD 5+260
Sampling Point: Tap Water **Nature of Sample:** Drinking Water
Sampling Date: 03-12-2015 **Date of** 07-12-2015
Sampling By: SEAL-Lahore **Completion:**
Reference No.: SEAL/CGGCGR/15/002 DW

Results:

| Sr. No. | Parameter | Unit | Result | WHO Guideline |
|---------|--|--------------------|-----------|---------------|
| 1 | Temperature | $^{\circ}\text{C}$ | 20.0 | --- |
| 2 | Ph | -- | 8.22 | 6.5-8.5 |
| 3 | Total Dissolved Solids (TDS) | mg/l | 367 | 1000 |
| 4 | Total Suspended Solids (TSS) | mg/l | 21 | --- |
| 5 | Chloride | mg/l | 65 | 250 |
| 6 | Fluoride | mg/l | 0.3 | 1.5 |
| 7 | Taste | Object/unobj. | Unobject. | Unobject |
| 8 | Odour | Object/unobj. | Unobject. | Unobject. |
| 9 | Colour | TCU | 0 | 15 |
| 10 | Iron | mg/l | 0.01 | 0.3 |
| 11 | Sodium | mg/l | 35 | 200 |
| 12 | Nitrate (as NO_3^-) | mg/l | 1.3 | 50 |
| 13 | Nitrite (as NO_2^-) | mg/l | BDL | 3 |
| 14 | Ammonia | mg/l | 0 | 1.5 |
| 15 | Hydrogen Sulphide (H_2S) | mg/l | BDL | 0.05 |
| 16 | Sulphate | mg/l | 65 | 250 |
| 17 | Lead | mg/l | BDL | 0.10 |
| 18 | Total Hardness as CaCO_3 | mg/l | 146 | 500 |
| 19 | Turbidity | NTU | 0 | 5 |
| 20 | Zinc | mg/l | 0.2 | 3 |
| 21 | Manganese | mg/l | BDL | 0.1 |
| 22 | Benzene | mg/l | BDL | 10-120 |
| 23 | Aluminium | mg/l | BDL | 0.2 |
| 24 | Molybdenum | mg/l | BDL | 0.070 |
| 25 | Chromium | mg/l | 0.01 | 0.050 |
| 26 | Cadmium | mg/l | BDL | 0.003 |
| 27 | Boron | mg/l | BDL | 0.300 |



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SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

Client Name: CGGC-GRC JV

Address:

E-35 Project Package I, Base Camp
RD 5+260

Sampling Point: Tab Water

Nature of Sample: Drinking Water

Sampling Date: 03-12-2015

Date of 07-12-2015

Sampling By: SEAL-Lahore

Completion:

Reference No.: SEAL/CGGCGRC/15/002 DW

| Sr. No. | Parameter | Unit | Result | WHO Guideline |
|---------|----------------|--------------|--------|---------------|
| 28 | Barium | mg/l | BDL | 0.700 |
| 29 | Antimony | mg/l | BDL | 0.005 |
| 30 | Arsenic | mg/l | BDL | 0.010 |
| 31 | Cyanide | mg/l | BDL | 0.070 |
| 32 | Mercury | mg/l | BDL | 0.001 |
| 33 | Nickel | mg/l | BDL | 0.020 |
| 34 | Total Coliform | Number/100ml | 0 | 0/100 ml |
| 35 | E.Coli | Number/100ml | 0 | 0/100 ml |

Note:

- BDL (Below Detection Limit)
- This report should be reproduced as a whole and not in parts.
- The responsibility of the ethical use of the results reported in this report lies with the client. Consequently, the laboratory is absolved of its responsibility for any claim that may result through the use by the client or others of the results appearing in this report.
- The left over samples (if so available) shall be retained for fifteen days after the issuance of the report unless otherwise negotiated between the client and the laboratory.
- The report is not valid for any negotiation.

Sample Analyzed By: Awaiz Shafique

Signature of analyst:

Chief Environmentalist with Seal:

ALEEM BUTT
Chief Environmentalist

Signature of Chief Environmentalist:

Date: 07-12-2015

Page 2 of 2



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SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

DRINKING WATER ANALYSIS REPORT

Client Name: CGGC-GRC JV **Address:** E-35 Project Package I, Camp RD
1+000
Sampling Point: Tap Water **Nature of Sample:** Drinking Water
Sampling Date: 03-12-2015 **Date of**
Sampling By: SEAL-Lahore **Completion:** 07-12-2015
Reference No.: SEAL/CGGCGR/15/001 DW

Results:

| Sr. No. | Parameter | Unit | Result | WHO Guideline |
|---------|--|----------------|-----------|---------------|
| 1 | Temperature | °C | 20.0 | --- |
| 2 | Ph | -- | 8.08 | 6.5-8.5 |
| 3 | Total Dissolved Solids (TDS) | mg/l | 188 | 1000 |
| 4 | Total Suspended Solids (TSS) | mg/l | 12 | --- |
| 5 | Chloride | mg/l | 24 | 250 |
| 6 | Fluoride | mg/l | 0.2 | 1.5 |
| 7 | Taste | Object./unobj. | Unobject. | Unobject. |
| 8 | Odour | Object./unobj. | Unobject. | Unobject. |
| 9 | Colour | TCU | 0 | 15 |
| 10 | Iron | mg/l | 0.01 | 0.3 |
| 11 | Sodium | mg/l | 34 | 200 |
| 12 | Nitrate (as NO ₃ ⁻) | mg/l | 1.2 | 50 |
| 13 | Nitrite (as NO ₂ ⁻) | mg/l | BDL | 3 |
| 14 | Ammonia | mg/l | 0 | 1.5 |
| 15 | Hydrogen Sulphide (H ₂ S) | mg/l | BDL | 0.05 |
| 16 | Sulphate | mg/l | 44 | 250 |
| 17 | Lead | mg/l | BDL | 0.10 |
| 18 | Total Hardness as CaCO ₃ | mg/l | 40 | 500 |
| 19 | Turbidity | NTU | 0 | 5 |
| 20 | Zinc | mg/l | 0.3 | 3 |
| 21 | Manganese | mg/l | BDL | 0.1 |
| 22 | Benzene | mg/l | HDL | 10-120 |
| 23 | Aluminum | mg/l | BDL | 0.2 |
| 24 | Molybdenum | mg/l | BDL | 0.070 |
| 25 | Chromium | mg/l | 0.01 | 0.050 |
| 26 | Cadmium | mg/l | BDL | 0.003 |
| 27 | Boron | mg/l | BDL | 0.300 |



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SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

Client Name: CGGC-GRC JV Address: E-35 Project Package I, Camp RD
1+000
Sampling Point: Tab Water Nature of Sample: Drinking Water
Sampling Date: 03-12-2015 Date of Completion: 07-12-2015
Sampling By: SEAL-Lahore Reference No.: SEAL/CGGCGR/15/001 DW

| Sr. No. | Parameter | Unit | Result | WHO Guideline |
|---------|----------------|--------------|--------|---------------|
| 28 | Barium | mg/l | BDL | 0.700 |
| 29 | Antimony | mg/l | BDL | 0.005 |
| 30 | Arsenic | mg/l | BDL | 0.010 |
| 31 | Cyanide | mg/l | BDL | 0.070 |
| 32 | Mercury | mg/l | BDL | 0.001 |
| 33 | Nickel | mg/l | BDL | 0.020 |
| 34 | Total Coliform | Number/100ml | 02 | 0/100 ml |
| 35 | E.Coli | Number/100ml | 0 | 0/100 ml |

Note:

- BDL (Below Detection Limit)
- This report should be reproduced as a whole and not in parts.
- The responsibility of the ethical use of the results reported in this report lies with the client. Consequently, the laboratory is absolved of its responsibility for any claim that may result through the use by the client or others of the results appearing in this report.
- The left over samples (if so available) shall be retained for fifteen days after the issuance of the report unless otherwise negotiated between the client and the laboratory.
- The report is not valid for any negotiation.

Sample Analyzed By: Awais Shafique

Signature of analyst: for A

ALEEM BUTT

Chief Environmentalist with Seal Chief Environmentalist

Signature of Chief Environmentalist: for A

Date: 07-12-2015

Page 2 of 2



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SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

NOISE LEVEL MONITORING REPORT

Project Title: CGGC-GRC JV **Site Location:** E-35 Project Package I
Monitoring Date: 03-12-2015 **Instrument Used:** Digital Sound Level Meter TM-102
Reporting Date: 07-12-2015 **Time of Monitoring:** 11:00am – 01:00 pm
Monitoring By: SEAL **Reference No:** SEAL/CGGCGR/15/0001 NM
Results:-

| Sr. No. | Monitoring point | Min. Noise Level (dB A) | Max. Noise Level (dB A) | Avg. Noise Levels (dBA) | Remarks |
|---------|---|-------------------------|-------------------------|-------------------------|--|
| 1 | Near Generator (Camp RD 1+00) | 71.5 | 72.6 | 72.05 | All noise levels are found in compliance with permissible Limit (85 dBA) Although recommended measures as described in EIA may be taken if levels exceed permissible Limits. |
| 2 | Near Batching Plant (Camp RD 1+00) | 68.3 | 69.8 | 69.05 | |
| 3 | Near Pile Area (Camp RD 1+00) | 66.1 | 68.3 | 67.2 | |
| 4 | Near Cranes (Camp RD 1+00) | 68.3 | 71.1 | 69.7 | |
| 5 | Near Generator (RD 5+260) | 81.6 | 84.3 | 82.9 | |
| 6 | Near Batching Plant (RD 5+260) | 74.6 | 75.3 | 74.9 | |
| 7 | Near Steel Cutting (RD 5+260) | 53.4 | 56.9 | 55.1 | |
| 8 | Near Offices (RD 5+260) | 57.9 | 61.1 | 59.5 | |
| 9 | Dump Truck (Camp Road 14+00) | 62.4 | 63.9 | 63.2 | |
| 10 | Near Batching Machine (Camp Road 14+00) | 63.7 | 65.8 | 64.7 | |

NEQS: National Environmental Quality Standards
NGVS: No Guideline Value Set



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SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

| | | | |
|-------------------------|-------------|----------------------------|----------------------------------|
| Project Title: | CGGC-GRC JV | Site Location: | E-35 Project Package I |
| Monitoring Date: | 03-12-2015 | Instrument Used: | Digital Sound Level Meter TM-102 |
| Reporting Date: | 07-12-2015 | Time of Monitoring: | 11:00am – 01:00 pm |
| Monitoring By: | SEAL | Reference No: | SEAL/CGGC/GRC/15/0001 NM |
| Results:- | | | |

Note:

- Selected measurement units were dB A otherwise stated
- Quality was assured through self calibration of the instrument.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for any negotiations.

Monitoring Supervisor: M. Asif Rana

Signature of Supervisor: *[Signature]*

Chief Environmentalist with Seal: Chief Environmentalist

Signature of Chief Environmentalist: *[Signature]*

Date: 07-12-2015



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SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

DRINKING WATER ANALYSIS REPORT

Client Name: CGGC- GRC JV

Address:

E-35 Project Package 1, Section 2
Camp Road 14+000

Sampling Point: Tab Water

Nature of Sample: Drinking Water

Sampling Date: 03-12-2015

Date of 07-12-2015

Sampling By: SEAL-Lahore

Completion:

Reference No.: SEAL/CGGCGRG/15/003 DW

Results:

| Sr. No. | Parameter | Unit | Result | WHO Guideline |
|---------|--|----------------|-----------|---------------|
| 1 | Temperature | °C | 20.0 | --- |
| 2 | Ph | -- | 8.10 | 6.5-8.5 |
| 3 | Total Dissolved Solids (TDS) | mg/l | 209 | 1000 |
| 4 | Total Suspended Solids (TSS) | mg/l | 16 | --- |
| 5 | Chloride | mg/l | 21 | 250 |
| 6 | Fluoride | mg/l | 0.3 | 1.5 |
| 7 | Taste | Object./unobj. | Unobject. | Unobject. |
| 8 | Odour | Object./unobj. | Unobject. | Unobject. |
| 9 | Colour | TCU | 0 | 15 |
| 10 | Iron | mg/l | 0.01 | 0.3 |
| 11 | Sodium | mg/l | 44 | 200 |
| 12 | Nitrate (as NO ₃ ⁻) | mg/l | 1.2 | 50 |
| 13 | Nitrite (as NO ₂ ⁻) | mg/l | BDL | 3 |
| 14 | Ammonia | mg/l | 0 | 1.5 |
| 15 | Hydrogen Sulphide (H ₂ S) | mg/l | BDL | 0.05 |
| 16 | Sulphate | mg/l | 55 | 250 |
| 17 | Lead | mg/l | BDL | 0.10 |
| 18 | Total Hardness as CaCO ₃ | mg/l | 60 | 500 |
| 19 | Turbidity | NTU | 0 | 5 |
| 20 | Zinc | mg/l | 0.3 | 3 |
| 21 | Manganese | mg/l | BDL | 0.1 |
| 22 | Benzene | mg/l | BDL | 10-120 |
| 23 | Aluminum | mg/l | BDL | 0.2 |
| 24 | Molybdenum | mg/l | BDL | 0.070 |
| 25 | Chromium | mg/l | 0.01 | 0.050 |
| 26 | Cadmium | mg/l | BDL | 0.003 |
| 27 | Boron | mg/l | BDL | 0.300 |

Page 1 of 2



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SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

Client Name: CGGC-GRC JV

Address: E-35 Project Package I, Section 2
Camp Road 14+000

Sampling Point: Tab Water

Nature of Sample: Drinking Water

Sampling Date: 03-12-2015

Date of: 07-12-2015

Sampling By: SEAL-Lahore

Completion:

Reference No.: SEAL/CGGCGRG/15/003 DW

| Sr. No. | Parameter | Unit | Result | WHO Guideline |
|---------|----------------|--------------|--------|---------------|
| 28 | Barium | mg/l | BDL | 0.700 |
| 29 | Antimony | mg/l | BDL | 0.005 |
| 30 | Arsenic | mg/l | BDL | 0.010 |
| 31 | Cyanide | mg/l | BDL | 0.070 |
| 32 | Mercury | mg/l | BDL | 0.001 |
| 33 | Nickel | mg/l | BDL | 0.020 |
| 34 | Total Coliform | Number/100ml | 0 | 0/100 ml |
| 35 | E.Coli | Number/100ml | 0 | 0/100 ml |

Note:

- BDL (Below Detection Limit)
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- The report is not valid for any negotiation.

Sample Analyzed By: Awais Shafique

Signature of analyst: [Signature]

Chief Environmentalist with Seal:

ALEEM BUTT
Chief Environmentalist
SEAL

Signature of Chief Environmentalist: [Signature]

Date: 07-12-2015

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SOLUTION ENVIRONMENTAL & ANALYTICAL LABORATORY

DRINKING WATER ANALYSIS REPORT

Client Name: CGGC-AM Associates JV Address: E-35 Project Package II Khanpur Road Chachian Soka Rajpur Haripur
Sampling Point: Consultants Residence Nature of Sample: Drinking Water
Sampling Date: 03-12-2015 Date of: 07-12-2015
Sampling By: SEAL-Lahore Completion: Reference No.: SEAL/CGGCAM/15/004 DW

Results:

| Sr. No. | Parameter | Unit | Result | WHO Guideline |
|---------|--|----------------|-----------|---------------|
| 1 | Temperature | °C | 22.4 | --- |
| 2 | Ph | -- | 7.5 | 6.5-8.5 |
| 3 | Total Dissolved Solids (TDS) | mg/l | 364 | 1000 |
| 4 | Total Suspended Solids (TSS) | mg/l | 22 | --- |
| 5 | Chloride | mg/l | 56 | 250 |
| 6 | Fluoride | mg/l | 0.3 | 1.5 |
| 7 | Taste | Object./unobj. | Unobject. | Unobject. |
| 8 | Odour | Object./unobj. | Unobject. | Unobject. |
| 9 | Colour | TCU | 0 | 15 |
| 10 | Iron | mg/l | 0.05 | 0.3 |
| 11 | Sodium | mg/l | 68 | 200 |
| 12 | Nitrate (as NO ₃ ⁻) | mg/l | 1.5 | 50 |
| 13 | Nitrite (as NO ₂ ⁻) | mg/l | BDL | 3 |
| 14 | Ammonia | mg/l | 0 | 1.5 |
| 15 | Hydrogen Sulphide (H ₂ S) | mg/l | BDL | 0.05 |
| 16 | Sulphate | mg/l | 82 | 250 |
| 17 | Lead | mg/l | BDL | 0.10 |
| 18 | Total Hardness as CaCO ₃ | mg/l | 124 | 500 |
| 19 | Turbidity | NTU | 0 | 5 |
| 20 | Zinc | mg/l | 0.2 | 3 |
| 21 | Manganese | mg/l | BDL | 0.1 |
| 22 | Benzene | mg/l | BDL | 10-120 |
| 23 | Aluminum | mg/l | BDL | 0.2 |
| 24 | Molybdenum | mg/l | BDL | 0.070 |
| 25 | Chromium | mg/l | 0.01 | 0.050 |
| 26 | Cadmium | mg/l | BDL | 0.003 |
| 27 | Boron | mg/l | BDL | 0.300 |



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