Environmental and Social Monitoring Report

Project Number: 44914-014
Quarterly Report (July-September 2015)
September 2015

Pakistan: Patrind Hydropower Project

Prepared by Star Hydro Power Limited for the Asian Development Bank.

STAR HYDROPOWER LIMITED

147 MW PATRIND HYDRO POWER PROJECT

ENVIRONMENTAL & SOCIAL MONITORING REPORT

(JULY-SEPTEMBER 2015)

STAR HYDRO
K-water Global

HEAD OFFICE: House No. 534, Margalla road, Sector F10/2, Islamabad - Pakistan
Tel: +92 51 2212610-1 Fax: +92 51 2212616
E-mail: patrind@patrind.com

A COMPANY OF KOREA WATER RESOURCES CORPORATION

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Acronyms

ADB	Asian Development Bank
AJK-EPA	Azad Jammu & Kashmir Environmental Protection Agency
KPK	Khyber Pakhtunkhwa
CDP	Community Development Plan
EH&S	Environmental Health & Safety
EPCC	Engineering Procurement Contracts Contractor
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
GRC	Grievance Redress Committee
IEE	Initial Environmental Examination
IDB	Islamic Development Bank
IFC	International Finance Corporation
ILO	International Labour Organization
KEXIM	Export Import Bank of Korea
NEQS	National Environmental Quality Standards
NTP	Notice To Proceed
PAPs	Project Affected Persons
PS	Performance Standard
RAP	Resettlement Action Plan
SHPL	Star Hydropower Limited

Introduction

i. Background

The Patrind Hydropower Project is run of river project located on the boundary of Khyber-Pakhtunkhwa and Azad Jammu & Kashmir. The purpose of the Project is to provide zero-emissions renewable electricity to the grid and also provide local and global environmental benefits as well as strong local socioeconomic benefits. The project has the total capacity of 147 MW. The project is being financed by multilaterals like IFC, ADB, IDB and KEXIM.

ii. Objectives:

The purpose of this Quarterly Environmental & Social Performance Report is to describe EPC contractor's compliance with the environmental and social performance requirements of IFC/ADB (including implementation of the Environmental Management Plan) and to assess any corrective actions implemented/proposed. This includes:

- A description of all significant health, safety, environmental and social activities and events that occurred during the reporting period.
- Provision of additional information about activities (i.e., status of permits or other approvals, ongoing public consultation etc.).
- Quantitative performance monitoring data summaries in comparison to appropriate ADB and IFC policies, guidelines and national requirements.
- An explanation of any cases of non-compliance with lender's guidelines or applicable regulatory limits that have occurred, identifying the cause and the corresponding corrective measures planned or underway to prevent future occurrences.
- Resettlement Action Plan activities and progress on the implementation of project within the Sustainable Development Strategy Framework

a. Project Name and Summary Information

i. Project/Business Name

Patrind Hydropower Project

ii. Status of Construction

The Notice to Proceed (NTP) for main works was issued by the Company to EPC Contractor on December 26, 2012. However the preliminary works under Preliminary Contract were initiated in October 2010 and were dovetailed in to the main contract. As of September 2015 the physical progress achieved is 63.24%.

iii. Location of project

Village Patrind, District Muzaffarabad, Azad Jammu and Kashmir

iv. Nature

Run of river Hydropower Project.

v. Scale/size

147 MW

vi. Date of construction/operation commencement

Preliminary works commencement:	September 2011
Main works start after issuance of NTP:	December 2012

vii. Name, designation and signature of person responsible for preparing/reviewing the report

Prepared By:	Syed Atif Ali Shah	Reviewed By:	Kyung Hwan Lee
Designation:	**Manager HSE**	**Designation:**	**Deputy Chief Executive Officer**

Approved By:	Waqar Ahmad Khan
Designation:	**Chief Executive Officer**

b. Relevant Environmental Permits or Compliance Certificates

a) Summary of permit conditions and media covered:

As per NOC Issued by AJK-EPA, SHPL/EPC is bound to:

Condition	Status of compliance
Ensure compliance to NEQS and undertake mitigation measures suggested in the EIA report & EMP. Constitute Environmental/Post EIA Monitoring Committee and submit monitoring reports on quarterly basis and provide the copy of this approval and EIA report to the contractor for information and compliance activities.	Environmental Monitoring Unit has been established and mobilized on site after the issuance of Notice to Proceed to the EPC Contractor. Quarterly E&S Monitoring reports are being submitted to the EPA AJ&K. Post EIA monitoring was undertaken by EPA during last year. Approval and EIA report is part of EPC contract.
Compensate PAPs for loss of agricultural land, crops, property, and usage right etc. in accordance with the rates that agreed upon and adopt appropriate mechanism for RAP grievance redress. Employ local peoples for all unskilled jobs and implement CDP sooner than later. Ensure all public utilities such as water supply pipes, power phone line be not disturbed by the execution of the project.	Owners have been compensated for the loss of agricultural land, trees and property as per the market rates/replacement cost. For unskilled jobs local workers from affected communities (Alda, Patrind, Tarcheela, Boi, Sarati Shoran and Deedal) are being employed and for skilled jobs locals are being hired on priority basis as per the requirement and the qualification. During civil works special care is being taken not to disturb any of the public utilities.
Ensure occupational and community health and safety backed by a comprehensive emergency response plan. Adopt controlled techniques in accordance with Pakistan explosive act and also make sure the safety & security of wild animals and their habitats at the project site and in its environs with the prior consultation and adhering to the guidelines of forestry and wild life departments strictly.	Emergency response procedures are in implementation. Provision of PPEs, education sessions, availability of medical facilities, installation of sign boards and close supervision by EPCC & OE HSE staff are ongoing activities to ensure Occupational health and safety on project sites. Blasting activities are carried out in accordance with Pakistan Explosive Act. Monitoring of Fish fauna and flora has been undertaken during quarter.
For compliance of regulation 13, 14, 17 & 18 of IEE/ EIA regulations 2000 which enunciate the conditions for approval. Confirmation of compliance, entry, inspection and monitoring of the proposed project. The site to install the asphalt plant and other machinery would be selected in consultation with the agency (AJK- EPA). The findings of quality analysis on regular basis should positively be shared. Also, the spoil should be dumped at pre identified location.	Quality monitoring reports are being sent to EPA-AJK. Spoil is being dumped on approved sites. Installation of batching plant has been undertaken with consultation of EPA-AJK.

Communicate any change in the approved project to AJK-EPA and that would be commenced after obtaining the approval. The approval shall stand null and void if the conditions mentioned herein before are not fully complied with. It does not absolve the proponent of the duty to obtain any other approval or clearance that may be required and can be withdrawn at any time with any prior notice if deem necessary in the public interest.	For the changes in the design of the weir site layout and Addendum to the EIA report was submitted to both the EPAs i.e. EPA AJ&K and KP covering the changes to be made in the design which was subsequently approved by both the EPAs on November 19, 2014.

Most of the conditions are common in both approvals with few exception of following issued by EPA KPK:

Condition	Status of compliance
Water in the pond created by construction of Patrind weir should be maintained at EI765m.amsl.Safety zone/adequate engineering measures should be provided to overcome fears of the residents regarding effects of pond to their houses. The level difference of 2 meter from765m.amsl to 767m will act safety zone so the owner of the land and housing structures falling within the zone should be compensated as per laid down procedure of compensation of the government.	The operation level of the Project is at 765 masl. The Company acquired the land at the level of 767 masl as per the condition of the EPA. The additional 2 meters shall act as safety zone and the owners were compensated as per the procedure.
The project management should contribute towards the repair of the road to be used during construction and operation activities of the project. The trees supposed to be submerged should be counted in the presence of all stake holders i.e. owners land collectors /patwari representing revenue department representative of EPA and forest/agriculture department. After the determination of exact number type and ownership of the trees be finalized and paid as per laid down procedure of the government	The owners have been compensated for the trees supposed to be acquired due to the land acquisition. The trees were counted in the presence of all stake holders i.e. owners land collectors /patwari representing revenue department representative of EPA and forest/agriculture department. Uneven section of project access road passing through Sarati village has been repaired with graders. Damaged portion, will be repaired if any. The maintenance of the access roads near the project area is part of Social uplift plan
Minimum flow of 2 cumecs in the downstream of weir in Kunhar River should be kept and provision for 10% extra of this amount of water for emergency in downstream should also be kept in plan. No extension would be permitted in the future in existing hydropower project without prior approval of the EPA /government of Khyber	Shall be applicable during the operation phase of the Project
Separate NOC is required for batching/crushing Plant	NOC was obtained from EPA KPK for installation of two batching plants near the weir site

b) Relevant Government Agencies

As the Project is located on the boundary of Khyber Pakhtunkhwa and Azad Jammu & Kashmir, Star Hydro Power Limited (the "Company") had to seek approval of Environmental Impact Assessment (EIA) from following two Environmental Protection Agencies (EPAs).

i. EPA Azad Jammu and Kashmir
ii. EPA Khyber Pakhtunkhwa

c) Issuance dates and duration of validity

Issuing Authority	Issuance Date	Duration of Validity
EPA-AJK	10-08-2010	3 years
EPA-KPK	14-04-2011	Project construction phase

d) Renewal Requirements:

As per AJK-EPA review of IEE and EIA Regulations, 2009 "Once the Environmental Approval is accorded in favor of the proponent, shall be valid for the period of 3-years from the date of issuance. However, if construction is commenced during the 3 years period, the approval shall stand extended "automatically" for a further period of 3-years from the date of expiry of initially issued Approval".

c. Incidents of Violations or Non-Compliance

HSE compliance monitoring is being undertaken regularly. EPC contractor made efforts to ensure remedial and corrective actions highlighted by SHPL and OE to mitigate HSE issues. OE has two HSE Officers for upper and lower sites who are engaged in monitoring / reporting contractor & subcontractors HSE compliance.

- Dust pollution had been a noticeable issue on the powerhouse site during the month of July due to irregular water sprinkling due to water sprinkling pump break down and the water bowsers were not available on time due to the tight schedule of construction activities. As a corrective action, it was ensured that water sprinkling is done on the site at least 5 times a day, meanwhile, new water tank, new water pump and new water sprinkling line were installed on the site and water sprinkling was ensured on the site on regular basis.

- The breakdown of the canvas pipe from the first corner tank towards last corner due to the torrential rainfall was observed during the month of July 2015, as a corrective action, the pipe was repaired and fixed properly into the tank to prevent the ground water contamination and to stop the sludge from going directly into the river. Later on, proper drainage was prepared in this location to avoid any further ground water contamination.

- During the month of July, oil spillage was observed in front of the batching plant due to the maintenance of the machinery and generators placed on the site. Corrective actions were taken immediately in this regard to stop oil spillage by

removing the contaminated soil by excavator and dumping into the concrete waste trench in the disposal area to prevent environmental degradation.




- During the month of August, sewerage water coming from the Daewoo workshop was observed going directly into the river without proper treatment as there were no main holes and drainage system properly prepared due to which people living nearby area were suffering by this. Corrective actions were suggested by SHPL and OE in this regard to prevent foul smell and water-borne diseases. Septic tank was made, layers of stone and sand bags were placed inside the pit to make a proper soakage pit. A pipe was installed inside pit from the inlet of sewage water that connects with the outlet and gives proper channel for the waste water to drain out. The septic tank was finally covered and soil to prevent environmental degradation in regard to the spread of diseases and ecosystem disturbance.




- During the month of August, spillage of fuel was observed at third corner due to the fuel tankers that were placed directly on the loose soil. Thus, inadequate fuel storage and inappropriate spill containment lead towards the soil contamination. As a corrective action, all the fuel from tanks was shifted into the metal tank at fuel storage area and remaining empty tanks were removed from the ground and transferred to the workshop. After that contaminated loose soil was got cleaned up and compacted with the help of excavator to prevent land degradation.


Warning Letters for Non Compliances

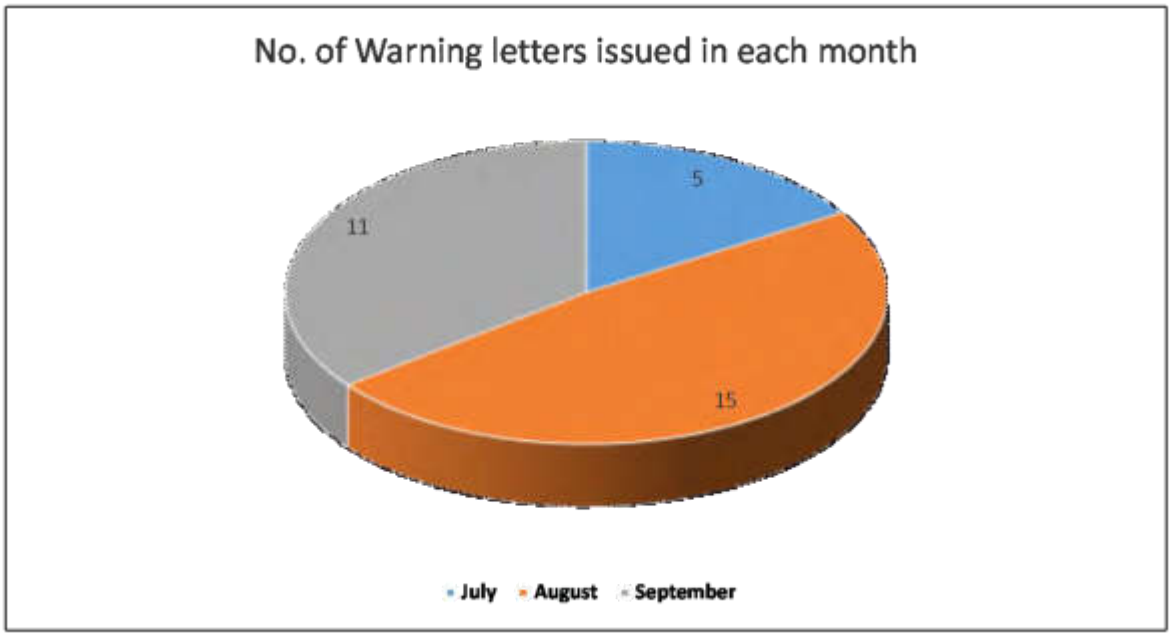
During reporting period, depending on nature and severity of violation warning letters have been issued to the violators. Verbal warning is given for the first time on minor violations. If any employee fails to abide by HSE policies after verbal warning a

written warning letter is issued. 31 warning letters were issued for incident for violations of HSE procedures. List of warning letter is given in the table below. As per company's standard procedure after three warnings employee would not be able to continue his/her job. However, before removal it is important to ensure that individual has been informed / trained and provided with the necessary PPEs.

WARNING LETTERS

Sr. No.	Name	Date			Site	Company	Designation	Reasons
		Day	Month	Year				
1.	Sher Zaman	9	7	2015	Weir Site	Sungbo	Excavator operator	Unsafe Act
2.	Shakeel Ahmad	9	7	2015	Weir Site	Sungbo	Diver	Unsafe Act
3.	Wali Khan	14	7	2015	Weir Site	Sungbo	Wheel Loader Operator	Unsafe driving
4.	Wali Khan	14	7	2015	Weir Site	Sungbo	Steel fixer	Unsafe Behavior
5	Ijaz	24	7	2015	Weir Site	Sungbo	Supervisor	Unsafe behavior
6	Nusheerul Allaha	4	8	2015	Weir Site	Sung Bo	Excavator Helper	PPEs Violation
7	Junaid Shabbir	6	8	2015	Weir Site	Sung Bo	Assistant Engineer	Failure to Supervise
8	Ubaid Riaz Awan	16	8	2015	Powerhouse	Kyung Dong	Tunnel labor	PPEs Violation
9	Kalim Akram	17	8	2015	Weir Site	Sung Bo	Helper	Using Faulty Equipment
10	Kalim Akram	17	8	2015	Weir Site	Sung Bo	Helper	Un Safe Behavior
11	Nadeem Maseeh	18	8	2015	Powerhouse	Kyung Dong	Steel Fixer	Fall Protection Violation
12.	Akbar	18	8	2015	Powerhouse	Kyung Dong	Labor	Fall Protection Violation
13	Masood	18	8	2015	Powerhouse	CNEEC	Labor	Fall Protection Violation
14	Ghulam Abbas	23	8	2015	Powerhouse	CNEEC	Rigger	working at height without body harness
15	Hameed	23	8	2015	Powerhouse	CNEEC	welder	working at height without

Sr. No.	Name	Date			Site	Company	Designation	Reasons
		Day	Month	Year				
								body harness
16	Jamal	23	8	2015	Powerhouse	CNEEC	welder	working at height without body harness
17	Nabeel	23	8	2015	Powerhouse	CNEEC	welder	working at height without body harness
18	Tan Long	23	8	2015	Powerhouse	Foreman	CNEEC	working at height without body harness
19	Arshad Mehmood	22	8	2015	Powerhouse Site	Crane Helper	Kyung dong	Found riding on crane in unsafe manner.
20	Shehar yar	27	8	2015	Weir Site	Excavator Helper	Sung Bo	Unsafe Act
21	M. Raza Awan	1	9	2015	Weir Site	Excavator Helper	Sung Bo	Unsafe Act
22	M. Tariq	8	9	2015	Weir Site	Daewoo E&C	Supervisor	Unsafe Act
23	Mr. Fayyaz	8	9	2015	Weir site	Foreman	Sungbo	Failure to supervise
24	Masood	8	9	2015	Weir Site	Welder	Sung Bo	PPE
25	M. Azar	8	9	2015	Weir Site	Labor	Sung Bo	Crossing the Barrier
26	Mr. Haleem	8	9	2015	Weir Site	Driver	Daewoo E&C	Unsafe Behavior
27	M. Alyas	8	9	2015	Weir Site	Supervisor	Sungbo	Unsafe Behavior
28	Rizwan	17	9	2015	Weir site	Welder	Sungbo	Unsafe Act
29	Shakeel Qureshi	18	9	2015	Weir Site	Operator	Daewoo	Over Speed
30	Niamat Shah	18	9	2015	Power House	Exc. Operator	Kyung Dong	Unsafe Behavior
31	Qasim	19	9	2015	Weir Site	Supervisor	Sungbo E&C	Using Bike At Site



d. Incidents of Environmental and Safety Accidents

a) Environmental Accidents and Mitigation

- No major environmental incident occurred during the reporting quarter on both the sites. However, minor soil contamination due to inappropriate handling of oil was observed.
- Dust on Project access roads due to vehicles/heavy equipment movement has been observed and mitigated through frequent sprinkling .
- HRT waste water sedimentation/treatment tanks were partially cleaned. Efforts were made for frequent de-sedimentation.
- The breakdown of the canvas pipe from the first corner tank towards last corner due to the torrential rainfall was observed during the month of July 2015, and was mitigated by fixing the Canvas Pipe and later on by preparing a concrete drainage for the waste water.
- Oil spillage was observed in front of the batching plant and was rectified by removing the contaminated soil. The contaminated soil was properly disposed-off in the concrete disposal trench.
- Sewerage water coming from the Daewoo workshop was observed going directly into the river without proper treatment, as a corrective action, proper septic tank was made.
- During the month of August, spillage of fuel was observed at third corner due to the
- fuel tankers that were placed directly on the loose soil, as a corrective action the tanks

were removed from the ground and the oil was transferred in to the proper oil storage metallic tank.

- Dust pollution had been a noticeable issue on the power house site during the month of August. To mitigate the problem, it was ensured that the water sprinkling was done on the site at least twice a day. New water tank and water sprinklers were also installed on the site.

b) Health and Safety Accidents and Mitigation

EPCC encourages and educates employees to take reasonable care for their own health and safety. Incidents are recorded for all workers/staff working for subcontractors and on rented vehicles/machinery.

Summary of health and safety incidents during quarter is in the table given below.

Incident	Frequency	Description	Media or Community Reaction
Fatality	01	1. On 9th July 2015, Mr. Qayyum (Late) Sung-Bo worker was unloading pipes from the pickup (Vehicle No. 2929) inside the Bypass adit tunnel mean while one excavator of Sung-Bo (Operator name: Sher Zaman) was also working nearby. After finishing the job, excavator start reversing and run over Mr. Qayyum (Late) and hit the pickup which was just behind the excavator. Excavator operator with the help of Sumair Afzal (Tunnel Labor) & Muhammad Shakeel (Pickup Driver) immediately shifted Mr. Qayyum (Late) to same pickup for sending him to hospital but while traveling to hospital he died in the way. (As described by witness Mr. Sameer Afzal & Mr. Muhammad Shakeel). Detailed investigation report is attached as **Annex. 3.**	Announced in local newspapers
First Aid Case	05	1. Based on the gathered information at the scene of the incident on Thursday 30 July 2015 about 10:15 hrs, Abdul Ghafoor welder was working inside HRT at a scaffolding platform and welding Lining Form work. Suddenly his foot slipped from scaffolding platform and he fell down on ground and got minor injury. Immediately rescued and shifted to HSE site clinic. Duty doctor treated the injured person, and referred to the PIMA AL HAJRI HOSPITAL for further examination, where the hospital doctor advised him necessary treatment and finally discharged on the same day. 2. On Thursday, 20th August, 2015, at around 5 PM, 10 steel	None

Incident	Frequency	Description	Media or Community Reaction
		fixers were fixing the steel rebar on a wall inside the power house block 4, A heavy piece of form work was installed at one side of the steel rebar wall. One side of wall was supported with the belts but other side was not supported. Suddenly the wall became unbalanced and fell at a side. Following steel fixers were working on the steel wall; I. Naeem Shahzad. II. Khaqan Abbasi. III. Roben Ghauri. IV. Khurram. 3. Based on the gathered information at the scene of the incident, on 18th September 2015, Mr. Jahangir Carpenter Lining helper was involved in lining concrete work, he lift some plywood pieces and passing through the tunnel lining formwork. The visibility in tunnel was low, he could not judge a H beam in front of his face, suddenly his head strike with the H beam, He fell down and become unconscious, he was wearing the helmet, so he escape from a serious injury. 4. Based on the gathered information at the scene of the incident, on 19th September 2015, Rashid Nazir was involved in cleaning of the lattice grader with power grinder-(size 4"). Buffing wheel of the grinder stuck in the spiders and his hand strike with the sharp edge of lattice grader resulting the injury on his little finger of left hand. 5. Based on the gathered information at the scene of the incident, on September 29th 2015, Mr. Aftab was doing housekeeping in Power house near block 2-3, mistakenly he put his feet on a chemical bottle, consequently it came out with pressure and splash into the IP's eyes, IP was shifted to the site clinic for medical checkup, after the first aid treatment, IP referred to CMH hospital for further medical consultancy.	
Medical Treatment Case	None	None	None
Damage only incident and Near Miss	None	None	None

Incident	Frequency	Description	Media or Community Reaction
Property damage/environmental incident	02	1. On 19th Sep. 2015 at 10:45am, M. Amir, Explosive Vehicle Driver, was operating the explosive vehicle to across the road for down site. However, he has fail to control the vehicle and a vehicle involved in this accident was crushed with crawler crane, exactly left of chain, placed in front of the Weir. 2. Based on the gathered information at the scene of the incident, on 20th September 2015, Excavator, EXC KD-02 was working outside the Pins tock Tunnel, and was performing the cleaning work. The excavator lifted the lattice girder which was taken out of the pin stock tunnel. The lattice girder was lifted in the bucket of the excavator and it slide back and hit the wind shield of the excavator. The wind shield glass of the excavator was broken and lattice girder hit the left leg of the operator, however there was no external or internal injury.	None
Medical Checkup / Examination / Treatment	1413	**July 2015:** 280(Lower site = 154 ,Upper site =126) **August 2015:** 645 (252 Upper Site + 393 Lower Site) **September 2015:** 488 (223 Upper Site + 265 Lower Site)	None

Safety Milestone

5.1 million Safe Man Hours were completed on 8th July, 2015, however, after the fatal incident on 9th July 2015, 1.1 Million safe man hours were completed till 30th September 2015.

External Monitoring /Inspection

Sites HSE internal inspection has remained an ongoing activity. As part of external monitoring, The Lenders (IFC, ADB & KEXIM) Environmental & Social Monitoring team visited the site during 11~14 August 2015. Lender's team conducted meetings with local community representatives and Project affected people on both sites of the project. The Lender's mission pointed out HSE & Social issues such as complaints received from Sarati village regarding blasting impacts, dust and noise problems, inadequate numbers of toilets on the powerhouse site, required improvements in the accommodation camps and mess halls, and

community security issues. Subsequent corrective actions were undertaken as recommended by the Lender's Environmental & Social Monitoring Mission. The detailed mission notes, including the actions required and the status of implementation of corrective measures are attached as **Annex- 15**.

Internal Inspections Conducted During Reporting Period

To mitigate safety incidents, machinery, equipment and electrical appliances are being inspected to ensure fitness through color coding system. List of inspections done during the quarter are attached as **Annex-1**.

According to the nature of work carried out on construction sites, inspections have continuously been carried out during the reporting period to reduce the risk of accidents and impacts on environment and for proper maintenance of machineries and other equipment regularly.

Following inspections have been undertaken during quarter;

- Heavy equipment inspection
- Batching Plant Inspection
- Site Overall Inspection
- Fire Extinguisher Inspection
- Health and Hygiene Inspection
- Gaseous concentration Inspection

Mitigation Measures

To ensure health and safety of both staff and labor on Project area, following were some of the prominent activities EPCC undertook during the quarter:

1. Workers (employed by Daewoo E&C and its sub-contractors) have been provided with necessary Personal Protective Equipment (PPE) comprising of helmets, safety shoes and safety jackets and ankle belts to prevent injuries.
2. Warning letters have also been issued to the personnel found to perform activities that are against the rules and regulations of the HSE
3. Newly employed staff, labor and daily wagers were given HSE inductions so that they are aware of potential risks associated with the construction sites emergency procedures
4. Safety campaigns and awards are distributed to encourage and develop safe work behavior

in labor and staff

5. To mitigate safety incidents, machinery, equipment and electrical appliances are being inspected to ensure fitness
6. Regular trainings/education sessions for staff and labor
7. Water sprinkling on project access road for community health and safety.

Permit To work (PTW)

Permit to work for the following activities have been issued during the quarter.

1. Welding/ Open Flame Work
2. Excavation
3. Lifting
4. Explosive issue
5. Blast
6. Work at height

e. Labor Relations and Conditions

(i) Nature of labor dispute or grievance

No labor dispute or conflict with local community was observed or reported during quarter. However, three complains were received from the workers and one (1) complain was recorded from the local community of the Thuri village during the quarter, all these complains were resolved on the priority basis by the mutual consent of OE and EPCC HSE staff. Details of the complaints received are annexed as **Annex-14**.

(ii) Legal requirements, Permit conditions and renewal requirements

During the reporting period, requirements related to labor's contracts, permits and other conditions remained constant and no change was observed.

EPCC and sub-contractors are providing insurance coverage in case of accident and death. Furthermore, a deduction is being made from salaries for Employees Old Age Benefits Institution (EOBI) as social security on KPK side

(iii)Authorities in charge of investigation/recording

In case of any labor incident, Site Construction Manager and HSE staff is responsible to record, investigate and address it appropriately. To address any dispute or work related complaint received from staff /workers. Internal Grievance Redress Committee (GRC)

comprising Planning Manager, Admin Manager and HSE Manager is mandated to investigate the matter in an unbiased manner and resolve it amicably so that the concerned party or individual may be satisfied and a friendly / peaceful environment is reinstated at project site. Furthermore, during the Lenders' site visit it was highlighted that the existing GRC is not as per the requirement and also less efficient. Lenders through their mission notes required/suggested to establish a three tier GRC from sub-contractor to SHPL level.

(iv) Media or community reactions (if any)

No reaction was observed from media or the community.

(v) Corrective actions, deadlines, identification of responsible parties.

SHPL, OE and EPCC's HSE departments continuously indicates corrective actions for further compliance by construction team.

(vi) Labor relations and living conditions for construction labor force

All staff/workers before induction have been educated to respect local norms and never involve in any conflict with locals. Furthermore, community liaison officer / coordinator who have been employed from local area, assist in managing these accommodations. Basic services like electricity, water and gas have been provided. Safety measures such as fire extinguishers and emergency contact numbers have been placed on main locations. Fire alarm system has been installed on main EPC camp at lower site and will be installed on new accommodations as well. Ambulance drivers are aware of all accommodations to have prompt access in case of any emergency. Government of Pakistan Labor Policy 2010 implemented

- Standards for labor health and safety are executed according to EPC Construction Contract
- EPC has made all necessary arrangements for payment, housing & feeding
- The living conditions are up to merit with all necessities
- Prefer to hire unskilled /skilled staff and labor from AJ&K or KP

Prefabricated accommodations labour at upper & lower Sites

Compliance status based on applicable National and International laws/ regulation on labor including ILO core labor standards

As per conditions stipulated in the Project construction contract between Company and EPC contractor those have been made in light of National and International laws and standards, implementation during the quarter has been observed accordingly. Statuses of compliance with these laws are given in the table below;

Table: Compliance Status with International and National Labor Laws/Regulations

CONTRACTUAL TERMS/ CONDITIONS	STATUS OF COMPLIANCE DURING QUARTER
ENGAGEMENT OF STAFF AND LABOR	
Except as otherwise stated in the Project Requirements, the Contractor shall make arrangements for the engagement of all staff and labor, local (People living in project vicinity) or otherwise, and for their payment, housing, feeding and	EPC contractor has made all necessary arrangements for the engagement of staff and labor and payment for their wages/ salaries, housing, feeding and transport. However, the local staff/workers do not need accommodation on project
The Contractor and its subcontractor(s) shall prefer, to the extent practicable and reasonable, to hire unskilled staff and labor, and skilled staff and labor with appropriate qualifications and experience, who are residents of AJ&K or KP especially who are the affected of the Project	More than 200 of unskilled jobs have been provided to nearby communities (Alda, Thori, Patrind, Tarcheela, Sarati, and other adjacent localities). Also preference has been given to local people who qualify for skilled positions

The Contractor shall, and shall ensure that its subcontractors shall, fulfill and observe the Environmental and Social Requirements in relation to the engagement of staff and labor	EPC Contractor has established a proper mechanism of daily and weekly reporting and consistent monitoring of HSE and related social issues. On the basis of recommendations, corrective measures are being taken accordingly
RATES OF WAGES AND CONDITIONS OF LABOR	
The Contractor shall pay rates of wages, and observe conditions of labor, which are not lower than those established for the trade or industry where the work is carried out or as prescribed under the Laws of the Country. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.	The minimum salary for the permanent worker is 13,000/- for 208 hours monthly according to the budget notification 2015 plus food and accommodation if required.
PERSONS IN THE SERVICE OF OTHERS	
The Contractor shall not recruit, or attempt to recruit, staff and labor from amongst the Employer's Personnel.	Full compliance of the condition was observed during entire quarter
LABOR LAWS	
International Human Rights & Core Labor Standards The Contractor shall comply with all the relevant labor Laws applicable Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights.	All regulations are in implementation. Local labor laws were devised in light of International Human Rights & Core Labor Standards; therefore, compliance with local standards is same with international laws /standards. Furthermore, Pakistan has ratified ILO's conventions on core labor standards.
The Contractor shall require its employees to obey all applicable Laws, including those concerning safety at work.	Site HSE status has been improved due to regular instructions and corrective measures.
Abolition of child labor	To ensure the abolition of child labor the Computerized National Identity Card (CNIC) has been made mandatory for induction which is only provided by the GOP after the age of 18.
Elimination of all forms of forced or compulsory labor	No forced labor observed /reported during quarter. Furthermore, during site inspections by SHPL, OE and EPCC's HSE staff, it is strictly checked that no forced labor has been undertaken on any site in any form.
Elimination of discrimination in respect of employment and occupation	No discrimination exists as all persons have been provided equal opportunities irrespective of color, race, origin and nationality. Only difference is the nature of job and relevant skills.
Freedom of association and the effective recognition of the right to collective bargaining	No ban is imposed on workers with regard to establishment of workers organization or freedom to express labor concerns. However, formal labor union or association has yet not been established.

WORKING HOURS	
No work shall be carried out on the Site on locally recognized days of rest, or outside normal working hours, unless: (a) Otherwise stated in the Contract, (b) the Employer gives consent, which shall not be unreasonably withheld, or The work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Employer	Work has been carried out on weekends but only with the consent of concerned staff/labor.
FACILITIES FOR STAFF AND LABOR	
(a) Except as otherwise stated in the Project Requirements, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated in Project Requirements.	Recommended facilities have been provided
(b) The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.	Nobody has been permitted during reporting period

(vii) Medical facilities provided to Staff and Labor during quarter:

On both sites of the Project, availability of clinical staff and facilities all the time has been insured. During the reporting quarter, 1413 staff and workers visited medical facilities. However, majority of all visitors having normal check up with very few exceptions of minor cuts but rest are of minor in nature like gastro enteritis, flue and headache etc. Availability of first aid boxes has also been ensured at all sites Implementation of local labor standard.

(viii) Project procedures for: (a) hiring; and (b) acquisition of goods and services:

Procedures for hiring have been adopted as per EPCC's policy and also in compliance with EPC Contract. While, procurement of goods and services by EPC contractor is being carried out under Quality Assurance and Quality Control plan.

(ix) Local Employment Status:

As per the EPC contract, EPCC is bound to employ unskilled labor from local areas/ adjacent villages and for skilled jobs preference has to be given to the qualified locals.

LOCAL EMPLOYMENT STATUS

Company	AJ&K							KPK						Others	Total Employees
	Alda	Thori	Patrind	Tarcheela	Shoran	Other AJ&K	Sub-Total	Sarati	Boi	Deedal	Dalola	Others	Sub-Total		
Daewoo	2	52	12	-	1	172	**239**	2	10	1	23	33	**69**	**76**	**384**
Kyung Dong	13	21	10	2	-	322	**368**	-	1	3	4	30	**38**	**47**	**453**
Sungbo	-	-	54	19	22	116	**211**	-	83	-	99	66	**248**	**13**	**472**
CNEEC	-	1	-	-	-	6	**7**	-	-	-	-	-	-	**0**	**7**
Hespak	-	-	-	-	-	16	**16**	-	-	-	-	26	**26**	**0**	**42**
Watch Man	-	-	2	-	-	-	**2**	-	17	-	-	-	**17**	**0**	**19**
Gurad & Guides	-	-	-	-	-	36	**36**	-	-	-	-	-	-	**0**	**36**
Total	**15**	**74**	**78**	**21**	**23**	**668**	**879**	**2**	**111**	**4**	**126**	**155**	**398**	**136**	**1413**
	1.7%	***8.4%***	***8.8%***	***2.3%***	***2.6%***	***76%***	***62.2%***	***0.5%***	***27.8%***	***1.0%***	***31.6%***	***38.9%***	***28.1%***	***9.6%***	***100%***

Compliance with legal requirement for employment

Project Legal Agreement/Contract	Conditions/Requirements	Compliance Status
EPC Contract Section 6.1 "Engagement of Staff and Labor"	"The Contractor and its subcontractor(s) shall prefer, to the extent practicable and reasonable, to hire unskilled staff and labor, and skilled staff and labor with appropriate qualifications and experience, who are residents of AJ&K or KP especially who are the affectees of the Project"	Nearly 85% of man power is employed from local areas (AJK 62%& KPK 23%)
As per Para 5 (n) of Environmental approval issued KPK EPA Approval Condition	"Non-technical jobs should be provided to the local community. Employment record for all positions shall be provided to EPA-Khyber Pakhtunkhwa and priority should also be given to local in technical jobs but not at the cost of merit or requirement of the management of the project"	Unskilled jobs have been provided to local residents whereas preference has been given to locals for technical positions but subject to availability
As per condition (xii) stipulated in Environmental approval issued by AJK EPA	"As far as possible, employment should be provided to local people for all unskilled jobs. Preference may also be given to local people for all semi-skilled and skilled jobs. Employment record for all positions shall be provided to AJK-EPA positively"	Employment opportunities have been disclosed to the local communities through different avenues such as newsp apers advertisement, public notice on prominent locations and through community coordinators and local project staff. Preference has been given to the locals subject to availability of skilled and unskilled human resources

f. Environmental and Social Capacity

i. Staff capacities in environmental and social management (as relevant)

The Project is being managed/ monitored by EPCC/OE/SHPL having a balanced team of HSE staff comprising safety, environment and health professionals. Organizational chart of EPC is attached as **Annex-4**. An orientation to environmental management, health and safety during construction work is part of induction form of all the staff and workers hired. Furthermore, daily HSE monitoring, toolbox meeting programs and other related activities raise the awareness level among all staff and workers.

ii. HSE Weekly Meetings:

As per monthly HSE Plan of EPC contractor, weekly internal meetings and meetings with site construction teams have regularly been conducted on both sites list of meetings is attached as **Annex-5**.

Issues regarding compliance with HSE standards have always been main agenda items during the meetings.

iii. Environmental laws and regulations

EIA study of the project was completed in light of following laws and regulations. EMP as part of EIA is in implementation under the same laws and regulations;

- Pakistan Environmental Protection Act 1997
- National Environmental Quality Standards (NEQS)
- AJK Environmental Protection Act 2000
- Land Acquisition Act 1894
- Draft National Resettlement Policy 2002
- NWFP Forest Ordinance 2002
- Sarhad National Conservation Strategy 1992
- ADB Safeguard Policy Statement 2009
- IFC Handbook (Resettlement Action Plan)

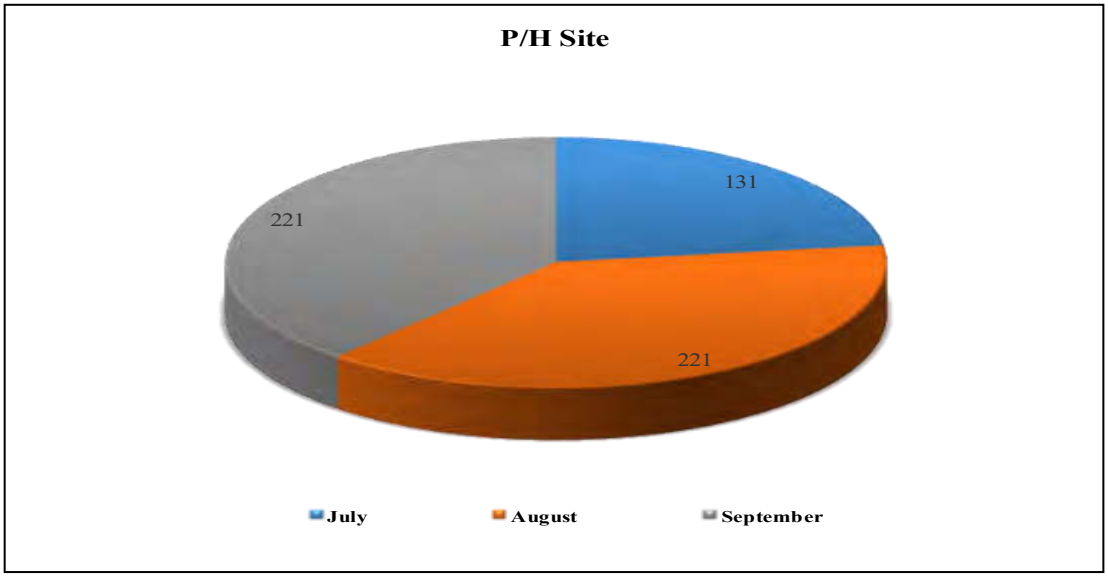
iv. Safety Training and Campaign

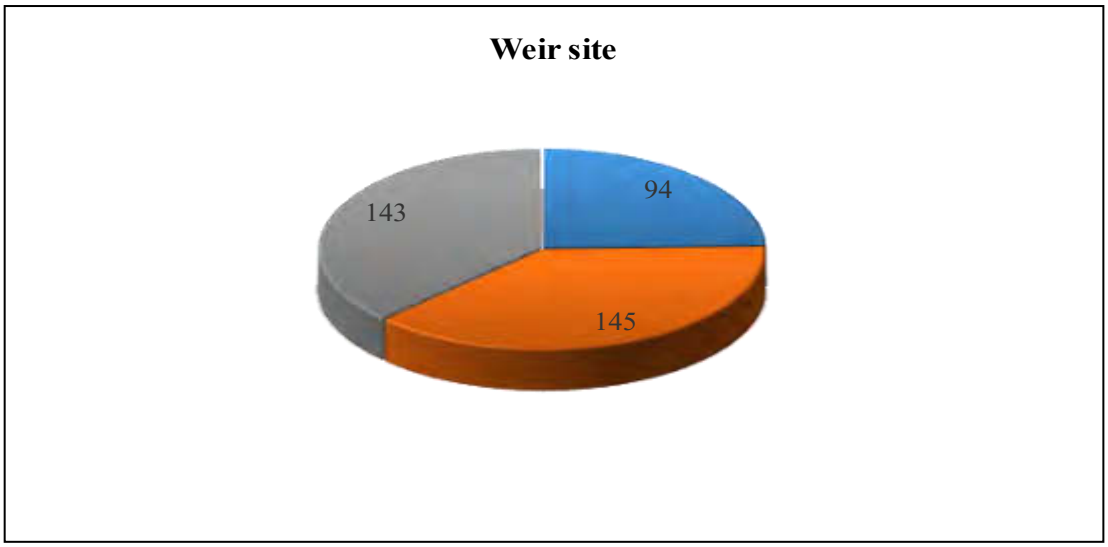
Capacity building activities coupled with effective supervision is always result oriented. Regular HSE trainings are conducted for Project employees on different subjects. These trainings are conducted in the light of standards guidelines and procedures developed by Daewoo E&C for its project while working across the globe, however, site specific modifications have been made in manual. List of the trainings and campaigns undertaken during the quarter is attached as **Annex-6**.

v. Induction Training

As part of EMP all staff and workers before starting their respective jobs have been given induction training as per "Induction Performa" recommended in EMP document. The induction trainings done during the quarter is given below;

	Total No of Induction Trainings		Total No. of employees inducted	
Months	**Lower Site**	**Upper Site**	**Lower Site**	**Upper Site**
July	19	16	131	94
August	36	29	221	145
September	36	30	221	143





Tool Box Meetings

This is a constant activity undertaken daily by EPCC before the start of every construction shift and is part of 3.5 Safety Campaign. Daily HSE related matters are conveyed to all staff and labor during the meeting by HSE staff.

Daily Education/Training on site

During frequent site visit on spot education/training is an ongoing activity that certainly enhance and promote safety culture on sites.

Moreover, during inspection of equipment and color coding activities, workers and relevant staff has also been educated appropriately. Safety Campaign as part of monthly HSE Plan **Annex-7** has been conducted during quarter on both sites.

Monthly Safety Award

Safety campaigns were arranged to promote and develop safe work behavior among labor and staff. To promote safety culture on sites, as per usual safety awards given during month of reporting period:

Safety Awards

Sr. No	Name	Company	Award	Location
1	Na Seoung Duk	Sangbo E&C	Best Supervisor	Weir Site
2	Mr. Hanif	Sungbo E&C	Best Labor	Weir Site
3	Mr. Rizwan	Sungbo E&C	Best Labor	Weir Site

Needs assessment of environmental and social management capacity

As ongoing activity, ccontinuous capacity building initiatives including more specific trainings on environment and social management are required for staff and labor. Furthermore, daily HSE monitoring, toolbox meeting programs and other related activities have raised the awareness level among all staff and workers.

EPCC's HSE department delivered orientation sessions, awareness raising and capacity building sessions on environment and social management and also identified following training needs of the staff and labor during the next quarter.

i. Waste Management
ii. First Aid Trainings
iii. Corporate Social Responsibility
iv. Defensive Driving

g. Stakeholder Consultation/CSR Activities

To initiate and sustain constructive external relationships with Project stakeholders particularly with adjacent /local communities, consultation is an important tool to enhance the social performance of the Project.

Meetings and discussions were held with local NGOs and government departments (Environment Protection Agency, district administration and development authority Muzaffarabad).

h. Details of community programs involving civil society/NGOs in implementation:

- Some professional services on quarterly basis are being hired by EPCC from locally based individuals and organizations during the quarter .Following organizations have been engaged to undertake activities under EMP and Social uplift Plan:

- HSE sign board preparation and printing activity requirements of the project is being undertaken by local vender (Add City) owned by Mr. Khursheed Qureshi, resident of Patrind village. Add City owner Mr. Khursheed is president of Kunhar Welfare Organization and he himself and rest of his partners are PAPs who are linked with same organization.

- Flora and Fauna Study by local Fisheries and wildlife expert Mr. Yousaf Qureshi who is also retired Director Fisheries Government of AJK.

Table: Organizations/NGOs consulted during the quarter

Organization Name	Location	Purpose/ issues discussed	Actions to address Issues
Kunhar Welfare Organization	Patrind- (Upper Site AJK Part)	EPCC is in constant liaison with the organization regarding preparation of awareness material.	During the reporting quarter, HSE sign board preparation and printing activity is being undertaken by local vender (Add City) owned by Mr. Khursheed Qureshi, resident of Patrind village who is president of Kunhar Welfare Organization and he himself and rest of his partners are PAPs who are linked with same organization. Therefore, all printing works are allocated to same organization.
Pakistan Red Crescent Society (PRCS)	Muzaffarabad- (Lower Site AJK)	Placement of First Aid Trained Ambulances Drivers for night shift+ Fitness /service of both ambulances.	First Aid trained drivers placed on night shift and ambulances were sent for service and maintenance by PRCS.
Edinburgh DIRECTAID	Muzaffarabad- (Lower Site AJK)	Environmental monitoring reports submitted by the NGO were discussed to address and incorporate the comments/recommendations made by the owner engineer.	Environmental monitoring activities are being organized by local NGO Edinburg Direct Aid

Rental Vehicle and Heavy Equipment Summary

Company	AJ&K							KPK						Others	Total Hired
	Alda	Thori	Patrind	Tarcheela	Shoran	Other AJ&K	Sub-Total	Sarati	Boi	Deedal	Dalola	Others	Sub-Total		
Daewoo	1	1	1	2		14	19	4	1		2	1	8		27
Kyung Dong						16	16					15	15	3	34
Sungbo			4			2	6	4	2		3	1	10		16
Naveed Brothers						4	4						-		4
Hespak						3	3						-		3
DaeKwang							-						-		-
Total	1	1	5	2	0	39	48	8	3	0	5	17	33	3	84
	2.1%	*2.1%*	*10.4%*	*4.2%*	*0.00%*	*81.25%*	*57.14%*	*24.2%*	*9.1%*	*0.%*	*15.15%*	*51.5%*	*39.3%*	*3.6%*	*100%*

i. Compliance and Implementation of Mitigating Measures in ESMP

Compliance monitoring of environmental and social management plan has been an on-going activity undertaken by OE and EPCC's HSE staff on both sites. Non compliances with recommended standards and regulations were recorded and reported daily, weekly and monthly. EMP Compliance status is attached as **Annex-8**.

a. Environmental monitoring under EMP:

Internal Environmental and Inspection checklist is developed and being filled on daily bases which is attached as **Annex-9**. Besides this following activities have been undertaken as part of environmental monitoring:

i. Fish fauna Study/Monitoring:

Quarterly Study/monitoring was undertaken in Kunhar River (Up & down stream of Project site) during the month of September 2015. Samplings were carried out at the six study points. This monitoring and its comparison with the past monitoring in last one and half year depicts that apparently there are no significant changes appeared on the aquatic environment of Kunhar River. Some insignificant changes in the fish catch and quality of water observed during the study is only due to the irregular seasonal changes and pattern of water turbidity due intensity of rain or drought. Detailed report is annexed as **Annex-10**.

ii. Flora Study/Monitoring:

Quarterly Study/monitoring was undertaken at both (Power house & weir) sites in September 2015. The outcomes of the monitoring shows a decrease in the vegetative cover on both the sites, and an increase in landslides have been observed. The monitoring report recommends the bio-engineering works for the treatment of unstable slopes and stabilization of landslides to retain the good looks and better environment as well; detailed report is annexed as **Annex-11**.

Table: Compliance with NEQ's

Environmental component	Standards (NEQS)	Compliance/Mitigation measure	Remarks
Air Quality	EPA ambient air quality (EPAs standards for each Parameter)	NEQS: To ensure dust suppression due to transportation activity, unpaved roads are being sprinkled with water at least twice a day. The EPC is taking all necessary measures to limit pollution from dust and any wind-blown materials during construction.	Dust control has improved significantly during the quarter.
Water quality	WHO Guidelines (EPAs standards for each Parameter)	Tests for drinking and waste water quality were undertaken on biannual basis during March & September 2014. Waste water from tunnel is treated through sedimentation tanks. Waste water discharged from HRT is being measured	Biannual quality monitoring of waste and drinking water was undertaken during April 2015 for both sites and results are shared with stakeholders during. Next water quality testing will be done in the November 2015.
Noise levels /Vibration	EPA ambient noise standards and worldwide vibration standards.	Noise: Noise prone activities are avoided during night time. No open blasting occurs during quiet hours. Excavators and all heavy machines are lubricated in a routine matter to minimize the noise and to increase the life of equipment Vibration: EPC is more concerned regarding factors of human comfort and structural damage and always try to comply with allowable vibration standards. Blasting checklist is used by HSE staff.	Noise level and vibration record is maintained on daily bases after each blast

Environmental component	Standards (NEQS)	Compliance/Mitigation measure	Remarks
Soil quality	EPA quality standard (Different standards for each Parameter)	No environmental incident except small soil contamination has been observed.	Visual observations mitigation was done by removing the contaminated soil cover
Flora	Visual observations by relevant Forest professional during EIA study.	Study /monitoring during previous quarter undertaken	Study undertaken in September 2015 **Annex-11**
Fish Fauna	Observation by relevant wildlife & Fisheries professional during EIA study.	Study /monitoring for last quarter undertaken	Study undertaken in September 2015 **Annex-10**

b. Occupational health and safety

Health and safety of workers has been a prime consideration of project. In accordance with the safety standards all workers working at site are provided with the Personal Protective Equipment comprising of hard hats, safety shoes, and jacket and dust masks depending upon the job specification to prevent injuries. Hygienic inspections have been made by medical staff. As per usual morning physical exercise has also been undertaken regularly at both sites. All sub-Contractors have issued necessary PPEs to employees. Also, daily site inspections are undertaken to ensure the implementation. Community Safety Health and Security:

1. Consistent supervision on surge shaft access road and power house protection works was ensured.

2. Waste management training sessions were held for supervisors and relevant personnel. Furthermore, waste segregation methods were practically taught to site workers and staff to adopt appropriate mechanism.

3. Water sprinkling on project access road for workers /community health and safety

4. Water filter plant is installed for drinking water by Daewoo EPCC at camp residence to provide clean & pure water. Filter Plant cartridges are being replaced quarterly to have better quality of water.

5. During quarter, coordination meetings, monitoring and inspections were undertaken jointly by EPCC and OE's HSE staff with regard to site HSE status,. No dumping of excavated material was allowed on unapproved sites.

6. Waste segregation, collection, transportation and disposal mechanism has been improved during the month and full time waste collectors were placed on both sites. Waste management training sessions were held for supervisors and relevant personnel.

7. Sign boards have been made and placed on the site where there is a need to aware people while doing work.

8. It is being ensured that landfill is carried out in such a manner that it does not cause harm to the environment. This can be done by ensuring that landfills are located, designed, constructed, operated and restored so as to ensure that ground and surface waters are not contaminated.

c. CO2 emissions by the Project

Following project activities are likely to produce CO_2 emissions, which were given due consideration and following mitigating measures were adopted to minimize the CO_2 emissions.

Sources of CO_2	Mitigating/ Preventive Actions
Use of excavation machinery	Regular tuning/servicing of the machinery is made compulsory and regular inspection is done to ensure that. Smoke producing vehicles are banned from working right away until they are repaired
Tree removal/Land use change	Removal of trees on construction sites will increase the concentration of CO_2 the Project Site atmosphere as trees acted as CO_2 sink. Therefore, as corrective approach, Tree Plantation shall be carried out as retrofitting measure as stipulated in the EMP when it will be practically possible
Solid Waste Disposal	Improper waste management could result accumulation of CO^2 and CH_4 in the atmosphere. For temporary storage of waste proper waste collection and storage areas have been designated. During last month of the reporting quarter waste management mechanism was improved
Use of Construction machinery	Regular inspections of machinery are practiced by HSE staff to check machinery conditions. Warning letters have been issued by OE and EPCC to the smoke producing and vehicles
Usage of liquid fuel	Liquid fuel used at different project activities amounts the maximum CO_2 emissions by the project
Emissions from electricity use	Electrical appliances release some trace amount of gases in order to mitigate that, it is in company's policy to switch off all the electrical appliances when not in use

d. Environmental and Social Management Plan, including IFC E&HS Action Plan

To manage the environmental and social issue appropriately, following detailed plans developed by EPCC have been in implementation to fulfill the environmental and social compliance requirements of the project;

a) Plan for Disposal of Excavated Material
b) Plan for Waste Management
c) Plan for Traffic Management
d) Social Uplift Plan

a) Plan for Disposal of Excavated Material

Excavated material is being disposed-off in excavated waste disposal area approved as per EIA. At lower site, embankment and gabion walls were washed away due to flash flood on 5th September 2014. Reconstruction of damaged structures has now been completed during the reporting quarter. Whereas, upper site no embankment has yet been developed.

b) Plan for Waste Management

Waste segregation and collection system has considerably been improved on both the sites. EPC and sub-contractors have waste collectors placed on both sites to maintain housekeeping and timely segregation /collection of waste. It is being ensured that landfill is carried out in such a manner that it does not cause harm to the environment. For instance a geo-membrane, concrete and clay lined This can be done by ensuring that landfills are located, designed, constructed, operated and restored so as to ensure that ground and surface waters are not contaminated.

All waste generated in all operation at sites is being managed in accordance with EMP & Waste Management Plan. All the recyclable Waste has been carried and transferred to the scrap dealer by HSE vehicle.

Paper, plastic, cardboard and few iron bars have been properly measured by the scrap dealer, the quantity of which has been noted down on the waste consignment note. Daily environmental Performa regarding potential environmental impacts has been made and monitored at site regularly by direct observation and inspection. These impacts include the monitoring of air emissions, water consumption and discharge, waste management, housekeeping, noise impact, hazardous waste management at the project site. Comments have been noted down In case of any improvement or any corrective action regarding any environmental activity if required.

Municipal Corporation Muzaffarabad is being paid to collect the community waste from collection point established near project site where as for project waste a detailed method statement has been prepared and is being implemented on both sites.

First step that has been followed so far in managing our Project Waste was the collection of all waste from all points of the site. Then, all the waste from different points are transported to the disposal area and placed in the trench. Next step of segregation has been attempted, in which cardboard, plastic bottles, paper and plastic sheet has been segregated. Then, waste has been transported to Scrap Yard where signature for evidence from waste collector, waste handler/transporter and scrap dealer has been taken on the "Waste Consignment Note" of Waste Management Plan. Thus, most of the Project Waste has been reused and recycled by selling it to the scrap dealer. Some of the items were of “Reusable” that are used again by a different user or for a different purpose, like a jacket, shoes or a jar used for a cup. They are not reprocessed into raw materials. Whereas some of our Project Waste includes “Recyclables” that are materials like glass, metal and paper that are collected, separated, processed back into raw materials, and made into new products. Final step of Waste Compaction other than segregated waste has been done which is the process of compacting

waste, reducing it in size. Wheel loader has been used for compressing waste so that more of it can be stored in the same space. Excavator has also been used to spread the waste evenly in layers over the landfill, and to compact waste to reduce its volume and help stabilize the landfill.

c) Plan for Traffic Management:

A revised traffic management plan was prepared during last quarter for both sites that partially has beenn implemented. Parking areas have been designated and speed limit is controlled; safety precautions have been placed to protect workers and the general public. Vehicles are equipped with directional control signage and are being inspected prior to use. Workers have been made aware of mobile equipment operating in the area. Hazard lights have been installed on heavy vehicles and mobile equipment. Updated traffic management plan is attached as **Annex-12**.

d) Social uplift plan:

Revised social uplift plan (SUP) was submitted by EPCC to SHPL in March 2013. Besides SUP various activities have also been undertaken to facilitate locals such as subletting works, supply of construction material. Implementation status of SUP has been given in **Annex-13.**

j. Resettlement Plan Implementation

i. Scope of Land Acquisition and Resettlement Impacts

The land identified by the EPC Contractor on the basis of basic design of the Project measuring 872.65 Kanal (683.95 Kanal on AJK and 188.7 Kanal on KP side) was acquired by the Company through Land Acquisition Act (LAA), 1894 applicable in both AJ&K and KPK.

During the construction on the weir site, it was noticed that the land area of 3.7 Kanal "Additional Land" is further required on AJ&K side which is to be submerged due to the headpond of the Project. Due to this addition the total land for the Project becomes 876.35 Kanal.

SUMMARY OF THE LAND TO BE ACQUIRED ON AJK AND KPK

PERMANENT LAND						
Sr.	**Project Component**	**Affected Land (Kanal)**				
		State owned Land/ Riverbed	**Farmland**	**Wasteland**	**House land**	**Total**
1	Reservoir Impounding	87.3	282.05	231.9	9.1	**610.35**
2	Weir Structures	0	1.5	48.7	0	**50.2**
3	Powerhouse	13.6	30.1	32.85	5.25	**81.8**
4	Surge Tank	-	-	47.75	-	**47.75**
5	Additional Land	0.3		3.4		**3.7**
Total Permanent Land Acquisition (Kanal)		**101.2**	**313.65**	**364.6**	**14.35**	**793.8**
TEMPORARY LAND						
1	Colony of Expatriate construction staff, Switchyard, labour camp, access road, bridge, batching plant at Powerhouse Site	54.75	0	27.8	0	**82.55**
Total Temporary Land Acquisition (Kanal)		**54.75**	**0**	**27.8**	**0**	**82.55**
Total Land Acquisition (Kanal)		**155.95**	**313.65**	**392.4**	**14.35**	**876.35**

ii. Status of Land Acquisition, Progress on Compensation Payments and Assistance Delivery

Payment for land acquisition on both sides of the project is in process. The Company has deposited the assessed cost (100%) into Government treasuries for subsequent payment to APs. For the additional land acquired for the headpond about 92% payment has been made which is reflected in the below table. However there is delay in the payment of compensation due to (i) unavailability of entitled land owners who are working or based in other cities or (ii) an existing shareholding dispute among the families. Status of the land acquisition is as follows;

Summary of Land Acquisition Progress and compensation payments

Village	Area	Award Amount	Disbursed	%age	No. of Persons	Persons received payment
1. AJ&K						
A. Land/Property						
Powerhouse (Alda Village AJ&K)	81.8	92,479,824	79,320,704	85.77%	196	479*
Headpond (Shoran Village AJ&K)	130.75	75,181,250	73,283,741	97.48%	611[1]	200
Weir + Headpond (Patrind Village AJ&K)	341.1	204,037,798	163,691,288	80.23%		345
Forest land for Surge Tank (Alda village)	47.75					
B. Additional Land/Property						
Weir + Headpond (Patrind Village AJ&K)	3.7	2,127,500	1,955,000	91.89%	3	3
B. Trees						
Alda		1,815,089	1,804,318	99.41%		19
Alda		75,546	75,546	100.00%		
Shoran		757,391	685,073	90.45%		55
Shoran		106,053	106,053	100.00%	1	1
Patrind		837,882	620,097	74.01%		33
Sub-Total	**605.1**	**377,418,333**	**321,541,820**	**85.20%**	**811**	**1135**
2. KPK						
Land/Property/Trees						
Weir + Headpond (Sarati Village KPK)	188.7	128,557,081	114,613,320	89.15%	196	Detail Yet to receive
Sub-Total	**188.7**	**128,557,081**	**114,613,320**	**89.15%**	**196**	

*The number of persons who received the payment is higher than the number of affected persons is due to the repetition of the owners names in the payment vouchers[1]

k. Resettlement and Reconstruction

Living standards have been improved due to better compensation received and economic activities in the project vicinity. Some of the PAPs who lost their houses and land had utilized compensation amount in reconstruction of houses and some have made investment in alternative lands in urban areas for better facilities and few have established small businesses like shops and canteens near the Project area.

Restaurant and shop near by New batching Plant, Power House Site in Thuri village

l. Resettlement Related Consultation and Disclosure Activities and Grievance Procedures

In order to ensure that grievances and complaints are addressed in a timely and satisfactory manner and that all possible avenues are available to project affected persons (PAPs) to resolve their grievances, a Grievance Redress Committee has been proposed with following composition:

1. District Revenue Officer	Chairman
2. Union Council Nazim	Principal Member
3. SHPL Representative	Member
4. Affected Community Representative	Member

Establishment of a grievance committee requires the consent from District Administrations (AJK & KPK). The proposed GRC has not been established because SHPL could not ensure the availability of District Revenue Officers as and when required. Nevertheless, while the GRC has not yet been formalized, issues related with acquisition and compensation and community complaints are being addressed with the involvement of same authorities. In practice the same forum is functional but officially has not yet been notified.

Furthermore, the lenders' E&S mission during their site visit in August 2015 suggested establishing a three tier GRC including the sub-contractors, EPC and SHPL/OE. The

same was established and communicated to all the workers and the community for future matters and contact. The GRC chart is presented in **Annex-16** to this report.

GRC would be a forum for raising objections and holding discussions to resolve conflicts. Moreover, consultation with the local community and concerned public representatives and officials of the relevant line departments is an ongoing process. Relevant information to the stakeholders has been provided in a timely manner and in a form and language that are understandable and accessible to them. A grievance mechanism is available to allow an AP appealing any disagreeable decision, practice or activity arising from land or other assets compensation. The community/ APs complaints are being addressed very diligently and carefully at all levels, i.e. district and at project level. Even though the GRC has yet not been established but complaints received are being addressed at all levels (project & local administration level) depending on nature of complaints. Issues related to land acquisition and compensation requires involvement of District Revenue Officer who is part of proposed GRC while other matters related with employment or employees are being managed through community liaison officers/coordinators and project management.

Annexures

Annex-1

Inspections

Sr.	Inspection	Date	Location	Details	Sr.	Inspection
1.	Fire Extinguisher inspection	4	7	2015	Power House Site	Inspection of fire extinguisher held at Powerhouse site.
2.	Heavy equipment	9	7	2015	Weir site	List of Issues prepared and proceeded for further action
3.	Gas Test	9	7	2015	Power House Site	Edge protection & proper access required.
4.	Heavy equipment	11	7	2015	Weir site	Back light & safe guard was damaged.
5.	Heavy equipment	16	7	2015	Weir site	Side mirrors and the hazard lights were damaged.
6.	Color Coding	17	7	2015	Power House site	Color Coding of tools and equipment carried out at powerhouse site for third quarter 2015
7.	Heavy equipment	21	7	2015	Weir Site	Issues enlisted and proceeded to the concerned department for further necessary action
8.	Heavy equipment	23	7	2015	Weir site	Hazard lights required
9.	Hygiene inspection of kitchen area and food	27	7	2015	Power House site	Inspection of CNEEC Mess carried out at powerhouse site, recommended to take proper measures to control flies and other insects.
10.	Hygiene inspection of kitchen area and food	27	7	2015	Power House site	Inspection of GDYT Mess carried out at powerhouse site, recommended to keep proper cleanliness, housekeeping, and hygiene conditions and maintain the food quality.
11.	Hygiene inspection of kitchen area and food	27	7	2015	Power House site	Inspection of Kyung dong Mess carried out at powerhouse site, recommended to keep proper cleanliness and make sure proper ventilation at area.
12.	Hygiene inspection of kitchen area and food	27	7	2015	Power House site	Inspection of Workshop Mess carried out at powerhouse site, recommended to control flies and make sure proper ventilation at area.
13.	Lifting Equipment Inspection	28	7	2015	Power House site	Test results of Inspection of Tower Crane - 1 which was previously carried out in 27th of April 2015 have now been arrived on date which were found satisfactory and the inspection party declared that the tower crane is fit for use as per manufacturer's load chart.
14.	Heavy Machine/ Equipment	28	7	2015	Power House site	Inspection of lining form, 2 units (01 & 02), steel binding platforms 2 units and main hoist 01 unit was previously been carried out from 3rd to 6th of July 2015. Inspection results have now been received from third party and the inspection party declared that the mentioned items are fit for services and have found in satisfactory condition at the time of inspection.
15	Fire Extinguishers	7	8	2015	Weir Site	Replaced the expired extinguisher with the new one.
16	Batching plant inspection.	8	8	2015	Weir Site	Soft Barrication was required
17	Crane Inspection	11	8	2015	Weir Site	Issues were reported to the concerned department.
18	Gas Test	13	8	2015	HRT	Gas test inside HRT during and after diesel tank running
19	Transit Mixture inspection	17	8	2015	Weir Site	Issues were reported to the concerned department.
20	Transit Mixture inspection	17	8	2015	Weir Site	Issues were reported to the concerned department.
21	Transit Mixture inspection	17	8	2015	Weir Site	Issues were reported to the concerned department.
22	Wheel Loader inspection	18	8	2015	Weir Site	Issues were reported to the concerned department.
23	Camp office and mess hall	18	8	2015	Camp Office &	Inspection of Camp Office and mess halls of CNEEC company by HSE staff

Sr.	Inspection	Date	Location	Details	Sr.	Inspection
	inspection				Mess	Daewoo E&C
24	Concrete Pump car inspection	18	8	2015	Weir Site	Issues were reported to the concerned department.
25	Fork Lifter inspection	18	8	2015	Weir Site	Issues were reported to the concerned department.
26	Mobile Crane Inspection	18	8	2015	Weir Site	Issues were reported to the concerned department.
27	Excavator Inspection	21	8	2015	Weir Site	Issues were reported to the concerned department.
28	Heavy Equipment	24	8	2015	Weir Site	Issues were reported to the concerned department.
29	Excavator Inspection	24	8	2015	Weir Site	Issues were reported to the concerned department.
30	Aggregate Plant	27	8	2015	Weir Site	Issues were reported to the concerned department.
31	Lighting inspection	29	8	2015	Weir Site	Issues were reported to the concerned department.
32	Heavy Equipment	2	9	2015	Weir Site	Satisfactory
33	Fire Extinguishers	2	9	2015	Weir Site	13 Cylinders were found expired
34	Fire Extinguishers	2	9	2015	Weir Site	OK
35	Heavy Equipment	3	9	2015	Weir Site	Excavator was found OK.
36	Heavy Equipment	6	9	2015	Power House Site	Inspection of Dump truck TKM- 257, issues was addressed to the concerned department.
37	Heavy Equipment	6	9	2015	Power House Site	Inspection of Dump truck TKN- 984, issues was addressed to the concerned department.
38	Heavy Equipment	6	9	2015	Power House Site	Inspection of Dump truck TAA-306, issues was addressed to the concerned department.
39	Heavy Equipment	9	9	2015	Weir Site	Satisfactory
40	Heavy Equipment	11	9	2015	Weir Site	Inspection of aggregate plant carried out, Oil spillage at some locations
41	Heavy Equipment	12	9	2015	Weir Site	The Excavator needs replacement.
42	Heavy Equipment	13	9	2015	Weir Site	The Reverse alarm was missing.
43	Heavy Equipment	15	9	2015	Weir Site	Issues were reported to the concerned department.
44	B. Plant Inspection	15	9	2015	Weir Site	Issues were reported to the concerned department.
45	Heavy Equipment	18	9	2015	Weir Site	Issues were reported to the concerned department.
46	Excavator Inspection	19	9	2015	Weir Site	Issues were reported to the concerned department.
47	Heavy Equipment	20	9	2015	Weir Site	Issues were reported to the concerned department.
48	Gas Test	27	9	2015	Weir Site	Issues were reported to the concerned department.
49	Air Quality Test	27	9	2015	Weir Site	Satisfactory
50	Fire Extinguisher	30	9	2015	Weir Site	OK

Annex-2

Work Permit

PAKISTAN PATRIND HYDRO POWER PROJECT

It's Possible DAEWOO E&C

CUTTING/ WELDING /HOT WORK PERMIT | PERMIT TO WORK NO. 263

WORK DETAIL	SPIRAL CASE FABRICATION
SPECIAL TOOLS TO BE USED	WELDING MACHINE + ALLESORIES
LOCATION	POWER HOUSE SITE

Issue Date	08/9/2015	Time	07:00
Validity Date	08/9/2015	Time	19:00

Do not proceed with your work until your permit has been authorised by the relevant member of staff.

HAZARDS AND PRECAUTIONS TO BE TAKEN

SIGNIFICANT HAZARDS: (fires, debris, liquids, dust, moving parts)

PLEASE ANSWER THE FOLLOWING QUESTIONS TRUTFULLY	YES	NO
Building sprinklers or other fire suppression systems.		✓
Cutting welding, flame or spark producing equipment is in good	✓	
Isolation of Plant.	✓	
Operator having good visibility	✓	
All flammable and combustible material have been removed.	✓	
Warning signs attached.	✓	
All sources of flammable vapors or combustible dusts have been eliminated.	✓	
lighting checks of all the units.	✓	
Opening have been covered.	✓	
All equipment has been cleaned.	✓	
Check fire extinguisher condition and location.	✓	

Other Precaution Required	
Other Safety Equipment Required	FULL PPE'S

AUTHORISATION AND ACCEPTANCE

I confirm that I have verified the above information and ensured that the necessary precautions have been taken. It is safe to carry out the work as defined above and the permit information has been explained to all workers involved. I accept responsibility for this work.

Permit Requester	WAQAR	Signature	
Issuing Authorising	Kazi Tariq Aziz	Signature	
HSE Representative	Mubashir	Signature	

HAND BACK AND CANCELLATION

I confirm that the work has been completed / partially completed *, checked y my self and the area left in a safe and tidy condition. (*delete as appropriate)

Permit Requester	MALIK ABBAS	Signature	
Issuing Authorising	Kazi Tariq Aziz	Signature	
HSE Representative	Mubashir Jamjed	Signature	

THIS PERMIT IS ONLY VAILD WHEN ALL SECTIONS ARE COMPELTE.

PAKISTAN PATRIND HYDRO POWER PROJECT

DAEWOO E&C

Lifting Work

PERMIT TO WORK NO. 366

Issue Date	02/09/2015	Time	07:00 Am
Validity Date	03/09/2015	Time	07:00 Am
Crane Type	Mobile + TADANO	Type of the Load to be lifted	Steel bars
No. of Workers	5	Maximum Weight of Load	05 ton
Operator Name	MATIULLAH	Rigger Name	ISHFAQ

Do not proceed with your work until your permit has been authorised by the relevant member of staff.

PRIMARY HAZARDS - fumes, eletics, liquids, sludge, moving parts

PLEASE ANSWER THE FOLLOWING QUESTIONS TRUTFULLY	YES	NO
Crane operator holding the valid licence	✓	
Crane travel routes determined	✓	
crane sitting on firm foundation out rigger pade	✓	
Area roped off & signs displayed		✓
Over / under ground facilities are be protected	✓	
sling wire & lifting equipments are be tested	✓	

Other Precaution Required	
Other Safety Equipment Required	

AUTHORISATION AND ACCEPTANCE

I confirm that I have verified the above information and ensured that the necessary precautions have been taken. It is safe to carry out the work as defined above and the permit information has been explained to all workers involved. I accept responsiblility for this work.

Permit Requester name	Abid	Signature	
Issuing Authorising Construction Manager	Jamey	Signature	
HSE Representative name	Usman Khan	Signature	

COMPLETION /CANCELATION

I confirm that the work has been completed / partially completed *, checked by my self and the area left in a safe and tidy condition. (*delete as appropriate)

Permit Requester name	Abid	Signature	
Issuing Authorising Construction Manager	M. Shahid	Signature	
HSE Representative name	Imran Yousaf	Signature	

THIS PERMIT IS ONLY VAILD WHEN ALL SECTIONS ARE COMPELTE.

PAKISTAN PATRIND HYDRO POWER PROJECT 17-8-2015 DAEWOO E&C It's Possible

CONFINED SPACE

PERMIT TO WORK NO. 44

JOB DETAILS	SPIRAL CASE FABRICATION
SPECIAL TOOLS TO BE USED	WELDING MACHINE + ACCESORIES
LOCATION	POWER HOUSE SITE

IS ANY OTHER WORK CURRENTLY BEING UNDERTAKEN THAT MAY INTERACT OR AFFECT THIS PERMIT(QUOTE PERMIT NUMBERS WHERE APPLICABLE)

Do not proceed with your work until your permit has been authorised by the relevant member of staff.

HAZARDS AND PRECAUTIONS TO BE TAKEN

Priamry Hazards- fumes, electric, gases, liquids, sludge, radiation, moving parts, underground hazard

PLEASE ANSWER THE FOLLOWING QUESTIONS TRUTFULLY	YES	NO
Are you qualified / trained to undertake this work ?	✓	
Has the confined space been isolated from all connected pipework ?		✓
Has the confined space been purged with steam / water / air ?		✓
Has the confined space been electrically isolated and locked out ?		✓
Is the confined space below 30 Dgree C on full cooling ?	✓	
Has the reactor been steamed through to recovery for at least 15 mins ?	✓	
Is a supply of respirable air assured / ventilation required ?	✓	
Is there an acceptable means of access to and escape from the confined space ?	✓	
Is breathing apparatus at hand and in good working order ?	✓	
Is a safety line / tripod / harness and any other back-up equipment to hand ?	✓	
Are there adequate emergency arrangements in place ?	✓	
Are you likely to come into contact with asbestor? If yes, please refer to asbestos Present Permit to Work		

TIME OF TEST 1		RESULT	TIME OF TEST 2		RESULT
OXYGEN	%	PASS / FAIL	OXYGEN	%	PASS / FAIL
HYDORGEN SULFIDE	%	PASS / FAIL	HYDORGEN SULFIDE	%	PASS / FAIL
CARBON MONOXIDE	%	PASS / FAIL	CARBON MONOXIDE	%	PASS / FAIL
NITROGEN	%	PASS / FAIL	NITROGEN	%	PASS / FAIL
COMBUSTIBLE GASES (LEL)	%	PASS / FAIL	COMBUSTIBLE GASES (LEL)	%	PASS / FAIL

Other Precaution Required	
Other Safety Equipment Required	FULL PPE'S

AUTHORISATION AND ACCEPTANCE

I confirm that I have verified the above information and ensured that the necessary precautions have been taken. It is safe to carry out the work as defined above and the permit information has been explained to all workers involved. I accept responsiblility for this work.

Permit Requester name	MALIK ABBAS	Signature	
Issuing Authorising Construction Manager	KAZI JUNAID	Signature	
HSE Representative name	KAMRAN	Signature	

COMPLETION / CANCELLATION

Permit Requester name	MALIK ABBAS	Signature	
Issuing Authorising Construction Manager	KAZI JUNAID	Signature	
HSE Representative name		Signature	

THIS PERMIT IS ONLY VAILD WHEN ALL SECTIONS ARE COMPELTE.

PAKISTAN PATRIND HYDRO POWER PROJECT

It's Possible DAEWOO E&C

		PERMIT TO WORK NO.	116

JOB DETAILS	SPIRAL CASE FABRICATION		
SPECIAL TOOLS TO BE USED	WELDING MACHINE + ACCESSORIES		
LOCATION	POWER HOUSE SITE		
Issue Date	06/07/2015	Time	06:00 HOURS
Validity Date	06/07/2015	Time	18:00 HOURS

Do not proceed with your work until your permit has been authorised by the relevant member of staff.

HAZARDS AND PRECAUTIONS TO BE TAKEN

PRIMARY HAZARDS - fumes, eletics, gases, liquids, sludge, radiation, moving parts

PLEASE ANSWER THE FOLLOWING QUESTIONS TRUTFULLY	YES	NO
Are you qualified / trained to undertake this work ?		✓
Are appropriate signs to be placed ?	✓	
Are crawl boards with handrails and roofing ladder to be used ?	✓	
Is scaffolding /platform and / or body harness required ?	✓	
If yes, is scaffolding platform in place and inpected ?	✓	
Has harness been inspected ?	✓	
Are weather condition acceptable ?	✓	
If yes any hazards from fumes, etc ?	✓	
Is there any risk from falling objects ?	✓	
are there any existing overhead services crossing and /or adjacent to proposed height working	✓	
Is edge protection / toeboards required ?	✓	
Is Personal Protective Equipments required ?	✓	

Other Precaution Required	
Other Safety Equipment Required	FULL PPE'S

AUTHORISATION AND ACCEPTANCE

I confirm that I have verified the above information and ensured that the necessary precautions have been taken. It is safe to carry out the work as defined above and the permit information has been explained to all workers involved. I accept responsiblility for this work.

Permit Requester name	AMMIR HUSSAIN	Signature	
Issuing Authorising Construction Manager	KOH JUNG MIN	Signature	
HSE Representative name	ASIF RIAZ	Signature	

COMPLETION OR CANCELLATION

I confirm that the work has been completed / partially completed *, checked by my self and the area left in a safe and tidy condition. (*delete as appropriate)

Permit Requester name	WAQAR AHMAD	Signature	
Issuing Authorising Construction Manager	KOH JUNG MIN	Signature	
HSE Representative name	ASIF RIAZ	Signature	

THIS PERMIT IS ONLY VAILD WHEN ALL SECTIONS ARE COMPELTE.

Annex-3

Final Fatality Investigation Report

FATALITY ACCIDENT INVESTIGATION REPORT

Incident	**Power House Site**
Project Name	**Pakistan Patrind Hydro Power Project**
Country	**Pakistan**
Client	**Star Hydro Power LTD**
Consultant	**Pakistan Engineering Services**
Contractor	**Daewoo Engineering & Construction**

PAKISTAN PATRIND HYDRO POWER PROJECT

- Table of Contents -

1. Purpose of Investigation

- To determine the direct cause (Causal Factor) and the underlying cause (Root Cause) of an accident for effective analysis and establishment of adequate corrective measures.

2. Accident Summary

- 06:45 am on 9th July 2015 at the Bypass Adit Tunnel, preparation of rock bolting works was carried out.
- At 30m from the entrance of the tunnel, the deceased and a worker were unloading the water hoses from a pick-up truck.
- At 50m from the entrance tunnel, the excavator was tasked to acquire the shotcrete machine outside the tunnel. The excavator approaches the entrance tunnel in a reverse motion and hit the deceased and rolls-over his chest.
- The deceased was immediately transferred to the first aid room. He was transported to the nearest hospital but died during transit at around 06:57am. He was officially announced dead in the hospital at 7:30am.

3. Incident Investigation Method

- Method : Official interviews and evidences were collected and verified.
- Investigation Technique: TapRooT® Note 1
  - ※ Proposed by American System Improvements Inc. Is an accident analysis technique developed to systematically uncover the root cause(s) of an incident.
- Period : 2015.07.21 ~ 2015.07.24 (3 Days)
- Investigation Committee

Sector	Job Title	Name
Pakistan Patrind Hydro Power Project	Construction Manager	Joo Seok Kim
Pakistan Patrind Hydro Power Project	H&S Manager	Kamran Hassan Janjua
Pakistan Patrind Hydro Power Project	HSE Manager	MinSun Choi

- Deceased Information

Occupation	Name	Age	Date Hired	Nationality
Tunnel Worker	Abdul Qayoom	22 years old	2015-05-15	Pakistani

- List of Interviewees

Department	Name	Position / Job	Nationality
Construction (Civil)	Byeong Kuk Ahn	Construction Manager (Sung-Bo)/Civil	Korean
Construction (Civil)	Byeong Jin Jo	Tunnel Foreman (Sung-bo)/Civil	Korean
Construction (Civil)	Sher Zaman	Excavator Operator (Operator)	Pakistani
Construction (Civil)	Sumair Afzal	Tunnel Labor (Witness)	Pakistani
Construction (Civil)	Muhammad Shakeel	Pick-up Driver (Witness)	Pakistani
HSE	Siraj Haq	Nurse	Pakistani
HSE	Saeed	HSE Watcher	Pakistani
Admin	Syed Behzad	Ambulance Driver	Pakistani

4. Synopsis of Event

- 05:00 am : Carry out rock bolt boring works inside the Bypass Adit Tunnel
- 06:00 am : Finished boring operation
- 06:00 ~ 06:30 am: Tunnel supervisor supervises the excavator activity of removing rocks (scaling) from the tunnel surface.
- 06:32 am: Outside the tunnel, the subcontractor Construction Manager instructed the deceased and the 2 workers to deliver the water hoses inside the tunnel. The water hoses will be used to inject mortar in the surface of the tunnel by attaching it to the mortar mixing and dispensing machine.
- 06:35 am: Setting-up the pick-up truck with loaded water hoses.
- 06:40 am: The deceased and 2 workers were inside the tunnel, 30m from the entrance point to unload the water hoses from the pick-up truck.
- 06:43 am: At 50m from the tunnel entrance, the excavator has completed the removal of rocks form the tunnel surface. The tunnel supervisor instructed the excavator operator to bring the mortar dispensing machine inside the tunnel.
- 06:44 am: The operator mobilizes the excavator in a reverse motion towards the tunnel.
- 06:45 am: Workers and the deceased were unloading the hoses from the pick-up truck while the excavator was approaching fast in a reverse motion towards their location.
- 06:45 am: The excavator hits the deceased and rolls-over his chest.
- 06:45 : Excavator stops moving after colliding with the pick-up truck
- 06:47 am: The victim was transferred to the first aid room.
- 06:55 am: The victim died during his transport to a nearby hospital.
- 07:30 am: The deceased was pronounced dead in the hospital.

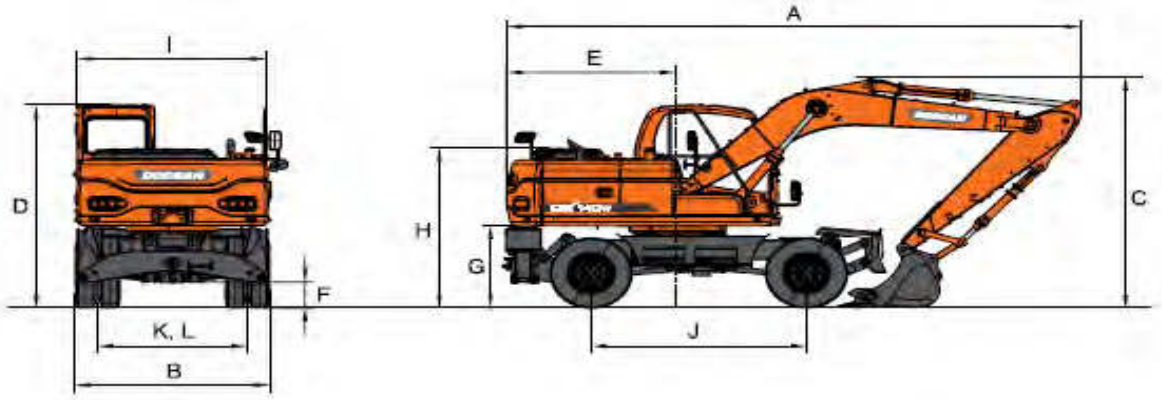
5. Major Findings

- Accident Area Information

Area	**Illumination (lux)**	**Noise (dB)**	**Dimension (Meter)** Width x Height x Length	**Remarks**
Adit Tunnel	19 lux (accident area)	85 ~ 95 dB	6.5 x 6.5 x 100	

- Heavy Equipment Information

Item	**Manufacturer**	**Model No.**	**Dimension (Meter)** Shipping Width x Height x Length	**Remarks**
Excavator	DOOSAN	DX140W	2.49 x 3.35 x 7.23	



Boom type (One-piece)	4,300mm (14'1")	4,600mm (15'1")	
Arm type	2,100mm (6'11")	2,300mm(6'11") (6'11")	2,500mm (8'2")
A Shipping Length	7,235mm (23'9")	7,820mm (25'8")	7,470mm (24'6")
B Shipping Width	2,496mm (8'2")	—	—
C Shipping Height (Boom)	3,351mm (11')	3,225mm (10'7")	3,460mm (11'4")
D Height Over Cab,	3,040mm (10')	—	—
E Counter Weight Swing Clearance	2,200mm (7'3")	—	—
F Ground Clearance	350mm (1'2")	—	—
G Counter Weight Clearance	1,206mm (4')	—	—
H Engine Cover Height	2,376mm (7'10")	—	—
I Upper Housing Width	2,494mm (8'2")	—	—
J Wheel Base	2,800mm (9'2")	—	—
K, L Tread Width	1,944mm (6'5")	—	—

- Construction Activity Schedule

Date	Details
2014. 04 - 2014. 08	Construction stopped due to design change
2015.04.17	Bypass Adit Tunnel MS approved
2015.05.02	Adit Tunnel Drilling Permit approved
2015.07.08	50 m Tunnel depth drilled
2015.07.09	Perform removal of rocks after rock bolt boring operation
2015.07.09	Date of the accident
2015.07.25 (After an accident)	60 m Drilling

- Prepared work plan was delayed 2.5 months.

- Unidentified safety measures prior to work (equipment status, work communication, control measures, absence of flagman)

- Working status on the day of the accident: Inadequate

  - Manager Joo Seok Kim (Construction Manager and responsible for Bypass Adit Tunnel)

    ⇨ 07/09(Thu) 05:00 am: Confirmed the Bypass Adit Tunnel rock bolt boring operation, unidentified control measures.

  - Sung-Bo/ Manager Byeong Kuk Ahn
    ⇨ 07.09(Thu) 06:00 am: Supervise outside the bypass Adit tunnel.
    ⇨ 07.09(Thu) 06:32 am: Instructed the 2 workers and the deceased to unload the water hoses from the pick-up truck to be used for mortar dispensing machine. There is no communication or coordination of work between the tunnel supervisor and Sung-Bo Manager.

  - Sung-Bo/ Byeong Jin Joo
    ⇨ 07.09(Thu) 05:00 am ~ 06:00 am: Rock bolt boring operation
    ⇨ 07.09(Thu) 06:00 am~ 06:30 am: Supervise excavator operation of removal of rocks (scaling) inside the tunnel from the rock bolt boring works. ⇨ 07.09 am (Thu) 06:43 am: Instructed the excavator operator to bring the mortar dispensing machine inside the tunnel. No flagman was provided during movement of the equipment.

- Personnel's Career in Charge of the Operation: Inadequate

  - Excavator Operator's proficiency is inadequate: equipment operation experience is 22 months, 2 days working on site and no tunnel experience.

- Insufficient preparation and review of risk prior to operation

  Bypass Adit Tunnel work plan (Method Statement) and risk review (Job Safety Analysis); Method statement did not cover the equipment operation inside the tunnel and JSA did not contain deployment of flagman during equipment activity.

- Worker's poor concentration due to heightened fatigue

  - .2015.05.15 (date of employment) : Performs weekly shift change work since the date of employment: Increase physical exhaustion

  - Ramadan Effect (fasting and sleep deprivation) : Deceased condition worsen due to shift change and Ramadan practices.

  - Because of the above issues, the deceased may be suffering from inattentiveness and lack of response capability which resulted in inability to recognize the approaching equipment.

  - Worker is positioned in the same line and direction of the moving equipment : Line of Fire

- Training and Awareness : Needs Improvement

  - Induction Training : 2015.05.15 (Deceased attended), 2015.07.06 (Operator's attending date)

- The involved excavator operator training not implemented :
- TBM : No task specific TBM conducted.

- Rental Equipment Inspection : Not implemented
  - Initial equipment inspection (pre-mobilization inspection) was not executed
  - Using substandard equipment: No rearview mirror, no reverse alarm, beacon uninstalled, obstructed rear glass view due to curtain.
  - No rental equipment management procedure
- Work location related observation
  - Tunnel width is only 4m; one equipment at a time is only allowed to access and egress
  - Excavator cannot rotate due to narrow tunnel space : Backward motion only
  - Poor visibility in the accident area inside the tunnel with luminosity 19 lux.
  - Daylight from the tunnel entrance may affect the operator's visibility while reversing.
  - Noise exposure hazard (Noise measurement: 85 - 95dB)
  - Reflective vest of workers needs improvement: vest not visible when strike by vehicular light.
  - No regulation for vehicle and equipment speed inside the tunnel and no speed limit signage: reversing motion of excavator was very fast.
  - Incomplete working environments measurement and inspection: Illumination, etc.
- Provision of flagman
  - Twelve (12) heavy equipment and three (3) vehicles operating in the area.
  - Three (3) Flagmen were deployed: two (2) were stationed in the road side and 1 deployed in the site.
  - A flagman was provided outside the tunnel and was not able to cover the operations inside the tunnel.
  - Flagman should use flashing light instead of a flag when working in poor illuminated area such as tunnel.
- HSE Supervision Ratio :Un-Sufficient
  - HSE personnel (13) : Total number of workers (1,200) = 1 : 92

6. Causes of Accident

No.	Direct Cause (Causal Factor)	Underlying Causes (Root Cause)
1	**Operator failed to recognize the workers while reversing the excavator**	■ Human Engineering – Work Environment – Lights NI (Needs Improvement) - Illumination in the accident area was measured to be 19 lux; luminosity shall be 30 lux as per standard. Reflective vest inside the tunnel needs improvement. ■ Human Engineering – Work Environment – Noisy - Noise level inside the tunnel measures 85-95 db; workers were exposed to high noise level, visual communication is recommended, equipment operation should be controlled by one (1) person and dispatched flagman shall use flashing light inside the tunnel ■ Work Direction – Selection of Worker – Not Qualified - Verify equipment operator competency and establish its requirements ■ Training – No Training – Missed Required Training - Heavy equipment operator, Training to be provided on equipment operation safety and deployment of flagman
2	**Deceased inability to avoid the approaching excavator**	■ Work Direction – Preparation – Scheduling NI - Work schedule to be reviewed and rescheduled (working on day and night shift) ■ Training – Understanding NI – Instruction NI - Induction and Demonstration Training for hazard recognition training to avoid "line of fire accident"; Work equipment and workers locations shall not be positioned within hazardous locations.
3	**Using substandard equipment**	■ Procedure – Not Used / Followed – No Procedure - Rental equipment inspection and periodic inspection procedure to be established and implemented.
4	**Insufficient flagman**	■ Management System – Standards, Policies, or Admin Controls(SPAC) NI - no SPAC - Flagman arrangement plan shall be reviewed including training needs. ■ Work Direction – Preparation – Work Package / Permit NI - Pre-job planning and risk assessment shall be performed to ensure adequate provision of equipment and human resources. ■ Procedures – Wrong – Situation Not Covered - The Method Statement and Job Safety Analysis for equipment operation inside the tunnel did not cover the risk of its operation and its control measures.

7. Improvement Measures

No.	Corrective Actions	Team	Deadline
1	Improve worker's visibility in the tunnel through replacement and provision of standard-based reflective vest and jacket.	Construction Team	Immediately
2	Arrangement for visual communication method shall be implemented inside the tunnel. Heavy equipment operation shall be planned and executed by one (1) person. A flagman shall be dispatched to guide the operator every equipment operation.	Construction Team	
3	Shift work schedule/planning shall be reviewed and revised.	Construction Team	
4	Review current JSA and Method Statement containing equipment operation inside the tunnel.	Construction Team	
5	Establish a flagman provision plan for equipment operation.	Construction Team/ HSE Team	
6	Induction and demonstration training to all workers for equipment operation hazards shall be conducted and it shall include topics such as blind spot, hazardous area, line of fire hazards, etc.	HSE Team	
7	Provide heavy equipment operator and flagman training.	HSE Team	
8	Establish procedure on initial and regular inspection scheme on rented equipment.	Heavy Equipment Team	
9	Establish procedure for assessment on equipment operator competency including rented equipment operators.	Heavy Equipment Team	

- Details of corrective action plans will be decided after consultation with the construction site. (Implementation of the corrective actions will be checked).

8. List of Attachments

- Attachment #1. Photographs
- Attachment #2. Accident Situation
- Attachment #3. Accident Flow Chart (SnapCharT®)
- Attachment #4. Initial Report
- Attachment #5. Witness Statements
- Attachment #6. Death Certificate
- Attachment #7. Work Permit (Excavation)
- Attachment #8. Method Statement (Excavation of Bypass Tunnel)
- Attachment #9. Job Hazard Analysis (Tunnel Work)
- Attachment #10. Training (Training Matrix, Attendance Record)
- Attachment #11. Excavator Operator's Qualification (CV, License, Training Record)
- Attachment #12.Sung-Bo Equipment List and Daewoo Heavy Equipment Inspection Checklist
- Attachment #13 Excavator Specification (DX140W)
- Attachment #14. Banksman, Signalman Training Records
- Attachment #15. Daily Manpower Report
- Attachment #16. Organization Chart
- Attachment #17. Deceased Time Card

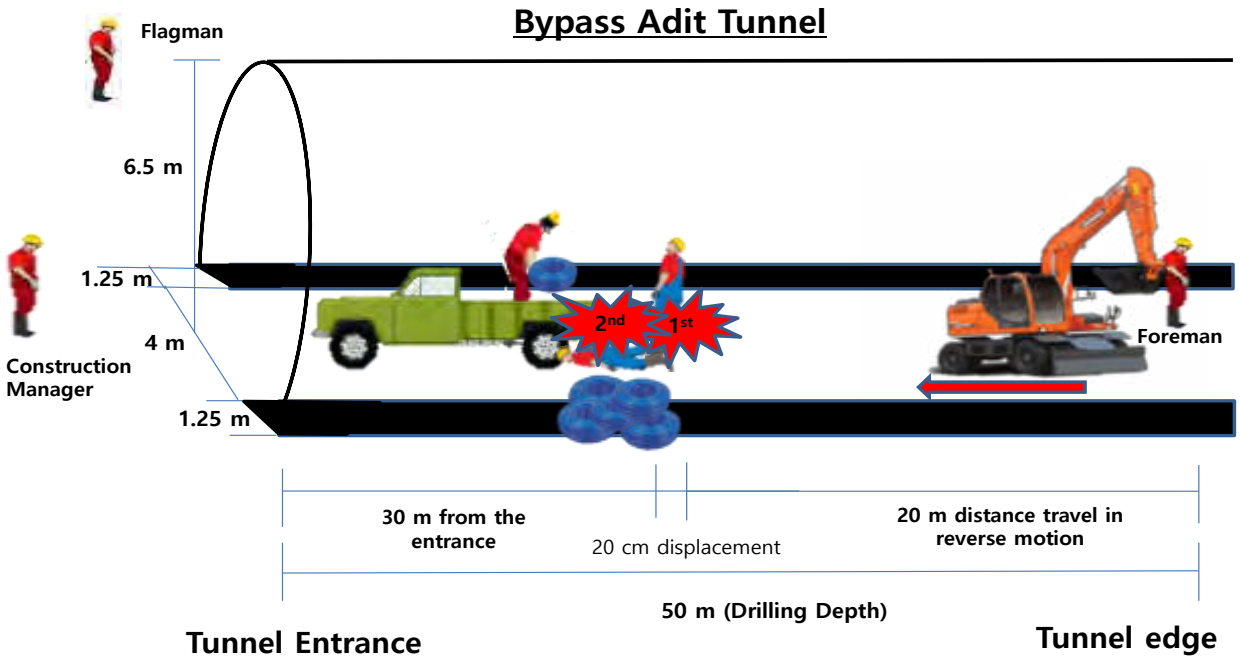
Attachment #1 Photographs

[Accident Area]

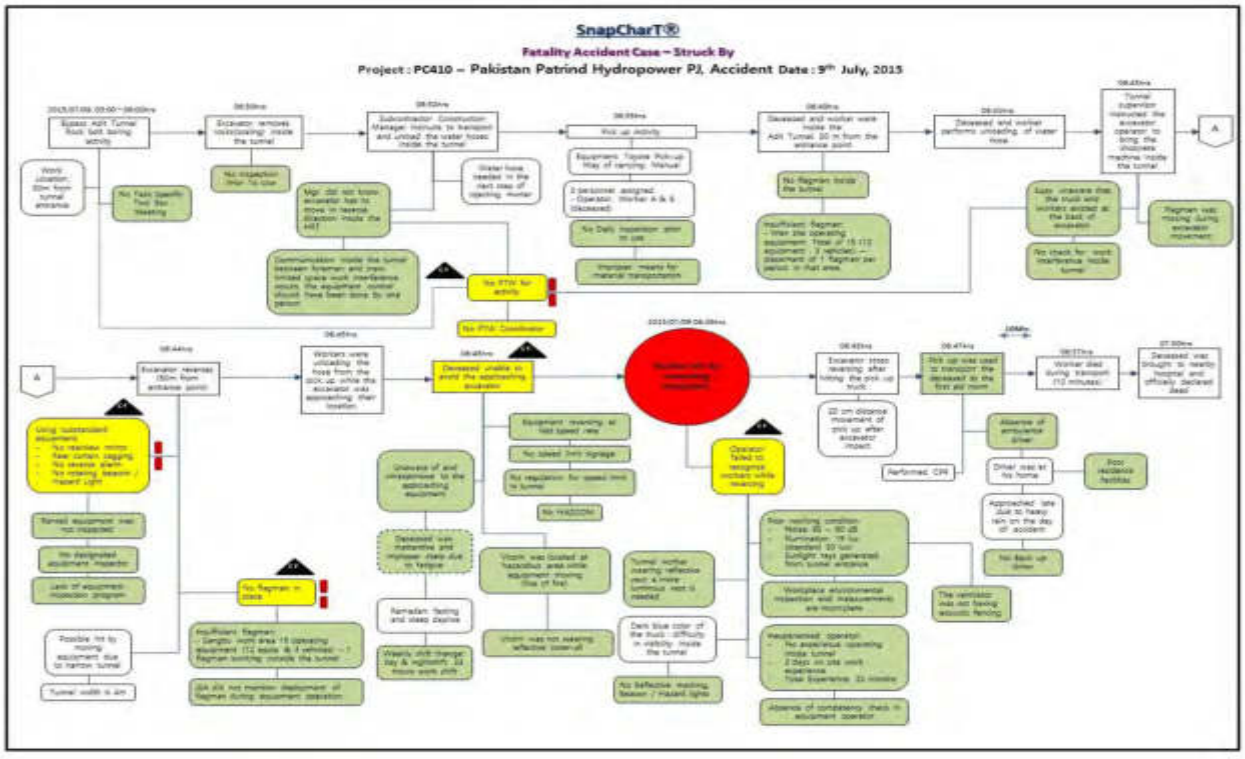
Description	Bypass Adit Tunnel Entrance

Description	Inside the Bypass Adit Tunnel

Attachment #2. Accident Situation



Attachment #3. Accident Flowchart (SnapCharT®)



DAEWOO E&C
Patrind Hydro Power Project

INITIAL INCIDENT REPORT

Name of Immediate Site Construction Manager: N.H.KIM		
1. Date: 09-07-2015	2. Time: 06:45	3. Location : By Pass Adit Tunnel (Weir Site)
4. Type of Incident: Fatality		5. Nationality : Pakistani
6. Name of Involved Person : Abdul Qayyum		7. Job Title: Tunnel Labor

8. Incident Detailed Description:

Based on the gathered information at the scene of the incident, Mr. Qayyum (Late) Sung-Bo worker was unloading pipes from the pickup (Vehicle No. 2929) inside the Bypass adit tunnel mean while one excavator of Sung-Bo (Operator name: Sher Zaman) was also working nearby. After finishing the job, excavator start reversing and run over Mr. Qayyum (Late) and hit the pickup which was just behind the excavator.
Excavator operator with the help of Sumair Afzal (Tunnel Labor) & Muhammad Shakeel (Pickup Driver) immediately shifted Mr. Qayyum (Late) to same pickup for sending him to hospital but while traveling to hospital he died in the way. (As described by witness Mr. Sameer Afzal & Mr. Muhammad Shakeel, **witness reports attached).**
Within forty five minutes (45 minutes) the dead body reached Civil Hospital Garhi Habibullah, after the medical examination of Mr. Qayyum (Late), Doctor declared him died. **(The report of doctor is attached.)**

9. Witness of the Incident:

Sumair Afzal (Tunnel Labor), Muhammad Shakeel (Pickup Driver)

10. Immediate Action Taken:

- Mr. Qayyum (Late) was immediately sent to hospital.
- HSE department was notified instantaneously about this incident.
- An initial investigation was conducted immediately.
- The operations in the area were also temporarily suspended.

11. Corrective Action to be taken :

1. All tunnel workers should be re-inducted.
2. Disseminate the information about the incident to all workers and the lessons learned from the incident through Tool Box Talks/Meetings.
3. Detail report (including police report) will be submitted after detail Investigation as per EPC contract.

REPORTED BY:

Kamran Hassan Janjua

NOTED BY: for

Seung-Ho Yoon

Min sun Choi

میں مسمی سمیر افضل ولد امیر افضل خان درہ تنگی سابو کنی تحصیل ...

پاور ہاؤس پروجیکٹ میں بطور ٹنل ہیلپر کام کرتا ہوں آج مورخہ 9-7-2015 بروز

ہم لوگ ٹنل میں کام کر رہے تھے میں گاڑی کے اوپر سے سامان اتار کر

کو دے رہا تھا کہ ایک ایکسی ویٹر جیسے ہم ہیڈر شمشیر زمان علی آپریٹ کر رہا

ریورس میں آتے ہوئے عبدالقیوم کو دھکا لگا اور وہ نیچے گر گیا اور ایکسی

کے ٹائر اس کے جسم کے اوپر چڑھ گئے۔

سمیر افضل

English Translation

Involved PersonStatement

NAME	Sumair Afzal	TRADE	Labour	ID NO.	
SUPERVISOR		SECTION		DATE OF BIRTH	
DATE/TIME	09-07-15 / 6:45 am				

BRIEF DESCRIPTION Accoding to 5W1H principle(when,where,who,what,why,how)

I Sumair Afzal S/o Ameer Afzal Khar, Resident of darra katungi working as tunnel Labour in Sungbo C&E.

Today, on 9th July 2015 at 6:45am, we were working in the tunnel and I was on the vehicle giving Pipes to Qayyum. In the mean while one excavator (operater Name: Sher Zaman Ali) start reversing and hit Abdul Qayum. He fell down and excavator run over from his body.

Sumair Afzal

SF058 Revision : 0

9/2015

میں مسمی محمد شکیل ولد غلام علی ... لاہور رنگ روڈ پراجیکٹ میں سامبو کمپنی میں
بطور ڈرائیور کام کرتا ہوں آج بروز ... 9/7/2015 بوقت صبح 6:45 اپنی گاڑی شمال سے
اندر لے گیا اور باہر سے گاڑی سے سامان اتارنا شروع کیا اسی وقت میں ایک
رکشہ ویگن جسے ... شہزاد خان علی ... ریورس کر رہا تھا ریورس کر رہا تھا جس سے
عبدالقیوم کو دھکا لگا اور وہ نیچے گر گیا اور رکشہ ویگن میری گاڑی کو پیچھے سے آ کر لگی۔

محمد شکیل ولد غلام علی ۔ [signature]

English Translation

Involved PersonStatement

NAME	Muhammad Shakeel	TRADE	Driver	ID NO	
SUPERVISOR		SECTION		DATE OF BIRTH	
DATE/TIME	09-07-15 / 8:45 am				

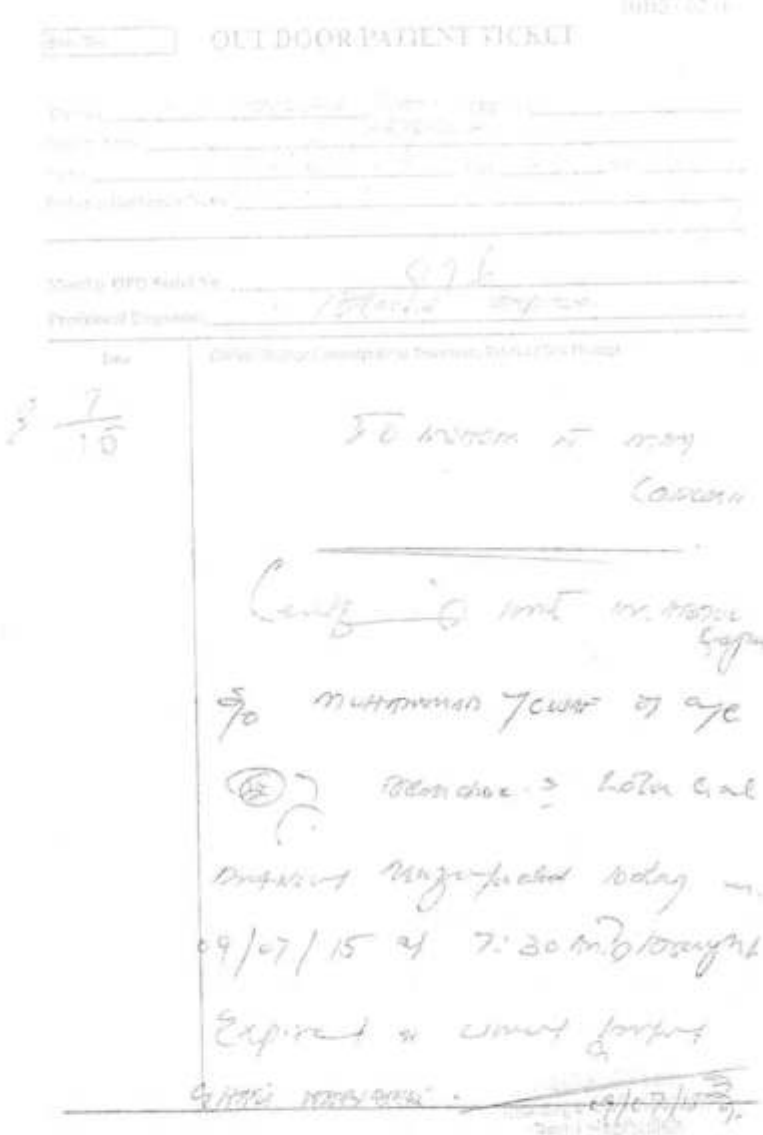
BRIEF DESCRIPTION — According to 5W1H principle(when,where,who,what,why,how)

I Muhammad Shakeel S/O Ghulam Ali working as driver in Sungbo CJSC.

Today on 9th July 2015 at 8:45am, I bring the Pickup inside the tunnel. I started unloading. In the meanwhile 1 excavator which was operated by sher zaman Ali, coming reverse and hit Abdul Qayum. He fell down and after that, excavator hit my car.

Muhammad Shakeel

SF058 Revision : 0


OUT DOOR PATIENT TICKET

Patrind Hydro Power Project
MUZAFFARABAD AJ&K
Date: 11- July - 2015

SUNGBO CONSTRUCTION & ENGINEERING

DEATH COMPENSATION CERTIFICATE OF MR. ABDUL QAYUM S/O MR. MUHAMMAD YOUSAF

Mr. Abdul Qayum S/O Mr. Muhammad Yousaf CNIC: 82203-1272274-1 had worked for Sungbo C &E. Unfortunately, he died during the work at Site. According to the Sungbo C&E Policy and Procedure and in compliance with Workmen's Compensation Act 1923 (enforced In AJK& KPK), and the agreement between Sungbo C&E and the family of **Mr. Abdul Qayum** S/O Mr. Muhammad Yousaf, We, Sungbo C&E, hereby pay of the death compensation with an amount of say One Million PakRs. (1,000,000) to Family of **Mr. Abdul Qayum** S/O Mr. Muhammad Yousaf **vide Cheque No.69235886 (Abl Chatter Branch MZD) Dated. 11-July-2015** and Funeral Expenses of Sum of Rupees Sixty Five Thousand PakRs. (65,000) was previously paid by cash.

Now, as agreed by the deceased's family, there is no further liability, dispute / litigation on death compensation of Mr. Abdul Qayum S/O Mr. Muhammad Yousaf CNIC: 82203-1272274-1 between Sungbo C&E, Daewoo E&C, The Machine Owners and family of Mr. Abdul Qayum S/O Mr. Muhammad Yousaf

This is for record

Name & Signature
(On Behalf of Sungbo C&E)

SUNGBO C&E CO.,LTD. KOREA

This is to acknowledge that we, the legal heirs of deceased, have received the **Cheque No. 69235886 (Abl Chatter Branch MZD) Dated 11-July-2015** from Sungbo C&E amounting One Million Pak Rs (1,000,000) for the death compensation and of Mr. Abdul Qayum S/O Mr. Muhammad Yousaf CNIC: 82203-1272274-1, there is no further liability, dispute / Litigation on death compensation of Mr. Abdul Qayum S/O Mr. Muhammad Yousaf CNIC: 82203-1272274-1 between Sungbo C&E, Daewoo E&C, The Machine Owners Family of Mr. Abdul Qayum S/O Mr. Muhammad Yousaf. And Funeral Expenses of Sum Sixty Five Thousand PakRs. (65,000) was previously paid by cash.

Receivers:

Father:
Name: Muhammad Yousaf S/O Abdulkarim
CNIC: 82203-7494280-7
Signature : _____

Uncle Name : M. Sajid S/O Abdulkarim
CNIC: 82203-1175466-7
Signature : _____

Witnessed by:
Name: ISHTIAQ AHMED ABBASI
S/O: ZABAR DUST KHAN
Id No. 82102-2273534-5

SUSAN FALAK CLASH
FALAK CLASH
42201-9566968-7
FINANCE OFFICER
11-7-2015

Muhammad Tallee Mughal
S/o Abdulkareem
82203-6251338-9

Allied Bank

Cheque No 22 69235886

ABL-BANK SQURE CHATTAR- MUZAFFARABAD

Date 1 1 0 7 2 0 1 5

Pay Muhammad Yousaf or bearer

Rupees One Million Rupees Only

PKR 1,000,000

PK72ABPA0010013949930025
SUNGBO C & E CO LTD

Please do not write below this line.

Signature

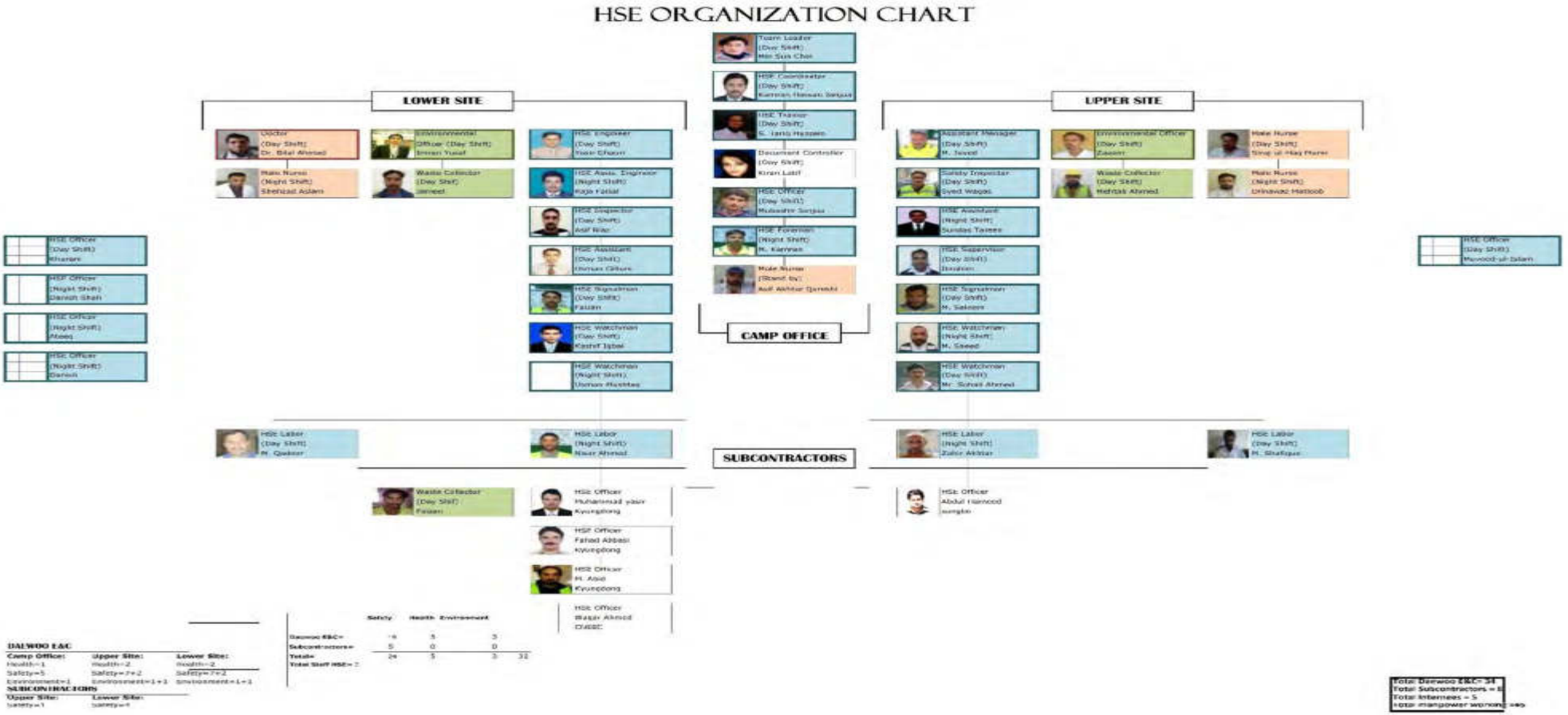
⑈6923588⑆014082911:00100139499300 25⑈000,⑈

Attachment #7 Compensation Photographs

[Accident Area]

Annex-4

HSE Organization


HSE ORGANIZATION CHART
LOWER SITE
UPPER SITE
CAMP OFFICE
SUBCONTRACTORS

Annex-5

WEEKLY MEETINGS

Sr.	Meeting with	Location	Date			Start Time	Main agenda
			Day	Month	Year		
1	Weekly HSE Meeting with Subcontractors and Construction Team Lower Site	HSE Training Hall Camp Office Powerhouse Site	14	7	2015	10:00	1-Tools equipment are not color coded in workshop 2- Metallic waste is not stored properly 3-Toilets are not cleaned 4- Improper working platform 5- Power house no housekeeping 6- Expired Fire Extinguisher 7- Improper Gas Cylinder storage 8 -The gas cylinders are without flash back arrestors and there are no pins for the locks.
2	Weekly HSE Meeting with Subcontractors and Construction Weir Site.	HSE Training Hall Camp Office Weir Site.	15	7	2015	10:00	Site HSE Issues
3	HSE Meeting with Auditor Weir Site	HSE Training Hall Camp Office Weir site	22	7	2015	10:00	Investigation of last incident issue.
4	Weekly HSE Meeting with Subcontractors and Construction Team Weir Site	HSE Training Hall Camp Office Weir site	29	7	2015	10:00	Discuss all issue regarding hse at site.
5	Weekly HSE Meeting with Subcontractors and Construction Team Weir Site	HSE Training Hall Camp Office Weir Site	05	08	2015	10:00	Site HSE Issues.
6	Weekly HSE Meeting with Subcontractors and Construction Power House Site.	HSE Training Hall Camp Office Power House Site.	05	08	2015	10:00	1. Vehicle without reverse alarm. 2. Operator found without induction and driving license in HRT. 3. HRT generator making heavy smoke. 4. Poor lighting in HRT. 5. Firefighting arrangement not completed in HRT and power house. 6. Unsafe transportation steel bars inside HRT. 7. Worker with safety harness. 8. Refueling without PPE. 9. Open electrical DB's. 10. Wrong parking. 11. Fire incident in power house. 12. No proper access and unsafe platform.

Sr.	Meeting with	Location	Date			Start Time	Main agenda
			Day	Month	Year		
7	Weekly HSE Meeting with Subcontractors and Construction Weir Site.	HSE Training Hall Camp Office Weir site	19	08	2015	10:00	Site HSE Issues.
8	Weekly HSE Meeting with Subcontractors and Construction Team Weir Site	HSE Training Hall Camp Office Weir site	26	08	2015	10:00	Site HSE Issues.
9	Weekly HSE Meeting with Subcontractors and Construction Team Weir Site	HSE Training Hall Camp Office Weir Site	02	09	2015	10:00	Discuss all site safety issue with construction team & take time frame/date & signature for the completion.
10	Weekly HSE Meeting with Subcontractors and Construction Power House Site.	HSE Training Hall Camp Office Power House Site.	02	09	2015	10:00	1. Heavy equipment access/ outgoing procedure. 2. Grinding cutting without face shield. 3. Others works without PPEs. 4. Drinking water issues 5. Waste segregation and other environmental issues 6. Permit to work, proper implementation.
11	Weekly HSE Meeting with Subcontractors and Construction Weir Site.	HSE Training Hall Camp Office Weir site	9	09	2015	10:00	Site HSE Issues.
12	Weekly HSE Meeting with Subcontractors and Construction Power House Site.	HSE Training Hall Camp Office Power House Site.	9	09	2015	10:00	1. Proper handling of gas cylinders. 2. Poor housekeeping 3. Depressed fire extinguishers on powerhouse 4. Use of damaged safety shoes at site 5. Unsafe scaffold / unsafe work at height 6. Third party load testing for muck bucket 7. Third party inspection of tower crane # 2 required.
13	Weekly HSE Meeting with Subcontractors and Construction Power House Site.	HSE Training Hall Camp Office Powerhouse Site	16	09	2015	10:00	1. Heavy equipment access/ outgoing procedure. 2. Drinking water issues 3. Improper electric cable handling in powerhouse 4. PTW proper implementation 5. Improper handling of gas cylinders 6. Poor housekeeping. 7. Depressed fire extinguishers on powerhouse 8. Unsafe scaffold inside HRT & M&E 9. Body harness 10. Improper fuel storage.

Sr.	Meeting with	Location	Date			Start Time	Main agenda
			Day	Month	Year		
14	Weekly HSE Meeting with Subcontractors and Construction Power House Site.	HSE Training Hall Camp Office Powerhouse Site	30	9	2015	10:00	1. Welding / Cutting without the fire blanket in HRT 2. Lack of lighting system 3. Scaffolding in HRT needs to be erected properly 4. Ventilation is required during concrete lining work in HRT 5. Working without body harness 6. Low quality electric water geyser 7. Pick HA-344 driver working without induction 8. Project vehicles service stations is required 9. EPC HSE team observed that PTW system is not maintained properly.

Annex-6

HSE TRAININGS

Sr. No	Title of the training	Date	Trainer	Time	Site	Location	No. of attendees	Contractor	Sr. No	Title of the training
1	Usage of chemical	2	7	2015	M. Zaeem	07:00	Weir Site	HSE Training Hall	16	Sung bo.
2	MSDS Training	2	7	2015	Sayed Tariq	12:00	Power House Site	HSE Training Hall Camp Office	12	Daewoo E&C
3	supervision training	4	7	2015	M. Javed	17:00	Weir Site	HSE Training Hall weir site	14	Daewoo & Kyung dong
4	Safe work procedure	7	7	2015	M. Javed	17:00	Weir Site	HSE Training Hall weir site	21	Sungbo, Daewoo & Kyung dong
5	Confined Space Entry	9	7	2015	Sayed Tariq	13:00	Power House Site	HSE Training Hall Camp Office	30	Kyung Dong
6	Defensive driving	13	7	2015	M. Javed	10:00	Weir Site	HSE Training Hall Camp Office	43	Sungbo + Daewoo
7	Defensive driving	13	7	2015	Zaeem & Sundas	16:00	Weir Site	HSE Training Hall Camp Office	13	Sungbo + Daewoo
8	Defensive driving	13	7	2015	Sayed Tariq	13:00	Power House Site	HSE Training Hall Camp Office	57	Daewoo E&C and subcontractors staff
9	working at height	16	7	2015	Raja Faisal Masaud	09:00	Power House Site	HSE Training Hall Camp Office	9	Kyung dong
10	Scaffolding safety	24	7	2015	M. Javed	11:00	Weir Site	HSE Training Hall Camp Office	43	Sungbo
11	Confined space entry	29	7	2015	M. Javed	11:00	Weir Site	HSE Training Hall Camp Office	35	Sungbo
12	Banksman Training	1	8	2015	Sayed Tariq	09:00	Power House Site	HSE Training Hall	02	Daewoo E&C
13	Internal quality auditing training	2	8	2015	Kamran Hassan	10:00	Power House Site	HSE Training Hall Camp Office	5	Daewoo E&C
14	Fall Protection Training	3	8	2015	Sayed Tariq	7:00	Power House Site	HSE Training Hall Camp Office	30	Daewoo E&C
15	Tunnel Lining Training	6	8	2015	Sayed Tariq	11:00	Power House Site	HSE Training Hall Camp Office	33	Daewoo E&C
16	work at height	8	8	2015	M. Javed	11:00	Weir Site	HSE Training Hall Camp Office	44	Sungbo + HESPAK
17	Banksman Training	12	8	2015	Sayed Tariq	7:00	Power House Site	HSE Training Hall Camp Office	12	Sungbo + Daewoo

Sr. No	Title of the training	Date	Trainer	Time	Site	Location	No. of attendees	Contractor	Sr. No	Title of the training
18	Heavy Equipment	16	8	2015	M. Javed	10:00	Weir Site	New Batching Plant	23	Daewoo E&C
19	HSE Counseling	18	8	2015	Raja Faisal Masaud	17:00	Power House Site	HSE Training Hall Camp Office	1	Kyung Dong E&C
20	HSE Counseling	18	8	2015	Sayed Tariq Hussain	18:00	Power House Site	HSE Training Hall Camp Office	2	Kyung Dong E&C
21	Lifting and rigging safety	19	8	2015	Sayed Tariq Hussain	13:00	Power House Site	HSE Training Hall Camp Office	24	Daewoo E&C
22	Safe operating & signal man	28	8	2015	M. Javed	11:00	Weir Site	By Pass tunnel	21	Sung bo
23	Work at height	29	8	2015	M. Javed	11:00	Weir Site	HSE Training Hall Camp Office	20	Sung bo
24	Form Work Safety Training	3	9	2015	Tariq Hussain	11:00	Power House Site	HSE Training Hall Camp Office	18	Daewoo E&C, Kyung Dong E&C
25	PTW Safety Campaign	4	9	2015	M. Javed	06:45	Weir Site	Weir Site Muster Point	265	Daewoo E&C, Sangbo E&C & Kyung Dong
26	Confined Space Entry	10	9	2015	Kamran Hassan	18:00	Power House Site	HSE Training Hall Camp Office	13	Daewoo E&C, Kyung Dong & CNEEC.
27	Work At Height	13	9	2015	M. Javed	11:00	Weir Site	HSE Training Hall Camp Office	15	Sungbo & HESPAK
28	Safe Operating & Driving	16	9	2015	M. Javed	07:00	Weir Site	Site	170	Sungbo E&C & HESPAK
29	Heavy Equipment Safety Training	21	9	2015	M. Javed	11:00	Weir Site	HSE Training Hall Camp Office	10	HESPAK
30	Banksman Training	29	9	2015	Sayed Tariq	11:00	Power House Site	HSE Training Hall Camp Office	22	Daewoo & Kyung Dong E&C

Annex-7

Monthly HSE Plan

DAEWOO E&C

MONTHLY HSE PLAN (PATRIND HYDRO POWER PROJECT)

JULY 2015

MON	TUE	WED	THU	FRI	SAT	SUN
		1	2	3	4	5
• As ongoing activity daily Tool Box Meetings will be held on both sites. • Site inspection and monitoring of HSE status will be carried out repeatedly on daily basis. • Daily & weekly HSE progress reports will be consistent activities.		PPEs Inspection (Lower Site)+ Weekly HSE Meeting with Site construction team (Upper Site)+ **Monthly HSE Report to Head Office**	Electrical Equipment Inspection (Lower Site) + **Scaffolding Safety Training (Both Sites)**	**Monthly HSE Report to PES / SHPL** + Site Visit by HSE Management for monitoring the labor conditions and site housekeeping (Upper Site)		
6	7	8	9	10	11	12
Management HSE Walkthrough (Both sites) + Weekly Progress meeting (All departments) + Weekly HSE Report to Head Office + Internal HSE Meeting	Weekly HSE Meeting with construction team (Lower Site)+Weekly HSE Report to SHPL /PES+ **Heavy Equipment Inspection (Lower Site)**	Weekly HSE Meeting with construction team (Upper Site)+ **Batching Plant Inspection (Upper Site)**	**Monthly Safety Campaign (Both Sites)+ Color Coding (Both Sites) +Permit to work inspection (Lower Site)**	**Batching Plant Inspection (Lower Site) + Ambulance Inspection by Medical Attendants (Upper Site)**		
13	14	15	16	17	18	19
Management HSE Walkthrough (Both sites) + Weekly Progress meeting (All departments) + Weekly HSE Report to Head Office + Internal HSE Meeting	Weekly HSE Meeting with construction team (Lower Site)+Weekly HSE Report to SHPL /PES	**Quarterly Environmental & Social Monitoring Report PES /SHPL** +Weekly HSE Meeting with construction team (Upper Site)	**Fire Extinguishers Inspection (Lower site)+ Work at height Training (Both Site)**	**Fire Extinguishers Inspection (Upper site) + Ambulance Inspection by Medical Attendants (Lower Site)**		
20	21	22	23	24	25	26
Management HSE Walkthrough (Both sites) + Weekly Progress meeting (All departments) + Weekly HSE Report to Head Office + Internal HSE Meeting **Subcontractor's HSE violation charge Bills submission to Admin**	Weekly HSE Meeting with construction team (Lower Site)+Weekly HSE Report to SHPL /PES + **Subcontractor's PPE Bills submission to Planning**	**Fish & Flora Study for third quarter 2015+** Weekly HSE Meeting with construction team (Upper Site) + **PPEs Inspection (Upper Site)**	Site Visit by HSE Management for monitoring the labor conditions and site housekeeping (Lower Site) + **Training Session on confined Space Entry (Both Sites)**	**Heavy Equipment Inspection (Upper Site)+ Inspection of waste management (upper site)**		
27	28	29	30	31		
Management HSE Walkthrough (Both sites) + Weekly Progress meeting (All departments) + Weekly HSE Report to Head Office + Internal HSE Meeting	Weekly HSE Meeting with construction team (Lower Site)+Weekly HSE Report to SHPL /PES	Weekly HSE Meeting with construction team (Upper Site) + **Electrical Equipment Inspection (Upper Site)**	**Training Session on Lifting Safety (Both Sites)**			

Prepared by:
HSE Manager: M. S choi

Approved by
Project Manager

10/29/2014

KL-Log#/01/02.04

Annex-8

EMP COMPLIANCE STATUS

Sr. No	Environmental Management Plan (Compliance Status)		
	Feature/Issue	**Parameters/monitoring**	**Compliance Status/Action taken by EPCC**
1.	Statutory Requirements	Compliance with approval conditions	• With few exceptions, implementation in compliance with EPA's NOC & ADB's Environmental and Social Safeguards, IFC's Performance Standards
2.	Landslides	Catchment stability	• Annual Monitoring undertaken after monsoon during September 2015 and report was shared with SHPL & OE. Next monitoring will be carried out during September 2016. • Slope stability activities on both sites have been carried out during the quarter
3.	Erosion and Sediment	i. Extent of erosion and sedimentation ii. Topsoil stripped and covered or seeded if stockpiled for longer than one month or during the monsoon	• Erosion & Sediments on project sites has yet not been quantified, however, to prevent this protection works have been undertaken on slopes at both sites. • Wind erosion of dust and sand has been controlled by frequent water sprinkling and covering stockpiles with polythene sheets • To prevent HRT waste water sediments flow to the river settling tanks and chambers have already been constructed and being cleaned.
4.	Muck Disposal	i. Reuse of spoil/muck within project areas where possible ii. Correct disposal of surplus spoil/muck in designated areas	• Excavated material being used in civil works and dumping is done on approved area at upper site. Muck material has also been used in repairing of project access road during the month
5.	Water Quality	Wastewater treated prior to river discharge (Temperature, dissolved oxygen, pH, conductivity, turbidity, total phosphorous, inorganic phosphorous, total nitrogen, ammonia nitrogen, nitrogen oxides, biochemical oxygen demand and fecal coli forms)	• Biannual water quality monitoring was undertaken during April 2015 and reports have been shared with SHPL & OE. Next monitoring will be carried out during October 2015. • Waste water treated and monitored on both the sites. • Filter cartridges changed of the filter plants to provide adequate drinking water.
6.	Waste Management	i. Waste materials reused or recycled on-site where possible	• Papers, mineral water bottles and tin cans are being sent to market for recycling

Sr. No	Environmental Management Plan (Compliance Status)		
	Feature/Issue	**Parameters/monitoring**	**Compliance Status/Action taken by EPCC**
		ii. Non-recyclable wastes disposed of appropriately	• Segregation, collection and disposal has been considerably improved on both the sites in the reporting quarter.
7.	Hazards/Risk	i. Workers provided with appropriate safety equipment and regular safety training ii. Storage of hazardous goods in bounded areas or in secure sheds iii. Explosives stored in guarded bunkers iv. Use of hazardous goods according to manufacturers' specifications	• Induction trainings • Providing PPEs • Tool Box Meetings, Job craft & on site trainings • Explosive store established under NOC (Lower Site) • MSDS and SOPs partially followed
8.	Aquatic Ecology	i. Fish and Aquatic populations	• Quarterly fish study undertaken during the reporting period during month of September 2015. • Fishing& hunting prohibited on project sites. No endanger species found. No considerable disturbance to aquatic life
9.	Flora	i. Direct observation of surrounding vegetation	• Study/monitoring undertaken during quarter. Removal undertaken as indicated in EIA. Mitigation measures will be undertaken after construction phase.
10.	Noise and Vibration	i. Maintenance of equipment in accordance with manufactures' specifications ii. Controlled blasting	• Regular inspections and service of heavy equipment • Regular monitoring, blast permit issued and SOPs adopted • Pre and post blast survey conducted
11.	Air Quality	i. Exhaust emissions from machinery – visual inspection. ii. Air quality testing by different gas detectors inside the Tunnels	• Regular inspections and service of heavy equipment • Regular gas testing been done after the blasting activity in all the tunnels on both the sites.
12.	Traffic/Access	i. Enforcement of speed limits on Project roads ii. Noise Traffic Signs	• Heavy equipment/vehicle drivers education sessions • Speed limit and directional sign board installed

Annex-9

ENVIRONMENTAL INSPECTION CHECKLIST

WASTE TRANSFER NOTE

PART A

Place : "Camp office"

Description of Waste and Estimate of Quantity (If more than one load state expected number) with the total amount of sale 450 RS.

Recycleable waste (card Boards + plastic bottles).
15RS/kg 5RS/kg

Date Collected : 11:30 – 6th September, 15 Time Collected : 11:30.

DESTINATION : "SCRAP DEALER"

Vehicle Reg #/ Identification : MDRA-449 (Daewoo)

Signed for (HSE Manager) : .....

Signed (Environmental officer) : .....

PART B

DISPOSAL SITE

This is to confirm that the above described waste was received at the destination stated above

Permission has been given to offload ☑

Permission was denied because: ☐
(Describe the reasons why it is denied)

.....
Name & Sign. (For Disposal Site)

Date 6/09/2015 Time 3:00 pm.

"LOG SHEET FOR WATER SPRINKLING OPERATORS IN THE MONTH OF SEPTEMBER"

DATE	TIME I	TIME II	TIME III	TIME IV	TIME V	PLACE	OPERATOR NAME
11-09-15	8:00 Thuri Road	9:30 camp office	10:30 Workshop Bypass	11:30 Bridge + Acess Road	12:00 Thuri road.	Block factory + Bridge + camp office + Workshop + Thuri road + Power h	Bashis
12-09-15	7:30 Block Factory	8:30 Workshop Bypass	9:30 Camp office	10:30 HRT + Surge Shaft	11:30 Bridge + Batching	Batching Plant + HRT, Bridge + Thuri Road + Block Factory	Bashis
13-09-15	7:00 camp office	8:00 Workshop Bypass	9:00 HRT + S. Shaft	10:00 Batching plant	11:00 Thuri Road.	Camp office, HRT, Thuri road, Batching Plant	Bashis
14 09 15	//	//	//	//	//	//	Bashis
15-09-15	//	//	//	//	//	//	Bashis
16-09-15	8:00 camp office	9:00 Workshop Bypass	10:30 HRT + Surge Shaft	11:30 Bridge Acess Road	— N/A	//	Bashis
17-09-15	8:30 camp office	9:30 HRT + S. Shaft	10:30 Bridge + Road.	12:00 Thuri Road.	—	//	Bashis
18-09-15	7:30 camp office	8:30 Bridge + Acess Road	9:30 Workshop Bypass	10:30 HRT + surge shaft	12:00 Thuri Road.	//	Bashis
19-09-15	//	//	//	//	//	//	bashis.
20-09-15	Raining	Raining	Raining	Raining	Raining	—	—

Checked By: Environment Officer

Noted By: HSE Manager

Daily Environment Report and Checklists

Project: Patrind Hydropower **Dated: 28-08-15**

Activity and Observations	Location	Measures (Remarks)
Air Pollution (Dust Emissions, smoke, vehicular exhaust)	Nearby Batching Plant	Water Sprinkling ensured by following three times schedule at all site
Solid Waste Management	In front of PES	Community Waste removed and sent to Disposal Area for properly managing it
Oil Spillage	Nil	Nil
Sedimentation Tank Cleaning	HRT	In progress because Machinery was busy.
Chemicals Spillage/release	Nil	Nil
Other (if any)	Nil	Nil
Inspected By	Imran Yousaf	
Noted By	HSE Manager	

DAEWOO E&C

Patrind Hydro Power Project, AJK

Daily Environmental Monitoring Performa

Date	Month	Time	Location	Inspected By	Reviewed By	Noted By
7th Sept, 2015	September		Power house Site	Muhammad Imran Yousaf	Sir Aftab Alam	M. S Choi

Potential Environmental Impacts	Yes	No	N/A	Comments
Air Emissions a) Any sources of air emission?	✓			Dust at surge shaft & HRT water sprinkling is done & schedule is also issued.
b) Are the emissions controlled and monitored?	✓			N/A
c) Is indoor air quality monitored?	–	✓	–	–
Water Consumption & Discharges	–	–	–	–
a) Any wastewater discharge?	✓			Septic tank leakage - Told management to repair - Install under progress
b) Is the quantity and quality of wastewater controlled and monitored?				
c) Any process modifications to reduce water usage?	–	–	–	closed the leakage points in order to save water
Waste Management & Housekeeping				
a) Any waste generation?	✓			Kitchen waste. Recyclable waste (Bottles+ plastic & card boards).

"Register of Environmental Aspects and Impacts"

Project Title: Patrind Hydropower Project			Dated:	01-09-15 to 07-09-15	
Completed by: Imran Yousaf	Reviewed By: Mr. Aftab Alam		Checked by:	Mr. Min Sun Choi	
Location	**Environmental Aspects**	**Environmental Impacts**	**Significance Rating**	**Operational Control/ Procedures**	**Environmental Objectives and Targets**
Power House	Vehicular Exhaust Emissions	Smoke from vehicle Include dangerous gases such as carbon monoxide, oxides of nitrogen, hydrocarbons and particulates which can effect human health as well environment	Medium	Proper maintenance schedule is followed	Later on, without prior inspection no vehicle is allowed on project site.
HRT and Bridge	Dust	High rate of Dust has been observed which cab effect in number of ways	High	Corrective action has taken in this regard to prevent dust. Separate water bowser has hired for daily water sprinkling to control dust	Scheduled has been issued to the Driver in order to carry out sprinkling in proper interval of time.

Daewoo E&C

Patrind Hydropower Project 2015

WEEKLY ENVIRONMENTAL COMPLIANCE CHECKLIST

Date Start	Date Finish	Month	Location	Inspected By	Reviewed By	Noted By
01-09-15	07-09-15	September	Project Site	Imran Yousaf	Aftab Aalam	Min Sun Choi

EXPLAIN THOSE ITEMS IDENTIFIED ABOVE THAT WERE CHECKED, AND DESCRIBE THE CORRESPONDING

ENVIRONMENTAL ASPECT/IMPACT	Yes	ENVIRONMENTAL ASPECT/IMPACT	Yes
1. **Air emissions:** Does the project monitor emissions from dust, or chemical gases?	✓	2. **Chemical Use, Storage, and Inventory:** Does the project manage lab chemicals, fuel, oils, cleaners, or solvents?	✓
3. **Waste Generation, Management, Storage, Transportation and Disposal:** Do any Hazardous/Non-Hazardous waste be generated and managed by the project?	✓	4. **Interaction with Wildlife/Habitat:** Do the project disturb soil in habitat areas or disrupt bird nests, aquatic life or other wildlife areas?	✓
5. **Use, Reuse, and Recycling:** Are any project activities designed to minimize generation of waste through reuse, recycling, and environmentally preferable purchasing, such as purchasing recycled-content materials?	✓	6. **Soil Pollution:** Does the project manage chemical spills for preventing soil contamination?	✓
7. **Noise:** Does the project generate and monitor noise that would impact personnel or wildlife nearby?	✓	8. **Housekeeping:** Do the project conducting good housekeeping practices for the entire site daily?	✓
9. **Soil and Groundwater Contamination:** Do project activities prevent soil and groundwater contamination in any way?	✓	10. **Vegetation clearance:** Does the project accomplish and supervise any alteration or removal of vegetation in or near surface water?	✓

CONTROLS TO BE IMPLEMENTED TO REDUCE POTENTIAL ENVIRONMENTAL IMPACTS:

It has been observed that there is much dust condition during the whole week because of harsh weather conditions measures are taken by proper sprinkling of water according to the given schedule and advised the management to shower water on the whole site whenever it's needed apart from this the septic tank near O&M building is leaking and water from that is directly going into the water which can spread disease and eff ect the aquatic life. I asked the management to repair that as soon as possible.

Signature of Site Officer	Imran Yousaf	Date	07-09-15
Reviewed by HSE Manager	Mr. Aftab Aalim	Date	07-09-15
Noted By Team Leader	Mr. Min Sun Choi	Date	07-09-15

Annex-10

FISH STUDY IN KUNHAR RIVER

Quarterly Report

Study and Monitoring of Fish Fauna of Kunhar River

July-September 2015

TABLE OF CONTENTS

1. Objectives of the Study:

a) To evaluate impact on the fish fauna of River Kunhar in, above and below the Patrind Project area during the construction phase and during the operational phase.

b) Suggest technical measures to have minimum impact on the aquatic life of River Kunhar by the Patrind Hydro Power Project.

2. Abstract

Patrind Hydro Power Project has been initiated at Patrind on river Kunhar in KPK. The river water will be diverted through a tunnel to give it a fall at Alda in Muzaffarabad AJK to produce the electricity. The construction of weir will affect the flow of river Kunhar downstream and it will also create an impoundment above the weir point. There is a diversion tunnel at the moment and another is planned to be constructed as a flushing tunnel. These tunnels will have a great impact on the aquatic life of the river at the construction site area. This study deals with exploring the possible impact on the fish fauna of river Kunhar at and around Patrind Hydro Power Project area and to suggest such measure which can reduce the this impact. The study gives us the information of seasonal changes and changes in the same months in different years.

The river blockage has not yet been done on the river Kunhar but the course of river has been changed at the weir site of the project where a diversion tunnel has been constructed at first stage of the project to get space for the construction of weir. The reported fish fauna of Kunhar River shows the wide diversity of fish species in it but the study carried out for one and a half year shows that only two fish species are present in the study area. Study in almost all the seasons have been carried out and no any other fish species could be caught or seen except the Schizothorax but according to the evidence of locals, the presence of Glyptothorax species in Nallah Boi is witnessed.

3. INTRODUCTION

The Patrind Hydro Power project site is situated in the rugged mountains where speed of River Kunhar is very fast making some cascades. River flow is very high during the summer and low during the winter. Similarly the turbidity percentage is high during the summer and low during the winter. The study periods are set with the seasonal changes of the river Kunhar so that a clear picture could be obtained for the impact assessment. The study will continue during and after the construction phase. Six sampling points were selected for the study with a stretch of about 100 meter, covering about 10 km up

and down the Weir at Patrind. The province of Khyber Pakhtunkhwa is located in the north-west of Pakistan and is largely located on the Iranian plateau and Eurasian land plate, while peripheral eastern regions are located near the Indian subcontinent and this has led to seismic activity in the past.

The province covers an area of 74,521 km² (28,773 sq mi). According to the 1998 census, the total population of Khyber Pakhtunkhwa was approximately 17 million out of whom 52% are males and 48% females. The density of population is 187 per km².

The northern part of the province is snowy in winters, and also experiences heavy rain falls. Its valleys Swat, Kaghan, Chitral and Kohistan are surrounded by rugged mountains and have temperate climate, including cold winters. Upper reaches of rivers in these valleys carry clean cold water and are suitable for trout and schizothoracines (snow trout). Several lakes and reservoirs also provide suitable conditions for cold water fish. As one move to south, transitional or semi-cold waters are present, with snow trout and mahsers fish species presence. Further south and at lower altitude warm water fish species prevail.

Recreational/sport fishery has been steadily increasing in the upper reaches with cold water. In 1990 cold water fish catches were estimated at about 200 t/yr (Akhtar, 1992), with the bulk formed by snow trout and indigenous small fish. In the same year Madyan fish farm produced 7.5 ton and the private sector about 5 ton of trout. With the completion of two more fish farms of trout fish in Swat and Kaghan, the private sector is expected to produce 50 ton annually.

Brown trout introduction and subsequent stocking in Kaghan and Chitral at the beginning of the 20th century were very successful. Starting in 1962 at least three schemes initiated the development of trout in five districts, i.e. Mansehra, Swat, Dir, Chitral and Kohistan, resulting in five trout hatcheries. It is estimated that about 40 percent of the total fry produced from these hatcheries are released in various natural water bodies. Sport fishery has promoted tourism and its economic role is well established (Akhtar, 1992). It is recognized that at present the trout industry in Khyber PakhtunKhwa is more advanced than elsewhere in Pakistan. There are now three trout hatcheries in Chitral Valley. The largest trout hatchery-cum-farm is in Madyan in Swat Valley. There is a hatchery at Kalkot in Dir, and the Shinu hatchery in Kaghan, the oldest one in the Province. A new hatchery has been completed at Dobar in Kohistan.

No attention has been paid to develop hatcheries for the native cold water fish species anywhere in Pakistan. Province of Punjab has developed one Mahsheer hatchery and AJK Fisheries department is also planning to develop one Mahsheer hatchery to restock it in Poonch River and its tributaries. Poonch River has been declared as National Park very recently to improve the conservation status of the river with special emphasis on Mahsheer. Nepal has worked on producing juvenile of Shizothorax species in Pokhra region but there is no plan of developing such hatcheries in Pakistan, AJK and Gilgit Baltistan.

The river Kunhar flows in district Mansehra with a stretch of about 250 km. The river carries clear water with little silt during the winter (September-March), but it causes heavy floods during the monsoon season and summer snowmelt.

4. FISH MIGRATION PAST MANGLA DAM

It is acknowledged that the results of the study are not necessarily representative of long term water way conditions. The lack of long term data on water quality, plankton concentrations and fish populations limits the conclusions that can be made about the aquatic ecology in the Project area. The scope of present study does not require covering of fish fauna present in Jhelum River along with its migration status. There is almost no possibility of upstream migration of fish fauna above Mangla Dam to the Project area as authenticated by the study results and supported by the local information recorded through the interviews. Even then, if some migration occurs that will be compensated by the Jhelum River. Thus, it can be safely concluded that the proposed Project will have minimal effects on the available fish fauna as well as the migration of fish species above Mangla

5. FISH

The reported diversity of fish shows that the river Kunhar is very rich but the studies conducted recently show that only little number of fish species is hardly found here. Although, the conditions are very conducive for the survival of various species, in actual they are very limited. The main cause which can be visualized for the absence of many other species is most probably over fishing and ruthless killing of the fish by using explosives and poisoning the water bodies during the near past. Interviews with the locals are the main proof of it. The department of Fisheries of Khyber Pakhtunkhwa has not been able to protect the river Kunhar down the town of Gharhi Habibullah most probably due to the shortage of conservation staff with them. Similar position prevails

with the Fisheries Department of AJK. The left bank of River Kunhar comes under the responsibility of Government of AJK below Patrind.

The main factors which influence fish life in the Himalayan streams are: (i) current velocity; (ii) Fluctuation in water discharge; (iii) Water temperature and dissolved oxygen level; (iv) Substratum; (v) Shelter from the current; and (vi). Food availability represented mostly by organisms clinging to and growing on rock and stone surfaces in fast current.

Snow trout, a cold water riverine and medium migratory fish is locally known as Malli or Sawti. It belongs to the family Cyprinidae and sub-family Schizothoracinae which are widely distributed in the Himalayan and sub-Himalayan region and much of the rest of Asia. Altogether 28 species of snow trout are reported in Himalayn river waters but only two of genus *Schizothorax* are recorded in the study area of river Kunhar. *Schizothoraxcurvifrons* and *Schizothorax plagiostomus* and they are common in river Kunhar. Both the species are phytophagous fish and has developed a special mouth to scrape the algae attached on stones. They spawn twice a year during September/October and March/April, but September/October is the best season for spawning. Clear water, stony bottom of creeks composed of fine pebbles and gravel, and water flow of 2.8-4 m/sec, pH 7.5 and dissolved oxygen concentrations of 8-15 mg/L form good spawning conditions in the natural environment.

To cope with the steep fall in temperature in winter months schizothoracines migrate from headwaters to lower altitudes where they represent a sizeable part in fish catches in large rivers and their tributaries. The rise in temperature in Kashmir and Kunhar streams from near-freezing level to 10-18°C during May-June induces *S. plagiostomus*, *S. longipinnis* and *S. curvifrons* to spawn. During the upstream migration the fish still finds itself in waters of low temperature of 8.0-9.5°C, owing to the steady influx of snow-melt water. This induces the species to migrate to and spawn in side streams or point warm and cold water confluence, which receive warm ground water of 17.5-21.5°C. In the same drainage *S. plagiostomus* and S. *curvifrons* migrate downstream to the lowermost reaches where it spawns from September to December at 15.0 to 21°C. These observations indicate that in some schizothoracines multiple spawning is determined by temperatures and flow rates optimal for egg laying. The eggs are large-sized (3.0-4.0 mm diameter) and sticky in nature. They are laid in shallow pools (50-70 cm depth) and remain adhered to the substratum until the hatching of fry.

The fluctuating discharge of water and drying out of streams, leaving only isolated pools or no water at all, is another important matter. A general observation during the last studies on seasonal fluctuation in river discharge in Kunhar river system indicate that the range of mean flow from October to March (winter months) represents only 8-10% of the total annual flow. There are also variations from year to year depending on the winter and monsoon precipitation. Reduction of torrential streams to stagnant pools exposes the fish to terrestrial predators and to depletion in dissolved oxygen concentrations, especially when autumn leaf fall takes place. However, due to low temperature, the level of dissolved oxygen may not fall below the optimum required by cold water fish (7.0-8.0 mg l). As soon as the flow is restored with spring rains and snow-melt water a rapid recolonization of the stream takes place.

Schizothorax and *Schizothoraichthys* spp are dominant among the cold water fish in river Kunhar in terms of catch and abundance in all seasons. The substratum consists of boulders, stones, gravel and patches of aquatic vegetation in the pools.

As a result of this study in river Kunhar it came out that a gradual increase in water temperature and pH corresponds to a decrease in dissolved oxygen, decline in the density of nymphs of mayflies and stoneflies, but in an increase in larval and adult aquatic beetles. The information collected during expeditions is based on spot measurements and it does not represent average values. The following parameter ranges for the Kunhar river were recorded at six sampling points during March 2015.Following table shows the result; transparency; pH; water temperature (^{o}C); dissolved oxygen;

Table-1 Showing water Parameters

S No	Point	Dissolved Oxygen (ppm)	pH	Temperature ^{o}C	Transparency
1	Boi	8.1	6.5	19	0.8
2	NallahBoi	7.25	7	21	0.7
3	Parri	8.12	6	18.5	0.9
4	Tunnel exit	8.14	6	18.5	0.9
5	Tunnel Inlet	8.13	6	18.5	1
6	Dumping Site	8.12	6.	18.5	1

6. Fish catch and fishery potential

The fishing activities take place for 8 months of the year during spring, summer, autumn and the early winter months (interview with locals and fishermen).There is usually no fishing during floods and part of the winter season. The full-time fishermen fish for 6 months and catch 0.2-1.2 kg per day. The individual catch is around 126 kg per person per year. The 6 professional part-time fishermen generally fished 2-5 months per year and were labourers, mechanics, a few businessmen and a few job holders. However, the electro fishing fishermen catch fish in the range of 2-4 kg, with an average of 315 kg per fisherman per year, and they do fishing in groups of 3-5 people. Basically, occasional fishermen were non-fisher groups and do fishing for recreation. Such groups do fishing 2-10 times per year and caught 0.2-0.5 kg per day, with an average of 2.1 kg per person per year for consumption.

The fishermen do fishing in the main Kunhar river system and its tributaries. The estimated total length of the river with its tributaries is 214 km other than the trout area with an average water depth of 2.2 m.

Fisheries in the Himalayan rivers can be divided into (a) subsistence fishery; and (b) sport/recreational fishery. Fish production in mountain streams is low and therefore any commercial fishery is on a very limited scale. The low biological productivity results in the prevalence of small-sized fish, except in pools where fish have some shelter and resting place.

The fishing methods using nets, traps, electro fishing gear, use of explosives and water poisoning are simple but well-suited to the turbulent nature of the streams. Cast nets of 1.0-2.0 m diameter, with mesh sizes 1.2 to 3.0 cm bar to bar and sinkers of a total weight of 5 kg are the most common gear used. The sinkers allow rapid settling of the net at the bottom, thus preventing it from being carried downstream by the rapid current. The fisherman upturns the stones on the stream bed covered by the net, which makes the fish come out of their hideouts below the stones and get trapped in the peripheral pockets of the net. The other types of nets used are: drag nets operated in conjunction with stake net (*kadh*), seines, stake nets, bag nets (*kochbi*), and some other types.

The various poisons used are lime, sap of *Euphorbia rogleana*, powdered seed of *Xanthoxylumalatum* and *Cascariatormentosa*, boiled tea leaves, etc. In addition, spears, horse hair nooses, harpoons with 4-5 barbed points and grain fishing are also used in different waters of the local rivers.

Use of explosives and electro fishing gear in river Kunhar is usually done by the non-professional fishermen who visit the areas in groups. They damage the point very badly and stay at the site for one to two hours, catch the easy accessible fish and leave the other dead fish to flow away with fast current of water.

7. Fish catches and species composition

Two professional fishermen were engaged for fishing in the river Kunhar at fixed sampling points. Fishing in the Kunhar River using cast nets of 1 m to 1.5 m diameter recorded a catch of only one fish species during this sampling. The catch comprised mainly of *Schizothoraxplagiostomus*(100%)and no catch of Schizothorax*curvifrons* was found from any point. The reason could be the coming breeding season of the fish species when these migrate to suitable places. The water is sandy greyish.

1. Fisherman Mr.Mohammad Haneef

2.*Fisherman Mr. Abdul Manhan*

7.1: Other Fish species of River Kunhar reported in the past:

Family: Salmonidae

Oncorynchusmykiss {Salmogairdneri} (Rainbow Trout)

Salmotrutta (Brown Trout)

Family: Cyprinidae

Schizothoraxesomus
Schizothoraxplagiostomus
Schizothoraxmicropogon
Schizothoraxcurvifrons (Snow Trout)
Tor putitora
Tor tor
Labeospp
Cyprinuscarpio

Family: Sisoridae

Glyptothoraxkashmirensis

8. Sport and recreational fishery

Trout

The trout, which is now acclimatized in the upper reaches of River Kunhar (upstream of Jared in Kaghan), is permitted to be caught on rod and line using both artificial and live baits. Special bylaws have been formulated under the Fisheries Act in the Khyber Pakhtunkhwa province. They regulate the fishing season, bag limit and prescribed baits.

Organized brown trout fishing is confined mainly to the upper reaches of river Kunhar. As per fishing regulations, `dry and wet' fly spinning, artificial and natural worms, etc. are the allowed baits for brown trout fishing. The number of anglers to be permitted in each beat is fixed on a daily, weekly or seasonal basis. The fishing season extends from March to October every year. The minimum legal size of trout to be caught ranges from 25-30 cm. The bag limit ranges from 5-7 fish of 25 cm and above in length. The number of undersized fish caught by each angler has to be returned in the river. However, there are very few anglers who follow such instructions.

9. Fisheries Status of River Kunhar in view of locals

During the study few locals were also interviewed who are having some water mills (Gharat) just beside the river or nallahs. Among them were Mr. Khaqan Hussain Shah, Mr. HusnainGilani and Mr. Mohammad Sadiq. According to them agradual decline in the fish catches have been observed during the last two decades. Use of explosives and poisoning are the major two reasons and electro fishing has also been observed for the

last two years in River Kunhar and Nallah Boi. The people responsible for doing so are mostly non-resident visitors not the locals. Most of the small size fish so killed flows down in river Kunhar. Another reason of decline in the fish population, according to them, is the predation of local fish by exotic trout fish in the upper reaches of the Kunhar.

10.Field Results:

10.1 Point-I (Boi)

First sampling point of the study is situated at 34° 18/ 19" N, 73° 26/ 44" E at2422 ft of elevation above sea level. The water level is moderate and it is greyish. The water level has gone down as compared to the study during June 2015.The fish caught with their details is given in the following table below. No fish of *Schizothoraxcurvifrons* could be netted here.

Sampling at point-I

Weighing the fish

10.2 Point-II (Domel Boi)

This sampling point is situated at 34° 18/ 36" N, 73° 26/ 43" E at2398 ft of elevation above sea level. This is the point where fish can migrate upstream in the Boi Nallah during the spawning period and can have little impact of low river flow when tunneling of the water starts. The nallah water was very clear as compared to the water of river Kunhar. Water temperature was high here due to confluence of warmer water of Nallah Boi. Similarly pH is also different as shown in the coming table below. The only fish caught here was of *Schizothoraxplagiostomus.* According to the locals, evidences of existence of *Glyptothoraxspp* and common carp (*Cyprinuscarpio*) were found in the Boi nallah.

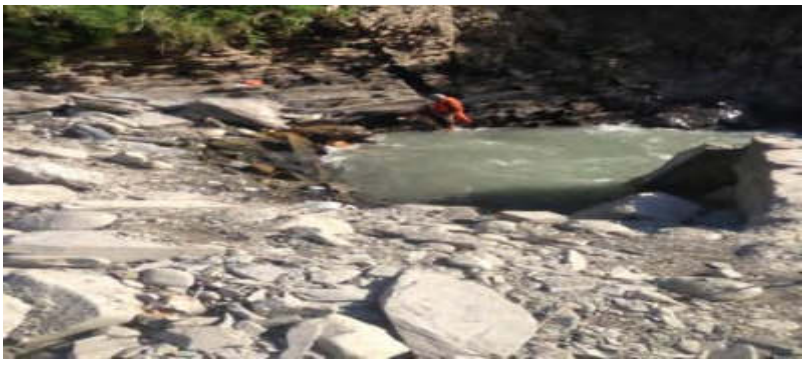
10.3 Point-III: (Parri)

This sampling point is situated at 34° 19/ 47" N, 73° 25/ 35" E at2475 ft of elevation above sea level. The river is turbid at this time of the year due to rain. A small creek joins the river here and possibility of suitable breeding ground of the fish could be expected here. One fish could be caught here. Detail is given in the table below.

Sampling at point-III, Parri

10.4 Point IV: (Outlet of river diversion)

The point is situated at 34° 18/ 19" N, 73° 26/ 44" E at 766 meters of elevation above sea level. The work around the area is in progress so the shape of the water body keeps on changing for each study time. This tunnel has a great impact on fish as down and upstream migration is not possible and there is no chance of the survival of the fish in this tunnel and at the outlet. The speed of the flowing water is tremendous and survival of the fish is not possible. This diversion tunnel has a definite impact on the fish production but to maximum of 800 meters downstream. No fish could be caught here.



Sampling Point at outlet

10.5 Point-V: Diversion Tunnel Inlet

This is the point situated at 34° 20/36" N, 73° 25/08" E at2615 ft of elevation above sea level. This is the inlet of the diversion tunnel. Although a small pool do exists even then the water flow velocity is quite high at this time as compared to the last sampling time. No fish could be caught here. Possibly due to coming breeding season the migration has taken place. The impact on aquatic life is not very high as the lake has not developed to its expected level and course and flow of water has not changed here. When the lake will grow after construction of Patrind weir, this can harbor the Rainbow and Brown trout. If carefully planned, this can become commercial activity but needs expert inputs.

Sampling at inlet of water diversion tunnel

10.6 Point-VI Dumping Point

This is the point situated at 34° 18/ 19" N, 73° 26/ 44" E at 776 meters of elevation above sea level. This is the dumping site of the disposal from the tunnel. This a potential site of the lake emerging due to damming on the river at Patrind. The river flow has changed its course due to more dumping of the material. No fish could be caught here.

Table-2 Showing Data collection at each sampling point

Point-I							
S No.	**Air temp. °C**	**Water temp. °C**	**pH**	**DO mg/l**	**Fish Species**	**Weight (gms)**	**Length (inche)**
1	33	19	6	8.12	*Schizothoraxplagiostomus*	75	8
2					--do--	46	6.6
3					--do--	110	9.8
4					--do--	32	6.6
Point-II							
5	33	21	7	7.25	--do--	70	8.4
Point-III							
6	33	19	6	8.13	--do--	41	7
Point-IV							
7	32	18.5	6	8.14	No fish		

Point-V							
8	32	18.5	6	8.12	No fish		
Point-VI							
9	32	18.5	6	8.12	No fish		
Total Fish collected							
		Schizothoraxplagiostomus				6	
		Schizothoraxcurvifrons				0	

Species composition

Schizothoraxcurvifrons0

Schizothoraxplagiostomus6

11.MANAGEMENT AND CONSERVATION

Conservation and river system management has remained a very big issue all over Pakistan. Over the years uncontrolled and often indiscriminate fishing in the largely unmanaged river and streams has resulted in a sharp decline in catches of the important sport and subsistence fish. The increasing use of river water for irrigation, hydropower production, municipal and industrial purposes, and the inputs of pollutants also have very negative impacted on fish stocks. Among the difficulties that fishery managers are facing today is the shortage of data for a number of rivers and even whole areas of Himalayas. The most essential requirement is to estimate the resources which would enable the fishery scientists and planners to formulate a management policy. Another and an increasingly important aspects, is the need to evaluate the environmental impacts caused by human-induced changes in river and lake catchments, and how these have contributed to the decline in fish stocks. The use of destructive methods of fishing calls for effective enforcement of legislative measures and for education of the fishing community. There is a need to improve the surveillance along the rivers in order to protect fish stocks. In this respect the role of voluntary agencies in conserving stocks must not be underestimated.

Fish ladders constructed on several weirs and barrages to facilitate migration of migratory fish species were found ineffective. The drawbacks of these fish ladders are their steepness and then narrow and inconspicuous inlets. These ladders were found to function as fish traps and as such used by poachers.

While the creation of a reservoir results in the creation of a new habitat for fish, at the same time many endemic species are adversely affected. To resolve this problem, priority should be given to the preservation of the diminished stocks of riverine fish

species. This should include enforcement of legislative measures such as closed season, types of nets and mesh size regulation, and also the involvement of voluntary organizations, including fishing associations and clubs, in an effort to maintain the fish stocks at a healthy level. The stocks should be enhanced through regular releases of hatchery-produced fingerlings. Only in this way can the rising demands from subsistence and sport/recreational fishermen are satisfied. A programme of stream improvement to maintain optimal conditions for cold water fish is also needed, especially where such streams have been impacted by dams, channelization and pollution.

The practice of protecting fish stocks of brown trout and schizothoracines during the low water level period by creating deep pools, covering them with tree branches and protecting them from poaching, also has proved beneficial. The best way of improving the trout and schizothoracines fishery in rivers and lakes is to regularly stock the waters with yearlings produced in hatcheries.

There is also need to improve infrastructure for recreational and sport fishermen, as this would attract more tourists to the areas. Kaghan Valley has already such facilities. There is a need to develop trout facility in Patrind when a pool is expected to appear as a result of Weir construction. This pool will change the ecology of the river system both up and down stream and some fish species are likely to disappear as a result of this. Permanent stocks of brown trout are required to be established in the near most suitable water to stock the fish in the upcoming lake. At present Kaghan Valley has 203 km of streams available for trout fishing. It is common knowledge that fishing tourism improves the economic status of a region. It is estimated that the economic benefits of sport fishing for trout is quite high and an angler spends about Rs. 2000 per week during the tourist season.

12.Comparison

There is no apparent difference in the results of these studies which shows that the impact has not significantly appeared on the aquatic environment of the River Kunhar. Insignificant changes in the fish catch and quality of water observed during the study is only due to the irregular seasonal changes and pattern of water turbidity due intensity of rain or drought. This is mainly because of the ecology of the river has not changed very much except at the outlet of the diversion at Patrind. The major change in ecology is expected after the weir construction and obstruction on the river flow. This will affect the migration of the fish even upstream and all breeding grounds will highly be affected

downstream. The species composition may change and some species may disappear with the change of river ecology.

Table-3 Comparative number of fish Caught at sampling points

Period	Point	No. of fish	Period	Point	No. of fish	Period	Point	No. of fish
July-September 2013	1	3	July-September 2014	1	0	July-September 2015	1	4
	2	6		2	4		2	1
	3	4		3	1		3	1
	4	0		4	2		4	0
	5	1		5	3		5	0
	6	0		6	2		6	0
Total:		**14**			**12**			**6**
October-December 2013			October-December 2014	1	6	October-December 2015	1	
				2	5		2	
				3	0		3	
				4	4		4	
				5	0		5	
				6	3		6	
Total:					**18**			
January-March 2014	1		January-March 2015	1	**2**	January-March 2016	1	
	2			2	**0**		2	
	3			3	**0**		3	
	4			4	**0**		4	
	5			5	**0**		5	
	6			6	**2**		6	
Total:					**4**			
April-June 2014	1	5	April-June 2014	1	3	April-June 2016	1	
	2	7		2	1		2	
	3	4		3	1		3	
	4	0		4	0		4	
	5	No access		5	0		5	
	6	2		6	2		6	
Total:		**18**			7			

13.Result

There is a very clear reduction in the number of fish catch during the same season of the last two years. Only 6 fish could caught during this sampling which is a clear indication of reduction in the population status of the fish. This shows that the impact has appeared because of the tunneling of the diversion and stoppage of the up and down stream migration of the fish. This has also changed the course of flow of water downstream due to which breeding grounds have been disturbed. If the breeding of the fish will not take place then its population will definitely drop down.

14.Recommendations

Fish catches in the Kunhar River have been declining because of the changes in river flow, use of illegal fishing methods such as poisoning and use of electro-fishing gears. To preserve the fish stocks, controls should be imposed on illegal fishing practices and a fish sanctuary be established. The deep water pools of the Kunhar and its feeder streams should be declared fish sanctuaries for the protection of spawning fish.

The Kunhar River catchment has been badly affected due to deforestation, resulting in erosion and silting of streams and rivers. There is a need for land rehabilitation measures to be urgently implemented in the watershed. The incidence of water pollution is increasing in the lower reaches of the river due to the discharges of sewage waste, and the illegal use of insecticides, pesticides. Control over such activities must be strictly enforced.

Habitat improvement is an essential factor for fishery improvement. To avoid seasonal changes of water level, suitable pools should be created under the management of the local development authority. Such a practice will improve the fish habitat quality and avoid the winter desiccation.

Protection of fish stocks and fishery regulation should be based on periodic assessments of fish stocks. It is high time to enforce the existing fishery law and to restrict the use of nets with less than 2 cm mesh size.

Early planning and consultation with expert should be initiated to have aquaculture development in the cold water pool appearing as a result of damming on river Kunhar at patrind.

11. REFERENCES

1. Mirza, 1975, 1978, 1980, 1990, 2003,
2. Rafique and Qureshi, 1997;
3. Rafique, 2000; Rafique, 2001; Rafique et al., 2003).
4. U.S. Environmental Protection Agency, July 1976.
5. Water Quality Criteria, California Water Quality Resources Board, Publication No. 3-A, 1963.
6. Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, 1972.
7. Study and Interpretation of the Chemical Characteristics of Natural Water, United States Geological Survey, Water Supply Paper 1473, 1970.
8. Management of Artificial lakes and ponds by Bennet, G.W. 1962. Reinhold Publishing Corporation London.
9. Fisheries Science, its methods and Applications by Rounsefell, G.A and Everhest 1953. John Willey & Sons inc. London.
10. A Survey of Fish industry of river Kunhar by Muslim, M. &Chaudhry, A. 2004. Pakistan Forest Institute, Peshawar, Pakistan.
11. Some Aspects of Morphometric Analysis of Kunhar River watershed by Anwar Masrur, 1973.The Pakistan Journal of Forestry-1973.
12. The Limnology of Lowland Streams in West Malaysia by Ho Sinn Ghye and Jose
13. Furado, 1982. Tropical Ecology, Vol. 23, No.1, 1982.
14. Cold water fish and fisheries in countries of the high mountain arc of Asia (Hindu Kush-Pamir-Karakoram-Himalayas).A review by T. Peter. 27 McLeod Street, Toowoomba 4350, Australia.
15. Akhtar, N., 1991. The Northern Areas (Pakistan). Fisheries profile, feasible sites for trout culture and an overall sector development perspective. Report for Project PAK/91/008. Rome, FAO. 29p.
16. Akhtar, N., 1991a. Azad Jammu and Kashmir. Fisheries profile, feasible sites for trout culture and an overall sectoral development perspective. Report for Project PAK/88/048. Rome, FAO. 25p.
17. Akhtar, N., 1992. Pakistan's cold water fisheries and trout farming sector study:
18. FAO Report of Cold Water fish in Himalayan Region
19. Beveridge, M.C.M. and M.J. Phillips, 1988. Aquaculture in reservoirs. *In*: Proceedings of a Workshop on Reservoir Fishery Management in Asia (S.S. De Silva, ed.): 234-243. IDRC, Ottawa..

20. EIA-Bheri-Babai, 1999. Environment Impact Assessment Stage - 1, Baseline Report of Bheri-Babai Hydroelectric Project.By New Era/Nippon Koei/JICA, December.
21. EIA-Budhi Ganga, 1998. Medium Hydropower Study Project (MHSP) of Budhi Ganga (BG - O) Hydropower Project Vol. 1 & 2. Main Volume by METCON Consultants Pvt. Ltd., November.
22. EIA-DudhKoshi, 1998. Project Preparation and Studies Directorate, Projects Preparation Department, Medium Hydropower Study Project of DudhKoshi Hydroelectric Project, NEA.EIA Volumes 1-4, CIWEC. Kathmandu, August
23. trends, opportunities and challenges. Report for FAO/UNDP Projects PAK/88/048 and PAK/91/008. Rome, FAO. 75p.
24. http://www.fishbase.org/summary/speciessummary.php?id=208.
25. http://www.fishbase.org/summary/SpeciesSummary.php?id=9194.
26. http://www.fishbase.org/summary/speciessummary.php?id=239.
27. http://www.fishbase.org/summary/SpeciesSummary.php?id=82.
28. http://www.fishbase.org/summary/speciessummary.p

Annex-11

VEGETATION STUDY- PATRIND HPP

Vegetation Study

Patrind Hydro Project Area

July-September 2015

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VEGETATION STUDY OF PATRIND HYDRO POWER PROJECT

1. Abstract

Movement of heavy machinery, cutting of the soil and disturbing the angle of repose of the hills due to cutting is the unavoidable part of any hydro power construction project. These activities leave a very negative impact on the vegetative cover of the area and communities residing in the near suburb of the project area. Beside the construction at intake and outlet, the tunneling activity also has devastating impacts on the micro-environment and on the local people in the area. These impacts not only cause serious environmental degradation and suffering for the affected communities, but also violate the collective rights of the indigenous peoples. As proven by the experience of various projects of the same nature, large-scale corporate mining and dams destroy, pollute, disrupt agricultural economies, and displace indigenous peoples.

Aside from land subsidence, the water table also subsides as deep mining tunnels and drainage tunnels disrupt groundwater paths. Tunneling often leads to a long-term lowering of the water table.

Ventilation shafts also draw water away from surface streams, irrigation canals, and pond fields. In addition, the felling of timber to shore up underground tunnels has denuded surrounding watersheds, aggravating water loss.

Forest cover in Pakistan is only 5% of the total land area (GoP 1991) and is said to be rapidly deteriorating due to unsustainable use of the resources, especially in the mountain regions (IUCN 2002). Another main reason for low tree cover is the high demand for grazing land and fodder for the animals. Local people in the area burn the land after cutting the grass in the month of October and November. This leads to the loss of all vegetative cover on the steep slopes and leaving behind the exposed surface to the mercy of the Nature. The soil loses the water percolation capability hence, giving support to start of gully making and erosion on larger scales. Thus we can say that the original vegetation is almost destroyed due to the heavy grazing, lopping, poor agricultural practices and urbanization. Because of this deficiency of vegetative cover, the area is very badly suffering from soil erosion.

Another serious impact is the landslide disaster of the fragile mountains due to mining and tunneling. This impact can easily be observed in and around the working area of Project sites.




2. Introduction

Power generation and especially Hydro Power generation is the most priority area of developing countries and Pakistan. To overcome the problem of energy shortage, hydropower projects are initiated at many places in Pakistan. These projects are initiated at large and small scales on the potential sites. Patrind is one of the projects of same nature on a small scale which has been launched on River Kunhar at Patrind (34° 20/ 36" N and 73° 25/ 10" E) at an elevation of 2516-3123 ft amsl) and around the outlet at Alda (34° 20/ 06.05" N, 73° 27/ 18.6" E) in AJK. It covers both the eastern aspects on the left bank of river Kunhar and right bank of river Jhelum in AJK. Total Area is about 100 Acres.

Expanding landslides at powerhouse site Lower Chatter Alda)

3. Forest Types (Ecological Zonation)

The Patrind project area lies in the Sub-tropical ecological zone of the country. This zone is again classified in:

a) Subtropical Scrub forest with broad leave tree species in the foot hills and

b) Subtropical Chir pine Forest with a major tree species of Chir Pine.

4. Vegetative Cover

Project site vegetation does not contain any species listed as endangered or threatened by the Government of Pakistan or IUCN. Only two species *Celtisaustarlus* (Batculd) and *Ficuscarica* (Enjeer) were found rare in Pakistan but they are listed as common for the rest of the world. The presence of these two species will not be disturbed as they were found above the submerged area and away from the area where trees needed to be felled down. The rest of the vegetation species were found protected and common in Pakistan and for the rest of the world. So it is concluded that there will be no negative impacts of Patrind Hydropower Project on conservation status of the endangered or rare vegetation species of the area.

Following Tree species were documented in the project area both in Patrind and in Alda:

Common Name	Botanical Name	Type of Tree	Status
Akhrot (Wallnut)	*Juglansregia*	fruit	common
Anjeer	*Ficuscarica*	fruit	rare
Batang	*Pyruspatia*	fruit	common
Batculd	*Celtisaustralis*	soil binder	rare
Beence	*salixspp*	firewood	common
Ber	*Zizyphusmauritiana*	fruit	common
Chir	*Pinusroxburglii*	timber	common
Dhaman	*Grewiaoppositifolia*	fodder	common

Drawa	*Ailianthus anus*	firewood	common
Drek	*Meliaazadrach*	firewood	common
Kangarr	*Pistaciakhunjak*	soil binder	rare
Kau	*Olea cuspidate*	agri tools,	common
Kiker	*Acacia nilotica*	firewood	common
Nim	*Azadirachataindica*	firewood	common
Phagwarr	*FicusPalmata*	soil binder	common
phulai	*Acacia modesta*	firewood	common
Pipal	*Ficusreligiosa*	firewood	common
Robinia	*Robiniapseudoacacia*	firewood	common
Shahtoot	*Morusalba*	fruit	common
Sherol	*Alnusnitida*	firewood	common
Snatha	*Dodonaeaviscosa*	soil binder	common
Talli (shisham)	*Dalbergiasisso*	furniture wood	common

The main contributor grass species were *Heteropogoncontortus* (Sariala), *Cenchrusciliaris* (Dhaman), *Desmostachyabipinnata* (Dab ghaas), and *Cynodondactylon* (Khabbal).

Comparatively low vegetation cover was recorded in the flat area and highest from steep slope areas (74.29%) followed by gentle slope and gully bed areas. Chir pine is the dominant species on powerhouse site while broad leaved species are mostly found on the Patrind inlet site.

Chir pine trees on the powerhouse site and land deterioration can be seen

5. Outcome of study and possible Impacts of the project on vegetative cover

Every study after three months shows a great devastating impact on the surrounding areas of the working sites both in Patrind and in Alda.

The slide area around Alda has expanded with much accelerated speed and it has affected the power house area by new landslide due to which the administration of the project had to change the site of the outlet of the tunnel. Another small slide has appeared at Lohar gali down the road which susceptible to grow in the near future and become another big hazard causing the road to come in the slide. This may become an irrecoverable loss if not addressed during December 2015 to February 2016 (proper planting season). The threats of landslide development have been reported in the previous studies but unfortunately, the recommendations of the reports have been ignored altogether. This has now proven that engineering structures alone cannot control the slides and again this will require a huge amount of funds for engineering structures. Treating with short creating instead of treating it with plantation and bio engineering will not be a permanent solution to it. The project is mostly looked after by the Engineers and to them, it is the easiest and permanent solution for treating the slides. The loss of biomass quantum is not as significant to them as there has been already a low vegetative cover in these areas.

The look of the area shows a picture of denuded mountains and such bad looking area is also expanding with every small shower of rain.

Some more trees have been observed fallen on the site with several more leaning towards one side. They will also fall down in the near future. No replacement plan of trees has been shown to make the area green.

Some broadleaved trees were observed dried up most probably due to ground water shortage which is a definite impact of the project. Project site vegetation does not contain any species listed as endangered or threatened by the Government of Pakistan or IUCN. Only two species Celtisaustarlus (Butculd) and Ficuscarica (Enjeer) were found rare in Pakistan but they are listed as common for the rest of the world. The presence of these two species will not be disturbed as they were found above the submerged area and away from the area where trees needed to be felled down. The rest of the vegetation species were found protected and common in Pakistan and for the rest of the world. So it is concluded that there will be no negative impacts of Patrind Hydropower Project on conservation status of the vegetation of the area on larger scale except to a limited extent for which suggestions have been given below.

The present status of vegetation on Patrind side does not depend upon the water of river Kunhar but it depends on natural precipitation or water channels taken out of the side nallahs or natural springs and underground water. So reduction in water regime downstream will not affect the vegetation of the area. However the change of water ducts due to tunneling in the area will have an adverse effect on the vegetative cove at the top and sides of the hill having that tunnel underneath. The average biomass for forage that will be submerged under water after the construction of weir was calculated as 3,468 Kg/ha. The total biomass to be inundated is estimated to about 200 tons. (*farmer Study Report for Patrind project*)

The area affected on the weir site due to inundation is 57.2 ha and on the powerhouse site is 5.5 ha which will come under construction

6. Recommendations

Since the area close to the tunnel and inlet and outlet of the tunnel where working concentration is high, the impact on the vegetation and water courses will have negative impact. The lake will submerge some of the vegetation due to rise in water level. Similarly downstream the water area will reduce so new species may appear along the banks of the river course. There is a need to compensate this loss by some possible means listed below:

1. It is highly recommended to plant the slide area with Eucalyptus and bamboo tree species to reduce the water pressure on the land slide.
2. Tree species of alternate requirement of water and soil should be planted in these area like shrole, salix be replaced by robinia, walnut, wild fig.
3. Water springs affected by the construction of tunnel may have impact on the life of the dependent community so; water from alternate sources should be made available to these spring dependent communities.
4. Responsible authorities should develop minimum standards for the protection of the environment and human rights that are binding on all countries and companies, based on the highest existing standards, and with effective monitoring and sanctions imposed on the offending parties

5. There exists voluntary guidelines, developed under the Convention of Biological Diversity, for the conduct of cultural, environmental and social impact assessments regarding developments proposed to take place on, or which are likely to impact on sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities. These guidelines should be made binding on the Powerhouse Construction Company rather than voluntary and could be adopted as a minimum standard by international financial institutions and national governments when implementing development projects like this, affecting indigenous peoples.
6. In the case of Patrind power project, where the local people have already suffered and will continue to suffer by enormous damage to their lands and environment due to the long-term impacts of mining and dams. Proper and immediate compensation and reparation should be provided to all affected people to include adequate monetary compensation, sustainable livelihood, alternative land, employment and other sources of regular income. A program for the restoration and rehabilitation of land and water destroyed by mines and dams should also be implemented. Although no monetary compensation nor livelihood project could replace or surpass the destroyed ancestral land and traditional livelihoods of affected indigenous peoples. The solution to restoring the living quality and to stop the permanent destruction of the environment is to cover up the area with plants and make it green and good looking.
7. National legislation and policy on the liberalization of mining and the energy industry need to be reviewed and revised as these have proven detrimental to the local people in different parts of the country. A new mining policy should support the people's efforts towards nationalist industrialization and ensure the creation of jobs, food security, a stable economy, mitigation of environmental degradation, and environmental
8. Areas of high working concentration (in-let and outlet of the tunnel) are facing the problem of soil erosion and these have been treated by concreting. It was suggested in the first study to initiate the Bio-engineering technology to control these slides effectively which include vegetated soft gabions, vegetated loose stone walls, gabion check dams, live brush wood check dams, planting, sowing and tufting, dry seeding, hydro seeding, hay seeding, grass sodding, sowing with geo- textile sheets, brush wattles, brush layering, hedge layering, semi-dead fences with live hedges. Total engineering treatment has caused a loss for growing vegetative cover. This will also contribute in the process of global warming and environmental degradation which is

not acceptable globally. This adverse effect should be compensated by treating the adjacent slides with Bio-engineering measures which will not only treat the soil but will also improve the environmental status. The months of November 2015 to February 2016 are very crucial to address the issue of landslide control by Bio-engineering works. If this period is lost, a big irrecoverable hazard may occur in the project area.

9. Another small slide has appeared at Lohar gali adjacent to the existing big slide. This slide needs to be stabilized without any delay otherwise this will also create a big havoc.
10. Slides inside the project area and adjacent to it are expanding with an alarming speed. These slides have accelerated due to mining in the tunnel. The mountains are very fragile and cannot bear the thrill of mining activity. Once they are destabilized, then there is no end to it. Immediate attention is required by the project to control and stabilize these slides as recommended above.

Annex-12

Updated Traffic Management Plan

TRAFFIC MANAGEMENT PLAN LAYOUT POWER HOUSE SITE

DAEWOO E&C

LEGENDS:

- Parking area
- No Parking.
- Access road for L.V.
- Access road for H.V. Only .
- Flag Man/Signal Man/ Banks Man
- Pedestrian walkway

TRAFFIC MANAGEMENT PLAN LAYOUT WEIR SITE

LEGENDS:

- Parking area
- No Parking.
- Site Access road for LTV and HTV

Annex-13

Implementation Plan of Social Uplift Plan

SR.	PROPOSED ACTIVITY	STATUS
1.	BRIDGE ACROSS JHELUM RIVER	✓ The bridge has been connected on September 1st 2012 from Lower Chatter Muzaffarabad to Alda village on the right bank of Jhelum river. Now, vehicular traffic access is available for the locals to across the river.
2.	CONNECTS SARATI VILLAGE (KP) TO PATRIND VILLAGES (AJK)	✓ Cofferdam is being used temporary access bridge and after the completion of the construction there will be a permanent bridge on the weir deck which will be used by the locals to cross the Kunhar river between both the sides
3.	IMPROVEMENT OF EXISTING ROAD	✓ The road from Supreme Court to Children Park will be improved and upgraded where possible. Recently damaged portion was rehabilitated spending huge cost.
4.	CONSTRUCTION OF NEW ROAD	✓ New road will be constructed beyond the Children Park located in Lower chatter to the location of the Access Bridge for Powerhouse. The road will be available for physical use by the locals. ✓ At present unpaved has been constructed for construction activities which will be improved after construction phase ✓ Project access road has recently been reconstructed by Muzaffarabad City Development project
5.	IMPROVEMENT OF THE SITES	✓ After construction phase
6.	MEDICAL TREATMENT FOR LOCAL RESIDENTS	✓ HSE Clinic and ambulances are available in case of any emergency on both sites ✓ A doctor and male nurses are placed in HSE office and local people can visit to get emergency treatment.
7.	LOCAL EMPLOYMENT	✓ Unskilled jobs have been provided to local residents whereas preference has been given to locals for technical positions but subject to availability.

SR.	PROPOSED ACTIVITY	STATUS
8.	SCHOOL SUPPORT	✓ School located at Sarati village (Deedal) has partially been completed by EPCC
9.	IMPROVEMENT OF WATER SUPPLY	✓ Water pipe line had been developed from existing water tank to Sarati village (GI Pipe : D50mm, L230m) ✓ The well has been developed at Batching Plant area during construction period and it will be transferred to local residents. ✓ Another well near camp office lower site is developed and is operational. It will be transferred to the local communities as well.
10.	IMPROVEMENT OF AREA AFTER COMPLETION OF CONSTRUCTION	✓ Project area used for stocks, temporary buildings, equipment storage and other various activities will be changed to the park, playground etc. after construction work.
11.	EMBANKNET PROTECTION	✓ From the Access Bridge area along the riverside, slope protection and embankment has been reconstructed for avoidance erosion of river bank and inundation of Lower Chatter during flood season.

Annex-14

SOCIAL ISSUES COMPLAINT REGISTER, 2015

LOG NO.	Complain Date	Name (Complaint Person) & Job Title	Description	Location	Status	Correction Date		Correction Verified	
						Req'd	Act.	EPCC	OE
1	**13-Aug-15**	Syed Iqtadar Hussain Kazmi (Electracian) (KungDong)	During Lender's Visit, the subject complaint against the Sub-Contractor about appointment agreement. According to his complain, he is been working since 2012 to date. But still he didn't receive any written agreement from the company. OE had taken action for follow-up. The signed dated 1-12-2012 written agreement has got from Sub-Con. OE has been discussed and share the same complain with EPCC HSE Manager and requested to EPCC for further necessary action should be taken.	Powerhouse	Close	**17-Aug-15**	**21-Aug-15**	YES	YES
2	**13-Aug-15**	Mohsin (Surveyor Helper) (KungDong)	A Complain has been reported by the Survey Helper (Mr. Mohsin) was working with Sub- Con. He told, he was terminated by the Korean Site Engineer without any prior warning (Verbal/Written). OE has been discussed and share the same complain with EPCC HSE Manager and requested to EPCC for further necessary action should be taken.	Powerhouse	Close	**17-Aug-15**	**24-Aug-15**	YES	YES
3	**14-Sep-15**	Latif Qazi (Worker EPCC)	An accident was occurred at 12/04/2015 location surge shaft. Fracture got on his right leg and EPCC arranged his medical treatment. After three months Mr. Latif Qazi complaint against EPCC about compensation and job resume on job. Complaint was reported and informed to EPCC for necessary corrective action.	Powerhouse	Close	**15-Sep-15**	**28-Sep-15**	YES	YES
4	**26-Sep-15**	Community Thuri Village	A complaint has been reported from local community of Thuri villagers regarding domestic waste removal. The concern was discussed with EPCC Environmental officer.	Powerhouse	Closed	**26-Sep-15**	**28-Sep-15**	YES	YES

Annex-15

Mission Notes Lenders' Visit, August 2015

September 3, 2015

PAK Patrind Hydropower Project
Lenders' (ADB, IFC, KEXIM) Joint Environment and Social Review Mission, 11-14 August 2014
Findings and Actions Required

Issue	Mission Findings	Actions Required	Completion Date
A. Land acquisition and resettlement	1. LARP Implementation Status a. Additional Commissioner (AC), KP and DC, AJK did not receive any grievances or complaints regarding compensation rates for land. No major complaints. SHPL clarified that there is no state land which will not be utilized. No surplus land. There are still some outstanding compensation payments which should be paid by the AJK government to private individuals. SHPL says Alda village requested for an additional 10% compensation as this was done for other projects. 10% additional compensation based on other project is not an eligible grievance as SPL paid much more than previous project. b. Land owner in KP fears that 5 kanals of his land may come under water. d. 9 land cases brought to court of which 5 are ongoing e. Affected communities on KP side (Dalola, Boi, Sarati, Patrind) complain that while land was taken from them, they are not being prioritized for non-technical jobs and small contracts. Only 11% hiring of employees from affected communities by Daewoo and its sub-contractors, evident from employment status presented by Daewoo. SHPL explains that the population of these villagers is	1. SHPL to provide the Lenders an updated 'LARP Implementation Status Report', including but not limited to the following: a. List of people affected by land acquisition in KP and AJK, with details of amount of compensation provided; disturbance allowance paid; job opportunities offered; small contracts awarded; and description of other benefits offered to PAPs and affected communicate at large. b. Details on outstanding payments made by the Government to private individuals/PAPs and reasons for delayed/pending payments. SHPL to provide assistance, as needed, to APs in completing formalities to receive payments particularly affected women. c. Detail survey, based on technical information and data, of the land feared to be submerged in KP area and an assurance that if the land will be affected they will be compensated. d. Details of cases filed against the company in the court of law related to land issues; status of each case; and company's understanding on further proceedings. e. Analysis of income and livelihood information of each affected household including how the compensation amount had been utilized by the PAPs [who has bought replacement land, built a house, started a business, how many got access to project jobs, etc.] and its effectiveness in livelihood restoration.	1. SHPL to provide LARP Implementation Status Report by September 15, 2014

Issue	Mission Findings	Actions Required	Completion Date
	small and efforts were made to provide job opportunities and small contracts awarded to local people especially to those affected by land acquisition.		
	2. Income Restoration Plan has been prepared by Refuge but the target beneficiaries, financing and implementation arrangements are unclear. Women requests to learn skills and may be included in the IRP.	2. Refuge to review the data provided under item 1.e above and identify who should be covered by the IRP and the cost, schedule and arrangements to implement such plan.	2. Updated IRP from Refuge by September 30, 2015. The updated IRP is expected to be discussed and agreed with SHPL.
B. Social Uplift Plan	Presently implemented by Daewoo – (i) post-project repair of project prior to turnover to community [Daewoo maintains the road and about Rs10milion spent to repair a road damaged by the flood]; (ii) continued implementation of social uplift plan.	SHPL to provide the Lenders an updated Social Uplift Plan (SUP) focusing at post construction scenario and taking ownership of its implementation. The post construction-SUP should serve as the CSR program of the project to be guided by a CSR Policy to be developed by the Company. A dedicated, qualified and experienced liaison/social officer should be appointed by the Company to assist preparation of SUP for operational phase in consultation with affected communities.	Initial report on SUP progress by September 30, 2015. Development of the CSR Policy by January 2016. Final draft of SUP by April 30, 2016
C. Labor and Working Conditions	1. Daewoo considers workers grievances as "blackmail". Meanwhile, agreements (see Attachment 1 and 2) to resolve workers grievances have been made with complainants and this has been witnessed by AC in KP and DC in AJK. However, there is limited or no progress in implementing such agreements. Workers interviewed say that "SHPL and PES turn a deaf ear and misleads lenders." DC, KP cautioned SHPL that it is losing credibility in KP side.	1. Daewoo to prepare and submit to lenders a progress report on implementing these agreements and an action plan to ensure that Daewoo and Sungbo, Kyungdong and all its subcontractors are complying with these agreements. SHPL and Daewoo to regularly update ACs and DCs who are dealing with the workers and community issues	Progress report by September 15, 2015
	2. Various violations of labor law have been cited. • *Freedom of Association* – A workers union (Employees Action Committee) is being formed in AJK side. Another workers union was registered in KP side which EPCC deemed is illegal because SHPL is	2. SHPL to ensure that the Company itself, Daewoo, Kyungdong, Sungbo and all other subcontractors are complying with legislative framework provided by national labor laws, international labor standards (ILO conventions/declaration ratified by GoP)IFC PS2, prior to Dec 2015 disbursement, by undertaking following actions	Report on Findings and Corrective Actions by September 30, 2015

Issue	Mission Findings	Actions Required	Completion Date
	registered in AJK side. Labor Director, KP and ACKP confirm that these are legally registered unions in KP because workers are from KP and they are working in KP regardless that Daewoo and SHPL offices are in Muzzafarabad. If the KP union requests the KP labor office to inspect the KP side construction site and find labor violations, the Company can be summoned from anywhere in Pakistan. • *Questionable terminations* - Workers allege that their freedom to organize is being suppressed and their leaders are being targeted. Workers who have formed unions and went on strike are being terminated. On KP side, Chairman and Vice Chairman of the union have been terminated from their jobs and have filed a case in court. On AJK side, about 300 workers went on strike on 1 May 2015. Mission was shown a copy of a warning letters issued to a worker for sending a notification of strike. A 2nd warning letter was also issued the following day without enough time for the worker to submit a report/explanation and final warning was issued on third day. Warning letter issued consecutively is against labor law as per KP Labor Director and AC and DC, AJK. *[60 Sungbo Workers were terminated because they took leave for 10-15 days without prior information to their supervisors.] 4 cases of illegal terminations and 3 on labor issues are in the court* • *Local workers had a strong sense of insecurity about their jobs, they alleged that termination rate of local workers is very high as administration is hiring non-local workers and most of them stay nonunionized.* • *Contracts* – Only engineers of main EPCC have written contracts, the rest do not(e.g. Sungbo has contracts with 5-7 workers/employees out of 550). Sub-Contractors do not havewritten contracts with any employee. Contracts also haveclauses preventing	and sharing finding and corrective actions with the Lenders: ***a) Contract Review:*** (i) SHPL, main EPC Contractor and Sub-contractors will get all the Agreement/Contracts (made with employees and contractors and/or subcontractors Kyungdong, Sungbo, Watchman. Guards and Guides, Kashmir Security, CNEEC, etc) reviewed by legal experts, Labor Department of KP and AJK on contract clauses and align these with the local Labour Laws and lenders policies. (ii) Sungbo will sign contracts with all of the already hired workers by 21 August 2015. If this deadline cannot be met, the reason for delay and the new deadline and has to be communicated and agreed with workers; (iii) Kyungdong and other subcontractors to sign contracts with their workers as soon as possible. ***b) Worker's Wages and benefits Review:*** (i) SHPL, main EPC Contractor and Sub-contractors will review their salary structure for compliance with the local government minimum wages notification for their employees and sub-contractors' workers, including the security companies.Each will prepare a 'Wages Status Report' comparing previous 2-3 years of data with the current rates.Each will also compare benefits received by workers, including the security companies with national legal requirements and identify gaps. (ii) Minimum Wage – by 31 August 2015, Daewoo, Kyungdong, Sungbo, 3 security companies such as Watchman, Guards and Guides, Kashmir Security and all other subcontractors and service providers should ensure payment of minimum official wage rate and competitive rates to semi and skilled labour by	

Issue	Mission Findings	Actions Required	Completion Date
	workers from initiating or participating in strike which are against labor law. Except for daily labor, labor law requires that all workers who have passed probation should have contracts. • *Minimum wage* – SHPL confirms that they find Sungbo has not paid the minimum wage but the latter has promised to do so.Salaries to semi-skilled and skilled labor are at the rate of minimum wage rate by Daewoo and its sub-contractors, which is fixed for daily wage labor only as per labor law. • No provision of salary slips to all workers by Daewoo and subcontractors *Respect for religious practices and respect for workers*- During Ramadan in 2014, workers went on a 4 day strike. In June 2015, 20 people were terminated because they had to go for prayers during Ramadan. Korean managers and supervisors are disrespectful to local people (cursing, shouting and name calling).*Working Hoursand Holidays*– law requires only 8hours excluding one hour lunch/prayer break and 2.5 hrsovertime is voluntary. Workers alleged that 2 to 4 hours overtime is mandatory and if not rendered they are terminated. Long work hours twice a month when change of shifts,18 hours. Labor asked to work on gazetted holidays at double wage rates while workers, interviewed by mission, desire to opt holidays. • No insurance of workers, as per Article 38 (C) Constitution of Pakistan for compulsory social insurance, done by Sungbo and other subcontractors, and not in all cases by Daewoo.	adjusting salaries and retroactively pay from 1 July 2015 (iii) Registration of all employees with Old Age Benefit Institution by Daewoo and all subcontractors. (iv) Registration of all employees/workers with EOBI by Daewoo and all subcontractors, and also include a clause on it in employees/workers contracts. (v) Provision of salary slips to all workers with support to provide answers to queries of illiterate workers. (vi) And adjustment of daily working hrs and provision of overtime accordingly, particularly on change of shift, and adjust gazatted holidays plan as per law. *c)* ***Hiring Protocol Review:*** SHPL to review the prevailing hiring procedures of the Contractor and Sub-Contractors and ensure that a transparent and clear policy and procedure for hiring of workers and procurement of services and goods are placed in their respective HR manual and communicated to PAPs and nearby communities. The employment procedure shall include a procedure for communication of job availability to the PAPs, local community and community at large. SHPL, through its OE, shall ensure implementation of the Employment/Procurement Procedure by the Contractor and Sub-Contractors. SHPL, Daewoo and subcontractors/service providers to give preference to affected communities in all types of employment including daily, semi-skilled, skilled and non-technical jobs. SHPL to engage by 15 September 2015, a qualified external labor expert to undertake a labor audit and completed by 15 Oct 2015..TOR of the audit shall be developed in consultation with the Lenders'.	

Issue	Mission Findings	Actions Required	Completion Date
	3. Lack of HR Policy and HR personnel – Daewoo and its subcontractors do not have an HR policy and HR personnel as required by law.	***HR Policy Review:***(i) SHPL, Daewoo, Sungbo, Kyundong and all other sub-contractors need to respect human, work place, freedom of association, advocacy and collective bargaining rights of workers and accept legitimacy of registered labor unions, and provide necessary logistics support to enable them to perform their legal and advocacy functions. SPHL will review its HR Policy and Procedure and that of its Contractor and key sub-Contractors' for compliance with PS2 and Labor Laws. (ii) Hiring of HR Personnel by Daewoo and its subcontractors. (iii) SHPL, all main and sub-contractors to build capacity of its labor administrative staff, to ensure efficient labor administration, by strengthening knowledge base of national labor laws, international labor standards (ILO Conventions/Declaration) and IFC PS2, skills in conducting social dialogue and negotiations, bargaining techniques, preventing and settling grievances/disputes.	Audit Findings by October 25, 2015
	3. Unresolved grievances is a reputational risk to SHPL and Lenders in communities and other institutional stakeholders	3. SHPL to engage by 15 September 2015, a qualified external labor expert to undertake a labor audit and completed by 15 Oct 2015.. TOR of the audit shall be developed in consultation with the Lenders'.	
	4. PES does not monitor labor and working conditions while this is a requirement in IFC PS2.	4. PES to appoint dedicated staff for monitoring of labor compliance for actions in item 1, 2, 3 & 4 and corresponding corrective and follow up actions . SHPL to revise the job description of the PES to include the monitoring of the contractor and subcontractors' HR performance on regular basis.	August 30, 2015

Issue	Mission Findings	Actions Required	Completion Date
D. Project Supervision	1. SHPL has limited presence at site and relying fully on its Owner's Engineer, PES.	1. PES should also include social aspects of the projects in its quarterly monitoring reports including but not limited to: (i) review of GM implementation by the Contractor and Sub-Contractors; (ii) update on all of the so far in-log grievances redress status; (iii) review of the staffing needs for social coordination, performance evaluation of social coordinators and effectiveness of measures planned and executed under social support context.	Reporting on social aspects to be included from next quarterly report
	2. PES recognizes the need to monitor and report on social matters including labor and working conditions, securing freedom of association and collective bargaining rights of workers, compliance of national labor laws and IFC/international standards, formalize the grievance management, grievance log and actions taken.	2. During construction phase, SHPL to require PES to appoint a qualified and experienced social officer to undertake the above monitoring activities.	PES to appointment Social Officer by September 15, 2015
	3. K-Water will undertake O&M phase planning.	3. For O&M phase, K-Water will prepare a staffing plan and appoint a qualified and experienced social officer to implement the CSR policy and programs.	K-Water to submit its Staffing Plan for O&M phase 3 months prior to mobilization.
E. Stakeholder Engagement	1. Inadequate dissemination of job opportunities and lack of public awareness of employees "hiring procedure".	1. SHPL to ensure access to information by communities and use of localized means to disseminate information i.e. Job opportunities advertisements/ posters to be posted in community centers based on consultations with the community. [Note: ADB mission in 2014 previously discussed with the EPC and SHPL agreed to enhance their information dissemination activities on available jobs by posting vacancies/ flyers/posters in public places where people frequently pass by or visit such market places, shops, and village halls/meeting places. These advertisement will clearly indicate the qualifications and experience required and a clear job description for each position.	Immediately. As soon as job vacancies are known and recruitment process starts.

Issue	Mission Findings	Actions Required	Completion Date
	2. No regular consultations and information dissemination on E&S matters with communities. Daewoo has a Community Relations Policy and has 2 community coordinators (AJK, KPK) which takes grievances and concerns from communities to Daewoo. 1 local coordinator terminated on his active participation in union activities and has a case in court.	2. SHPL and PES to ensure improve gender inclusive community engagement under social monitoring and review of the Contractor and Sub-contractors' activities. PES to appoint dedicated social staff and expand its engagement with the entire communities particularly affected ones. to. [Note: During the 2014 ADB mission, it was discussed SHPL and EPC contractors to explore and devise culturally appropriate and acceptable ways (for instance engaging female staff or consultant) of conducting dialogues and consultations with women, youth, and other vulnerable groups to help spread correct and updated information as well as listen and address the concerns and suggestions they raise. SHPL and EPC to conduct regular and adequate documentation of meetings with APs, communities, and NGOs/CSOs (i.e. noting the date/ participants/venue, agenda/ topics discussed, concerns/issues raised, agreements reached, and actions required).	
	3. Daewoo is more involved and conducts regular meetings with various government offices, DCs, ACs. SHPL needs to continue interacting with various government agencies with local government offices being approached by communities	3. SHPL to have good coordination with local government administration and relevant agencies (AC, DCs, EPA, Labor Department). On a quarterly basis SHPL to follow up with the relevant government units (District Administrations of AJK and KPK) to establish the grievance redress committee (GRC) or discuss with the government on a more feasible GRC composition to enable its establishment.]	SHPL to start the quarterly meetings by September 2015
	4. Demobilization of workers and operations phase recruitment plans	4. SHPL to ensure hassle free transformation from construction to operational phase through measures such as preparation of a plan for construction labor demobilization/retrenchment , policy on O&M phase recruitment plan to ensure providing opportunities for the local communities, etc. SHPL may consider preparing a database of employees having better performance and reputation during construction phase for possible engagement during O&M phase.	Include required information in Staffing Plan for O&M Phase required under 'Project Supervision' above.

Issue	Mission Findings	Actions Required	Completion Date
	5. 2010 Stakeholder Engagement plan may be irrelevant.	4. SHPL, PES, and Daewoo to review the SEP and update to current context specific arrangements.	Revised SEP to be submitted by September 30, 2015
F. Grievance Mechanism	Daewoo has a suggestion box and has established a grievance committee and have started to implement a grievance log. SHPL does not have a comprehensive and functional grievance mechanism.	SHPL to revamp existing workers and communities related project based grievance mechanism to ensure compliance with Lenders PSs and EHS Guidelines including but not limited to the following: a. Implementation of an effective, efficient and a well-coordinated GM at Contractor and Sub-contractors' level (Tier-I). b. Integration of Contractors' Level GM (Tier-I) with Company/Project levels GM (Tier-II), c. Establishment of a Tier-III GM involving the office of the DC to respond and resolve the grievances of PAPs and community at large. d. Define clearly the composition and job description of the grievance committees at all Tiers. e. Establishment of procedures to: i) monitor, through OE, adequate communication of GM to the workers and community, ii) realistically implement by the Contractor/Sub-contractors, and iii) establish, maintain, and update GM database and records showing when, how, who received the grievances, which unit is responsible to address it, actions to address them, and when it was addressed or current status .in built accountability mechanism, regular review of grievance records and modify procedures/practices to minimize grievances. f. Ensure Social Coordinators are appointed by the Contractor at all construction sites and their performance is monitored regularly by OE. g. Ensure that GM is smoothly transform from Construction Phase to Operations Phase.	First draft of GM by September 30, 2015

Issue	Mission Findings	Actions Required	Completion Date
G. EHS issues	The following EHS issues were identified 1. Villagers from Sarati alleged that blasting impacted housing structures and caused cracks. 2. Dust and noise problems in the community – spraying is only done twice a day and sometimes not done regularly. No agreement with owners of housing units of Sarati village that they will be paid Rs500,000 for disturbance. [Confusion may be caused by the fact that originally they were notified that their houses will be acquired. Their houses were denotified as requested by them. Now those chose to stay and experiencing dust and noise problems would like to be compensated.]Also requested for rehabilitation of electricity wire damaged from blasting. 3. Construction site condition have improved compared to the situation in June 2015. Inadequate number of toilets for workers at construction sites e.g. presently Daewoo construction area has 5 portable toilets for 300 plus workers).	SHPL to ensure that following actions are initiated and implemented at the PHHP site by the EPCC and/or OE. A compliance status report on following actions should be sent to Lenders : 1. Monitoring after earthquake of any damage to the community structures being monitored at present for impacts from blasting. 2. Dust issue should be controlled. PES should have dust monitoring stations and not wait for community to complain before sending contractor. Quantitative monitoring of dust, noise and vibration levels at the community vulnerable to the construction activities on regular basis and implementation of the mitigation. Those denotified not eligible for disturbance allowance as they requested to stay there with their own will. Contractor to rehabilitate the electricity wire. 3. Adequacy of sanitation facilities at the construction site should be reviewed and additional facilities added as per international standards for construction sites. 4. Workers' accommodations provided by the Contractor and specially the Sub-contractors should be in compliance with the IFC Workers' Accommodation: Processes and Standards.[2] All camp facilities rooms, toilets and washrooms, kitchen, dining halls, etc. should be inspected and checked for compliance with the standards. Daewoo and subcontractors to specify smoking	First Compliance Status Report to be sent by October 15, 2015. Second Compliance Status Report to be submitted by December 15, 2015.

[2] Available from http://www.ifc.org/wps/wcm/connect/9839db00488557d1bdfcff6a6515bb18/workers_accomodation.pdf?MOD=AJPERES&CACHEID=9839db00488557d1bdfcff6a6515bb18 If there are no specific dimensions given in the IFC, consider using the ILO FactSheet No. 6 on Workers' Housing http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---multi/documents/publication/wcms_116344.pdf

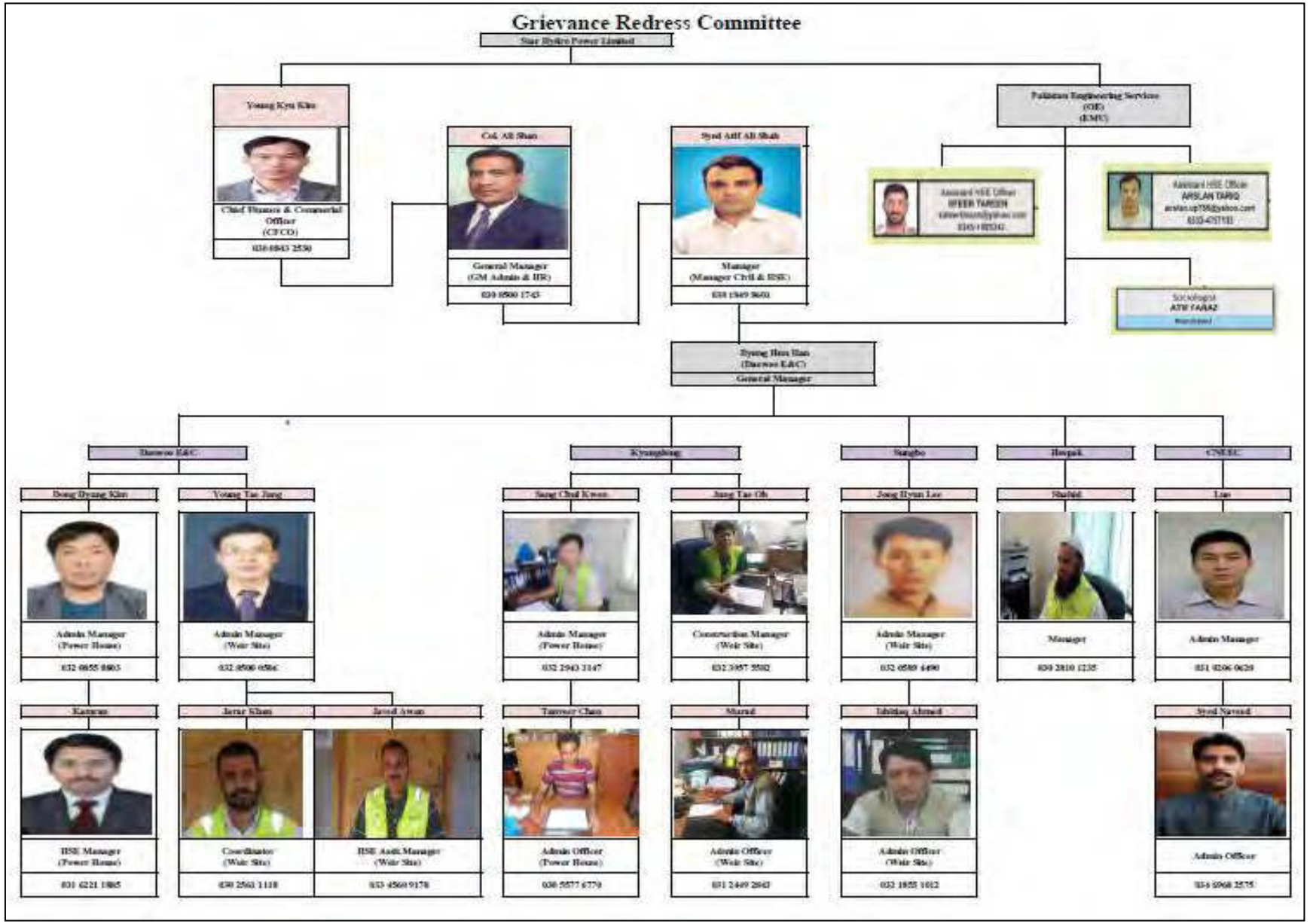
Issue	Mission Findings	Actions Required	Completion Date
	4. Accommodation has slightly improved – previously CNEEC camp condition was very bad. Kyungdong Workers camp accommodation still need improvement – sleeping quarters are congested with 10 to 12 people in one container van, inadequate cleaning of toilets, lack of provision of toilet cleaners/soaps and insufficient ventilation at workers accommodation areas of Daewoo, Sungbo and Kyungdong. Mess hall managed by subcontractor is adequate but the mess hall managed by workers is not – the place is too small and has little ventilation. 5. Community security – inadequate security arrangements at entrance and exit areas – workers use the Patrind village walkway and women feel insecure, the use of their walkway also restricted their mobility and socialization.	areas. Daweoo and all subcontractors' to appoint adequate number of sanitary workers to ensure frequent cleaning of toilets in a day, provision of sufficient quantity of soaps and toilet cleaners to minimize risk to workers health, and improve ventilation. Also raise awareness of workers to observe hygiene practices through display of material and orientation. 5. Resolve security arrangements and women's ,mobility issues in consultation with the community particularly women. Note: REFUGE to include implementation status of the above items in in the next monitoring reports.	
H. Local Procurement Issue	DC-AJK, local communities' and small contractors complained about lack of transparency in awarding subcontracts and lack of preference to local contractors in this regard, alleged that bribes are taken for providing employment by supervisors/foremen and by administration of contractors/subcontractors for awarding of smaller contracts. Protesters from AJK Upper/Lower Chatter area claim that (i) access to sand mining areas restricted; (ii) procurement is not transparent and contracts are either dismissed for no reason and/or awarded to outsiders (HESPAK) with a higher bid compared to local AJK contractors. Villagers allege that maybe outsiders are giving a commission to the	Daewoo and subcontractors to ensure transparency and take adequate actions to prevent bribery (if exist as a result of due diligence) in employment and bidding of smaller subcontracts, and need to give preference to local workers and contractors. Document the grievances, investigate them and the conclusion on the issue documented in the grievance log and explained to the complainant.	

Issue	Mission Findings	Actions Required	Completion Date
	Koreans. SHPL explains that (i) there are no sand mining operators whose access to sand mining areas to the river for was restricted; (ii) the contract awarded to HESPAK is not a simple contract as it involves the construction of the powerhouse. Standards and requirements have not been met by the local contractor		
I. External monitoring by Refuge	Need to strengthen monitoring activities and quality of reports, improve communication and coordination between SHPL and Lenders.	In view of the discussions held during the field visit and based on the 'action required' by the mission, REFUGE would revise their scope of work and engage needed personnel to ensure factual and authentic monitoring of the project activities. REFUGE shall also submit summary of quarterly monitoring findings and recommended actions to SHPL senior management and lenders. Comprehensive reporting on social issues and grievances including labor and working conditions. Refuge to submit Apr-Jun report within a week after the mission with detail of strikes, labor issues, follow up on agreed actions with ACs/DCs and would annex signed agreements. SHPL and EPCC field staff shall ensure proper facilitation during quarterly visits by REFUGE.	Revised Scope of Work and Staffing Plan by September 15, 2015

Under CTA – (i) significant environmental and social events (including significant environmental and social claims, significant non-compliance, incident or accident resulting in death or significant injury) are to be reported within 5 business days of its occurrence, (ii) non-significant environmental and social events to be reported within 8 business days of its occurrence, and (iii) environmental and social claims within 10 business days upon SHPL becoming aware of the same. SHPL to inform Lenders as per CTA.

Annex-16

Grievance Redress Committee


Grievance Redress Committee
Star Hydro Power Limited
Young Kyu Kim
Chief Finance & Commercial Officer (CFCO)
Col Ali Shan
General Manager (GM Admin & HR)
Syed Atif Ali Shah
Manager (Manager Civil & HSE)
Pakistan Engineering Services (OE) (EMP)
Assistant HSE Officer
IFFER TARIEN
Assistant HSE Officer
ARSLAN TARIQ
Sociologist
ATIF FAAIZ
Byung Hun Han
(Daewoo E&C)
General Manager
Daewoo E&C
Kyungdong
Sungbo
Hwapok
CNEEC
Dong Dyung Kim
Admin Manager (Power House)
Young Tae Jung
Admin Manager (Weir Site)
Sung Chul Kwon
Admin Manager (Power House)
Jung Tae Oh
Construction Manager (Weir Site)
Jong Hyun Lee
Admin Manager (Weir Site)
Shahid
Manager
Luo
Admin Manager
Kamran
HSE Manager (Power House)
Jarar Khan
Coordinator (Weir Site)
Javed Awan
HSE Audit Manager (Weir Site)
Tanveer Chan
Admin Officer (Power House)
Murad
Admin Officer (Weir Site)
Ishtiaq Ahmed
Admin Officer (Weir Site)
Syed Nawaid
Admin Officer