

# Environmental and Social Monitoring Report

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Project Number: 43903-014  
Quarterly Report (Jul - Sept 2015)  
September 2015

## Pakistan: Uch-II Power Project

Prepared by Uch-II Power (Private) Limited for the Asian Development Bank.

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**OPERATIONAL PHASE**  
**ENVIRONMENTAL AND SOCIAL MONITORING REPORT**  
**Q3-2015**



A Project/Business Name and Summary Information		
<b>Development of 404 MW Gas Fired Combined Cycle Power Plant by Uch-II Power (Private) Limited</b>		
(i)	<i>Location of project/business</i>	Dera Murad Jamali, Baluchistan, Pakistan
(ii)	<i>Nature</i>	Operation & Maintenance of low BTU gas fired combined cycle power plant.
(iii)	<i>Scale/size</i>	404 MW (ISO Gross Rating) 2 Gas Turbines x 01 Steam Turbine
(iv)	<i>Date of construction/operation commencement</i>	Construction activities commenced in July 2011. Project achieved Commercial Operation Date (COD) on April 4, 2014. after successful completion of Reliability Run Test on April 3, 2014
(v)	<i>Name, designation and signature of person responsible for preparing/reviewing the report</i>	Fida Muhammad Khan, Manager HSE Uch-II / Waseem Ellahi Plant General Manager
B Relevant Environmental Permits or Compliance Certificates		
(i)	<i>Summary of permit conditions &amp; media(s) covered</i>	"No Objection Certificate issued by BEPA"
(ii)	<i>Issue by which government Agency</i>	Baluchistan Environmental Protection Agency (BEPA)
(iii)	<i>Issuance date and duration of validity</i>	December 9, 2010 – BEPA also issued Confirmation of compliance under PEPA Regulation 2000 in April 2014. Copy of BEPA confirmation of compliance attached as Appendix-H.
(iv)	<i>Renewal requirements</i>	None
C Incidents of Violations or Non-Compliance		
(i)	<i>Recorded date and responsible agencies</i>	None in Q3-2015
(ii)	<i>Nature of non-compliance</i>	No reportable incident to authorities recorded during Q3-2015.
(iii)	<i>Violation or non-compliance based on what environmental standards and regulations</i>	N/A
(iv)	<i>Recorded dates and authorities</i>	During Q3-2015, EHS related observations of minor nature recorded during routine site monitoring. Log with corrective actions attached as Appendix A.
(v)	<i>Media or community reactions (if any)</i>	None in Q3-2015
(vi)	<i>Corrective actions, deadlines, identification of responsible parties</i>	Short term corrective actions identified through regular site H&S walks. Please refer to Appendix A.
	<i>(a) short-term: remedial action</i>	Please refer to Appendix A
	<i>(b) long-term: preventative measures</i>	None in Q3-2015
D Incidents of Environmental and Safety Accidents		
(i)	<i>Incident recorded dates and responsible agencies,</i>	None in Q3-2015
(ii)	<i>Scale of damage and injury (if any)</i>	None in Q3-2015
(iii)	<i>Authorities in charge of investigation/recording</i>	Uch-II Management responsible for recording and investigation.
(iv)	<i>Media or community reactions (if any)</i>	None in Q3-2015
(v)	<i>Corrective actions, deadlines, identification of responsible parties</i>	None in Q3-2015
	<i>(a) short-term: remedial action</i>	None in Q3-2015
	<i>(b) long-term: preventative measures</i>	None in Q3-2015
E Labour Relations and Conditions		
(i)	<i>Nature of labour dispute or grievance</i>	None in Q3- 2015
(ii)	<i>Legal requirements, Permit conditions and renewal requirements</i>	None in Q3-2015
(iii)	<i>Authorities in charge of investigation/recording</i>	Uch-II Management responsible for recording and investigation.

**UCH-II POWER PLANT****IPR-GDF-SUEZ**

(iv)	Media or community reactions (if any)	None in Q3-2015	
(v)	Corrective actions, deadlines, identification of responsible parties	N/A	
(vi)	Labour relations and living conditions for construction labour force	Large portion of construction labour camp decommissioned after completion of project phase and major chunk of EPC labour demobilized. Only warranty team is at site residing in dormitories with satisfactory living conditions.	
F	Environmental Capacity		
(i)	Staff capacities in environmental management (as relevant)	Uch-II O&M Environmental Staff Consists of; (i) 01 Manager HSE (ii) 01 Deputy Manager Chemical (Effluent treatment, analysis & Spill Response) (iii) 01 Assistant Manager Chemical (Effluent treatment, analysis & Spill Response) (iv) 01 Assistant Manager HSE (v) 01 HSE Officer (vi) 02 Senior Chemists (Effluent treatment, analysis & Spill Response) (vii) 01 Chemical Assistants (Effluent treatment & Spill Response) • Dedicated total 08 Personnel • Organization structure of Uch-II O&M Environmental team is attached as Appendix-G.	
(ii)	Degree of awareness of: (i) environmental management, (ii) health and safety, (iii) environmental laws and regulations	Project O&M phase H&S Management plan and all other Environmental applicable & relevant Laws and regulations orientation to O&M team on regular basis. Owner (Uch-II) project HSE department continues managing O&M phase. Very well updated on all the relevant HSE laws and regulations.	
(iii)	Training programs carried out	<ul style="list-style-type: none"><li>• Training sessions on Noise Pollution, HSEQ Policy Awareness, Point of Work Risk Assessment, and Hazard Identification &amp; Basic Fire Fighting carried out with O&amp;M and Contractor staff.</li><li>• Pre Job TBTs conducted on regular basis.</li><li>• Weekly Fire drills performed by O&amp;M Team</li></ul>	
(iv)	Needs assessment of environmental management capacity (as relevant)	All positions filled as per O&M staffing plan.	
(v)	Compliance audits carried out	None in Q3-2015	
G	Stakeholder Consultation/CSR Activities		
(i)	Details of consultations, if any, with local communities, nongovernmental organizations, civil society groups, and other stakeholders, including affected people	None has been conducted in Q3-2015	
(ii)	Describe efforts to promote community relations and local development for inhabitants of the project area.	No communities migrated or effected residing in the vicinity of project site due to facility setup. Uch-II is located within UPL boundary where UPL (owner of Uch-II) maintained a comprehensive CSR local community outreach and social development program since last many years. Main community development segments include; (i) Standardized primary education schools (ii) Modernized Emergency care centre (iii) 08 Drinking water treatment plants (iv) Internship and Trainee engineers program (v) Roads construction, calamity relief and free medical camps.	
(iii)	Project procedures for (a) hiring and (b) acquisition of goods and services	UPL prefers hiring human resource from local area at all levels. Local – Balochistan O&M employees ratio 22%	
(iv)	Provide List of grievances and status of grievance resolution	None in Q3-2015.	
H	Issues, Status of Implementation of Mitigating Measures in the Environmental and Social Management Plan and Compliance with Environmental Qualities and Standards (national and international, as relevant) and Environmental and Social Requirements		
	Parameter	Issue	Status
I	Air	None	Gas Turbines Stack emissions monitored through CEMS. Air Emissions data (HRSGs stacks) for quarter under review attached as Appendix-B. Results of ambient air quality are provided in Appendix-B while annual exhaust emission testing of vehicles shall be carried out in November 2015.

2	<i>Water (surface and ground water)</i>	None	Overall compliance with EMP (as applicable against specific parameters) in place. Attached is Appendix C, indicating water consumption data. Waste water generated is treated at water treatment plant and waste water treatment plant before disposal to evaporation pond. Appendix C indicates waste water qualitative and quantitative data for the period under review.
3	<i>Waste generation and management</i>	None	Solid waste managed through onsite land fill for Bio degradable and household waste. Recyclable waste provided to recycling contractor. Solid waste record indicated in Appendix-D for the period under review.
4	<i>Noise and vibration</i>	Plant high noise areas highlighted	Plant noise monitoring data (ambient & occupational noise levels) indicated in Appendix-E. Issue of high noise levels around plant equipment is also explained in Appendix-E.
5	<i>Occupational health and safety</i>	None	Monitoring of Health & Safety Key performance Indicators by Uch-II in place. Well-equipped UPL Site medical center with Medical officer and 02 nurses available 24/7 for medical treatment & emergencies. Annual medical surveillance program for UPL employees in place.
6	<i>Community safety and security</i>	None	Community safety during road travel is ensured through driver's awareness and training program. The non-local staff within the boundary wall of power plant sensitized for taking care of local norms and customs and avoiding unnecessary interaction with local community.
7	<i>CO<sub>2</sub> emissions by the Project</i>		CO <sub>2</sub> emissions data indicated in Appendix-B for the period under review. Methodology for computation of the CO <sub>2</sub> produced by the plant is provided in the Appendix-B)
8	<i>Environmental and Social Management Plan, including IFC E&amp;S Action Plan (September 29, 2010)</i>		Project H&S plan and EMP implementation and monitoring maintained throughout project phase. Attached Appendix-F summarizes the compliance status of mitigation measures for E&S plan for Operational Phase for the period under review. (Ref Table 4-2 of EIA and Table 6-3 of EMP, both tables integrated into Appendix-F to avoid repetition of issues)

## I Summary Assessment of Client Performance and Recommendations

Project Commercial Operation commenced on April 4, 2014 after completion of Reliability Run Test on April 3, 2014. Total Power Generation for the period under review remained 672.16 GWh.

### Areas of concern:

- High noise around some plant equipment.
- Waste water treatment (RO Plant) commissioning in progress by EPC and not yet handed over to O&M. The issue has been taken up with EPC contractor as post COD major rectification items

### Positive Achievements:

There were no employees or contractors Lost Time Incident recorded during the quarter. No environmental incident is reported in the period under review.

Uch-II scheduled outage successfully concluded without any safety incident. Risk Assessments of outage related tasks reviewed prior to start of outage to verify their appropriateness, HSE induction sessions carried out with outage man power and a comprehensive tool box talk delivered to outage staff over site general safety rules.

Post outage housekeeping drive performed together with staff and management. Waste management and housekeeping toolbox talk delivered by HSE manager. Total of 06 groups comprising 5 members each covered 05 different plant areas for this activity.

Firefighting equipment monthly inspections, regular housekeeping activities, fresh eyes observations, point of work risk assessments carried out. No other significant Environmental & Social issues to report.

## Acronyms

BEPA	Balochistan Environmental Protection Agency
CCR	Central Control Room
COD	Commercial Operation Date
CO <sub>2</sub>	Carbon Dioxide
dB	Decibel
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
PEPA	Pakistan Environment Protection Agency
EPC	Engineering Procurement Construction
ESAP	Environment and Social Action Plan
E&S	Environmental and Social
GOB	Government of Balochistan
GOP	Government of Pakistan
GWh	Giga watt hours
HRSG	Heat Recovery Steam Generation
HSD	High Speed Diesel
HSE	Health Safety & Environment
H&S	Health and Safety
m <sup>3</sup>	Cubic Meter
MSDS	Material Safety Data Sheet
MW	Mega Watt
NEQS	National Environment Quality Standards
NOC	No Objection Certificate
OGDCL	Oil and Gas Development Company Limited
O&M	Operation and Maintenance
pH	Hydrogen Ion Concentration
PPE	Personal Protective Equipment
PTW	Permit to Work
RA	Risk Assessment
RO	Reverse Osmosis
SOP	Standard Operating Procedure
SS	Sub Station (Electrical)
ST	Steam Turbine
TBT	Tool Box Talk
Uch-I	Uch Power Station
Uch-II	Uch-II Power (Private) Limited
WHO	World Health Organization

**Appendix-A**      ***Uch-II Site Monitoring Summary Q3-2015***  
***Corrective Actions***

Monitoring Conducted by	Uch-II Staff
Corrective Actions By	Uch-II Maintenance & Operation Departments

<b>S. No</b>	<b>Findings</b>	<b>Corrective Actions</b>	<b>Compliance Status</b> (as of Sep 30, 2015)
01	Bund wall cracks in fuel gas condensate secondary containment needs repair.	Repair work carried out on affected portion.	Completed
02	Wild growth / bushes at the waste water treatment area need to be removed since these are combustible.	Wild growth / bushes removed.	Completed
03	Housekeeping is required near HCL tank area, where sand and some polythene material is lying on ground unattended.	Housekeeping was carried out to clear the area.	Completed
04	Stairs for Chemical Dosing tanks do not have any hand / guard rails alongside and pose falling hazard.	Hand rails installed along with the stairs.	Completed
05	Demin water building doors sealing is required to prevent entry of insects, reptiles etc.	Sealing provided at all the doors.	Completed
06	At Demin plant, HCL tank concrete base is damaged. Need to be repaired with acid resistant bricks lining.	Repair work / tiling work of foundation completed.	Completed
07	Chemical storage room at demin plant has no ventilation provided at the roof.	Exhaust ventilation fan at roof top is provided.	Completed
08	STG flash Tank, trench concrete covers are loose and required to be fixed properly as there is risk of sudden trip.	Trench covers are fixed properly and intact.	Completed
09	Trip slip hazard due to water supply line of wash shower on walk way near chemical lab. Rerouting of supply line required.	Water supply line re-routed.	Completed
10	Outside Uch-II CCR building, a scaffolding structure found unsafe as there were no side braces installed. Scaffolding to be made safe by providing suitable braces.	Braced provided and scaffold re-inspected.	Completed



11	Uch-II Cooling Tower # 1, oil seepage observed from level guage glass assembly. Leakage to be fixed at the earliest.	Area cleaned and leakage rectified.	Completed
12	Uch-II chemical dosing skid, material safety data sheet (MSDS) at ammonia tank is missing.	MSDS pasted on ammonia tank	Completed
13	GT # 2, air intake filter house, JIB crane pendent (Operating box) is trapped in between stair case and railing. Its supply cable is excessively stretched. Pendent is required to be release and positioned properly.	Corrective action taken and pendent is positioned properly.	Completed
14	Deep water caution signage at raw water pond fence is weathered off and need replacement.	New safety signs installed.	Completed
15	Painting work was being performed by DIPL workers without using job specific PPEs (safety goggles and gloves).	Tool box talk / counseling carried out with working party and supervisor ins instructed for strict compliance.	
16	Poor housekeeping / spider webs observed in STG area between condenser and Lube Oil Skid. Condenser Pit also needs cleaning.	Housekeeping performed.	Completed
17	No flashback arrestor was installed in the cutting torch which was being used by the IKAN team for plate cutting activity at Uch-II colony car parking shed area	Flash back arrestor provided and risk assessment of the job reviewed.	Completed
18	Fire hydrant found blocked in mechanical workshop due to material storage in front of fire hydrant. Material should be removed to clear the access of hydrant at earliest.	Material removed and access cleared.	Completed
19	During outage, air intake filters replacement job was in progress at GT-2, some of the removed filters were placed over the stairs platform created access blockage for workers working at top in case of emergency particularly.	Issue addressed to CP and filters removed to maintain free access.	Completed
20	Raised floors at road turning in front of CCR should be painted with fluorescent color for increased visibility in night since it could be a source of tripping.	Raised floor surfaces have been painted with fluorescent color.	Completed



21	During outage, untagged / un-inspected scaffold platform in use for feed water tank access. CP was instructed to get the scaffold platform inspected and tagged before further use	Scaffold inspected and tagged	Completed
22	A contractor worker found at job site at HRSGs area without wearing safety helmet, although safety helmet was available with him.	Contractor worker counseled and communicated him the importance of PPEs.	Completed

**Appendix-B**

Period Q-3 2015

Fuel Type: Low Btu Gas

**GTs Stack Emissions**

Stack Emissions	Units	Average GT-1	Average GT-2	Average Both GTs	Limits
Exhaust Temp.	°C	118.4	116.8	117.6	NEQS
Particulate Matter	mg/Nm <sup>3</sup>	8.53	0.41	4.47	500
SO <sub>2</sub>	mg/Nm <sup>3</sup>	0.48	0.15	0.31	400
SO <sub>2</sub>	Metric ton/d			-	100
NO <sub>x</sub>	mg/Nm <sup>3</sup>	40	39.47	39.73	400
NO <sub>x</sub>	lb/MMBTU			0.07	0.2

**CO<sub>2</sub> Produced**

	Unit	Monthly Average	Total Quantity
CO <sub>2</sub> Produced (including CO <sub>2</sub> in fuel gas)	[Tonnes]	175,569.29	526,707.88
CO <sub>2</sub> Produced (excluding CO <sub>2</sub> in fuel gas)	[Tonnes]	98560.4	295,681.25

CO<sub>2</sub> Calculation Methodology

- 1.0 Monthly average Natural Gas quality data is obtained from Gas chromatograph indicating Natural gas constituents in %age.
- 2.0 Mole fraction of constituents is calculated and CO<sub>2</sub> weight is obtained.
- 3.0 The monthly gas consumption data is obtained from flow computers available at gas station in MMBTU.

Typical monthly computation data is as follows;

Data from Gas Chromatograph		
Gas Constituents		Moles %
Carbon Dioxide	CO <sub>2</sub>	36.00976667
Nitrogen	N <sub>2</sub>	20.44097333
Methane	CH <sub>4</sub>	41.68367
Ethane	C <sub>2</sub> H <sub>6</sub>	1.11432
Propane	C <sub>3</sub> H <sub>8</sub>	0.41803
I-Butane	C <sub>4</sub> H <sub>10</sub>	0.11367
N-Butane	C <sub>4</sub> H <sub>10</sub>	0.121
I-Pentane	C <sub>5</sub> H <sub>12</sub>	0.03967
N-Pentane	C <sub>5</sub> H <sub>12</sub>	0.0300
Hexane	C <sub>6</sub> H <sub>14</sub>	0.0200
Molar Total	----	100.0

Manual Calculations					
Molecular weight	Fraction of Gas Mole	Wt	Moles of CO <sub>2</sub> Generated	Wt of CO <sub>2</sub>	
44.0098	0.360098	15.847826	44	15.84430	
28.01348	0.204410	5.726228	0	0.00000	
16.04276	0.416837	6.687211	44	18.34081	
30.06964	0.011143	0.335072	88	0.98060	
44.09652	0.004180	0.184338	132	0.55180	
58.1234	0.001137	0.066069	176	0.20006	
58.1234	0.001210	0.070329	176	0.21296	
72.15028	0.000397	0.028620	220	0.08727	
72.15028	0.000300	0.021645	220	0.06600	
86.17716	0.000200	0.017235	264	0.05280	
	0.9999	28.984573		36.3366	Incl CO <sub>2</sub> in gas
				20.4923	Excl CO <sub>2</sub> in gas

## Heating values

Constituents	HHV (dry) MJ/kg	LHV (dry) MJ/kg	HHV (dry)	LHV (dry)
Carbon Dioxide	0	0	0	0
Nitrogen	0	0	0	0
Methane	55.4850	49.9995	371.0400	334.3574
Ethane	51.8645	47.4742	17.3783	15.9073
Propane	50.3414	46.3418	9.2798	8.5426
Isobutane	49.5135	45.7279	3.2713	3.0212
N-Butane	49.5135	45.7279	3.4823	3.2160
Isopentane	48.9996	45.3419	1.4024	1.2977
N-Pentane	48.9996	45.3419	1.0606	0.9814
Hexanes	48.6694	45.0907	0.8388	0.7772

407.7535 368.1007 MJ/mole of gas  
 MJ/kg MJ/kg  
 14.06795 12.69988

For calculating CO<sub>2</sub> emissions the following formula is:

$$\text{CO}_2 \text{ Tons} = \frac{\text{Gas Consumed MJ} / \text{LCV (MJ/Kg)} \times \text{Total wt of CO}_2}{(\text{Molecular wt of Gas Kg} \times 1000)}$$

Whereas 01 MJ = 1055.056 x MMBTU

If we have consumed Natural Gas = 1,830,729.00 MMBTU than Natural Gas than Total CO<sub>2</sub> Generated including CO<sub>2</sub> in Gas will be 190,667.7481 Tons and 107,528.5354 Tons excluding CO<sub>2</sub> in gas.

## Energy Usage

Parameters	Units	Jul-15	Aug-15	Sep-15
Fuel gas consumed	m <sup>3</sup>	103,903,300.87	112,366,074.66	892,651,88.43
Hours of Operation	Hours	714.21	742.03	602.88

### Ambient Air Quality Data

Parameters	Units	Monitoring Location: Uch Power Station	NEQS Limits
		24 Hours Average Concentration	
CO	mg/m <sup>3</sup>	Below Detectable Limit	5 mg/m <sup>3</sup> (limit for 8 hours)
NO	μg/m <sup>3</sup>	Below Detectable Limit	40 μg/m <sup>3</sup> (limit for 24 hours)
NO <sub>2</sub>	μg/m <sup>3</sup>	Below Detectable Limit	80 μg/m <sup>3</sup> (limit for 24 hours)
SO <sub>2</sub>	μg/m <sup>3</sup>	Below Detectable Limit	120 μg/m <sup>3</sup> (limit for 24 hours)

### Annual Vehicle Exhaust Emissions

FY 2015, Annual vehicle exhaust emission test for Uch-II is planned to be carried out in November 2015.

### Heavy Metals Emissions

Although the requirement of heavy metals emission monitoring is mentioned in Table 7-2 of the EMP and monitoring frequency is defined as annual, however, Continuous Emission Monitoring Systems (CEMS) installed for GTs stack emissions monitoring doesn't have the provision to monitor heavy metals.

Further, the plant is not designed to operate on liquid fuel containing heavy metals or contaminated fuel; therefore, expected emissions from stacks should not contain heavy metals.

However heavy metal emission monitoring will be sourced through 3<sup>rd</sup> party annual environmental testing in Nov-2015.

## Appendix-C

Q3-2015

### Cooling water

Location: Cooling tower discharge point

Parameters	Units	Jul-15	Aug-15	Sep-15	NEQS Limits
Temp	°C	34.67	34	32	40
pH	pH	8.22 - 8.38	8.24 - 8.36	8.28 - 8.40	6 to 10

### Sewage Treatment Plant

Location: Sewage treatment discharge point

Parameters	Units	Jul-15	Aug-15	Sep-15	NEQS Limits
pH	pH	8.23	7.75	8.1	6 to 10
TSS	mg/liter	20	28	28	150
BOD	mg/liter	10	7.7	14	80
COD	mg/liter	40	18	44	150

### Process Water Treatment Plant

Closed Cooling Water (CCW)

Parameters	Units	Jul-15	Aug-15	Sep-15	NEQS Limits
pH	pH	9.65	9.56	9.48	6 to 10
TSS	mg/liter	1	1	1	150
Cl-	mg/liter	< 0.1	<0.1	<0.1	1000
Metals (Fe)	ppb	98	53	122	

Heat Recovery Steam Generator # 1 (HRSG-1)

Parameters	Units	Jul-15	Aug-15	Sep-15	NEQS Limits
pH	pH	9.54 - 9.79	9.40 - 9.79	9.43 - 9.89	6 to 10
TSS	mg/liter	< 1	< 1	< 1	150
Cl-	mg/liter	< 0.1	< 0.1	< 0.1	1000
Metals (Fe)	ppb	8	14	10	

Heat Recovery Steam Generator # 2 (HRSG-2)

Parameters	Units	Jul-15	Aug-15	Sep-15	NEQS Limits
pH	pH	9.48 - 9.78	9.40 - 9.90	9.45 - 9.90	6 to 10
TSS	mg/liter	< 1	< 1	< 1	150
Cl-	mg/liter	< 0.1	< 0.1	< 0.1	1000
Metals (Fe)	ppb	13	11	10	

Discharge Point RO Reject

Parameters	Units	Jul-15	Aug-15	Sep-15	NEQS Limits
pH	pH	RO Plant out of service			
TSS	mg/liter				
Cl-	mg/liter				
Metals (Fe)	ppb				

### Evaporation Pond

Location: Effluent flowing to evaporation pond

Parameters	Units	Jul-15	Aug-15	Sep-15	NEQS Limits
BOD	mg/liter	1.7	0.9	0.7	80

COD	mg/liter	25	16	26	150
Cl-	mg/liter	269	243	268	1000
metals (Fe, Zn)	mg/liter	2.26, 0.1	3.7, 0.03	3.1, 0.11	Fe 8.0 & Zn 5.0
Temp	°C	32	32	31	40
pH	pH	8.14	8.24	8.4	6 to 10
TSS	mg/liter	29	27	17	150
Oil & grease	mg/liter	2.5	1.2	0.8	10

### Surface Drains

Location: Within 100m of turbines, WTP, Workshops /stores, oil water separator discharge

Parameters	Jul-15	Aug-15	Sep-15
Appearance & condition of oil & grease	No water in drains	No water in drains	No water in drains

### Water Usage

Location: Pat Feeder Canal intake point

Water usage (m <sup>3</sup> )	Jul-15	Aug-15	Sep-15
	565,440	565,440	448,033

#### Appendix-D

Q-3 2015

Uch-II Waste Generation Statistics				
Waste Type	Unit	Jul-15	Aug-15	Sep-15
Used oil	Ltr	15	32	150
Metal	Kg	5	6	13
Paper/ Plastic/ Glass	Kg	80	32	41
Wood & Food Waste	Kg	284	375	110
Oil Filters & Oily Rags	Kg	24	16	40
Used Batteries, wet/dry cells	Nos	4	—	6
Old Tyres	Nos	0	0	0



## Appendix-E

Occupational Noise Monitoring		Q3-2015	
S. No	Noise Monitoring Location of Equipment	Guarantee limits	Average Noise Monitoring Results (dB) A
1	East side of pump "A" at Raw Water Pumping Station	85 (dB) A	83.1
2	East side of pump "B" at Raw Water Pumping Station	85 (dB) A	82.8
3	South Side of potable water supply pump "A"	85 (dB) A	75.5
4	South Side of CT Basin Makeup Pump "A"	85 (dB) A	82.2
5	East Side of CT Basin Makeup Pump "B"	85 (dB) A	—
6	West side of DM distillation pump "B"	85 (dB) A	—
7	South side of Hot Well make up pump "B"	85 (dB) A	81
8	East side of Service Water pump "A"	85 (dB) A	86.1
9	North Side of CT at ground level close to cell #02	85 (dB) A	87
10	North Side of CT at ground level close to cell #04	85 (dB) A	88
11	North Side of CT at ground level close to cell #06	85 (dB) A	86
12	South Side of CT at ground level close to cell #08	85 (dB) A	85
13	East Side of Cooling Tower fan motor # 6(10PAB01-AN006)	85 (dB) A	84.2
14	East Side of Cooling Tower fan motor # 8 (10PAB01-AN008)	85 (dB) A	84.5
15	East Side of Fire water pump house with door close & Diesel pump OFF	85 (dB) A	—
16	North Side of Fire water pump house with door close & Diesel pump OFF	85 (dB) A	—
17	West side of HSD Decanting point # 3	85 (dB) A	62.3
18	North Side of HRSG-2 main stack	85 (dB) A	73.5
19	North side of GT -2 Generator	85 (dB) A	78.6
20	South side of GT -2 turbine combustion chamber	85 (dB) A	81.5
21	North side of GT -2 PEECC	85 (dB) A	71
22	South side of boiler feed pump "B" (HRSG-2)	85 (dB) A	90
23	South side of boiler feed pump "A" (HRSG-2)	85 (dB) A	90
24	South side of GT -1 PEECC	85 (dB) A	73.2
25	South side of GT -1 turbine combustion chamber	85 (dB) A	81.8
26	West side of GT -1 Generator	85 (dB) A	79.6
27	South side of GT -1 turbine compartment (shaft) entrance door	85 (dB) A	90
28	North Side of HRSG-1 main stack	85 (dB) A	74.5
29	West side of HRSG-1 at bottom close to HRSG duct entrance	85 (dB) A	83.5
30	West Side of Cooling water pumping station	85 (dB) A	84
31	West Side of CW pump "B" in cooling water pumping station	85 (dB) A	86.5
32	North Side of CW pump "B" in cooling water pumping station	85 (dB) A	86.5
33	West Side of CW pump "C" in cooling water pumping station	85 (dB) A	89
34	North Side of CW pump "C" in cooling water pumping station	85 (dB) A	88.7
35	West Side of Auxiliary CW pump # 1 in cooling water pumping station	85 (dB) A	95
36	East Side of Auxiliary CW pump # 1 in cooling water pumping station	85 (dB) A	91
37	West Side of Auxiliary CW pump # 2 in cooling water pumping station	85 (dB) A	84.5
38	East Side of Auxiliary CW pump # 2 in cooling water pumping station	85 (dB) A	93
39	North Side of CCW pump "B"	85 (dB) A	81
40	North Side of CCW pump "A"	85 (dB) A	79.9
41	North Side of instrument Air Compressor "A"	85 (dB) A	80.1
42	East Side of instrument Air Compressor "B"	85 (dB) A	—
43	North Side of instrument Air Compressor "B"	85 (dB) A	—
44	North Side of Boiler Feed Pump # 1 at HRSG-1 Bottom	85 (dB) A	87.2
45	North Side of Boiler Feed Pump # 2/B at HRSG-1 Bottom	85 (dB) A	86.7
46	East side of Steam Turbine	85 (dB) A	88
47	West side of Oil cooler in lube oil console skid for STG	85 (dB) A	85
48	West side of Steam Turbine	85 (dB) A	85
49	Waste Water Treatment plant near pump station	85 (dB) A	85

50	North Side of workshop	85 (dB) A	54.7
51	West side of HRS-2, duct entrance	85 (dB) A	83
52	South Side of EDG	85 (dB) A	—
53	West Side of EDG	85 (dB) A	—
54	South side of sand filter pump B	85 (dB) A	—
55	South side of sand filter pump A	85 (dB) A	—

***High Noise Around Plant Equipment:***

Higher noise levels pertain to BOP (Balance of Plant) equipment including cooling water pumps and auxiliary cooling water pumps etc. The matter of high noise has already been taken up with EPC Contractor. The high noise levels have not been accepted by owners and Currently the matter is taken up with EPC contractor for demonstrating noise levels acceptable as per contract and National Environmental Quality Standards. The matter is still unresolved and pending with EPC contractor. Mitigation measures like in house awareness and high noise signage posted on all areas. All employees have ear muffs and ear plugs available as basic personal protective equipment.

Ambient Noise Monitoring			<u>Q3-2015</u>
S. No	Noise Monitoring Locations	Guarantee limits	Average Noise Monitoring Results (dB) A
1	Main gate Uch-II	70 (dB) A	52.5
2	Check Post # 3 (at boundary wall)	70 (dB) A	48
3	Check Post # 5 (at boundary wall)	70 (dB) A	46
4	Check Post # 7 (at boundary wall)	70 (dB) A	47.5

## Compliance Status of EMP Control Measures Q3-2015

### Appendix-F

### Uch-II Project

Environmental / Social Impacts	Control & Mitigation Measures	Monitoring Frequency	Responsibility	Compliance Status
<b>Air Emissions</b>	<ul style="list-style-type: none"> <li>- Stack emissions monitoring in place through CEMS (Continues Emission Monitoring System)</li> <li>- Annual third party stack emissions and ambient air quality testing</li> <li>- Monitoring compliance with National Environmental Quality Standards</li> </ul>	<ul style="list-style-type: none"> <li>- Monthly</li> <li>- Annually</li> </ul>	Uch-II O&M team	Complied
<b>Plant Noise</b>	<ul style="list-style-type: none"> <li>- Noisy equipment are placed inside the acoustic enclosure</li> <li>- Availability of silencers at intake and exhaust channels</li> <li>- Plant routine noise monitoring in place</li> <li>- High noise areas are identified and high noise signage displayed to enhance awareness</li> </ul>	Monthly	Uch-II O&M team	Complied
<b>Waste Water</b>	<ul style="list-style-type: none"> <li>- Uch-II is zero liquid discharge facility</li> <li>- Waste streams generated from plant (sanitary waste water, cooling tower blow down, demin regeneration waste water, oily waste water etc.) disposed off into onsite evaporation pond after required treatment</li> <li>- Waste water sampling, analysis and test record being maintained</li> <li>- Compliance monitoring and reporting in place</li> </ul>	Daily	Uch-II O&M team	Complied
<b>Water Sourcing</b>	<ul style="list-style-type: none"> <li>- Fresh surface water sourced from Pat Feeder Canal as per project design and irrigation permits from Government of Balochistan.</li> <li>- Water consumption monitoring on monthly basis</li> <li>- Water conservation – Reuse from waste Reverse osmosis Plant. (waste water plant not yet handed over to O&amp;M by EPC)</li> </ul>	Applicable after RO plant handover	Uch-II O&M team	After RO plant handover
<b>Hazardous Materials</b>	<ul style="list-style-type: none"> <li>- Segregation of hazardous waste</li> <li>- Separate storage area for hazardous wastes</li> <li>- Hazardous waste disposal through waste contractor</li> <li>- Hazardous waste quantification on monthly basis and record being maintained</li> <li>- Regular inspection of storage areas</li> </ul>	Monthly	Uch-II O&M team	Complied
<b>Solid Waste Management</b>	<ul style="list-style-type: none"> <li>- Waste Management Procedure in place</li> <li>- Color coded waste bins available at different plant locations for different waste types</li> <li>- Designated land fill area for disposal of food / kitchen waste</li> <li>- Non Hazardous waste quantification on monthly basis and record being maintained</li> </ul>	Monthly	Uch-II O&M team	Complied

Occupational Health and Safety				
<b>Electrical Hazards</b>	<ul style="list-style-type: none"> <li>- Permit to work / Lock out Tag out procedure in place. All electrical isolations are ensured before performing any activity on energized systems</li> <li>- Access to high voltage areas (electrical substations, 220 KV switchyard, panel rooms etc.) is controlled</li> <li>- Electrical safety signage displayed in respective areas to enhance the risk awareness of staff</li> </ul>	Ongoing on regular basis	Uch-II O&M team	Complied
<b>Confined Space Entry</b>	<ul style="list-style-type: none"> <li>- Identification of all confined spaces at plant</li> <li>- Confined Space entry procedure in place covering all confined space associated risks and control measures</li> <li>- Regular confined space training sessions with staff</li> <li>- Training sessions on Responsibilities of Standby Man</li> </ul>	Ongoing on regular basis	Uch-II O&M team	Complied
<b>Machine Guarding</b>	<ul style="list-style-type: none"> <li>- Moving and rotating parts of plant equipment are properly guarded to eliminate the risk of entanglement and injury</li> <li>- Permit to work / Lock out Tag out procedure in place to ensure the safety of staff working in plant equipment</li> <li>- All kinds of plant and machinery inherent dangers to workers are mitigated through engineering controls and safety devices</li> </ul>	Ongoing on regular basis	Uch-II O&M team	Complied
<b>Eye Head and Foot Protection</b>	<ul style="list-style-type: none"> <li>- Mandatory and Job specific personal protective equipment are provided to all staff and contractors working at plant</li> <li>- A procedure for provision, use &amp; maintenance of PPEs in place</li> <li>- Open toe shoes are not allowed inside the plant area</li> <li>- PPEs awareness signage displayed at prominent locations at plant</li> <li>- Regular monitoring of PPEs compliance</li> <li>- Contractors and visitors safety induction program in place</li> </ul>	Ongoing on regular basis	Uch-II O&M team	Complied
<b>Fire and Explosion Hazards</b>	<ul style="list-style-type: none"> <li>- Portable fire extinguishers are available throughout the plant area and buildings as per design layout and clearly identifiable</li> <li>- Inspection of fire extinguishers on monthly basis</li> <li>- Fire water system composed of fire water storage tanks, fire water pumps, fire water ring main (hydrants, monitors) available as per design and clearly marked</li> <li>- Emergency exits are well marked luminaries</li> <li>- Emergency response plan in place</li> <li>- No smoking policy in place</li> </ul>	Ongoing on regular basis	Uch-II O&M team	Complied
<b>Housekeeping</b>	<ul style="list-style-type: none"> <li>- Regular housekeeping drives program in place</li> <li>- Regular safety walks and housekeeping inspections</li> <li>- Lock out Tag out procedure in place</li> </ul>	Ongoing on regular basis	Uch-II O&M team	Complied

<b>Chemical Exposure</b>	<ul style="list-style-type: none"> <li>- Respirators are made available to staff works in chemical areas</li> <li>Regular inspection of work areas and storage areas to detect any leakages/ spillage</li> <li>- Safe movement of chemicals and fuels</li> <li>- Spill emergency response procedure</li> </ul>	Ongoing on regular basis	Uch-II O&M team	Complied
<b>Noise Levels</b>	<ul style="list-style-type: none"> <li>- Provision of ear defenders (ear muff, ear plugs) to staff</li> <li>- High noise safety signage displayed around noisy equipment to enhance awareness</li> <li>- Awareness session with workers on High Noise Risks and Control Measures</li> </ul>	Ongoing on regular basis	Uch-II O&M team	Complied
<b>Heat Related Stress / Illness</b>	<ul style="list-style-type: none"> <li>- Provision of cooling neck bands to employees, shaded rest areas for workers and cold drinking water facilities during summer season</li> <li>- Rest break system is ensured during works in hot weather</li> <li>- Heat Stress awareness session with staff</li> </ul>	Ongoing on regular basis	Uch-II O&M team	Complied

## Mitigation Measures – Photographs

### Noise Signage at High Noise Equipment and Areas



### Color Coded Waste Bins at different plant location





**Safety Awareness Signage (PPEs, Housekeeping, Chemicals and Electrical Hazards)**





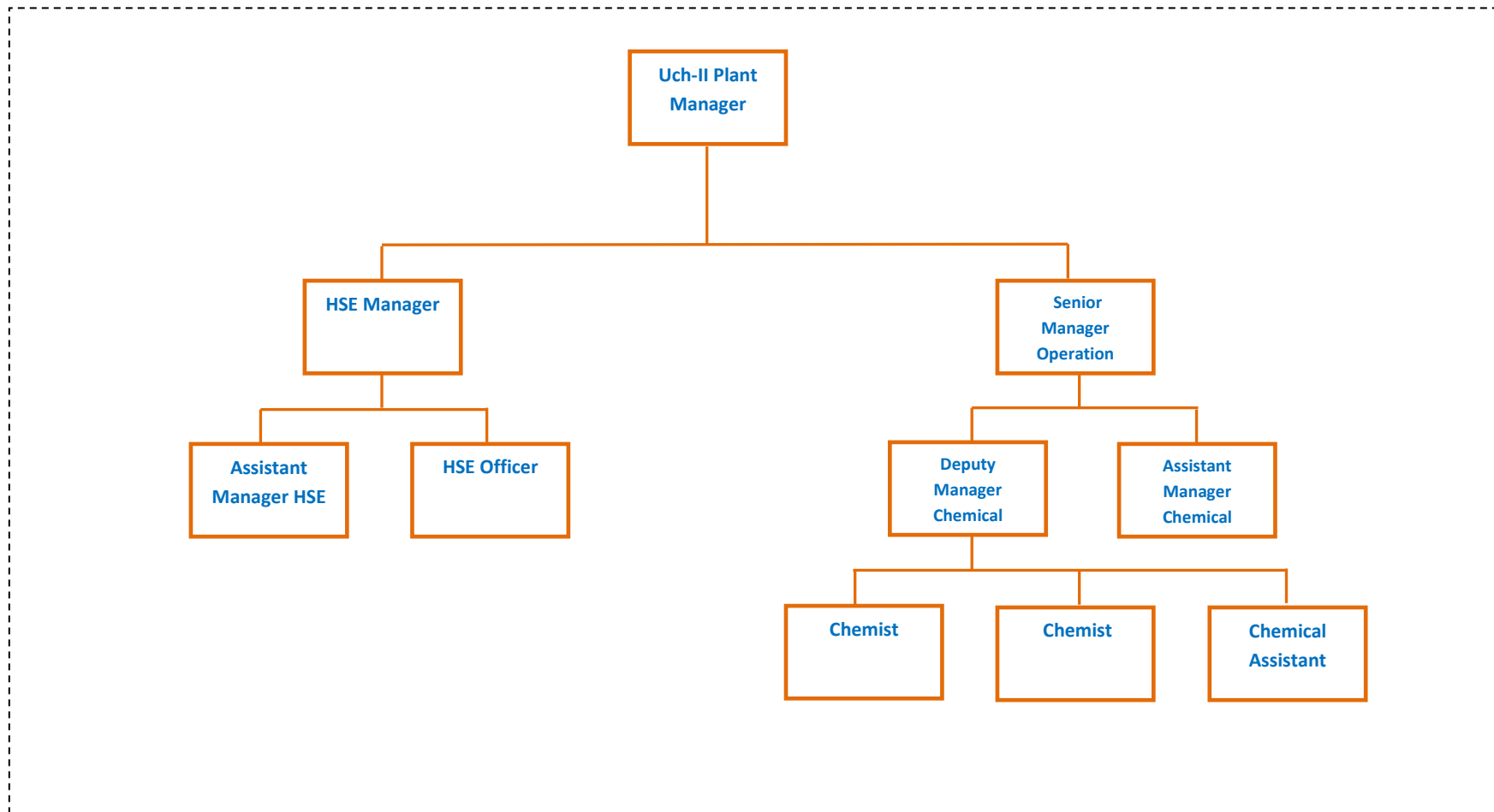
**Fire Equipment at Plant and Emergency Exits**



## Appendix-G

# Uch-II (404 MW – ISO) CCGT Power Project

## Uch-II Environmental Team - Organization Structure



Total Dedicated members	08
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Appendix H

Attention: MR FIDA KHAN SB  
MAS USE  
OFFICE OF THE DIRECTOR GENERAL BALUCHISTAN  
ENVIRONMENTAL PROTECTION AGENCY  
GOVERNMENT OF BALUCHISTAN  
SAMUNGLI ROAD QUETTA



Office: 081-9201840 Fax: 081-9201180 Email: epa\_baluchistan@yahoo.com  
No. DG (EPA)/ 4688 /2014 Dated: 22-04- /2014

To,

Mr. Babar Saeed Khan,  
Construction Manager  
# 48, Khayabar-e-Iqbal, Main Margalla Road  
F-7/2 Islamabad-400 Pakistan  
Tel: - +92512654901-4, Fax: +92512654905

Subject:- Request for Confirmation of Compliance under BEPA  
IEE/EIA Regulation 2000.

With reference to your letter No.2.7.8/BEPA)/Corr dated 18<sup>th</sup> January, 2014 and to convey the approval of this Agency for the commencement of operation and commissioning of Combined Cycle subject to the conditions as already conveyed vide letter No. DG(EPA)/ 6269-72 dated 09-12-2010.

2. Furthermore, under section 14(1) of IEE/EIA Regulations, 2000, the proponent is supposed to submit regular auditing and reporting in order to mitigate and manage the environmental impacts for the life of project.

  
(Naseer Khan Kashani)  
Director General

Master file.

Incoming

Sent To:	PM, BS, FK, RI
Date Received	22-04-14
Mail Reg. No.	98 LA4
File No./Divider Name	
Doc. to be Archived	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Fax <input checked="" type="checkbox"/>	Doc. <input type="checkbox"/> Sealed <input type="checkbox"/>
Forwarded to	
Forwarded from	

Apr. 22 2014 02:27PM P1

FAX NO. : 9202484

FROM : A