

Environmental and Social Monitoring Report

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Annual Report (2015)
December 2015

Pakistan: Uch-II Power Project

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

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UCH-II POWER (PRIVATE) LIMITED

OPERATIONAL PHASE ENVIRONMENTAL AND SOCIAL MONITORING REPORT FY-2015



UCH-II POWER (PRIVATE) LIMITED

A	Project/Business Name and Summary Information	
	Development of 404 MW Gas Fired Combined Cycle Power Plant by Uch-II Power (Private) Limited	
(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 & 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 year 2015
(ii)	<i>Nature of non-compliance</i>	No reportable incident to authorities recorded during year 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 the year 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 year 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 year 2015
D	Incidents of Environmental and Safety Accidents	
(i)	<i>Incident recorded dates and responsible agencies,</i>	None in year 2015
(ii)	<i>Scale of damage and injury (if any)</i>	None in year 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 year 2015
(v)	<i>Corrective actions, deadlines, identification of responsible parties</i>	None in year 2015
	<i>(a) short-term: remedial action</i>	None in year 2015
	<i>(b) long-term: preventative measures</i>	None in year 2015
E	Labour Relations and Conditions	
(i)	<i>Nature of labour dispute or grievance</i>	None in year 2015
(ii)	<i>Legal requirements, Permit conditions and renewal requirements</i>	None in year 2015
(iii)	<i>Authorities in charge of investigation/recording</i>	Uch-II Management responsible for recording and investigation.

UCH-II POWER (PRIVATE) LIMITED

(iv)	<i>Media or community reactions (if any)</i>	None in year 2015
(v)	<i>Corrective actions, deadlines, identification of responsible parties</i>	N/A
(vi)	<i>Labour relations and living conditions for construction labour force</i>	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)	<i>Staff capacities in environmental management (as relevant)</i>	<p>Uch-II O&M Environmental Staff Consists of;</p> <ul style="list-style-type: none"> (i) 01 Manager HSE (ii) 01 Senior Manager Operations (iii) 01 Manager Operations (iv) 01 Deputy Manager Chemical (Effluent treatment, analysis & Spill Response) (v) 01 Assistant Manager HSE (vi) 01 HSE Officer (vii) 02 Senior Chemists (Effluent treatment, analysis & Spill Response) (viii) 01 Chemical Assistants (Effluent treatment & Spill Response) (ix) 01 Manager Admin / PR (x) 01 Manager Colony & Security (xi) 01 Deputy Manager HR <ul style="list-style-type: none"> • Dedicated total 12 Personnel • Overall organizational structure of Uch-II O&M Environmental and social team and Health & Safety team is attached as Appendix-G.
(ii)	<i>Degree of awareness of: (i) environmental management, (ii) health and safety, (iii) environmental laws and regulations</i>	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)	<i>Training programs carried out</i>	<p>Training sessions on QHSE Policy, Safe Systems of Work, Hazard Identification & Risk Assessment, Environment Management Plan Awareness, Confined Space, Basic Firefighting, Safe Forklift Operation, Point of Work Assessment, Responsibilities of Fire Wardens, Safe Rigging, Ladder Safety, Work at Height, Use & Inspection of Fire Extinguishers, Delivering Effective Tool Box Talk and Noise Pollution carried out with O&M and Contractor staff.</p> <ul style="list-style-type: none"> • Pre Job TBTs conducted on regular basis. • Weekly Fire drills performed by O&M Team • Comprehensive classroom based HSE induction sessions conducted with contractor manpower during Uch-II complex outage.
(iv)	<i>Needs assessment of environmental management capacity (as relevant)</i>	All positions filled as per O&M staffing plan.
(v)	<i>Compliance audits carried out</i>	None in year 2015
G	Stakeholder Consultation/CSR Activities	
(i)	<i>Details of consultations, if any, with local communities, nongovernmental organizations, civil society groups, and other stakeholders, including affected people</i>	None has been conducted in year 2015
(ii)	<i>Describe efforts to promote community relations and local development for inhabitants of the project area.</i>	<p>No communities migrated or effected residing in the vicinity of project site due to facility setup.</p> <p>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;</p> <ul style="list-style-type: none"> (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)	<i>Project procedures for (a) hiring and (b) acquisition of goods and services</i>	<p>UPL prefers hiring human resource from local area at all levels.</p> <p>Attached Appendix-I provided the local - Balochistan staff ratio at UPL site (including O&M employees & contractors staff).</p>
(iv)	<i>Provide List of grievances and status of grievance resolution</i>	None in year 2015.

UCH-II POWER (PRIVATE) LIMITED

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
1	Air	None	Gas Turbines Stack emissions monitored through CEMS. Air Emissions data (HRSGs stacks) FY-2015 is attached as Appendix-B. Results of ambient air quality and annual vehicles exhaust emission testing are provided in Appendix-B.
2	Water (surface and ground water)	None	Overall compliance with EMP (as applicable against specific parameters) in place. Attached is Appendix C, indicating water consumption data FY-2015. Waste water generated is treated at water treatment plant and waste water treatment plant before disposal to evaporation pond. A brief description of waste water treatment is provided in Appendix C. Attached Appendix C-I indicate waste water qualitative and quantitative data FY-2015.
3	Waste generation and management	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 FY-2015.
4	Noise and vibration	Plant high noise areas highlighted	Plant noise monitoring data (ambient & occupational noise levels) FY-2015 is indicated in Appendix-E. Issue of high noise levels around plant equipment is also explained in Appendix-E.
5	Occupational health and safety	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	Community safety and security	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	CO ₂ emissions by the Project		CO ₂ emissions data indicated in Appendix-B FY-2015. Methodology for computation of the CO ₂ produced by the plant is provided in the Appendix-B).
8	Environmental and Social Management Plan, including IFC E&S Action Plan (September 29, 2010)		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 FY-2015 remained 2318.713 GWh.			
Areas of concern:			
<ul style="list-style-type: none">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			



UCH-II POWER (PRIVATE) LIMITED

Positive Achievements:

Uch-II completed its first 01 million safe man hours without LTI in December 2015. There were no employees or contractors Lost Time Incident recorded during the year 2015. No environmental incident is reported in year 2015.

Uch-II complex planned outage in March-2015, a great success from Health Safety & Environmental perspective successfully concluded without significant HSE incident. A total of 372 Contractors employees were inducted during 06 HSE Induction sessions on arrival at site for outage. Prior to start of outage risk assessments of all outage related tasks were critically reviewed by HSE team to check their appropriateness. A total of 90 risk assessments were reviewed. 12 Contractors employees trained for Standby man job for confined spaces. A comprehensive TBT delivered to outage contractor's manpower raising awareness on Hazards and risk associated to work at height, confined spaces & hot jobs. Housekeeping and waste management was given a prime importance during the outage. Efforts were deployed to maintain work areas in clean and tidy conditions through regular housekeeping drives and effective implementation of waste management plan.

During the year, HSE site monitoring walks, Permit to work audits and housekeeping inspections carried out as per plan. EPC Contractors' activities were closely monitored to ensure compliance with health & safety plan and procedures. Firefighting equipment monthly inspections, weekly fire drills, tool box talks, fresh eyes observations, point of work risk assessments carried out. No other significant Environmental & Social issues to report.

UCH-II POWER (PRIVATE) LIMITED

Acronyms

BEPA	Balochistan Environmental Protection Agency
CCR	Central Control Room
COD	Commercial Operation Date
CO ₂	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 ³	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 FY-2015**
Corrective Actions

Monitoring Period		Q1, 2015	
Monitoring Conducted by		Uch-II Staff	
Corrective Actions By		Uch-II Maintenance & Operation Departments	
S. No	Findings	Corrective Actions	Compliance Status (as of Mar 31, 2015)
01	Access doors of raw water pond close to colony wall found unlocked.	The doors have been locked for controlled access and keys kept in possession of shift engineer.	Completed
02	At Uch-II Admin building, a catering contractor's personnel while carrying tea to first floor got slipped on stairs. As a result he received a one inch superficial cut on his right leg knee from the edge of same stair step on which he slipped. Treatment provided at medical center and IP re-joined his duty on same day after treatment.	Anti-slip tape fixed on the stairs. TBT carried out with contractor staff.	Completed
03	HSD tank area, HSD un-loading hoses found placed without plugs (open ends) and a carboy containing liquid having no label on it found stored under the stairs of HSD tank bund, some HSD collection drums found filled with HSD while no activity was in progress.	Issue brought in to the notice of operation department. Immediately removed the carboy and emptied out HSD collection drums. Hoses plugged and stacked in proper manner.	Completed
04	EPC contractor fork lifter engaged in lifting scaffold material on road in front of Admin building without barricading the area. The load was also placed in awkward manner blocking whole road.	Stopped the activity and informed to EPC contractor to take safety measures before resuming the activity.	Completed
05	Waste collection contractor's personal were seen without mandatory job specific PPE's while handling general waste.	Instructed the supervisor for providing complete PPEs. Tool Box Talk performed with workers on the spot.	Completed
06	Un-attended wooden pallet was spotted outside of admin building causing tripping and falling hazards for the workers working or moving nearby.	Wooden pallet removed.	Completed
07	No MSDS and COSHH assessment	MSDS, COSHH assessments and signage	Completed

	found for HCL bulk chemical storage at Uch-II plant.	displayed at chemical storage.	
08	Wild growth (Bushes) seen inside the Sludge thickener beds in waste water treatment area.	Wild growth removed.	Completed
09	Unsecured scaffolding material placed along road sides at water treatment area.	Material stacked correctly with hard and soft barrication around.	Completed
10	At GT-1 generator, a ladder installed with a scaffold structure. No inspection tag found on the ladder.	Informed to electrical section. Ladder inspected and tagged.	Completed
11	Water leakage observed from service water line while ST transformer cleaning activity, creating slip hazard.	Leakage rectified.	Completed
12	During Uch-II complex outage, damaged welding cables were being used for welding activities inside the CW pumps pit.	Activity stopped and CP is advised to replace the welding cables with healthy one before resuming the activity. Cables replaced.	Completed
13	Deprived housekeeping (loose clothes and debris) near GT 01 PEECC.	Housekeeping performed.	Completed
14	During Uch-II complex outage, epoxy work was being carried out using unsafe access (ladder) inside the clarifier-B.	Stopped the work. Proper work platform (with outriggers support) provided to perform the job.	Completed
15	At HRSG-1 and HRSG-2 D/A drums, ventilation fan is fitted at the main hole for forced ventilation without protection cover / guard over the fan blades.	Mechanical section is informed and they fixed guards over the ventilation fans.	Completed
16	Refrigerant gas cylinders (that belongs to contractor's HVAC team) placed unsecured and un-attended over CCR roof.	Gas cylinders removed.	Completed
17	Concrete debris from curb stone breaking activity scattered near EDG creating trip hazard for operators and other workers working nearby, especially during night.	Housekeeping carried out and debris removed.	Completed
18	While constructing hard standing at cooling towers area, a fire hydrant obstructed / blocked by a concrete mixer.	Instructed to the contractor supervisor and concrete mixer relocated.	Completed

Monitoring Period		Q2, 2015	
Monitoring Conducted by		Uch-II Staff	
Corrective Actions By		Uch-II Maintenance & Operation Departments	
S. No	Findings	Corrective Actions	Compliance Status (as of June 30, 2015)
01	Grounding cable near sludge tank in Raw Water Pretreatment Area was found improperly dressed inside the cable tray, which was causing tripping and falling hazard.	Cable dressing was performed by the Electrical Maintenance Department.	Completed
02	A PVC pipe found above ground level near STG CCW return header creating tripping and falling hazards.	Excessive part of PVC pipe was removed by the MMD team to eliminate the hazards.	Completed
03	Waste material observed scattered on track / access path to EPC residential camp due to poor housekeeping practice.	Housekeeping was carried out to clean the path way along with proper storage of waste at designated waste storage bins.	Completed
04	At UPS firing range facility, extension lead plugs and socket found in damaged condition, which could result into electrocution. Issue addressed for replacement of substandard electrical accessories with healthy ones.	Damaged sockets and leads were replaced by EMD with healthy ones.	Completed
05	Hot water Geyser was spotted installed inside the Admin building wash room without having any protection from being exposed to human.	Immediately Geyser was made inoperable and will be installed outside the wash room.	Completed
06	GTs Auxiliary and Turbine compartment's built-in lights are not working and can leads towards low visibility issues which can further cause striking with objects hazards.	Work order was raised to EMD for fixing of new lights.	Completed
07	Due to high wind storm, some plastic waste collection bins blew off from designated locations and need to be properly placed back near gas turbine and gas station areas.	Waste Bins were kept at their original positions and also work order raised for fabrication of cage around the waste bins to protect them from being blown during high wind.	Completed
08	UCH II Main CCR building entrance glass door got broken by hi velocity of wind. Small pieces were spotted all over the ground surface causing cut and laceration hazards.	Effected area was barricaded immediately and broken glass and pieces were removed. Later on, new glass door was installed.	Completed
09	Excessive water filled in plant cable trenches especially near GTs, ST, CD	Water evacuation system needs to be improved through inserting auto	Completed

	tank etc. which may cause short circuiting and deteriorate the cables and metal structures as well.	drainage pumps and pits. After water removal, cable trays and cables inspection were also carried out.	
10	Emergency exit of Demin control room was locked from outside. It seems that it is locked to avoid opening due to wind or air.	Work Order was raised for installation of proper door closure to keep the door close all the time and the lock of the door should remain open so that it can be used during emergency.	Completed
11	Safety eye wash shower near Raw Water pretreatment area was found with faulty valve. Such unsafe condition can lead toward delay in emergency response time, if happens accidentally.	Issue addressed to maintenance team for setting up the regular Preventive Maintenance / Checks of Eye Wash Safety shower.	Completed
12	Beside CW pump house a cable protruding out of ground freely on ground, causing an electrical and trip hazards.	Issue addressed to EMD team for proper dressing of cable, which they performed on immediate basis.	Completed
13	At clarifier area, it was found that pit cover is not place on pit opening and creating risk of falling. Pit cover need to be placed back over the pit to eliminate falling hazard.	Pit covers placed on pit.	Completed
14	MCC panel doors and substation door is found open and un-attended, which is a critical safety hazard because there may be chances of electrical shock to any one if access due to door opening or any animal can easily enter into panel and may cause short circuit	Instruction has been passed to Operation team for closing such panel's door.	Completed
15	Spider webs observed all over the walls inside service water pumps building. General cleaning is required.	Housekeeping performed.	Completed

Monitoring Period		Q3, 2015	
Monitoring Conducted by		Uch-II Staff	
Corrective Actions By		Uch-II Maintenance & Operation Departments	
S. No	Findings	Corrective Actions	Compliance Status (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 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 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.	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

Monitoring Period		Q4, 2015	
Monitoring Conducted by		Uch-II Staff	
Corrective Actions By		Uch-II Maintenance & Operation Departments	
S. No	Findings	Corrective Actions	Compliance Status (as of Dec 31, 2015)
01	At water treatment area, leakage observed from a carboy containing paint. The carboys were placed without secondary containment.	Paint shifted to another carboy, area was cleaned and contractor is instructed to place the carboys over secondary containment.	Completed
02	A big size reptile fell into the neutralization pit and suspected entry route found the drain channel coming from Demin building. At few points there are openings in channel since the slabs are not properly fitted over and misaligned.	Rectification done. Openings in the drain channels are sealed and slab covers properly fitted over the drain channels.	Completed
03	HSD main storage tank, the floor of the secondary containment bund is having parting planes from where HSD (in case of spillage) can go down to soil.	The gaps between parting planes closed and sealed by cement work.	Completed
04	While the work on NaOCl piping was in progress, a contractor worker found without wearing chemical gloves.	The work is stopped temporarily and tool box talk conducted with working party over the importance of PPEs at work.	Completed
05	A metallic drum placed at the top platform of HRSG was being used as a waste bin.	Drum removed from the area and maintenance team is informed to place waste skip (if required in the area.)	Completed
06	Wind Sock installed at fuel gas station area found deteriorated and damaged.	Wind sock replaced with new one.	Completed
07	Access door of raw water pond found open, door should be locked to restrict the un-authorized entry.	Notified to Operation staff and door locked.	Completed
08	House Keeping of raw water pumping station area is required.	Housekeeping performed.	Completed
09	HSD leakage observed from HSD pipeline passing through a trench in front of GT-02 near HSD heaters.	Drain valve of HSD line inside the trench was identified malfunctioned. Drain valve was made corrected and dead plug was also installed to prevent the recurrence of such leakage in future.	Completed
10	Exposed battery terminals of fire water pump require the cover or rubber caps.	Rubber caps provided over exposed battery terminals.	Completed
11	Wild growth (dry bushes) present at	Wild growth removed	Completed

	waste water treatment area and required removal.		
12	Emergency exit door inside CCR first floor found locked.	Door locked open and asked maintenance team for arrangement of door panic bars.	Completed
13	Waste water treatment area, no MSDS is available at Acid and Anti-scalant tank.	MSDS pasted over the tanks	Completed
14	A dry powder fire extinguisher installed at Gate # 3 found depressurized.	Replaced with Pressurized one.	Completed

Appendix-B

Period: Year 2015

GTs Stack Emissions

Q1, 2015						
Stack Emissions	Units	Average GT-1	Average GT-2	Average Both GTs	NEQS Limits	WB / IFC Guidelines
Exhaust Temp.	°C	116.48	115.10	115.79	-	-
Particulate Matter	mg/Nm3	14.71	-	-	500	50
SO2	mg/Nm3	0.13	-	-	400	N/A
SO2	Metric ton/d			-	100	-
NOX	mg/Nm3	65.5	54.69	60.09	400	152 (at 15% excess O2 level)
NOX	lb/MMBTU			0.08	0.2	-
Q2, 2015						
Stack Emissions	Units	Average GT-1	Average GT-2	Average Both GTs	NEQS Limits	WB / IFC Guidelines
Exhaust Temp.	°C	117.17	116.82	116.99	-	-
Particulate Matter	mg/Nm3	9.85	0.97	5.41	500	50
SO2	mg/Nm3	0.87	0.16	0.51	400	N/A
SO2	Metric ton/d			-	100	-
NOX	mg/Nm3	58	58.15	58.07	400	152 (at 15% excess O2 level)
NOX	lb/MMBTU			0.10	0.2	-
Q3, 2015						
Stack Emissions	Units	Average GT-1	Average GT-2	Average Both GTs	NEQS Limits	WB / IFC Guidelines
Exhaust Temp.	°C	118.4	116.8	117.6	-	-
Particulate Matter	mg/Nm3	8.53	0.41	4.47	500	50
SO2	mg/Nm3	0.48	0.15	0.31	400	N/A
SO2	Metric ton/d			-	100	-
NOX	mg/Nm3	40	39.47	39.73	400	152 (at 15% excess O2 level)
NOX	lb/MMBTU			0.07	0.2	-
Q4, 2015						
Stack Emissions	Units	Average GT-1	Average GT-2	Average Both GTs	NEQS Limits	WB / IFC Guidelines
Exhaust Temp.	°C	119	118.3	118.6	-	-
Particulate Matter	mg/Nm3	9.0	1.14	5.07	500	50
SO2	mg/Nm3	0.40	0.82	0.61	400	N/A
SO2	Metric ton/d			0.01	100	-
NOX	mg/Nm3	63.76	64.37	64.06	400	152 (at 15% excess O2 level)
NOX	lb/MMBTU			0.11	0.2	-

CO₂ Produced

Q1, 2015			
	Monthly Average [Tons]	Total Quantity [Tons]	Total Quantity [Kg/KWh]
CO ₂ Produced (including CO ₂ in fuel gas)	70,405.26	211,215.79	0.76
CO ₂ Produced (excluding CO ₂ in fuel gas)	39,507.94	118,523.82	0.42

Q2, 2015			
	Monthly Average [Tons]	Total Quantity [Tons]	Total Quantity [Kg/KWh]
CO ₂ Produced (including CO ₂ in fuel gas)	176,621.33	529,863.99	0.75
CO ₂ Produced (excluding CO ₂ in fuel gas)	99151	297,453	0.42

Q3, 2015			
	Monthly Average [Tons]	Total Quantity [Tons]	Total Quantity [Kg/KWh]
CO ₂ Produced (including CO ₂ in fuel gas)	175,569.29	526,707.88	0.76
CO ₂ Produced (excluding CO ₂ in fuel gas)	98560.4	295,681.25	0.42

Q4, 2015			
	Monthly Average [Tons]	Total Quantity [Tons]	Total Quantity [Kg/KWh]
CO ₂ Produced (including CO ₂ in fuel gas)	181,588.13	544,764.4	0.73
CO ₂ Produced (excluding CO ₂ in fuel gas)	101,939.24	305,817.74	0.41

CO₂ 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 CO₂ 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			Manual Calculations				
Gas Constituents		Moles %	Molecular weight	Fraction of Gas Mole	Wt	Moles of CO ₂ Generated	Wt of CO ₂
Carbon Dioxide	CO ₂	36.00976667	44.0098	0.360098	15.847826	44	15.84430
Nitrogen	N ₂	20.44097333	28.01348	0.204410	5.726228	0	0.00000
Methane	CH ₄	41.68367	16.04276	0.416837	6.687211	44	18.34081
Ethane	C ₂ H ₆	1.11432	30.06964	0.011143	0.335072	88	0.98060

Propane	C3H8	0.41803
I-Butane	C4H10	0.11367
N-Butane	C4H10	0.121
I-Pentane	C5H12	0.03967
N-Pentane	C5H12	0.0300
Hexane	C6H14	0.0200
Molar Total	----	100.0

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 ₂ in gas
				20.4923	Excl CO ₂ in gas

Heating values

Constituents	HHV (dry) MJ/kg	LHV (dry) MJ/kg
Carbon Dioxide	0	0
Nitrogen	0	0
Methane	55.4850	49.9995
Ethane	51.8645	47.4742
Propane	50.3414	46.3418
Isobutane	49.5135	45.7279
N-Butane	49.5135	45.7279
Isopentane	48.9996	45.3419
N-Pentane	48.9996	45.3419
Hexanes	48.6694	45.0907

HHV (dry)	LHV (dry)
0	0
0	0
371.0400	334.3574
17.3783	15.9073
9.2798	8.5426
3.2713	3.0212
3.4823	3.2160
1.4024	1.2977
1.0606	0.9814
0.8388	0.7772

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

For calculating CO₂ 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 CO₂ Generated including CO₂ in Gas will be 190,667.7481 Tons and 107,528.5354 Tons excluding CO₂ in gas.

Energy Usage

Energy Usage FY-2015

Parameters	Units	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
Fuel gas consumed	m ³	646,266,74.42	125,562,53.19	453,655,59.85	980,451,10.94	100,990,629.68	108,217,939.30	103,903,300.87	112,366,074.66	892,651,88.43	107,560,100.89	102,458,539	106,531,916.43
Hours of Operation	Hours	421.07	76.97	299.65	661.87	679.54	713.46	714.21	742.03	602.88	673.15	715.98	709.73

Ambient Air Quality Data

Q1, 2015

Parameters	Units	Monitoring Location: Uch Power Station	NEQS Limits
		24 Hours Average Concentration	
CO	mg/m ³	2.25	5 mg/m ³ (limit for 8 hours)
NO	μg/m ³	11	40 μg/m ³ (limit for 24 hours)
NO ₂	μg/m ³	2.05	80 μg/m ³ (limit for 24 hours)
SO ₂	μg/m ³	4.05	120 μg/m ³ (limit for 24 hours)

Q2, 2015

Parameters	Units	Monitoring Location: Uch Power Station	NEQS Limits
		24 Hours Average Concentration	
CO	mg/m ³	2.1	5 mg/m ³ (limit for 8 hours)
NO	μg/m ³	10.66	40 μg/m ³ (limit for 24 hours)
NO ₂	μg/m ³	0.1	80 μg/m ³ (limit for 24 hours)
SO ₂	μg/m ³	4.86	120 μg/m ³ (limit for 24 hours)

Q3, 2015

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

Q4, 2015

Parameters	Units	Monitoring Location: Uch Power Station	NEQS Limits
		24 Hours Average Concentration	
CO	mg/m ³	6.2	5 mg/m ³ (limit for 8 hours)
NO	µg/m ³	7.4	40 µg/m ³ (limit for 24 hours)
NO ₂	µg/m ³	0.1	80 µg/m ³ (limit for 24 hours)
SO ₂	µg/m ³	4.1	120 µg/m ³ (limit for 24 hours)
PM (10)	µg/m ³	23	150 µg/m ³

Vehicle Exhaust Emissions

Annual Vehicle Exhaust Emissions, FY-2015

Parameter	Units	NEQS Limit	Vehicle #						
			CU-0636	PVA-013	PVA-014	PVA-015	PVA-016	PVA-017	Forklift
CO	%	06	0.01	0.03	0.01	0.02	0.02	0.02	0.01
Smoke	Percentage	40 %	16.10	18.70	11.50	4.50	10.70	4.10	23.80
Noise	dB (A)	85	79	72.8	73	71.3	72.4	73.8	83.4

Heavy Metals Emissions

Heavy Metals Emissions

Stack's heavy metal emission test results shall be provided in Environmental and Social Monitoring Report of Q-1, 2016.

Appendix C

Raw Water Treatment Plant:

Raw water is supplied to Uch-II site from the Pat Feeder canal located approximately 3km away from site through a pipeline. Raw water is stored in a raw water storage pond. Raw water is pumped from the storage pond via pumps to clarifiers. Clarified water is forwarded via a surge tank for cooling water make-up, to the service water tank and to the potable water plant.

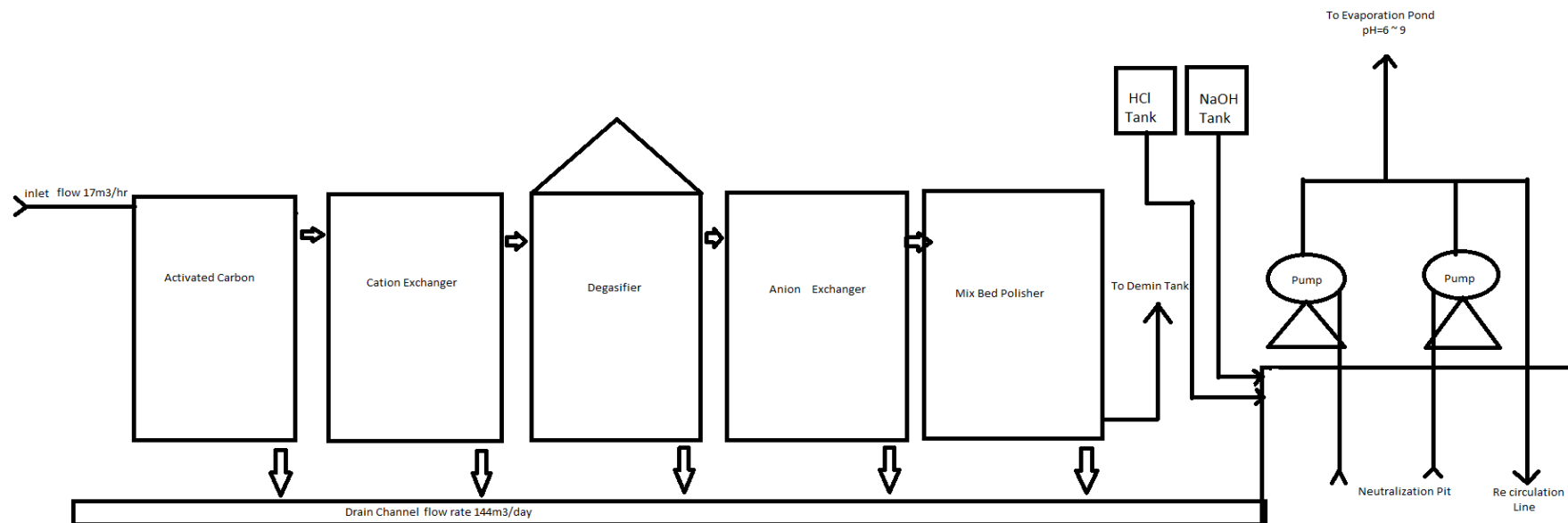
The water treatment demineralization building has two trains. Each train is comprised of carbon filter, cation bed, de-gasifier, anion and mixed bed. Regeneration of the resin beds use HCL and NaOH which is stored in bund tanks.

Treatment of Demin Plant Regenerated Wastewater:

Chemical waste from raw water pretreatment area and wastewater produced in demineralization building by backwashing of activated carbon filters, regeneration of Cation and Anion exchangers is collected in neutralization pit (10GCK01 BB010).

As acidic and alkaline effluent is collected in neutralization pit, pH of accumulated effluent is neutralized itself. However for variation in pH acid and caustic dosing system with pH controller is provided. A recirculation line is provided with effluent transfer pumps for uniform mixing of the chemicals. Once pH is neutralized in the pit, the effluent is discharged to evaporation pond through Effluent Transfer Pumps (10GCK01 AP019/020). Pumps start/stop is manual and would trip at low level in neutralization pit. Manual change over in case of fault of pumps is provided

Demin Plant and Neutralization Pit



Appendix C

Sanitary Wastewater:

Sanitary wastewater generated from plant, residential colony and offices first pass through the screen channel containing bar and mechanical screens for removal of any floating materials. Trash free wastewater is collected in the Sanitary Wastewater Tank (10GRK01 BB001). This tank serves the purpose of liquid holdup and pumping to the aeration tank (10GRC01 BB002). Two submersible pumps (10GRK01 AP001/002) are installed in the tank. Pumps start /stop at liquid level (HLL/LLL) and a level switch (LS 10GRK01CL101) is provided for automatic operation of submersible pumps. Manual change over in case of fault of pumps is provided.

Aeration Tank:

This unit supports the bacterial growth. Air is continuously supplied in this unit for biological reaction. Moreover this method of aeration offers the potential for high efficiency because bubbles of air rising through the water are continually exposed to fresh liquid surfaces maximizing water surface per unit of air.

The organic matter in the effluent is oxidized by the bacteria and is converted into harmless CO₂ gas. Two air blowers (10GRC01 AN001/002) are provided for aeration in the aeration tank (10GRC01 BB002). A portion of the settled biomass from secondary clarifier (10GRD01AT002) is recycled back to maintain the desired concentration of cells in the aeration tank. The sludge recycling is achieved by continuously blowing air inside the liquid media in secondary clarifier.

Secondary Clarifier:

This is also called sedimentation tank. The purpose of secondary clarifier (10GRD01 AT002) is to remove the microorganism by sedimentation process. Hopper shaped secondary clarifier is provided for collection of sludge in the center for onward pumping for recycling and disposal as well.

The settled sludge in the secondary clarifier is continuously recycled in the aeration tank (10GRC01 BB002). Supernatant also referred as treated effluent is drawn from an effluent weir to the chlorination tank (10GRK01 BB004).

Chlorination Tank:

Chlorination Tank (10GRK01 BB004) is provided for disinfection of the treated effluent. Partition walls with opening at the end are provided for proper mixing of chlorine in the effluent for disinfection. Sodium Hypochlorite is used for disinfection.

Two pumps (10GRN01 AP003/004) are provided for chemical dosing. Sodium Hypochlorite dosing pumps are interlocked with sanitary wastewater pumps (10GRK01 AP001/002), however dry run protection is provided by level switch (LS 10GRN01CL101). Operation of pumps is continuous. Manual change over in case of fault of dosing pump is provided. The final treated water from this tank is then transferred to the evaporation pond.

Appendix C

Waste Water Treatment & RO.

Cooling tower blow down waste stream is sent to an onsite industrial wastewater tank where it is mixed with other wastewater streams from evaporative cooler and sludge drying bed water. Wastewater from industrial wastewater tank is transferred to a clarifier where clarified water and sludge is separated and transferred to clarifier tank and sludge drying bed respectively.

Clarified water first filtered through the multimedia filters and then passes through Reverse Osmosis (RO) membranes. Filtered water from RO is transferred to the CW system for reuse, whereas concentrate from RO is discharged to the evaporation pond for final disposal. pH of RO reject is 7~8 and no further treatment is required.

However other streams such as bypass line from filter feed pumps (10GNK02 AP007/008), effluent of pump sump (10GNK01 BB003) and overflow of clarified water tank (10GNK02 BB007) also be drained to evaporation pond occasionally.

Parameters for one train of RO are as below:

Feed water Quantity = 80m³/ hr.

Feed water pH = 8.0

Feed water conductivity = 2694 us/cm

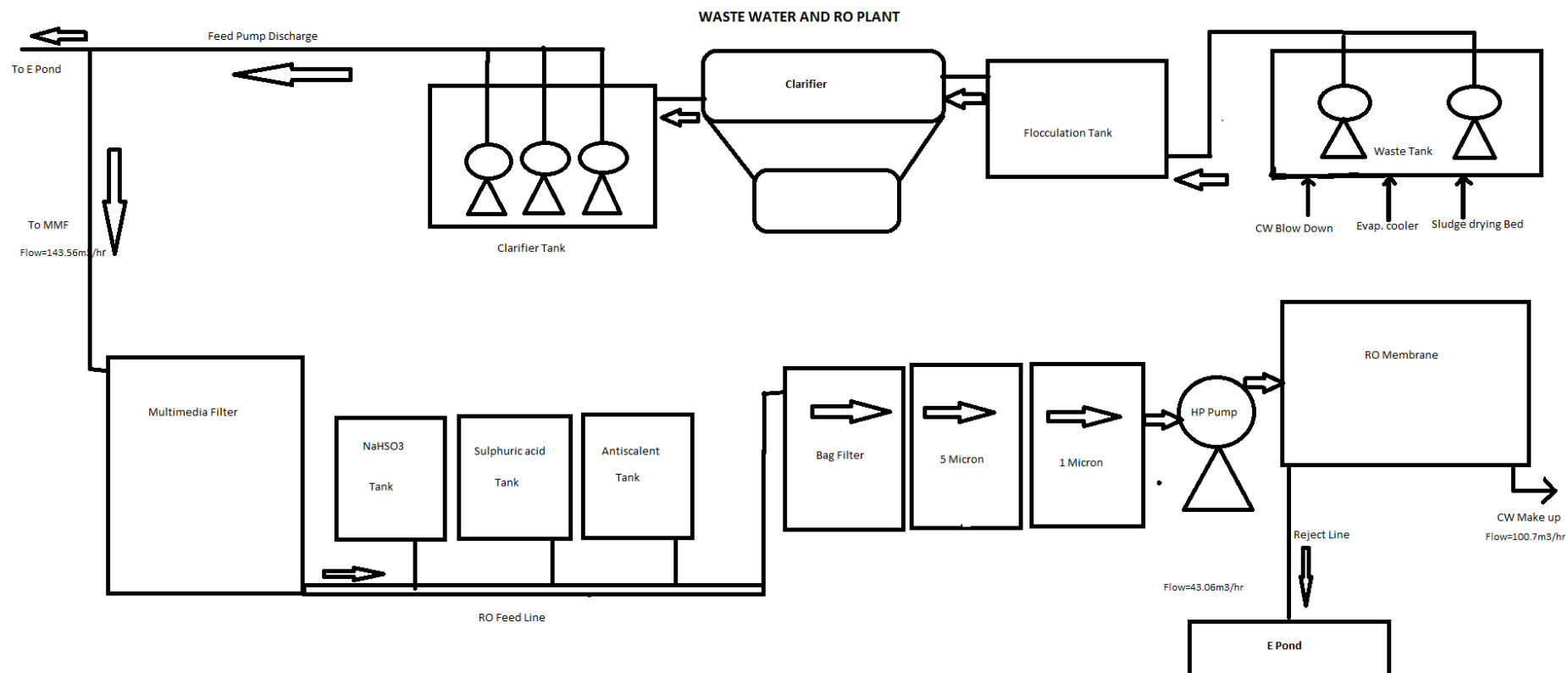
Product water (Permeate) quantity= 53.9 m³/hr.

Product water (Permeate) conductivity = <280 us/cm.

Recovery = 70%

Appendix C

Waste Water & RO Plant - Single Line Diagram



Appendix-C I**FY-2015****Cooling water**

Location: Cooling tower discharge point

Parameters	Units	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	NEQS Limits
Temp	°C	26.3	24.8	24.9	30.9	31.05	33.29	34.67	34	32	31	30	28	40
pH	pH	7.94 - 8.32	8.21 - 8.3	7.85 - 8.31	8.25 - 8.38	8.2 - 8.37	8.22 - 8.38	8.22 - 8.38	8.24 - 8.36	8.28 - 8.40	8.3 - 8.37	8.25 - 8.35	8.28 - 8.4	6 to 10

Sewage Treatment Plant

Location: Sewage treatment discharge point

Parameters	Units	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	NEQS Limits
pH	pH	7.86	7.80	7.90	6.74	8.95	8.65	8.23	7.75	8.1	7.46	7.86	7.65	6 to 10
TSS	mg/liter	21	7	5	8	20	16	20	28	28	30	12	16	150
BOD	mg/liter	3.3	11	4.2	1.9	5.6	12	10	7.7	14	18	22	2.8	80
COD	mg/liter	68	28	18	26	57	34	40	18	44	30	21	28	150

Process Water Treatment Plant

Closed Cooling Water (CCW)

Parameters	Units	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	NEQS Limits
pH	pH	9.90	9.84	9.94	9.97	9.76	9.8	9.65	9.56	9.48	8.8 - 9.87	9.1 - 9.12	9	6 to 10
TSS	mg/liter	1	1	1	1	1	1	1	1	1	1	1	1	150
Cl-	mg/liter	<0.1	<0.1	<0.1	< 1	< 1	< 0.1	< 0.1	<0.1	<0.1	< 1	< 1	< 1	1000
Metals (Fe)	ppb	103	65	152	129	85	80	98	53	122	37 - 500	115	177 - 195	

Heat Recovery Steam Generator # 1 (HRSG-1)

Parameters	Units	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	NEQS Limits
pH	pH	9.42	9.54	9.71	9.6 - 9.7	9.6 - 9.78	9.45 - 9.88	9.54 - 9.79	9.40 - 9.79	9.43 - 9.89	9.44 - 9.78	9.5 - 9.72	9.47 - 9.72	6 to 10
TSS	mg/liter	<1.0	<1.0	<1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	150
Cl-	mg/liter	<0.1	<0.1	<0.1	< 1	< 1	< 0.1	< 0.1	< 0.1	< 0.1	< 1	< 1	< 1	1000
Metals (Fe)	ppb	14	15	19	12	10	5	8	14	10	12	7	9	

Heat Recovery Steam Generator # 2 (HRSG-2)

Parameters	Units	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	NEQS Limits
pH	pH	9.62	9.44	9.60	9.4 - 9.7	9.55 - 9.7	9.62 - 9.9	9.48 - 9.78	9.40 - 9.90	9.45 - 9.90	9.51 - 9.74	9.45 - 9.72	9.35 - 9.72	6 to 10
TSS	mg/liter	<1.0	<1.0	<1.0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	150
Cl-	mg/liter	<0.1	<0.1	<0.1	< 1	< 1	< 0.1	< 0.1	< 0.1	< 0.1	< 1	< 1	< 1	1000
Metals (Fe)	ppb	11	13	10	14	9	8	13	11	10	12	7	11	

Discharge Point RO Reject

Parameters	Units	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	NEQS Limits
pH	pH	RO Plant out of service / Under commissioning												
TSS	mg/liter													
Cl-	mg/liter													
Metals (Fe)	ppb													

Evaporation Pond

Location: Effluent flowing to evaporation pond

Parameters	Units	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	NEQS Limits
BOD	mg/liter	9.7	2.3	5.4	7.7	1.4	1.1	1.7	0.9	0.7	0.1	0	0.2	80
COD	mg/liter	50	18	19	26	34	31	25	16	26	27	9	25	150
Cl-	mg/liter	151	217	106	340	231	370	269	243	268	276	208	212	1000
metals (Fe, Zn)	mg/liter	2.5, 0.16	3.0, 0.17	1.6, 0.12	4.2, 0.18	3.6, 0.39	2.4, 0.29	2.26, 0.1	3.7, 0.03	3.1, 0.11	1.78, 0.05	1.6, 0.02	1.34, 0.05	Fe 8.0 & Zn 5.0
Temp	°C	23	25	22	26	27	31	32	32	31	27	28	22.5	40
pH	pH	8.1	8.12	8.6	8.89	8.37	8.92	8.14	8.24	8.4	8.42	8.28	8.1	6 to 10
TSS	mg/liter	55	38	20	31	17	32	29	27	17	18	18	40	150
Oil & grease	mg/liter	1.7	1.9	0.2	1.1	0.3	1.8	2.5	1.2	0.8	1.78	0	0	10

Surface Drains

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

Parameters	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
Appearance & condition of oil & grease	No water in drains	No water in drains	No water in drains	No water in drains	No water in drains	No water in drains	No water in drains	No water in drains	No water in drains	No water in drains	No water in drains	No water in drains

Water Usage

Location: Pat Feeder Canal intake point

Water usage (m ³)	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15
	127,600	87,934	99,846	232,940	0	447,640	565,440	565,440	448,033	355,025	260,315	200,987
					Water canal annual closure in May - 2015							

Appendix-D**Q1, 2015**

Uch-II Waste Generation Statistics				
Waste Type	Unit	Jan-15	Feb-15	Mar-15
Used oil	Ltr	25	980	400
Metal	Kg	5	13	35
Paper/ Plastic/ Glass	Kg	59.5	44	98
Wood & Food Waste	Kg	95	105	301
Oil Filters & Oily Rags	Kg	32	12	70
Used Batteries, wet/dry cells	Nos	4	0	4
Old Tyres	Nos	0	0	0

Q2, 2015

Uch-II Waste Generation Statistics				
Waste Type	Unit	Apr-15	May-15	Jun-15
Used oil	Ltr	1600	150	450
Metal	Kg	5	2	22
Paper/ Plastic/ Glass	Kg	95	34	36
Wood & Food Waste	Kg	157	70	236
Oil Filters & Oily Rags	Kg	20	13	31
Used Batteries, wet/dry cells	Nos	6	10	6
Old Tyres	Nos	0	0	0

Q3, 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

Q4, 2015

Uch-II Waste Generation Statistics				
Waste Type	Unit	Oct-15	Nov-15	Dec-15
Used oil	Ltr	48	50	33
Metal	Kg	32	15	9
Paper/ Plastic/ Glass	Kg	262	52	65
Wood & Food Waste	Kg	514	400	298
Oil Filters & Oily Rags	Kg	36	15	25
Used Batteries, wet/dry cells	Nos	6	2	4
Old Tyres	Nos	0	0	2

Appendix-E

Occupational Noise Monitoring			Average Noise Monitoring Results (dB) A			
S. No	Location of Equipment	Guarantee limits	Q1, 2015	Q2, 2015	Q3, 2015	Q4, 2015
1	East side of pump "A" at Raw Water Pumping Station	85 (dB) A	79.1	82.1	83.1	82.9
2	East side of pump "B" at Raw Water Pumping Station	85 (dB) A	—	83.2	82.8	—
3	South Side of potable water supply pump "A"	85 (dB) A	—	72.5	75.5	—
4	South Side of CT Basin Makeup Pump "A"	85 (dB) A	77.7	82.23	82.2	80.9
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	—	77.5	81	77.1
8	East side of Service Water pump "A"	85 (dB) A	83.9	86	86.1	86
9	North Side of CT at ground level close to cell #02	85 (dB) A	85.2	86	87	86.15
10	North Side of CT at ground level close to cell #04	85 (dB) A	—	85	88	86.5
11	North Side of CT at ground level close to cell #06	85 (dB) A	84.6	85.5	86	86.2
12	South Side of CT at ground level close to cell #08	85 (dB) A	—	82.2	85	82.1
13	East Side of Cooling Tower fan motor # 6(10PAB01-AN006)	85 (dB) A	82.1	81.6	84.2	84.9
14	East Side of Cooling Tower fan motor # 8 (10PAB01-AN008)	85 (dB) A	84.7	83.8	84.5	85
15	East Side of Fire water pump house with door close & Diesel pump running	85 (dB) A	84	69	—	87.3
16	North Side of Fire water pump house with door close & Diesel pump OFF	85 (dB) A	—	68.7	—	65.8
17	West side of HSD Decanting point # 3	85 (dB) A	62.6	63.2	62.3	63.4
18	North Side of HRSG-2 main stack	85 (dB) A	71.4	72.3	73.5	74
19	North side of GT -2 Generator	85 (dB) A	77	78.6	78.6	80.4
20	South side of GT -2 turbine combustion chamber	85 (dB) A	80.8	81.8	81.5	82.3
21	North side of GT -2 PEECC	85 (dB) A	76	71	71	72.2
22	South side of boiler feed pump "B" (HRSG-2)	85 (dB) A	—	88	90	86.4
23	South side of boiler feed pump "A" (HRSG-2)	85 (dB) A	86	87	90	88
24	South side of GT -1 PEECC	85 (dB) A	72	72.2	73.2	73.6
25	South side of GT -1 turbine combustion chamber	85 (dB) A	78	82.0	81.8	81.9
26	West side of GT -1 Generator	85 (dB) A	82	80.7	79.6	85
27	South side of GT -1 turbine compartment (shaft) entrance door	85 (dB) A	87.5	88	90	90.2
28	North Side of HRSG-1 main stack	85 (dB) A	72.2	73	74.5	75.5
29	West side of HRSG-1 at bottom close to HRSG duct entrance	85 (dB) A	87	84.2	83.5	87
30	West Side of Cooling water pumping station	85 (dB) A	75	81.5	84	84
31	West Side of CW pump "B" in cooling water pumping station	85 (dB) A	—	86.4	86.5	86.7
32	North Side of CW pump "B" in cooling water pumping station	85 (dB) A	—	86.3	86.5	86.3
33	West Side of CW pump "C" in cooling water pumping station	85 (dB) A	86.3	86	89	88.8
34	North Side of CW pump "C" in cooling water pumping station	85 (dB) A	89	89.4	88.7	87.1
35	West Side of Auxiliary CW pump # 1 in cooling water pumping station	85 (dB) A	—	89.7	95	88.4
36	East Side of Auxiliary CW pump # 1 in cooling water pumping station	85 (dB) A	—	99	91	96.6
37	West Side of Auxiliary CW pump # 2 in cooling water pumping station	85 (dB) A	91	87	84.5	84
38	East Side of Auxiliary CW pump # 2 in cooling water pumping station	85 (dB) A	90	88.1	93	91
39	North Side of CCW pump "B"	85 (dB) A	—	79.8	81	81.2
40	North Side of CCW pump "A"	85 (dB) A	80.7	82.7	79.9	81.7
41	North Side of instrument Air Compressor "A"	85 (dB) A	—	78.5	80.1	82.3
42	East Side of instrument Air Compressor "B"	85 (dB) A	—	83.4	—	84.1
43	North Side of instrument Air Compressor "B"	85 (dB) A	84	78.2	—	83.6
44	North Side of Boiler Feed Pump # 1 at HRSG-1 Bottom	85 (dB) A	—	87	87.2	87
45	North Side of Boiler Feed Pump # 2/B at HRSG-1 Bottom	85 (dB) A	86	87	86.7	86
46	East side of Steam Turbine	85 (dB) A	80	85.7	88	88
47	West side of Oil cooler in lube oil console skid for STG	85 (dB) A	82.4	85	85	89
48	West side of Steam Turbine	85 (dB) A	80	85	85	54.8
49	Waste Water Treatment plant near pump station	85 (dB) A	52	59.4	55	55.1
50	North Side of workshop	85 (dB) A	54	54.3	54.7	85
51	West side of HRSG-2, duct entrance	85 (dB) A	—	84.2	83	79
52	South Side of EDG	85 (dB) A	—	66.7	—	—
53	West Side of EDG	85 (dB) A	—	62.6	—	—
54	South side of sand filter pump B	85 (dB) A	—	78.4	—	—
55	South side of sand filter pump A	85 (dB) A	—	—	—	—

High Noise Around Plant Equipment:

Higher noise levels pertains 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			Average Noise Monitoring Results (dB) A			
S. No	Noise Monitoring Locations	Guarantee limits	Q1, 2015	Q2, 2015	Q3, 2015	Q4, 2015
1	Main gate Uch-II	70 (dB) A	46.5	49	52.5	51.9
2	Check Post # 3 (at boundary wall)	70 (dB) A	—	48.5	48	48.2
3	Check Post # 5 (at boundary wall)	70 (dB) A	—	48.8	46	48.4
4	Check Post # 7 (at boundary wall)	70 (dB) A	—	47	47.5	50.1

Compliance Status of EMP Control Measures FY-2015

Appendix-F

Uch-II Project

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

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

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



Uch-II ENVIRONMENTAL AND SOCIAL ACTION PLAN (ESAP)

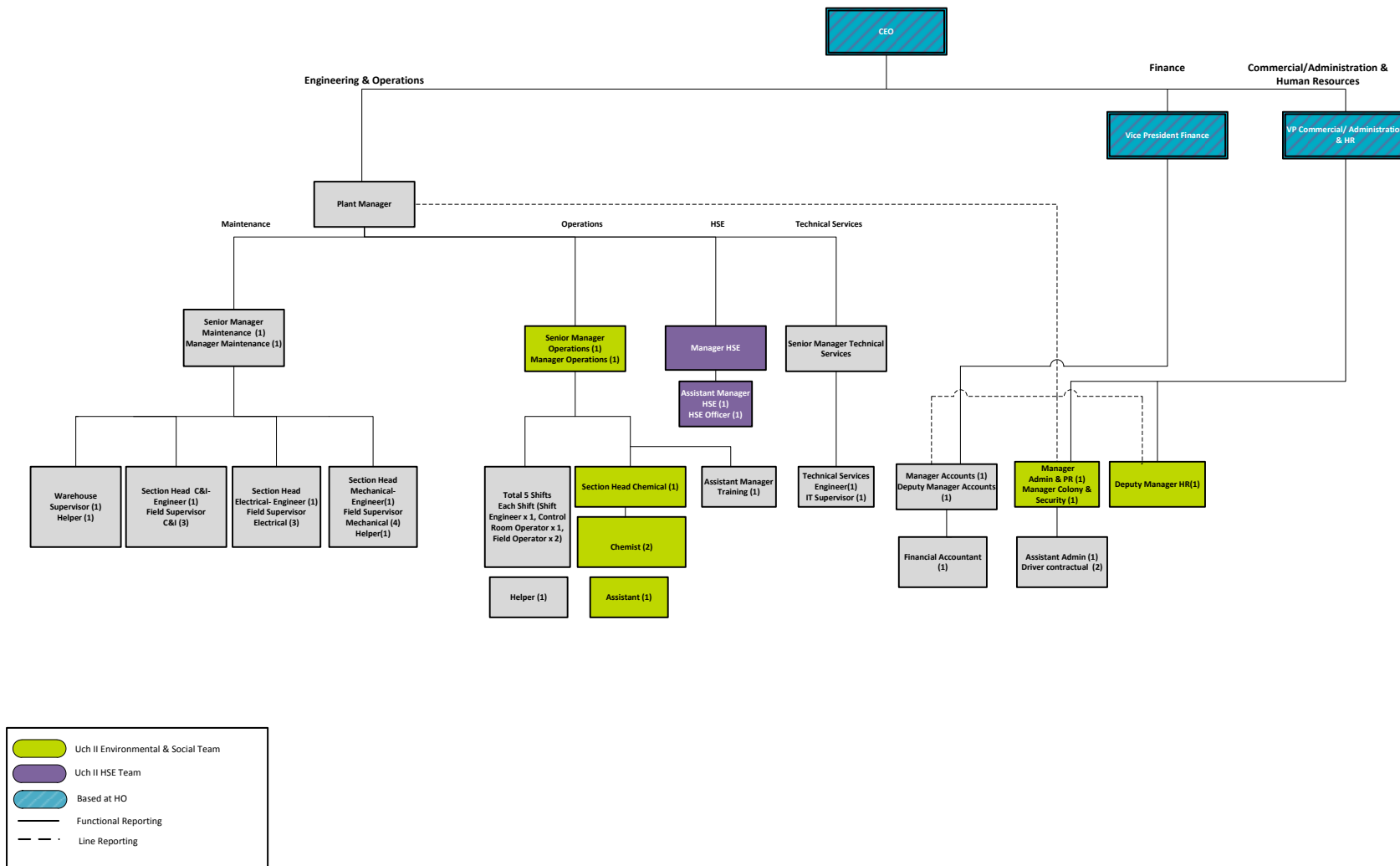
Compliance matrix for Operational Phase

Compliance status of E&S Action Plan items relevant to the operational phase of Uch-II is provided below.

No.	Action	To be verified by:	Schedule	Status
PS1-2	Update the Environmental Management Plan (Appendix A of the January 2010 EIA) based on the final arrangements of the Operation & Maintenance, and implement.	A copy of the updated Environmental Management Plan including detailed monitoring program for the operational phase.	Update: Before the Commercial Operations Date. Implement: During the operational phase.	Completed. The first table of this Appendix-F is a combination / integration of following two tables. Table 4-2 of EIA: Environmental management and monitoring plan, operational phase Table 6-3 of EMP: Mitigation Plan for Operation Phase This table indicates the environmental aspects to be monitored by O&M team for operation phase as per the requirements mentioned in EIA and EMP. It also explains the control and mitigation measures implemented by Uch-II, monitoring frequencies and status of compliance.
PS2-1	Establish and implement the labor hiring policy and procedure (including local employee hiring criteria) in line with IFC Performance Standard #2.	Copy of the local employee hiring procedure.	Construction phase: Before first disbursement. Operational phase: 6 months before the Commercial Operations Date.	Completed.
PS3-1	Incorporate the Company into the UPS Emergency Preparedness and Response Plan.	Copy of the Emergency Preparedness and Response Plan to cover both UPL and the Company operations.	Before commercial operation of the Company.	Completed. Emergency Response Procedure is in place.

Appendix G

Uch II Organizational Structure (O&M Team)



Appendix H

Attention: MR FIDA KHAN SB
MAG 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 18th 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 LAU		
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"/>	
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Forwarded from			

Apr. 22 2014 02:27PM P1

FAX NO. : 9202484

FROM : A

Appendix - I

UPL Site - Local Employment Ratio

Category	Total Strength	Local / Balochistan	Local Employment Ratio
O & M Staff	150	39	26%
Site Contractor Workers	411	173	42%
Others (TCF Schools, Hospitals Dera Murad Jamali)	113	113	100%