



PPEPCA

Sectoral Guidelines for Upstream Petroleum Sector - Onshore

Volume 2 of 2
Annexures



September 2004

Halcrow

Pakistan Petroleum Exploration and Production Companies Association

Sectoral Guidelines for Upstream Petroleum Sector – Onshore

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Contents

Annexure A: Potential Impact and Mitigation	A-1
Annexure B: Policy, Legislation and Guidelines	B-1
Annexure C: Relevant Guidelines for Environmental Assessment Techniques	C-1
Annexure D: Summary of Environmental Monitoring	D-1
Annexure E: Protected Areas in Pakistan	E-1
Annexure F: Public Consultations	F-1

List of Exhibits

Exhibit A-1:	Potential Hazards Related to Seismic Operations	A-2
Exhibit A-2:	Potential Hazards Related to Drilling Projects	A-3
Exhibit A-3:	Potential Hazards Related to Pipeline Projects	A-4
Exhibit A-4:	Potential Hazards Related to Processing Plants	A-5
Exhibit A-5:	Typical Mitigation Measures for Seismic Operations	A-6
Exhibit A-6:	Typical Mitigation Measures for Drilling Operations	A-10
Exhibit A-7:	Typical Mitigation Measures for Pipeline projects	A-15
Exhibit A-8:	Typical Mitigation Measures for Processing Plants	A-19
Exhibit A-9:	Setbacks from Environmental Features	A-23
Exhibit B-1:	Summary of Environment Related Laws in Pakistan	B-7
Exhibit B-2:	Summary of International Conventions	B-14
Exhibit B-3:	Summary of International and Local Guidelines	B-17
Exhibit C-1:	Summary of EA Techniques	C-2
Exhibit C-2:	Schedule III – IEE/EIA Review Fees [See regulation 7]	C-3
Exhibit C-3:	Schedule IV – Application Form [See regulation 8 (2)(a) of the 2000 Regulations]	C-4
Exhibit C-4:	Schedule V – Decision on IEE [See regulation 12 of the 2000 Regulations]	C-5
Exhibit C-5:	Schedule VI – Decision on EIA [See Regulation 12 of the 2000 Regulations]	C-6
Exhibit C-6:	Schedule VII – Undertaking [See Regulation 13(2) of the 2000 Regulations]	C-7
Exhibit C-7:	Typical project Details for Reporting in EA's	C-8
Exhibit C-8:	Examples of Possible Changes to Upstream Projects	C-11
Exhibit D-1:	Summary of Environmental Monitoring in Upstream Projects	D-2
Exhibit D-2:	Suggested Format for Effects Monitoring Programme	D-3
Exhibit D-3:	Suggested Format for a Non-compliance Register	D-4
Exhibit D-4:	Sample Checklist for Compliance Monitoring	D-5
Exhibit D-5:	Suggested Format for Recording Audit Findings	D-6

Exhibit D-6:	Suggested Criteria for Performance Evaluation	D-7
Exhibit D-7:	Typical Contents for Environmental Reports	D-8
Exhibit E-1:	Pakistan Wildlife Protected Areas Data	E-2
Exhibit E-2:	Definitions of Protected Ecosystems	E-3
Exhibit E-3:	Ramsar Sites in Pakistan	E-4
Exhibit E-4:	Summary of Protected Antiquities	E-9
Exhibit E-5:	World Heritage Sites in Pakistan	E-10
Exhibit E-6:	Typical Services and Functions of Protected Areas	E-11
Exhibit E-7:	Impact Magnitude Criteria	E-13
Exhibit E-8:	Impact Significance Criteria	E-14
Exhibit F-1:	Broad Objective of Public Consultation	F-2
Exhibit F-2:	Explanation of Key Stakeholders	F-3
Exhibit F-3:	Principles for Effective Community Consultation	F-4

Annexure A

Potential Impact and Mitigation



Exhibit A-1: Potential Hazards Related to Seismic Operations

Activity	Potential Hazards
Camp setup and operation	Dust emissions from use of dirt tracks Exhaust emissions from vehicles and generators Water use for workers Waste disposal Land and vegetation clearing Land uptake and land acquisition Noise from generators, machinery and vehicles Light
Line clearing (vibroseis)	Noise from vibroseis Dust and exhaust emissions from vibroseis Use of access tracks Wastes (littering, oil stains or leakages) Land and vegetation clearing Land acquisition Damage to local infrastructure and archaeological sites
Data acquisition	Noise from vibroseis, dynamite and upholes Dust and exhaust emissions from vehicles Wastes (littering, oil stains or leakages) Use of access tracks Damage to local infrastructure and archaeological sites (from vibrations) Use of water for drilling (upholes, deepholes) Disposal of drilling mud and cuttings (for deep holes and upholes)
Restoration	Noise, dust and exhaust emissions Left over wastes or materials/incomplete restoration

Exhibit A-2: Potential Hazards Related to Drilling Projects

Activity	Potential Hazards
Construction camp setup and operation	Dust emissions from use of dirt tracks Exhaust emissions from vehicles and generators Water use for workers Waste disposal (domestic and medical) Oil spill or leakage Land and vegetation clearing Land uptake and land acquisition Noise from generators, machinery and vehicles Light from camp and vehicles
Construction of access road, well site and rig camp	Land and vegetation clearing Oil spill or leakage Waste disposal (construction wastes) Waste use (for construction) Noise from vehicles, generators, and construction machinery and methods (such as blasting) Dust emissions from road travel and construction works Exhaust emissions from vehicles, generators and construction machinery Land acquisition Off road travel
Rig mobilisation and demobilisation	Noise and dust and exhaust emissions (from vehicles) Temporary accommodation of drivers and waste disposal Oil spills, leakages Off road travel Accidents (public and workforce safety, damage to local infrastructure)
Drilling	Noise (from vehicles, well site, and rig camp) Light from well site and rig camp Dust and exhaust emissions Emissions from flaring H ₂ S emissions Road travel Water use (for drilling, domestic use and road maintenance) Disposal of drilling mud and cuttings Well blowout
Restoration	Noise and dust and exhaust emissions Left over wastes or materials/incomplete restoration

Exhibit A-3: Potential Hazards Related to Pipeline Projects

Activity	Potential Hazards
Camp setup and operation	Dust emissions from use of dirt tracks Exhaust emissions from vehicles and generators Water use for workers Waste disposal Land and vegetation clearing Land uptake and land acquisition Noise from generators, machinery and vehicles Light
Pipeline laying	Dust emissions from use of dirt tracks Exhaust emissions from vehicles and generators Waste disposal (litter, used oil, other machinery and equipment waste) Land and vegetation clearing for ROW (Right of Way) Land uptake and land acquisition Noise from generators, machinery and vehicles Damage to infrastructure and archaeological and cultural sites
Pipeline cleaning, testing and commissioning	Noise, dust and exhaust emissions from vehicles Water use for hydro-testing Use of radioactive materials for testing Wastewater from cleaning and hydro-testing of lines Hydrocarbon leakage from pipelines
Pipeline decommissioning	Oil spillage from leftover oil in pipelines Other issues similar to pipeline laying

Exhibit A-4: Potential Hazards Related to Processing Plants

Activity	Potential Hazards
Construction camp setup and operation	Dust emissions from use of dirt tracks Exhaust emissions from vehicles and generators Water use for workers Waste disposal Land and vegetation clearing Land uptake and land acquisition Noise from generators, machinery and vehicles Light from construction camp
Construction of processing plant	Dust emissions from use of dirt tracks Exhaust emissions from vehicles and generators Water use for workers Waste disposal Land and vegetation clearing Land acquisition Noise from generators, machinery and vehicles Large scale procurement of construction materials Quarrying of construction materials Development of bitumen road
Operation of processing plant	Exhaust and fugitive emissions from processing plant, camp and vehicles Flaring of gas (which may have high sulphur content) Long term occupation of site Long term water use (domestic and operations) Long term power supply Long term demand on local resources Disposal of domestic, medical, and oily wastes Disposal of produced water, condensate and hydrocarbon sludge Disposal of process wastes from gas sweetening and dehydration Land transportation of crude oil Noise from processing plant operation and camp and vehicles Large scale procurement of construction materials Quarrying of construction materials
Restoration	Noise, dust and exhaust emissions from restoration works Left over wastes (produced water, condensate, domestic waste, etc) Cleaning of tanks and equipment contaminated with hydrocarbons and other process chemicals and wastes Disposal of construction debris and mechanical and electrical fixtures

Exhibit A-5: Typical Mitigation Measures for Seismic Operations

Activity	Mitigation Measures for 2D and 3D Seismic Operations
Land management	<p>Keep area of the seismic camp to the minimum required</p> <p>Locate camp sites in plain areas with minimum vegetation cover, avoid clearing of land and vegetation</p> <p>Keep width of the seismic lines cleared for vibroseis to the minimum required (typically 3m). While clearing seismic lines preserve root stock</p> <p>Use shot-hole method in place of vibroseis where preservation of vegetation cover is required and where access is a concern. Ensure charge is small and deep enough to avoid cratering. Consider aquifer protection and proper plugging. Ensure misfired charges are disabled</p> <p>Avoid preparation of new access tracks in mountainous terrain. Access seismic lines in mountainous terrain by camels and foot. Use existing foot and camel tracks where possible.</p> <p>Minimise disturbance to natural topography and soils while clearing seismic lines for vibroseis. Minimise line cutting along the sides of sand dunes</p> <p>Minimise clearing of vegetation; especially dense patches, large trees, woody shrubs, slow growing species</p> <p>Avoid clearing of rare vegetation species</p> <p>Use existing access tracks. Minimise preparation of new access tracks and keep width of new access tracks to the minimum required</p> <p>Avoid off road travel</p> <p>Control vehicle speeds</p> <p>Avoid disturbance to natural drainage and obstruction of canals, streams or nullahs</p>
Air quality and noise	<p>Maintain generators, vehicles and other equipment and machinery in good condition to ensure exhaust emissions and noise are kept to a minimum level</p> <p>Control vehicle speeds to minimise dust emissions</p> <p>Avoid using access tracks that pass through communities. If un-avoidable maintain speed limit of less than 30km/hr and sprinkle water to minimise dust emissions</p> <p>Avoid use of horns by vehicles unless required for safety reasons</p> <p>Keep generators within enclosures to minimise dispersion of noise</p> <p>Provide sand cushion over shot holes and deep holes to minimise dispersion of noise</p>

Exhibit A-5, Continued

Activity	Mitigation Measures for 2D and 3D Seismic Operations
Waste management ¹	<p>Dispose sewage in septic system comprising of septic tanks and soak pits. Dispose grey wastewater (wastewater from laundry, kitchen washings, and showers) into separate soak pits</p> <p>Build soak pits in absorbent soil</p> <p>Construct soak pits such that surface runoff cannot enter the pits</p> <p>Locate soak pits 300 m from local water wells or any perennial surface water source</p> <p>Design soak pits to accommodate wastewater generated during the total duration of the operation</p> <p>Use excess grey water from soak pits for dust suppression, provided it does not have excessive oil and grease. Provide oil and grease traps to avoid entry of oil and grease into grey water soak pits</p> <p>Do not sprinkle sewage; in case the soak pits get filled dispose excess sewage into the nearest municipal drains</p> <p>Do not throw or leave solid wastes in the open. Within camp areas, keep all solid wastes in waste bins</p> <p>Burn all combustible material in burn pit. Locate burn pit 500 m from and downwind of local settlements. Fence burn pit to entry of animals and avoid waste material from flying outside of the pit</p> <p>Temporarily store non-combustible waste (including plastic or glass bottles and cans) onsite and hand over to waste/recycling contractor who can reuse or recycle these wastes</p> <p>Restore septic tanks by dismantling in place and backfilling with at least 1 m of soil cover</p> <p>Restore soak pits (after they have dried or wastewater removed and disposed off) by backfilling with at least 1 m of soil cover</p> <p>Temporarily store medical wastes onsite separately and incinerate at the nearest hospital or a similar facility</p> <p>Check vehicles daily for fuel or oil leaks. Do not operate vehicles until leaks have been repaired</p> <p>Provide concrete pad underneath all fuel and oil storage areas to prevent soil contamination in case of leaks or spills</p> <p>Mark all fuel tanks to highlight their contents</p> <p>Provide secondary containment for fuel and oil storage areas in the form of concrete or brick masonry bunds. The volume of the containment area should be equal to 120% of the total volume of fuel stored</p> <p>Check fuels tanks daily for leaks and plug all leaks immediately</p> <p>Prepare and follow spill prevention and contingency plan. Ensure that shovels, plastic bags, and absorbent material are present near fuel and oil storage or handling areas to attend spills and leaks</p> <p>Provide used oil and vehicle related waste to local contractors for recycling</p> <p>Prepare bentonite mud (used for the purpose of uphole and shot hole drilling) in earthen pits. Leave the mud in place to dry and backfill pit</p>

¹ Where additional guidance is required use E&P Forum Waste Management Guidelines or other guidelines/standards after ensuring that the selected waste management option is the best available alternative and poses no significant residual risk to the environment

Exhibit A-5, Continued

Activity	Mitigation Measures for 2D and 3D Seismic Operations
Use of water	<p>Use surface or groundwater only from sources, which have the additional capacity to supply water without affecting the availability for local users, sustainability of the source, and the water quality of the source.</p> <p>Do not use surface water from sources, which have an ecological significance (such as wetlands of importance) and where the use of the source for water sourcing can have direct or indirect impacts on the ecology of the source and the associated wildlife.</p> <p>Use surface and groundwater sources only after consultation with and consent of local communities, other users and stakeholders (such as irrigation department)</p> <p>Do not use surface and groundwater sources, which have limited or no recharge</p> <p>Keep consumption of water to the minimum required by taking prudent water conservation measures on site</p> <p>Where ever possible use non-potable water for process requirement</p> <p>Avoid contamination of surface and groundwater resources</p> <p>Maintain a complete record of water consumption during all operations</p> <p>If a new water well is to be installed, locate the well 500 m from existing local wells. If possible, design the well to abstract water preferably from deep aquifer not being used by local communities</p> <p>Use water from a local well only after ensuring that the available capacity at the well (safe yield minus local demand) is at least 50% greater than the project demand. Regularly monitor discharge from the water well to monitor any changes in the yield of the wells. If a single well fails to meet this requirement, obtain water from multiple wells such that each well meets the above-mentioned requirement</p> <p>Purchase water from local wells at the prevalent market rate</p>
Wildlife protection	<p>Avoid surveys during breeding periods of endangered or rare wildlife species, if significant impacts on these species may occur</p> <p>Where possible, align seismic lines to avoid core wildlife habitats. Alternatively, follow special controls to minimise any impacts on habitat quality and wildlife.</p> <p>Strictly prohibit hunting or harassment of wildlife</p> <p>Minimise vegetation clearing and land uptake</p> <p>Follow all mitigation recommended for waste management, noise and air emissions</p> <p>Avoid night travelling</p> <p>Maintain set backs from wetlands, live dens, live nests, live rodent holes</p> <p>Keep lights used at the seismic camp to the minimum required. Use low upward scattering lights in wildlife sensitive areas</p> <p>Adopt special measures to minimise impact on significant wildlife resources such as avoiding activities during critical periods of migration, breeding and feeding.</p> <p>Adopt project specific mitigation measures for projects in wildlife sensitive areas</p>

Exhibit A-5, Continued

Activity	Mitigation Measures for 2D and 3D Seismic Operations
Compensation and land acquisition	<p>Disburse compensation amounts for land leased for various project components in an equitable and transparent manner</p> <p>Give due consideration to loss of standing crops, traditional land rights and community ownership while determining compensation amounts</p> <p>Settle compensation amounts on prevailing market rates and in agreement with local traditions</p> <p>Restore all leased lands to as close to their original condition as possible</p>
Community relations	<p>During all projects maintain communication links with local communities</p> <p>Record and resolve all community grievances</p>
Employment	<p>Hire all unskilled labour from local communities. Where skills are available, give preference to hiring locals for semi-skilled and skilled jobs</p> <p>Provide employment in a just manner in consultation with local communities</p> <p>Recruit labour from local communities equitably from amongst the various tribes, keep avenues for conflict resolution open, and maintain transparency in employment procedures</p> <p>Give priority to local residents living closest to the project location</p>
Cultural and archaeological	<p>Project personnel should respect local cultural norms</p> <p>Seismic lines, access roads, and camps should maintain setbacks from cultural and archaeological sites</p>
Emergency response	<p>Prepare and follow emergency response plans (covering medical emergency, oil spills etc)</p>
Restoration	<p>Remove all temporary survey markers, stakes, cables, wastes, pinflags, etc from survey lines</p> <p>Backgrade windrows and reinstate natural drainage as far as practicable</p> <p>Repair any damaged property</p> <p>Where required, discourage public access to seismic lines and access tracks</p> <p>Demobilise all materials and equipment from the camp site</p> <p>Disposal of all left over wastes, backfill soak pits, septic tanks, and all other pits and excavations</p> <p>Relieve compacted areas to enable re-vegetation</p>

Exhibit A-6: Typical Mitigation Measures for Drilling Operations

Activity	Mitigation Measures for Drilling Operations
Land Management	<p>Take account of natural topography, drainage and site runoff in locating camp and well site. Avoid areas prone to flooding</p> <p>Select sites to be as unobtrusive as possible, with minimal visual intrusion</p> <p>Keep area of the construction camp, well site and rig camp to the minimum required</p> <p>Where possible locate well site and camp sites in levelled areas</p> <p>Utilise existing access tracks as much as possible and minimise preparation of new track</p> <p>Avoid off road travel</p> <p>Avoid large cut and fill operations and align access road along natural contours. Avoid steep cuts along hill sides and sand dunes, alternatively provide retaining structures</p> <p>Minimise clearing of vegetation; especially dense patches, large trees, woody shrubs, slow growing species, and rare species</p> <p>Compact cleared surfaces at the well site, rig camp and along the access road</p> <p>Control vehicle speeds</p> <p>Avoid disturbance to natural drainage and obstruction of canals, streams or nullahs</p>
Air quality and noise	<p>Maintain generators, vehicles and other equipment and machinery in good condition to ensure exhaust emissions and noise are kept to a minimum level</p> <p>Control vehicle speeds to minimise dust emissions</p> <p>Avoid using access tracks that pass through communities. If un-avoidable maintain speed limit of less than 30km/hr and sprinkle water for dust suppression</p> <p>Avoid use of horns by vehicles unless required for safety reasons</p> <p>Keep generators within enclosures to minimise dispersion of noise</p> <p>Do not use open blasting in community or wildlife sensitive areas. Adopt alternatives methods such as controlled or muffled blasting</p> <p>Avoid construction works during night where impacts on communities or wildlife can occur</p> <p>Flare hydrocarbons produced during testing within banded flare pits (the bunds should help dissipate noise and light from flaring). Keep flare pit downwind of local communities (at least 500 m set back) and rig camp.</p> <p>Vent air emissions from generators through vertical stacks</p> <p>Locate well site and camp site at least 500 m from nearest community, alternatively provide physical controls (such as noise barriers) to mitigate impacts</p> <p>Avoid use of horns, prohibit use of pressure horns</p> <p>Keep quarry sites 1,000 m away from nearest community unless lesser distance is possible without having impacts on local population</p>

Exhibit A-6, Continued

Activity	Mitigation Measures for Drilling Operations
Waste management ²	<p>Dispose sewage in septic system comprising of septic tanks and soak pits. Dispose grey wastewater (wastewater from laundry, kitchen washings, and showers) into separate soak pits</p> <p>Build soak pits in absorbent soil</p> <p>Construct soak pits such that surface runoff cannot enter the pits</p> <p>Locate soak pits 300 m from local water wells or any perennial surface water source</p> <p>Design soak pits to accommodate wastewater generated during the total duration of the operation</p> <p>Use excess grey water from soak pits for dust suppression, provided it does not have excessive oil and grease. Provide oil and grease traps to avoid entry of oil and grease into grey water soak pits</p> <p>Do not sprinkle sewage; in case the soak pits get filled dispose excess sewage into the nearest municipal drains</p> <p>Do not throw or leave solid wastes in the open. Within camp areas, keep all solid wastes in waste bins</p> <p>Burn all combustible material in burn pit. Locate burn pit 500 m from and downwind of local settlements. Fence burn pit to entry of animals and avoid waste material from flying outside of the pit</p> <p>Temporarily store non-combustible waste (including plastic or glass bottles and cans) onsite and hand over to waste/recycling contractor who can reuse or recycle these wastes</p> <p>Restore septic tanks by dismantling in place and backfilling with at least 1 m of soil cover</p> <p>Restore soak pits (after they have dried or wastewater removed and disposed off) by backfilling with at least 1 m of soil cover</p> <p>Temporarily store medical wastes onsite separately and incinerate at the nearest hospital or a similar facility</p> <p>Check vehicles daily for fuel or oil leaks. Do not operate vehicles until leaks have been repaired</p> <p>Provide concrete pad underneath all fuel and oil storage areas to prevent soil contamination in case of leaks or spills</p> <p>Mark all fuel tanks to highlight their contents</p> <p>Provide secondary containment for fuel and oil storage areas in the form of concrete or brick masonry bunds. The volume of the containment area should be equal to 120% of the total volume of fuel stored</p> <p>Check fuels tanks daily for leaks and plug all leaks immediately</p> <p>Prepare and follow spill prevention and contingency plan. Ensure that shovels, plastic bags, and absorbent material are present near fuel and oil storage or handling areas to attend spills and leaks</p> <p>Provide used oil and vehicle related waste to local contractors for recycling</p>

² Where additional guidance is required use E&P Forum Waste Management Guidelines (E&P September 1993) or other guidelines/standards (WB April 1999) after ensuring that the selected waste management option is the best available alternative and poses no significant residual risk to the environment

Exhibit A-6, Continued

Activity	Mitigation Measures for Drilling Operations
Drilling mud, drill cuttings, and Formation water	<p>Line pits built for storage and/or disposal of drilling mud, cuttings and formation water with high density polyethylene liner</p> <p>Pits must have slopes of 2:1 (or less in case of pits excavated in rock or in stable soils)</p> <p>Anchor the liner at the top of the pit in a trench at least 1 foot wide and 1 foot deep</p> <p>Design and construct pits that can accommodate the drilled cuttings and mud and any emergency flows without overflowing</p> <p>Pits should lie at least 5 feet above the shallowest aquifer in the area</p> <p>Use non-toxic water-based mud. In mud systems use barite with low lead levels</p> <p>Use bentonite spud mud in initial depths that encounter groundwater aquifer</p> <p>If oil based mud is used adopt special handling, storage, transportation and disposal procedures. Do not store oil based mud and cuttings inside lined or unlined pits onsite or offsite. Reuse oil based mud to the extent possible and dispose mud and cuttings using best available technologies in the country.</p> <p>Where economically feasible use mud recovery systems (such as flocculation units, Hi-G shakers etc)</p> <p>Water based mud and drill cuttings can be disposed onsite by allowing the mud to evaporate (to the extent possible) and burying the waste encapsulated within the HDPE liner and backfilled with at least 1 m of top soil cover. In agricultural lands undertake a separate risk assessment for disposal on site and adopt mitigation measures accordingly</p>
Use of Water	<p>Use surface or groundwater only from sources, which have the additional capacity to supply water without affecting the availability for local users, sustainability of the source, and the water quality of the source.</p> <p>Do not use surface water from sources, which have an ecological significance (such as wetlands of importance) and where the use of the source for water sourcing can have direct or indirect impacts on the ecology of the source and the associated wildlife.</p> <p>Use surface and groundwater sources only after consultation with and consent of local communities, other users and stakeholders (such as irrigation department)</p> <p>Do not use surface and groundwater sources, which have limited or no recharge</p> <p>Keep consumption of water to the minimum required by taking prudent water conservation measures on site</p> <p>Where ever possible use non-potable water for process requirement</p> <p>Avoid contamination of surface and groundwater resources</p> <p>Maintain a complete record of water consumption during all operations</p> <p>If a new water well is to be installed, locate the well 500 m from existing local wells. If possible, design the well to abstract water preferably from deep aquifer not being used by local communities</p> <p>Use water from a local well only after ensuring that the available capacity at the well (safe yield minus local demand) is at least 50% greater than the project demand.</p> <p>Regularly monitor discharge from the water well to monitor any changes in the yield of the wells. If a single well fails to meet this requirement, obtain water from multiple wells such that each well meets the above-mentioned requirement</p> <p>Purchase water from local wells at the prevalent market rate</p>

Exhibit A-6, Continued

Activity	Mitigation Measures for Drilling Operations
Wildlife protection	<p>Avoid drilling and associated activities during breeding periods of endangered or rare wildlife species, if significant impacts on these species may occur</p> <p>Where possible, select well site and access road that avoids core wildlife habitats. Alternatively, consider directional drilling to access critical areas or follow special controls to minimise any impacts on habitat quality and wildlife.</p> <p>Strictly prohibit hunting or harassment of wildlife</p> <p>Minimise vegetation clearing and land uptake</p> <p>Follow all mitigation recommended for waste management, noise and air emissions</p> <p>Keep lights used at the camp and well site to the minimum required. Use low upward scattering lights in wildlife sensitive areas</p> <p>Limit vehicle speeds on access road to avoid incidental mortality of small mammals and reptiles</p> <p>Fence all pits excavated to avoid entry of small mammal or reptiles</p> <p>Avoid construction works during night in wildlife sensitive areas. Avoid night travelling unless absolutely necessary</p> <p>Adopt special measures to minimise impact on significant wildlife resources such as avoiding activities during critical periods of migration, breeding and feeding.</p> <p>Adopt project specific mitigation measures for projects in wildlife sensitive areas</p>
Compensation and land acquisition	<p>Disburse compensation amounts for land leased for various project components in an equitable and transparent manner</p> <p>Give due consideration to loss of standing crops, traditional land rights and community ownership while determining compensation amounts</p> <p>Settle compensation amounts on prevailing market rates and in agreement with local traditions</p> <p>Restore all leased lands to as close to their original condition as possible</p>
Community relations	<p>During all projects maintain communication links with local communities</p> <p>Record and resolve all community grievances</p>
Employment	<p>Hire all unskilled labour from local communities. Where skills are available, give preference to hiring locals for semi-skilled and skilled jobs</p> <p>Provide employment in a just manner in consultation with local communities</p> <p>Recruit labour from local communities equitably from amongst the various tribes, keep avenues for conflict resolution open, and maintain transparency in employment procedures</p> <p>Give priority to local residents living closest to the project location</p>
Cultural and archaeological	<p>Train project personnel to respect local cultural norms</p> <p>Access road, well site, and camps should maintain setbacks from cultural and archaeological sites</p>
Emergency response	<p>Prepare and follow emergency response plan (covering oil spills, H₂S release, well blow out etc)</p>

Exhibit A-6, Continued

Activity	Mitigation Measures for Drilling Operations
Restoration	<p>In case of complete restoration, restore campsites and well site to as close to their original condition as possible. If community demands, access road can be left for community use. However only after ensuring that the continued and increased access to the area does not affect social conditions, ecology or wildlife viability</p> <p>Repair any damaged property</p> <p>Demobilise all materials and equipment</p> <p>Dispose off all wastes</p> <p>Backfill soak pits, septic tanks, and all other pits and excavations such that there is at least 1 m cover of topsoil. Backfill cuttings and mud pit only after the pits have substantially dried up.</p> <p>Relieve compacted areas to enable re-vegetation</p>

Exhibit A-7: Typical Mitigation Measures for Pipeline projects

Activity	Mitigation Measures for Pipeline Projects
Land management	<p>Keep area of the camp site to the minimum required</p> <p>Locate camp sites in plain areas with minimum vegetation cover, avoid clearing of land and vegetation</p> <p>Keep right of way (RoW) width for pipeline/flow line to a minimum</p> <p>Align pipelines/flowlines along existing access tracks/roads</p> <p>Minimise disturbance to natural topography and soils during clearing operations</p> <p>Minimise clearing of vegetation; especially dense patches, large trees, woody shrubs, slow growing species, and rare species</p> <p>Use existing access tracks. Minimise preparation of new access tracks and keep width of new access tracks to the minimum required</p> <p>Avoid off road travel</p> <p>Control vehicle speeds</p> <p>Avoid disturbance to natural drainage and obstruction of canals, streams or nullahs</p>
Air quality and noise	<p>Maintain generators, vehicles and other equipment and machinery in good condition to ensure exhaust emissions and noise are kept to a minimum level</p> <p>Control vehicle speeds to minimise dust emissions</p> <p>Avoid using access tracks that pass through communities. If un-avoidable maintain speed limit of less than 30km/hr</p> <p>Avoid use of horns by vehicles unless required for safety reasons</p> <p>Keep generators within enclosures to minimise dispersion of noise</p> <p>Avoid construction works during night where impacts on communities or wildlife can occur</p> <p>Vent air emissions from generators through vertical stacks</p> <p>Locate camp site at least 500 m from nearest community, alternatively provide physical controls (such as noise barriers) to mitigate impacts</p>
Waste Management ³	<p>Dispose sewage in septic system comprising of septic tanks and soak pits. Dispose grey wastewater (wastewater from laundry, kitchen washings, and showers) into separate soak pits</p> <p>Build soak pits in absorbent soil</p> <p>Construct soak pits such that surface runoff cannot enter the pits</p> <p>Locate soak pits 300 m from local water wells or any perennial surface water source</p> <p>Design soak pits to accommodate wastewater generated during the total duration of the operation</p> <p>Use excess grey water from soak pits for dust suppression, provided it does not have excessive oil and grease. Provide oil and grease traps to avoid entry of oil and grease into grey water soak pits</p>

³ Where additional guidance is required use E&P Forum Waste Management Guidelines or other guidelines/standards after ensuring that the selected waste management option is the best available alternative and poses no significant residual risk to the environment

Exhibit A-7, Continued

Activity	Mitigation Measures for Pipeline Projects
	<p>Do not sprinkle sewage; in case the soak pits get filled dispose excess sewage into the nearest municipal drains</p> <p>Do not throw or leave solid wastes in the open. Within camp areas, keep all solid wastes in waste bins</p> <p>Burn all combustible material in burn pit. Locate burn pit 500 m from and downwind of local settlements. Fence burn pit to entry of animals and avoid waste material from flying outside of the pit</p> <p>Temporarily store non-combustible waste (including plastic or glass bottles and cans) onsite and hand over to waste/recycling contractor who can reuse or recycle these wastes</p> <p>Restore septic tanks by dismantling in place and backfilling with at least 1 m of soil cover</p> <p>Restore soak pits (after they have dried or wastewater removed and disposed off) by backfilling with at least 1 m of soil cover</p> <p>Temporarily store medical wastes onsite separately and incinerate at the nearest hospital or a similar facility</p> <p>Check vehicles daily for fuel or oil leaks. Do not operate vehicles until leaks have been repaired</p> <p>Provide concrete pad underneath all fuel and oil storage areas to prevent soil contamination in case of leaks or spills</p> <p>Mark all fuel tanks to highlight their contents</p> <p>Provide secondary containment for fuel and oil storage areas in the form of concrete or brick masonry bunds. The volume of the containment area should be equal to 120% of the total volume of fuel stored</p> <p>Check fuels tanks daily for leaks and plug all leaks immediately</p> <p>Prepare and follow spill prevention and contingency plan. Ensure that shovels, plastic bags, and absorbent material are present near fuel and oil storage or handling areas to attend spills and leaks</p> <p>Provide used oil and vehicle related waste to local contractors for recycling</p> <p>Dispose wastewater from hydrotesting after project specific impact assessment (impacts may vary depending on the quality of the wastewater, method of disposal and the surrounding environment)</p>
Use of Water	<p>Use surface or groundwater only from sources, which have the additional capacity to supply water without affecting the availability for local users, sustainability of the source, and the water quality of the source.</p> <p>Do not use surface water from sources, which have an ecological significance (such as wetlands of importance) and where the use of the source for water sourcing can have direct or indirect impacts on the ecology of the source and the associated wildlife.</p> <p>Use surface and groundwater sources only after consultation with and consent of local communities, other users and stakeholders (such as irrigation department)</p>

Exhibit A-7, Continued

Activity	Mitigation Measures for Pipeline Projects
	<p>Do not use surface and groundwater sources, which have limited or no recharge</p> <p>Keep consumption of water to the minimum required by taking prudent water conservation measures on site</p> <p>Where ever possible use non-potable water for process requirement</p> <p>Avoid contamination of surface and groundwater resources</p> <p>Maintain a complete record of water consumption during all operations</p> <p>If a new water well is to be installed, locate the well 500 m from existing local wells. If possible, design the well to abstract water preferably from deep aquifer not being used by local communities</p> <p>Use water from a local well only after ensuring that the available capacity at the well (safe yield minus local demand) is at least 50% greater than the project demand. Regularly monitor discharge from the water well to monitor any changes in the yield of the wells. If a single well fails to meet this requirement, obtain water from multiple wells such that each well meets the above-mentioned requirement</p> <p>Purchase water from local wells at the prevalent market rate</p>
Wildlife Protection	<p>Avoid critical wildlife habitats and pipeline laying activities during breeding periods of endangered or rare wildlife species, if significant impacts on these species may occur</p> <p>Avoid blocking seasonal migration paths of wildlife</p> <p>Strictly prohibit hunting or harassment of wildlife</p> <p>Minimise vegetation clearing and land uptake</p> <p>Follow all mitigation recommended for waste management, noise and air emissions</p> <p>Keep lights used at the campsite to the minimum required. Use low upward scattering lights in wildlife sensitive areas</p> <p>Limit vehicle speeds on access road to avoid incidental mortality of small mammals and reptiles</p> <p>Avoid construction works during night in wildlife sensitive areas. Avoid night travelling unless absolutely necessary</p> <p>Adopt special measures to minimise impact on significant wildlife resources such as avoiding activities during critical periods of migration, breeding and feeding.</p> <p>Adopt project specific mitigation measures for projects in wildlife sensitive areas</p>
Compensation and Land Acquisition	<p>Disburse compensation amounts for land leased for various project components in an equitable and transparent manner</p> <p>Give due consideration to loss of standing crops, traditional land rights and community ownership while determining compensation amounts</p> <p>Settle compensation amounts on prevailing market rates and in agreement with local traditions</p> <p>Restore all leased lands to as close to their original condition as possible</p>
Community relations	<p>During all projects maintain communication links with local communities</p> <p>Record and resolve all community grievances</p>

Exhibit A-7, Continued

Activity	Mitigation Measures for Pipeline Projects
Employment	<p>Hire all unskilled labour from local communities. Where skills are available, give preference to hiring locals for semi-skilled and skilled jobs</p> <p>Provide employment in a just manner in consultation with local communities</p> <p>Recruit labour from local communities equitably from amongst the various tribes, keep avenues for conflict resolution open, and maintain transparency in employment procedures</p> <p>Give priority to local residents living closest to the project location</p>
Cultural and Archaeological	<p>Project personnel should respect local cultural norms</p> <p>Access tracks, camp, and pipeline alignment should maintain setbacks from cultural and archaeological sites</p>
Emergency Response	<p>Prepare and follow emergency response plan (covering medical emergency, oil spills etc)</p>
Restoration	<p>Repair any damaged property</p> <p>Demobilise all materials and equipment from the camp site</p> <p>Disposal all left over wastes</p> <p>Backfill pipeline excavation with topsoil</p>

Exhibit A-8: Typical Mitigation Measures for Processing Plants

Activity	Mitigation Measures for Processing Plants
Land management	<p>Take account of natural topography, drainage and site runoff in locating processing plant. Avoid areas prone to flooding</p> <p>Select sites to be as unobtrusive as possible, with minimal visual intrusion</p> <p>Keep area of the plant and camp to the minimum required</p> <p>Where possible locate plant and camp in levelled areas</p> <p>Utilise existing access tracks as much as possible and minimise preparation of new track</p> <p>Avoid off road travel</p> <p>Avoid large cut and fill operations; avoid steep cuts along hill sides and sand dunes, alternatively provide retaining structures</p> <p>Minimise clearing of vegetation; especially dense patches, large trees, woody shrubs, slow growing species, and rare species</p> <p>Compact cleared surfaces at the plant, camp and along the access road</p> <p>Control vehicle speeds</p> <p>Avoid disturbance to natural drainage and obstruction of canals, streams or nullahs</p>
Air quality and noise	<p>Identify and quantify all sources of process emissions (flaring, venting exhaust emissions) in the planning phase of the project and plan mitigation measures. Model significant emissions to quantify impacts on local communities and ambient air quality. Meet applicable National Environmental Quality Standards as a minimum. Adopt best practices for minimising flaring, venting and other process emissions</p> <p>Maintain generators, vehicles and other equipment and machinery in good condition to ensure exhaust emissions and noise are kept to a minimum level</p> <p>Control vehicle speeds to minimise dust emissions</p> <p>Avoid using access tracks that pass through communities. If un-avoidable maintain speed limit of less than 30km/hr and sprinkle water for dust suppression</p> <p>Avoid use of horns by vehicles unless required for safety reasons</p> <p>Keep generators within enclosures to minimise dispersion of noise</p> <p>Do not use open blasting for construction in community or wildlife sensitive areas. Adopt alternatives methods such as controlled or muffled blasting</p> <p>Avoid construction works during night where impacts on communities or wildlife can occur</p> <p>Vent air emissions from generators through vertical stacks</p> <p>Locate processing plant at least 500 m from nearest community</p> <p>Avoid use of horns, prohibit use of pressure horns</p> <p>Keep quarry sites 1,000 m away from nearest community unless lesser distance is possible without having impacts on local population</p>

Exhibit A-8, Continued

Activity	Mitigation Measures for Processing Plants
Waste management ⁴	<p>Identify and quantify all sources of effluents and solid wastes (domestic and medical wastes, produced water, crude oil, hydrocarbon sludge, used chemicals etc) in the planning phase of the project and plan mitigation measures. Meet applicable National Environmental Quality Standards as a minimum. Adopt best practices for waste management</p> <p>Treat domestic effluents in a treatment plant; avoid use of septic tanks and soak pits. Meet applicable National Environmental Quality Standards as a minimum. Reuse treated effluent for plantation or process needs.</p> <p>Burn combustible wastes in a purpose built incinerator.</p> <p>No solid waste will be disposed off in the field. Within the camp areas all solid wastes will be disposed off in waste bins provided within the camp area</p> <p>Temporarily store non-combustible waste (including plastic or glass bottles and cans) onsite and hand over to waste/recycling contractor who can reuse or recycle these wastes</p> <p>Temporarily store medical wastes onsite and incinerate at the on-site incinerator or at nearest hospital or a similar facility</p> <p>Check vehicles daily for fuel or oil leaks. Do not operate vehicles until leaks have been repaired</p> <p>Provide concrete pad underneath all fuel and oil storage areas to prevent soil contamination in case of leaks or spills</p> <p>Mark all fuel tanks to highlight their contents</p> <p>Provide secondary containment for fuel and oil storage areas in the form of concrete or brick masonry bunds. The volume of the containment area should be equal to 120% of the total volume of fuel stored</p> <p>Check fuels tanks daily for leaks and plug all leaks immediately</p> <p>Prepare and follow spill prevention and contingency plan. Ensure that shovels, plastic bags, and absorbent material are present near fuel and oil storage or handling areas to attend spills and leaks</p> <p>Provide used oil and vehicle related waste to local contractors for recycling</p>
Use of water	<p>Identify and quantify water resources in the area. Plan a long-term water abstraction strategy taking into consideration both short term and long term impacts.</p> <p>Plan and implement water conservation measures and set and monitor water consumption targets.</p> <p>Use surface or groundwater only from sources, which have the additional capacity to supply water without affecting the availability for local users, sustainability of the source, and the water quality of the source.</p>

⁴ Where additional guidance is required use E&P Forum Waste Management Guidelines or other guidelines/standards after ensuring that the selected waste management option is the best available alternative and poses no significant residual risk to the environment

Exhibit A-8, Continued

Activity	Mitigation Measures for Processing Plants
	<p>Do not use surface water from sources, which have an ecological significance (such as wetlands of importance) and where the use of the source for water sourcing can have direct or indirect impacts on the ecology of the source and the associated wildlife.</p> <p>Use surface and groundwater sources only after consultation with and consent of local communities, other users and stakeholders (such as irrigation department)</p> <p>Do not use surface and groundwater sources, which have limited or no recharge</p> <p>Keep consumption of water to the minimum required by taking prudent water conservation measures on site</p> <p>Where ever possible use non-potable water for process requirement</p> <p>Avoid contamination of surface and groundwater resources</p> <p>Maintain a complete record of water consumption during all operations</p> <p>If a new water well is to be installed, locate the well 500 m from existing local wells. If possible, design the well to abstract water preferably from deep aquifer not being used by local communities</p>
Wildlife protection	<p>Avoid critical wildlife habitats and activities during breeding periods of endangered or rare wildlife species, if significant impacts on these species may occur</p> <p>Strictly prohibit hunting or harassment of wildlife</p> <p>Minimise vegetation clearing and land uptake</p> <p>Follow all mitigation recommended for waste management, noise and air emissions</p> <p>Keep lights used at the plant and camp to the minimum required. Use low upward scattering lights in wildlife sensitive areas</p> <p>Limit vehicle speeds on access road to avoid incidental mortality of small mammals and reptiles</p> <p>Avoid construction works during night in wildlife sensitive areas. Avoid night travelling unless absolutely necessary</p> <p>Adopt special measures to minimise impact on significant wildlife resources such as avoiding activities during critical periods of migration, breeding and feeding.</p> <p>Adopt project specific mitigation measures for projects in wildlife sensitive areas</p>
Compensation and land acquisition	<p>Disburse compensation amounts for land leased for various project components in an equitable and transparent manner</p> <p>Give due consideration to loss of standing crops, traditional land rights and community ownership while determining compensation amounts</p> <p>Settle compensation amounts on prevailing market rates and in agreement with local traditions</p> <p>Restore all leased lands to as close to their original condition as possible</p>
Community relations	<p>During all projects maintain communication links with local communities</p> <p>Record and resolve all community grievances</p>

Exhibit A-8, Continued

Activity	Mitigation Measures for Processing Plants
Employment	<p>During operation a long term hiring policy will be prepared and followed and skill development programme will be implemented for local people</p> <p>During construction and operation hire all unskilled labour from local communities. Where skills are available, give preference to hiring locals for semi-skilled and skilled jobs</p> <p>Provide employment in a just manner in consultation with local communities</p> <p>Recruit labour from local communities equitably from amongst the various tribes, keep avenues for conflict resolution open, and maintain transparency in employment procedures</p> <p>Give priority to local residents living closest to the project location</p>
Cultural and archaeological	<p>Project personnel should respect local cultural norms</p> <p>Maintain setbacks from cultural and archaeological sites</p>
Emergency response	<p>Prepare and follow emergency response plans (covering medical emergency, oil spills etc)</p>
Restoration	<p>Develop a restoration plan and share with the regulators prior to decommissioning of the site. The plan should address the disposal of large quantities of construction debris and mechanical and electrical fixtures</p> <p>Restore plant and campsite to as close to their original condition as possible. If community demands, access road can be left for community use. However only after ensuring that the continued and increased access to the area does not affect social conditions, ecology or wildlife viability</p> <p>Repair any damaged property</p> <p>Demobilise all materials and equipment</p> <p>Dispose off all wastes</p> <p>Backfill soak pits, septic tanks, and all other pits and excavations such that there is at least 1 m cover of topsoil. Backfill produced water pits only after the pits have substantially dried up.</p> <p>Relieve compacted areas to enable re-vegetation</p>

Exhibit A-9: Setbacks from Environmental Features

Activity/Feature	Receptor	Setback (m)	Comments
Camps/well site/processing plant	Local settlement	500	May vary (increase or decrease) depending on topography, wind direction, level of impacts, duration of occupation, contingency planning; size of settlement, and physical controls (such as noise barriers)
Camps/well site/processing plant	Cultural or archaeological site	500	May vary (increase or decrease) depending on type, condition and significance of the site; topography; level of impacts; duration of occupation; contingency planning; physical controls (such as barricades provided to control access to the site)
Camps/well site/processing plant	Sensitive or core wildlife habitat	Can vary between 300 to 1000 or greater for processing plants	May vary (increase or decrease) depending on topography, wildlife species; season; level of impacts; duration of occupation; contingency planning; physical controls (such as noise barriers) etc
Soak pits at temporary camps for seismic, drilling and pipelines	Water well	300	May vary (increase or decrease) depending on sub-surface geology
Soak pits at temporary camps for seismic, drilling and pipelines	Surface water source	300	May vary (increase or decrease) depending on sub-surface geology; flows and water quality of the source (distance maybe reduced if the source is a known wastewater drain)

Exhibit A-9, Continued

Activity/Feature	Receptor	Setback (m)	Comments
Seismic line	Local settlement	100	May vary (increase or decrease) depending on the survey technique; type of construction at the local settlement; topography etc
Seismic line	Cultural or archaeological site	100	May vary (increase or decrease) depending on the survey technique; type, condition and significance of the site; topography etc
Seismic line	Water well	100	May vary (increase or decrease) depending on the survey technique and sub-surface geology
Pop-shot/deep hole/uphole - Seismic	Live den, nest, rodent hole	25	May vary (increase or decrease) depending on the survey technique, type of species etc
Access road	Local settlement	200	May vary (increase or decrease) depending on prevalent wind direction; duration of use; level of traffic; community demand etc
Access road	Cultural or archaeological site	100	May vary (increase or decrease) depending on type, condition and significance of the site; topography; level of impacts; physical controls (such as barricades provided to control access to the site); duration of use; level of traffic etc

Annexure B

Policy, Legislation and Guidelines



Annexure B: Policy, Legislation and Guidelines

B.1 Brief History of Environmental Law in Pakistan

Environment as a direct concern of the Government of Pakistan dates back to the UN Conference on Human Environment held in Stockholm in June 1972. Until that time, environmental protection was the concern of weakly enforced indirect provisions in local, provincial, and federal laws. These provisions were mainly designed to improve civic and factory conditions and the management of canals, forests, and wildlife.

The 1973 Constitution (which came shortly after the 1972 Stockholm Conference) was the first to formally recognise the subject of “Environmental Pollution and Ecology” and placed the subject on the Concurrent Legislative List⁵.

In 1974 the federal cabinet directed the drafting of “an overall legislation for pollution”. In the same year, the Agrovilles Division⁶ of the federal government was renamed as Environment and Urban Affairs Division. The Division enjoyed considerable international exposure leading eventually to the election of Pakistan to the membership of the Governing Council of the United Nations Environment Programme (UNEP), the institution heir to the Stockholm Conference. The role of the Division, or the concept of environment however, continued to be restricted to the living conditions and planning and housing sector. Under the 1975-76 Annual Plan, the Division was made part of the Physical Planning and Housing Sector, rather than a separate Ministry of Environment as suggested by the development perspective for 1975-80 prepared by the Planning Commission.

The most notable achievement in the 1980s was the enactment of the Pakistan Environmental Protection Ordinance (PEPO) on December 31, 1983. The PEPO envisaged Pakistan Environmental Protection Council (PEPC) as a policy making body and the Environmental Protection Agencies (EPA’s) for implementation of the Ordinance. Neither the PEPO nor the PEPC or the EPA’s operationalised for quite some time. The PEPC met for the first time in 1991 and the Pakistan Environmental Protection Agency, though toothless and scantily staffed, was set-up for the first time in 1984.

In 1992 the Federal Cabinet approved the National Conservation Strategy (NCS), the first ever-environmental policy of the Government of Pakistan. Following the NCS there was significant progress towards the creation of institutions and adoption of policy

⁵ Allows jurisdiction to the federations as well as the provinces.

⁶ The Agrovilles Division of the federal government was created in 1971 to provide urban amenities to rural centers.

measures for the environment sector: reactivation of the Pakistan Environmental Protection Council (PEPC); endorsement of the PEPO by the Parliament in 1997; establishment of federal and provincial Environmental Protection Agencies (EPA's), approval of National Environmental Quality Standards (NEQS), and the initiation of Provincial Conservation Strategies.

B.2 Key Institutions and their Roles

B.2.1 Environment

Headed by a federal minister, the Ministry of Environment, Local Government and Rural Development is the main government organization responsible for the protection of environment and resource conservation. The Ministry works with the Pakistan Environmental Protection Council (PEPC) and the Federal and Provincial EPA's.

The PEPC is a high-level committee comprising the President of Pakistan (or someone appointed by the President) as the Chairperson; governors; federal and provincial ministers and secretaries of the relevant departments; heads of the federal and provincial EPA's; environmentalists and community representatives. The functions of the Council include policy formulation and approval of standards.

A respective Director General heads the Federal and provincial EPA's. The EPA's have wide-ranging functions including the preparation and co-ordination of national environmental policy for approval by the PEPC, administering and implementing the PEPA 1997 and preparation, revision or establishment of NEQS.

B.2.2 Biodiversity

The National Council for Conservation of Wildlife (NCCW) is responsible for formulation of national wildlife policies; co-ordination with provincial wildlife departments on the implementation of these policies; and co-ordination with international organisations on matters related to international treaties. The NCCW works under the Ministry of Environment, Local Government and Rural Development and is headed by the Inspector General Forests (IGF). The IGF office has ongoing responsibilities for policy formulation, implementation, monitoring, technical assistance, and research and development. NCCW comprises of an advisory council, which is chaired by the Minister of Environment and includes representatives from provincial wildlife departments, NGO's, members of civil society and other ministries. A NCCW secretariat based in Islamabad handles the day-to-day affairs, the implementation of the policies and recommendations of the advisory council. At provincial level each province has wildlife and forest departments and related laws. Each department is headed by a Conservator and comes under the control of the relevant ministry.

B.2.3 Cultural Heritage

The Department of Archaeology and Museums under the Federal Ministry of Culture and Sports is the custodian of the nation's cultural heritage. The main functions of the Department are as follows (HBP June 2002):

- Preservation and conservation of historical and archaeological monuments
- Exploration and excavation
- Collaboration with foreign archaeological missions working at various sites in Pakistan
- Control of movement of cultural property
- Establishment and maintenance of museums
- Treatment and restoration of antiquities
- Administration of Antiquities Act, 1975
- Research on epigraphy, numismatics, and other relevant fields of archaeology
- Organisation of seminars, symposia, and workshops at the national and international level

Since 1985, the Provincial governments have created their own departments of Archaeology and have been listing monuments as "Special Premises" in the Punjab and "Protected Heritage" in the Province of Sindh. The N.W.F.P government has not yet enacted laws governing archaeological and historical sites in the province, although they have created their own Department of Archaeology and are engaged in excavations of sites. Balochistan does not have a department of archaeology.

B.2.4 Others

Other government institutions with designated responsibility for natural resource management are sectorally organised, in line with the general arrangements for administration and development between the federal, provincial and local governments.

B.2.5 NGO's

Numerous NGO's are active in Pakistan in the tradition social sector: emergency support, rehabilitation, health, and education. Other areas include income generation, poverty reduction, vocational training, nutrition and food security, and maternal, child health and family planning. There are five different laws under which NGO's in Pakistan can be registered¹. The UNDP suggests that the number of registered NGOs under the five different laws is from 8,000 to 16,000. More information on NGO's is provided in ADB (1999).

¹ The Societies Registration Act of 1860, the Trust Act of 1882, the Cooperative Societies Act of 1952, the Voluntary Social Welfare Agencies Ordinance 1961 and the Companies Ordinance of 1984

B.3 Judiciary, Enforcement Mechanism and Penalties

The enforcement mechanisms contained within the Pakistan Environmental Protection Act, 1997 quantify a measurable degree of administrative penalties and pollution charges as well as environmental protection orders for offences and violations of any of the rules contained within the Act. The enforcement mechanism and penalties are comprehensively described in Qadar (2002).

Apart from the Pakistan Environmental Protection Act, the Pakistan Penal Code of 1860 and the Criminal Procedure Code of 1898 cover environmental offences of the nature of water pollution, and pollution to the atmosphere. However due to the nature of the time frame they were written they are too broadly focused which has espoused the GoP to enforce and implement several provincial and federal environmental policies and laws since then under the umbrella of the PEPA 1997.

B.4 National and Provincial Environment Policies and their Relevance

The National Conservation Strategy together with the National Environmental Action Plan sets policy level directions and priorities for the GoP. At the provincial level NWFP and Balochistan have prepared their respective conservation strategies. Although these strategies define strategic direction and action plans for the federal and provincial governments, they also identify core areas of concern for the two governments. All upstream project proponents should ensure that their projects are planned and executed such that they do not aggravate or add to the core environmental concerns faced by the country and that the management of the projects is in line with the policies and action plans recommended in the strategies.

B.5 Environment Related Laws in Pakistan

The Pakistan Environmental Protection Act, 1997 is the basic environmental law in Pakistan. The act is a replacement of the Pakistan Environmental Protection Ordinance, 1983, which was considered narrow in scope and had some deficiencies. Various regulations relating to the environment have been promulgated under PEPA 1997 and to date some are still under review.

Various other laws cover different facets of environmental protection, biodiversity, cultural heritage, and natural resources exist. A summary of these laws is provided in **Annexure B (Exhibit B-1)**. A more concise and up to date package of information on environmental laws is being collated by IUCN, details of which can be obtained from the IUCN Head Office in Karachi.

B.6 Applicability of Laws

The implications and applicability of statutes summarised in Exhibit 3-1 will vary from project to project and will have to be assessed on a case basis in the EA. Over the past

few years various issues and concerns have also been highlighted with regards to the applicability of certain standards and laws to the upstream oil and gas industry (such as Self Monitoring and Reporting and NEQS). It is expected that because of the nascent stage of the development of environmental laws and standards, such concerns and issues might continue to arise and would need continued dialogue between the upstream industry associations, regulators and other stakeholders for their resolution.

B.7 Standards for Upstream Projects

The present environmental laws in the country do not cover some of the issues that are specific to the upstream industry e.g. there are no specific standards for the disposal of drill cuttings; for the disposal of produced water through re-injection etc. Till the time any standards are invoked in the country most relevant and applicable international standards and best practices may be adapted and followed by the upstream industry. In following these standards consideration will be given to local conditions, environmental impacts and risks and conflicts with other legal requirements. The project EA should recommend most suitable standard and any modification to the standard based on the aforementioned considerations.

Examples of a few standards that may be adopted for pollution prevention and waste management are listed below:

- Exploration and Production Waste Management Guidelines, The E&P Forum, Report No. 2.58/196, September 1993
- Environmental Guidance Document: Waste Management in Exploration and Production Operations, American Petroleum Institute, API E5, 1997.
- Statewide Order 29 – B, State of Louisiana, Department of Natural Resources, 1990.
- Pollution Prevention and Abatement Handbook, World Bank, April 1999.
- Land Farming Guidelines, US EPA, October 1994
- Guidelines for Produced Water Injection, Report No. 2.80/302, January 2000, OGP.

B.8 International Conventions

Pakistan is a signatory to a number of international and regional treaties. The implications of these treaties for the upstream exploration and production sector are discussed below. Global and regional treaties are, in principle, binding in the first instance on national governments, which are obliged to implement such arrangements through national legislation. The speed and timing of implementation at the national level may be slow and not all international treaties might have a local legislation to support their implementation at the national level. However, it is prudent and environmentally desirable for exploration and production companies to ensure that the

intent of such treaties is respected in all their projects. A summary of the international conventions is provided in **Annexure B (Exhibit B-2)**.

B.9 Guidelines

In the absence of adequate environmental laws and enforcement in emerging economies, there have been calls for oil companies to voluntarily adopt "best practices". The norms, principles or standards contained in the guidelines, declarations of principles and codes of practice of NGOs and IGOs, such as the non-binding Rio Declaration on Environment and Development, are often termed as "soft law". Soft laws and best practices can have legal implications in future beyond the formal status of these documents as "non-binding" guidelines. Thus, over time, conformance to soft laws and best practices may become standard practices that the international community expects every government to require of oil and gas corporations by law in the future (OGEL 2004).

In the international oil exploration and production industry, the guidelines and standards of the International Association of Oil and Gas Producers (OGP – formerly the Oil Industry International Exploration and Production Forum) and the American Petroleum Institute (API) are particularly influential. The OGP represents oil and gas companies from around the world, and the API, through the history of the dominance of US oil companies in the international oil industry, has a strong influence in the industry. The guidelines of various NGOs and IGOs are also influential, including the World Conservation Union (IUCN), the United Nations Environment Programme (UNEP), the International Standards Organisation (ISO), the World Bank, the International Chamber of Commerce (ICC) and the World Business Council for Sustainable Development (WBCSD).

A synopsis of a few guidelines is provided in **Annexure B (Exhibit B-3)**. Where local legislation or industry specific standards do not exist these guidelines may be adopted as the prescribed standard; after taking into consideration local conditions and environmental risks.

Exhibit B-1: Summary of Environment Related Laws in Pakistan

1	Environmental Assessments
1.1	<p><i>Pakistan Environmental Protection Act, 1997 and IEE and EIA Review Regulations, 2000</i></p> <p>As per clause 12 of PEPA 1997 and clause 3 and 4 of the IEE and Review Regulations all upstream projects outside environmentally protected areas require an IEE and all projects in environmentally sensitive areas require an EIA.</p>
2	Environmental Monitoring, Sampling, Testing, and Reporting
2.1	<p><i>IEE and EIA Review Regulations, 2000</i></p> <p>As per clause 19 of the IEE and EIA Review Regulations, 2000 proponents of all projects are required to monitor their projects and submit reports to the concerned EPA.</p>
2.2	<p><i>National Environmental Quality Standards (Self Monitoring and Reporting by Industry) Rules, 2001</i></p> <p>The rules establish pollution limits for industries in Pakistan under an honor-based self-monitoring system obliging all industries to submit environmental monitoring reports to the federal EPA timely and correctly</p>
2.3	<p><i>Industrial Pollution Charge (Calculation and Collection) Rules, 2001</i></p> <p>These rules ensure the correct calculation, reporting and payment of pollution charges by polluting/industrial units. Pollution units per unit of production are the basis for calculation of the pollution charge by the industrial unit</p>
2.4	<p><i>Environmental Sample Rules, 2001</i></p> <p>These rules regulate the procedure for obtaining samples from polluting industries, their tests and analysis by the environmental laboratories as well as seeking recourse for the contravention of the above procedures</p>
2.5	<p><i>National Environmental Quality Standards (Certification of Environmental Laboratories) Rules, 2001</i></p> <p>These rules were established as checks to the environmental laboratories for safety purposes. The standards prescribe for the procedure for certification encompassing the terms and conditions for the function of an environmental laboratory</p>
3	Soils and Landscape
3.1	<p><i>Punjab Land Preservation Act, 1900</i></p> <p>This act aims at protecting the ground water, and preventing any land erosion by prohibiting tree felling, land clearing for agriculture, quarrying of stones, and transit of forest produce. This act requires landowners to carry out anti erosion work at their own cost. Penalties for breach of regulation, and payment of cash compensation are provided in this act</p>
3.2	<p><i>The Punjab Soil Reclamation Act, 1952</i></p> <p>The Punjab Soil Reclamation Act of 1952 governed the preparation of drainage schemes and other drainage related works. The Act was later extended to cover the whole country</p>

Exhibit B-1, Continued

4 Air quality

4.1 The Motor Vehicle Ordinance 1965 and The Motor Vehicle Rules, 1969

Rule 155 requires every motor vehicle to be so constructed or equipped that the exhaust gases from the engine are not discharged downwards so as to impinge on the road surface
Rule 163 requires every motor vehicle to be so constructed, maintained and driven and used that smoke, visible vapour, grit, sparks, ashes, cinders or oily substance is not emitted

4.2 The Pakistan Penal Code, 1860

Section 278 prohibits vitiating the atmosphere in any place so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighbourhood or passing along a public way.

4.3 The Punjab Local Government Ordinance, 1979

The Ordinance requires Zila Council and Urban Local Council to prepare and implement schemes for the prevention of air pollution emitted by automobiles, engines, factories, brick kilns, crushing machines and such other sources as the bye-laws may provide

4.4 The Factories Act, 1934

The factories Act of 1934 governs the effective disposal of solid waste, and effluents, from industries

4.5 The Lahore Development Authority Act, 1975

Enacted in 1975 the Act oversees the development, operations and maintenance of water-supplies of sewerage and drainage systems within the greater Lahore Metropolitan Area

4.6 PEPA 1997 and NEQS

As per clause 11 of PEPA 1997, no person shall discharge gaseous emissions in excess of the NEQS or any other standards developed specifically for the industry or sector

5 Noise

5.1 The Motor Vehicle Rules, 1969

Rule 155 requires all vehicles to be fitted with silencers to reduce noise. Rule 158 requires all motor vehicles to be maintained in condition not to cause noise when in motion. Rule 154 (1) bars the use of horns that produce harsh, shrill or alarming noise. Rule 252 prohibits the use of horns or other audible warding devices, except to avoid imminent accident

5.2 The West Pakistan Regulation and Control of Loudspeakers and Sound Amplifiers ordinance (II), 1965

Stipulates that no person shall use a loudspeaker in a public place so as to cause “annoyance or injury” to the residents of the locality. The use of loudspeakers is prohibited near offices, courts, hospitals or places of workshops

5.3 PEPA 1997 and NEQS

PEPA 1997 prohibits noise from motor vehicles to exceed 85 dbA when measured from 7.5 m from the source

Exhibit B-1, Continued

6 Pollution and Waste Management

6.1 PEPA 1997 and NEQS

Clause 11 of PEPA 1997 prohibits discharge of effluents in excess of the NEQS. NEQS are separate for discharge into inland waters, sewage treatment, and sea. The NEQS disallow the dilution of effluents with freshwater. Effluents that meet NEQS when discharged into the recipient body should meet a 1:10 dilution (i.e. for every 1 cum of effluent there should be 10 cum of water in the recipient water body) otherwise more stringent NEQS may apply.

6.2 The Canal and Drainage Act, 1873 (amended in 1952, 1965, 1968 and 1970)

Prohibits corrupting or fouling of canal water, which maybe used for domestic purposes.

6.3 The Punjab Minor Canals Act, 1905

This act governs and administers the operation, maintenance and water allocation rules for canal irrigation

6.4 Sindh Fisheries Ordinance, 1980

Prohibits the discharge of untreated sewage into water

6.5 The Punjab Local Government Ordinance, 1979

Under Section 61 the urban local council may require the owners, tenants or occupiers of commercial and industrial concerns to have at their own cost prepared and implement a scheme for the safe drainage and disposal of their wastes and effluents of the quality permitted under the rules or the bye-laws

6.6 The Factories Act, 1934 including the Provincial Factories Rules

Requires effective arrangements to be put in place in every factory for the disposal of waste and effluents

6.7 The Pakistan Penal Code, 1860

Section 277 prohibits corrupting or fouling the water of any public spring or reservoir so as to render it less fit for the purposes for which it is ordinarily used

6.8 Balochistan Water and Sanitation Authority Ordinance, 1988

This Act authorizes the development of water supply, sewage and sanitation facilities, and to control disposal of industrial wastes

6.9 The Hospital Waste Management Rules

These rules fall under the PEPA 1997, whereby, every hospital has to apply to the federal EPA for a license for the proper management of waste and disposal and for hospitals generating risk waste

7.0 Forests

7.1 The Forest (West Pakistan Amendment) Act, 1964

This amendment to the 1927 Forest Act extends to all provinces (except Hazara district in NWFP and Tribal Areas). The amendment makes it easier to recover encroached land in Reserved and Protected forests, but the amendment did not change the situation much.

Exhibit B-1, Continued

-
- 7.2 *Reserved Trees Act 1966*
- The Juniper tree has been declared a reserved tree by The Reserved Trees Act, 1966, and the Balochistan Forests Amendment Act, 1974. These prohibit the cutting and removal of Juniper trees from all areas, irrespective of ownership without the permission of forest officers. So far no enforcement mechanism has been put in place by the forest department.
-
- 7.3 *The Cutting of Trees (Prohibition) Act, 1975*
- Cutting of trees without approval can result in fine or 3 years imprisonment
-
- 7.4 *The West Pakistan Firewood and Charcoal (Restriction) Act, 1964*
- This Act covers all the provinces except Tribal Areas. It restricts the burning of firewood and charcoal and brick and limekilns in factories. Its purpose was to reduce the use of firewood and stabilize its price.
-
- 7.5 *The Forest Act, 1927*
- The Forest Act empowers provincial governments to prohibit the cleaning of forest for cultivation, grazing, hunting, removing forest produce; quarrying and felling, lopping and topping of trees, branches in reserved or protected areas.
-
- 8 Wildlife**
- 8.1 *Northern Areas Wildlife Preservation Act, 1975*
- The Kashmir Affairs and Northern Areas Affairs Ministry published the Northern Areas Wildlife Preservation Act, 1975 after having it approved by the competent authority. This Act extends to the whole of Northern Areas. Under this Act, three major categories of protected areas are managed in addition to the Community Controlled Hunting Areas where local communities are empowered to manage their natural resources and to get 80% income from hunting.
-
- 8.2 *Islamabad Wildlife Protection, Preservation, Conservation, and Management Ordinance, 1979*
- This Ordinance was issued to provide protection, preservation, conservation and management of wildlife and setting up of a National Park (Margalla Hills National Park) in the Islamabad Capital Territory. Under this Ordinance, all the area under the Capital Territory was divide into three types of protected areas.
-
- 8.3 *N.W.F.P. Wildlife (Protection, Preservation, Conservation and Management) Act, 1974*
- The Governor of North West Frontier Province (N.W.F.P) assented to the N.W.F.P Wildlife Protection Act, 1975 after having been passed the N.W.F.P Wildlife (Protection Preservation, Conservation and Management) Bill by the Provincial Assembly of N.W.F.P 29 July 1975. This Act is applicable to all of N.W.F.P except the tribal areas for protection, conservation and preservation and management of wildlife. In addition to the three major categories of protected areas, there is provision of private and community controlled conservation areas under this Act.
-
- 8.4 *Balochistan Wildlife Protection Act, 1974*
- The Governor of Balochistan assented to the Balochistan Wildlife Protection Act, 1974 after having been passed the Balochistan Wildlife Protection Bill by the Provincial Assembly of Balochistan on 22 July 1974. This Act is applicable to whole of the Balochistan Province except the tribal areas for protection, conservation and preservation and management of wildlife.
-

Exhibit B-1, Continued

8.5 *Sindh Wildlife Protection Ordinance, 1972*

The Sindh Wildlife Protection Ordinance was approved in pursuance of the Martial Law Proclamation of 25th March, 1969, read with the Provisional Constitution Order, and in exercise of all powers vested with the Governor of Sindh and Martial Law Administrator. This Ordinance is applicable for the whole of the Sindh Province. Under this Ordinance, three types of the protected areas viz. National Park, Wildlife Sanctuary and Game Reserve have been notified for protection, conservation and preservation and management of wildlife

9 Land Acquisition, Compensation, Resettlement

9.1 *The Land Acquisition Act, 1894*

This act is the legal umbrella under which the government or private parties, subject to certain conditions and procedures, may in the interest of the public undertake compulsory acquisition of land. The land may be acquired for use in development activities or projects, which directly or indirectly promote the general welfare of the public

10 Community Development

10.1 *Pakistan Model Petroleum Concession Agreement*

The Model Petroleum Concession Agreement reflects a number of fiscal and operational incentives to the investors to attract investment in petroleum exploration and production sector as enshrined in the new Onshore Petroleum Exploration and Petroleum Policy 2001 approved by the Cabinet in May 2001

11 Culture and Heritage

11.1 *The Antiquities Act, 1975*

The Antiquities Act of 1975 is the principle national legislation that deals with the protection and preservation of Pakistan's archeological heritage

11.2 *The Sindh Cultural Heritage (Preservation) Act, 1994*

This provincial act empowers the Government of Sindh to preserve and protect any premises or objects of archeological, architectural, historical, cultural, or national interest in Sindh by declaring them protected; compulsorily purchasing them; or making arrangements to restore and maintain the object or premises

11.3 *The NWFP Antiquities Act, 1997*

The Antiquities Act of 1997 is the principle national legislation that deals with the protection and preservation of NWFP's archeological heritage

11.4 *The Punjab Special Premises Preservation Ordinance, 1985*

This provincial act empowers the Government of Punjab to preserve and protect any premises or objects of archaeological, architectural, historical, cultural, or national interest in Sindh by declaring them protected; compulsorily purchasing them; or making arrangements to restore and maintain the object or premises

12 Hazardous Materials

12.1 *The Hazardous Substances Rules, 1999*

The hazardous substances rules of 1999 provide licensing for the import and transport of hazardous substances in accordance with the provisions of PEPA 1997.

Exhibit B-1, Continued

13 Health, Safety, and Hygiene

13.1 The Explosive Act, 1884

The Explosives Act of 1884 gives the central government [India] the power to make rules as to licensing of the manufacture, possession, use, sale, transport and importation of explosives. The Act also gives the authority to grant licenses, the fees to be charged for licenses, and the other sums (if any) to be paid for expenses by applicants for licenses; the manner in which application for licenses must be and the matters to be specified in such applications; the form in which, and the conditions on and subject to which, licenses must be granted; and the period for which licenses are to remain in force

13.2 The Factories Act, 1934

Prohibits pollution of the atmosphere and Regulates the working conditions in factories, employing 10 or more workers

13.3 The West Pakistan Factories Canteen Rules, 1959

These rules envisage provisions of canteen facilities, where 250 or more workers are employed

13.4 The Mines Act, 1923

The mines act of 1923 pertains mainly to the regulation and inspection of mines. The act also relates to labor laws in terms of operations and management of the working of mines

13.5 Regulation of Mines and Oil Fields and Mineral Development (Government Control) Act, 1948

This is the basic law, which regulates the Oil and Gas sector. This Act provides for enforcement of rules related to the storage and distribution of "mineral oils", the establishment of prices at which mineral oils may be bought or sold and any matter ancillary and incidental to the objectives set out in the act.

13.6 The Oil and Gas (Safety in Drilling and Production) Regulations, 1974

These regulations outline safety in exploration and production of oil and gas companies operating in Pakistan. Some of the safety protocols under these regulations include:
 Appointment of a Welfare and Safety Officer in all drilling operations employing more than 250 workers
 Safety requirements of workplaces and drilling equipment
 Fire precautions and firefighting equipment; personal protective equipment (including breathing apparatus and safety belts)

13.7 The Pakistan Nuclear Regulatory Authority Ordinance, 2001

The PNRA would be regulatory authority for nuclear safety and radiation protection in the country and the extent of civil liability for nuclear damage resulting from any nuclear incident. The authority shall be responsible for controlling, regulating, and supervising all matters related to nuclear safety and radiation protection measures in Pakistan

13.8 The Electricity Act, 1910

The electricity act of 1910 was an insertion to the Land Acquisition Act where section 40 and section 41 of the land act termed the word "work" to include electrical energy supplied or to be supplied by means of the work to be constructed

Exhibit B-1, Continued

13.9 The Electricity Rules, 1937

The electricity rules act of 1937 relates to the transmission, supply, and use of energy

13.10 The Petroleum Act, 1934

The petroleum act of 1934 was to consolidate and amend the law(s) relating to the import, transport, storage, and production, refining and blending of petroleum and other inflammable substances

Exhibit B-2: Summary of International Conventions

1 International Conventions

1.1 The Convention on Conservation of Migratory Species of Wild Animals, 1979

The Convention requires countries to take action to avoid endangering migratory species. Species covered in the Convention should be given special attention during EA and monitoring, and any impacts identified should be mitigated to acceptable levels. Mitigation measures should be allowed in projects to ensure that for all species in Appendix I of the Convention habitats of the species are conserved; there is prohibition on the hunting, fishing, capturing, harassing and deliberate killing of the species; and the project activities do not seriously hinder migration of the species.

1.2 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The convention requires the signatories to impose strict regulation (including penalisation, confiscation of the specimen etc.) regarding trade of all species threatened with extinction or that may become so, in order not to endanger further their survival. In view of the threats to the species covered in the Convention, all upstream projects should evaluate impacts of individual projects on the species and adopt mitigation measures necessary to bring the impacts to acceptable levels

1.3 1992 Climate Change Convention

The convention aims at stabilizing greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. To achieve the objective of the convention, all parties are generally required to develop national inventories of emission; formulate and implement national and regional programs of mitigation measures; all developed country parties and the EC were specifically obliged to take measures to limit greenhouse gas emissions by the year 2000 at 1990 levels

1.4 1992 Biodiversity Convention

The relevance of this convention to the petroleum industry becomes apparent since upstream petroleum operations will always introduce interference with biological sources such as land, vegetation and forests, and downstream petroleum operations cause various environmental problems ranging from air pollution to climate change

1.5 The Rio Declaration

The Rio Declaration comprises twenty seven principles which address such important issues as: sustainable development to integrate environmental protection into the development process; common but differentiated responsibilities to conserve, protect and restore the earth's ecosystems; public participation and information access at the national level, reduce and eliminate unsustainable patterns of production and consumption (more relevant to oil and gas)

1.6 Agenda 21

Agenda 21 is a blueprint and action plan for international cooperation towards sustainable development. It is important to note that Agenda 21 makes particular reference to offshore petroleum operations, which encourages states to assess the need for additional measures to protect the marine environment against pollution arising from offshore oil and gas platforms

Exhibit B-2, Continued

1.7 1985 Vienna Convention on the Protection of the Ozone Layer and its Protocols

The Parties to this Convention are aware of the potentially harmful impact on human health and the environment through modification of the ozone layer and recall the pertinent provisions of the Declaration of the United Nations Conference on the Human Environment, and in particular principle 21, and are also mindful that measures to protect the ozone layer from modifications due to human activities require international co-operation and action and should be based on relevant scientific and technical considerations

1.8 Convention on Biological Diversity

The Convention on Biological Diversity was negotiated under the auspices of the United Nations Environment Programme (UNEP). It was opened for signature at the June 1992 UN Conference on Environment and Development (UNCED) and entered into force on 29 December 1993, ninety days after the 30th ratification. Article 25 of the CBD establishes a Subsidiary Body on Scientific, Technical and Technological Advice to provide the COP with "timely advice" relating to implementation of the Convention. The second session of SBSTTA took place from 2-6 September 1996 in Montréal, Canada. The agenda included issues such as the monitoring and assessment of biodiversity, practical approaches to taxonomy, economic valuation of biodiversity, access to genetic resources, agricultural biodiversity, terrestrial biodiversity, marine and coastal biodiversity, biosafety and the CHM. The above issues are important for E&P for oil and gas companies operating upstream activities for which guidelines of the preservation of biodiversity is a prerequisite before any drilling stage

1.9 Conventions on Wetlands (Ramsar Convention)

The broad aim of the Convention on Wetlands (Ramsar, Iran, 1971) is to halt the worldwide loss of wetlands and to conserve those that remain through wise use and management. This requires international cooperation, policymaking, capacity building and technology transfer. Contracting Parties have made commitments to:

- Designate at least one site that meets the Ramsar criteria for inclusion in the List of Wetlands of International Importance
 - Protect the ecological character of listed sites
 - Include wetland conservation within their national land-use planning
 - Establish nature reserves on wetlands and promote wetland training
-

1.10 Convention to Combat Desertification and Drought (CCD)

The stated objective of the Convention is "to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa"

Exhibit B-2, Continued

Most of the endangered dryland regions lie near the world's five main desert areas of which the Thar Desert lies in India extending in to Pakistan where E&P upstream activity is in progress. According to the convention O&G companies operating in desertified affected area must work with the local communities and the government to:

- Give priority to combating desertification and drought by allocating adequate resources in accordance with capabilities;
- Establish strategies to combat desertification and drought;
- Address the underlying causes of the problem and pay special attention to relevant socio-economic factors;
- Promote awareness and the participation of local population in action to combat desertification and drought; and

Provide an enabling environment through appropriate laws, policies and action programs.

Exhibit B-3: Summary of International and Local Guidelines

1 Local Guidelines

1.1 The Pakistan Environmental Assessment Procedures, 1997

For oil and gas companies undertaking E&P activities the guidelines state that onshore exploration activities, including seismic surveys, can be carried out without having to submit either an IEE or an EIA. This is subject to the project proponents adherence to the provisions of the guidelines, and provided that such exploration is not taking place within or adjacent to a sensitive or critical area. Possible adverse impacts that may arise in a seismic survey include damage to flora and fauna, and to crops and livestock as well as the production of waste. Project proponents are required to take measures to mitigate such effects.

1.2 Guidelines for Operational Safety, Health, and Environmental Management in Pakistan's Petroleum Exploration and Production Sector, DGPC

These guidelines are the outcome of a study commissioned by the Directorate General Petroleum Concessions, Ministry of Petroleum and Natural Resources, Government of Pakistan. The guidelines list down the relevant laws related to the operational health, safety and environment and also recommends environmental controls and management practices to be adopted in O&G exploration projects.

2 International Guidelines

2.1 Environmental Assessments

2.1.1 Principles for Impact Assessment: The Environment and Social Dimension-OGP

Environment and social dimensions are inextricably linked throughout the project's life cycle from the early planning phases through to decommissioning. The key considerations for the successfully planning and execution of oil and gas projects lies in the understanding of the projects impact assessment and consequent mitigation measures on people, communities and the environment. For E&P projects to effectively capture the integration of social and environmental considerations into project planning a formal consultative social and environmental assessment process that can help address and identify the social and environmental issues, develop prevention control, mitigation, and monitoring strategies as well as understanding and responding to community and other stakeholders.

The most significant aspect of a social and environment assessment is stakeholder consultation, which allows stakeholders to understand and influence company decision making process. Involvement of stakeholders facilitates, and resolution of concerns can increase stakeholder ownership in and support of decisions. To achieve transparent and a clear consultative process a social environmental assessment must clearly define the projects goal and scope, and its impact assessment which brings project information together with baseline environmental and social data to estimate the timing, likelihood, magnitude, and duration of potential impacts. Lastly follow up and implementation through effective monitoring should be adopted pre and post project cycle

Exhibit B-3, Continued

2.1.2 *The Environment Assessment Source Book 1998 and Update-WB*

The purpose of The World Bank's policy and procedures for environmental assessments (EAs) are to ensure that development options under considerations are environmentally sound and sustainable and that any environmental consequences are recognized early and taken into account in the project design. The World Bank EAs emphasize identifying environmental issues early in the project cycle, designing environmental improvements into projects, and avoiding, mitigating, or compensating for adverse impacts. By following recommended EA procedures that are documented in the EA source book and subsequent EA updates the Bank as well as implementing agencies are able to address environmental issues immediately thereby reducing subsequent requirements for project conditionalities and avoiding costs and delays in implementation due to unanticipated problems

2.1.3 Biodiversity and Environment Assessment Toolkit-WB

The World Bank developed the biodiversity and environment toolkit after the Convention to Combat Biodiversity CBD was ratified in 1992, with the important inclusion of and Environmental Assessment (EA) as part of one of its main components for bund funded investment projects. The intended effect of EA in development planning is to prevent, minimise, mitigate, or compensate for, adverse environmental impact and otherwise improves their design from an environmental of often-social perspective. For oil and gas companies performing E&P activities environmental assessments are required procedures to undertake in the life cycle of a project.

2.1.4 Roads and the Environment-WB

The objective of this World Bank published handbook is to provide a description of practical methods for designing and executing effective EAs to those who are involved in various aspects of road projects, from planning to construction to maintenance. It should be thought of as a kind of template for designing and executing effective EAs For Oil and Gas companies undergoing E&P activities which may require construction and or rehabilitation of roads ranging from major works on new alignments to minor rehabilitation and maintenance activities on existing roads. The techniques discussed in this handbook can be applied to in-depth environmental assessment studies, or to modest action plans for dealing with environmental aspects of small projects. The handbook also provides an overview of the EA process in the context of road planning and construction that may be pertinent to upstream construction activities and also describes the detailed methodological steps of the EA process, as they apply to specific projects being planned principally in a rural and inter-urban setting. The urban setting is more complex and issues pertaining to urban road projects warrant treatment in a separate handbook.

2.2 *Waste Management and Pollution Prevention*

2.2.1 Pollution Prevention and Abatement Handbook-WB

The guidelines of the pollution prevention and abatement handbook are designed by the World Bank Group to update 1998 guidelines. The guidelines are designed to protect human health, reduce mass loadings to the environment; draw on commercially proven technologies; be cost effective; follow current regulatory trends and promote industrial practices, which offer greater productivity and increased energy efficiency. The handbook promotes sustainable development in light of pollution abatement by E&P activities by focussing attention on the benefits – both environmental and economic – of pollution prevention, including cleaner production and good management techniques.

Exhibit B-3, Continued

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- 2.2.2 **Exploration and Production Waste Management Guidelines-OGP**
 The Oil Industry International Exploration and Production Forum (E&P) prepared guidelines for the oil and gas sector requiring a range of waste management options available for waste generated by upstream activities. In addition to identifying a general description of waste management principles and options for waste reduction, recycling, treatment and responsible disposal oil and gas operators can use these guidelines to develop a waste management program appropriate to their activities and to the ecological sensitiveness of the operating location.
-
- 2.3 *Oil Spills*
- 2.3.1 **A guide to contingency Planning for Oil Spills on Water-IPIECA**
 The International Petroleum Industry Environmental Conservation Association have prepared a response to oil spills on water by creating a three tier classification response to oil spills categorized according to the size of the spill and its proximity to the company's operating facilities. In addition, any contingency plan should cover each tier and be directly related to the company's potential spill scenarios.
-
- 2.4 *Decommissioning*
- 2.4.1 **Decommissioning, Reclamation and Remediation Guidelines for Onshore E&P Sites-OGP**
 Planning for decommissioning is an integral process part of the overall management process and should be considered at the beginning of the development process during design as part of a decommissioning and restoration plan and is equally applicable to both onshore and offshore operations. Decommissioning of an operation may lie with the government or the company depending on what agreements have been reached. Decommissioning of operations most likely are mentioned in the approval licenses as well as in baseline studies. It is an important procedure to have a formal consultation process with stakeholders and the communities on the decommissioning and restoration of sites.
-
- 2.5 *Environment Management Systems*
- 2.5.1 **Guidelines for the development of Health, Safety and Environmental Management Systems, Onshore-E&P Forum**
 OGP guidelines collated from various OGP reports and recommendations submit that an effective health management system should be based on quality management and should be linked to, or embedded within, a higher level HSE or total management system governing overall operations. This linkage is critical to ensure top-down commitments and define the principles and vision needed to enable health to be managed as an integral part of the company's HSE policy
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Exhibit B-3, Continued

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- 2.5.2 **Environmental Management in Oil and Gas Exploration and Production-E&P Forum**
 The UNEP along with The E&P Forum following the United Nations Conference on Environmental and Development (UNCED) held in Rio de Janeiro in 1992 focussed on a common-industry wide Health, Safety, and Environment Management Systems (HSE-MS) that has been agreed upon by O&G companies as best practices adopted by global E&P operations.
 Under the HSE-MS model standards procedures, programs, practices, goals and targets that have to be established, and where necessary agreed with regulators and stakeholders. Monitoring and auditing will indicate how well an operation performs in providing a measure of effectiveness. For an effective implementation of a management system requires clear analysis of current practice that must be redressed if the critical elements that make up an effective HSE-MS system that includes top down company commitment, corporate intentions, evaluation and risk management, planning implementation and monitoring auditing and reviewing are not conclusive.
-
- 2.5.3 **ISO 14000**
 ISO 14000 is a series of international standards on environmental management. It provides a framework for the development of an environmental management system and the supporting audit program.
 ISO 14001 is the corner stone standard of the ISO 14000 series. It specifies a framework of control for an Environmental Management System against which an organization can be certified by a third party.
-
- 2.6 *Produced water*
- 2.6.1 **Guidelines for Produced Water Injection-OGP**
 The International Association of Oil and Gas Producers (OGP) have documented guidelines on the practice, management and effective disposal of produced water from the production of oil and gas from exploration and production operations. The management of produced water requires a structured and integral approach and relies on disposal technologies including direct disposal and injection. The determination and implementation of the most appropriate option in particular situation will depend on appropriate applicable regulatory requirement, the environmental protectiveness and the various options and associated costs.
-
- 2.7 *Environmental Auditing and Monitoring*
- 2.7.1 **Guidelines for HSE Auditing in the Geophysical Industry-OGP**
 Audits provide assurance to management that the health, safety, and environmental HSE risks of a particular operation are well controlled and managed, and that the operation is being executed competently. The guidelines prepared by the E&P Forum helps ensure compliance with operational policies, procedures, and applicable regulations. They also provide guidance for the geophysical industry on how to implement audits as well as improve acceptability of audits across company boundaries. Finally the guidelines determine whether the HSE management system has been properly implemented and maintained and also identify areas of potential improvement in the audit management system
-

Exhibit B-3, Continued

2.7.2 Environmental Auditing-WB

The environmental audit update gives a detailed overview of the different types of audits for different sectors of the industry. Environmental audits which most E&P activities undertake help reduce environmental and public health risks in improving environmental management at the company level. The World Bank increasingly requires environmental audits in connection with the preparation and or implementation of oil and gas sites, fields, pipelines, and gas plants. For most facilities The World Bank compliance and phase 1 liability audits apply which take the form of interviews, review of documentation, visual inspections and limited testing and sampling. For those facilities where these audits determine a major environmental risk exists a more rigorous phase 2 audit is carried out.

2.7.3 Environmental Performance Monitoring and Supervision-WB

The environmental department performance monitoring and supervision is part of a larger World Bank effort to support the purpose of Environmental Assessments as an integral part of investment project especially in the energy sector that minimize potentially adverse impacts and enhance the overall quality of the project.

2.7.4 ISO 14010

ISO 19011:2002 replaces ISO 10011, ISO 14010, ISO 14011 and ISO 14012. So now in one single standard there are four critical decision-support resources for the efficient planning, conduct and evaluation of quality and/or environmental audits:

- A clear explanation of the principles of management systems auditing.
- Guidance on the management of audit programs.
- Guidance on the conduct of internal or external audits.
- Advice on the competence and evaluation of auditors.

At the core of the standard is a set of principles that will enable anyone connected with an audit to perform effectively. And because it focuses primarily on the underlying processes of audit management, it can be adapted for use when auditing any management system.

2.8 *Air Pollution*

2.8.1 Flaring and Venting in the Oil and Gas Industry-OGP

The International Association of Oil and Gas Producers (OGP) have documented guidelines in the minimization of flaring and venting of gas in the exploration and production operations. The option to choose whether to flare to vent gas depends on the economic and technical feasibility of E&P operations as well as a combination of geography and government energy policies in the country of exploration. To minimize the impacts of venting (noise pollution, toxicity of gases being produced, and the hydrocarbon content of the gas) as well as flaring, governments need to provide an energy policy framework which will encourage and allow companies to select from among very different approaches in order to achieve the best practicable outcome in particular circumstances.

Exhibit B-3, Continued

2.9 *Environmental Conduct*

2.9.1 Code of Environmental Practice-APPEA

The APPEA code of practice provides the Australian petroleum industry with clear guidance on management practices and measures to protect the environment during onshore and offshore exploration and production. Recognizing the need for environmental protection the APPEA code of practice makes three basic recommendations: environmental planning should be an integral part of the planning process; the industry should ensure minimum impact on the environment, public health and safety by using the best practical technology; and the industry should consult with communities about their concerns regarding industry activities. The code of practice is central to achieving three of APPEA's key objectives: self regulation, industry operation to the highest standards, and continued access to areas of exploration.

2.9.2 Guidelines for Extractive Industries in Arid and Semi Arid Zones-IUCN

The World Conservation Union (IUCN) and the United Nations Convention to Combat Desertification (UNCCD) prepared guidelines to address the long term threat of desertification that can be caused by exploration and production activities. These guidelines elaborate on the key guiding principles and lessons that will help government officials, environmental NGOs, and executives of O&G companies to take into account ecosystem conservation needs to prevent desertification in arid and semi arid zones. There are three basic divisions highlighted by IUCN and UNCCD that effectively capture the methods to reduce land degradation by extractive companies. They are: advance planning and management where baseline studies and environmental impact assessments and environmental management plans are initiated; strengthening institutional arrangements which rely on the effective integration of social assessment and environment through a formal consultative process of engaging stakeholders; and finally monitoring and evaluation where extractive industries performance in relation to agreed procedures is crucial to ensure that license or permit holder are accountable for their actions in the presence of an overseer (inter agency commissions) or steering groups

2.9.3 Onshore Oil and Gas Production Practices for Protection of the Environment-API

The American Petroleum Institute survey of 1995 documented E&P waste volume and waste management practices for the oil and gas industry. The survey covers waste categories of and categorizes them into: produced water, distilling waste, and associated wastes. The findings of the survey show that the total volume of wastes generated annually by the oil and gas industry has decreased substantially over the past decade. The results of the survey also show increase use of improved drilling practices and improved waste management practices. The survey results suggest a trend towards overall reduction of oily tank bottoms and sludges, glycol dehydration wastes, and drilling waste from operations using based mud. Over 90% of E&P wastes continue to be disposed by injection, and underground injection continues to offer the best method to safely and efficiently dispose of liquid E&P wastes.

Exhibit B-3, Continued

2.9.4 Industry Sector Guidelines, Onshore-WB

Best practices employed by oil and gas companies for E&P activities for onshore operations involve the entire life span of a project from planning and design to decommissioning and rehabilitation. The World Bank guidelines established through environmental assessment processes emphasize good practices of proper disposal of environmental waste, pollution prevention and control through reducing impacts of waste water discharges, oil spills, and soil contamination; and treatment technologies for air emissions, liquid effluents, ambient noise, and monitoring and reporting.

Annexure C

Relevant Guidelines for Environmental Assessment Techniques



Exhibit C-1: Summary of EA Techniques⁷

EA Technique	Description	Key Applicable Standards
Strategic Environmental Assessment (SEA)	SEA is a systematic process for evaluating the environmental consequences of proposed policy, plan or programme initiatives in order to ensure they are fully included and appropriately addressed at the earliest appropriate stage of decision-making on par with economic and social considerations	Sectoral Environmental Assessment, Environmental Assessment Source Book, Update No. 4, October 1993, World Bank
Social Impact Assessment (SIA)	It is used to identify and quantify the impacts on human populations resulting from changes to the natural environment	Environmental Assessment Source Book, Social and Cultural Issues in Environmental Assessment, Chapter 3, World Bank Key Questions in Managing Social Issues in Oil and Gas Project, Report No. 2.85/332, October 2002, OGP
Cumulative Effects Assessment (CEA)	This technique is designed to assess the combined effects of multiple activities, rather than the effects of specific development activities	-
Environmental Health Impact Assessment (EHIA)	Provides for a more comprehensive and rigorous approach, and is used to identify, predict and appraise those environmental factors which might affect human health	Strategic Health Management, Principles and Guidelines for the Oil and Gas Industry, Report No. 6.88/307, June 2000, OGP Health Aspects of Environmental Assessment, World Bank Environmental Assessment Source Book, Update No. 18, July 1997
Biodiversity Impact Assessment (BIA)	This emerging technique is based on the belief that EIA is not matching its potential in addressing biodiversity issues	Biodiversity and Environmental Assessment Tool Kit, World Bank, March 2000

⁷ Adapted from IIED September 1998

Exhibit C-2: Schedule III – IEE/EIA Review Fees

[See regulation 7]

Total Project Cost	IEE	EIA
Upto Rs. 5,000,000	Nil	Nil
Rs. 5,000,001 to 10,000,000	Rs. 10,000	Rs. 15,000
Greater than Rs. 10,000,000	Rs. 15,000	Rs. 30,000

Exhibit C-3: Schedule IV – Application Form

[See regulation 8 (2)(a) of the 2000 Regulations]

1.	Name and address of proponent		Phone: Fax: Telex:	
2.	Description of project			
3.	Location of project			
4.	Objectives of project			
5.	IEE/EIA attached?	IEE/EIA	: Yes/No	
6.	Have alternative sites been considered and reported in IEE/EIA?		Yes/No	
7.	Existing land use		Land Requirement	
8.	Is basic site data available, or has it been measured?	(Only tick yes if the data is reported in the IEE/EIA) Meteorology (including rainfall) Ambient air quality Ambient water quality Ground water quality	Available Yes/No Yes/No Yes/No Yes/No	Measured Yes/No Yes/No Yes/No Yes/No
9.	Have estimates of the following been reported?	Water balance Solid waste disposal Liquid waste treatment	Estimated Yes/No Yes/No Yes/No	Reported Yes/No Yes/No Yes/No
10.	Source of power		Power requirement	
11.	Labour force (Number)	Construction: Operation		

Verification. I do solemnly affirm and declare that the information given above and contained in the attached IEE/EIA is true and correct to the best of my knowledge and belief.

Date _____

Signature, name and _____ Designation of proponent (with official stamp/seal)

Exhibit C-4: Schedule V – Decision on IEE

[See regulation 12 of the 2000 Regulations]

1. Name and address of proponent _____

2. Description of project _____
3. Location of project _____
4. Date of filing of IEE _____
5. After careful review of the IEE, the Federation Agency has decided
 - (a) to accord its approval, subject to the following conditions:

or (b) that the proponent should submit an EIA with the following modifications

[Delete (a) or (b), whichever is inapplicable]

Dated _____

Tracking no. _____

Director General
Federal Agency
(with official stamp/seal)

Exhibit C-5: Schedule VI – Decision on EIA

[See Regulation 12 of the 2000 Regulations]

1. Name and address of proponent _____
2. Description of project _____
3. Location of project _____
4. Date of filing of EIA _____
5. After careful review of the EIA, and all comments thereon, the Federation Agency has decided –
 - (a) to accord its approval, subject to the following conditions:

or (b) that the proponent should submit an EIA with the following modifications

or © to reject the project, being contrary to environmental objectives, for the following reasons:

[Delete (a)/(b)/(c), whichever is inapplicable]

Dated _____

Tracking no. _____

Director-General
Federal Agency
(with official stamp/seal)

Exhibit C-6: Schedule VII – Undertaking

[See Regulation 13(2) of the 2000 Regulations]

I, (full name and address) as proponent for (name, description and location of project) do hereby solemnly affirm and declare that I fully understand and accept the conditions contained in the approval accorded by the Federal Agency bearing tracking no. _____ dated _____, and undertake to design, construct and operate the project strictly in accordance with the said conditions and the IEE/EIA.

Date _____

Signature, name and _____
Designation of proponent
(with official stamp/seal)

Witnesses

(full name and addresses)

- (1) _____
- (2) _____

Exhibit C-7: Typical project Details for Reporting in EA's⁸

No.	Parameter
1	General description of the concession
1.1	Name, year of ward, location, acreage (sq km); history of exploration and production
2	Timing and duration of projects
2.1	Timing and duration of each activity in exploration and production operations (including mobilization, construction, operation and restoration)
3	Workforce
3.1	Average number of crew personnel; duration/timing in which workforce will peak
3.2	Probable approximate number of local people employed in the project (a trend if possible)
4	Camps
4.1	Number, location, area, duration for which the camp will be operational, layout of the camp
5	Access and road travel
5.1	Proposed access to the main project facilities (camps, well site, plant etc) which will be used for mobilization, demobilization and frequently for supplies
5.2	Proposed mode of access to seismic lines (use of existing tracks, development of new tracks, access to mountainous terrain by foot, camels, donkeys)
5.3	Expected number of vehicles (4x4, water tankers, vibroseis, others)
5.4	Qualitative description of traffic load during mobilization, demobilization and operations
6	Procurement and fuel and water consumption
6.1	Local procurement (from within or in close vicinity of the project area)
6.2	Fuel consumption (total, average daily)
6.3	Water consumption (average daily, total)
6.4	Source of water (surface water, groundwater, location)
7	Health, safety, security and environment
7.1	Health, safety, security and environmental controls inherent to the project (including waste disposal and water conservation and reuse/recycle)
8	Land acquisition
8.1	Total land area to be acquired (fenced area of the well sites and camp sites, parking areas, land acquired along seismic lines etc)
8.2	Duration for which land will be acquired
8.3	Procedure for land acquisition and compensation

⁸ Item 1 to 8 are applicable for all types of projects

Exhibit C-7, Continued

No.	Parameter
9	Seismic operations
9.1	2-D, 3-D or both
9.2	Size of seismic programme (line km in case of 2-D and sq km in case of 3-D)
9.3	Alignment of seismic lines and location of upholes
9.4	Energy source (shot hole, deep hole, uphole, vibroseis)
9.5	A non-technical description of the different activities in a chronological order including: line permitting, line surveying, line clearing, data acquisition and recording, and restoration (including amount of dynamite to be used, distance between recording points, type of mud used for drilling of upholes or deep holes etc)
10	Drilling projects
10.1	Location of the well site; alignment of the proposed access to the well site
10.2	Timing and duration of the drilling activity (with breakdown of individual activities including mobilization of construction contractor and set-up of construction camp; construction; rig mobilization and set-up; drilling; well testing; completion; work over; and restoration
10.3	A non-technical description of the different activities in a chronological order including: mobilization of construction contractor; construction, rig mobilisation, drilling, well testing, completion; work over; and restoration.
10.4	<p>Construction:</p> <p>Well site layout and area coverage with short description of construction activities (leveling, excavation, earth fill, brick masonry, concreting, fencing etc) specially construction and lining of mud and cuttings pits</p> <p>Type of access road to be built for the project (dirt track, gravel top, black top) and a short description of the construction activities</p> <p>Length and width of the access road</p> <p>Rig camp layout and area coverage with short description of construction activities (leveling, clearing, gravel topping, fencing etc)</p> <p>Requirement for blasting and rock breaking {volume of rock excavation, type of blasting (controlled, open)}</p> <p>Location of borrow areas, rough estimate of material to be borrowed</p> <p>Details of equipment, construction material and their procurement</p>
10.5	<p>Mobilisation of rig and rig and well site set-up:</p> <p>Number of loads for rig mobilization</p>

Exhibit C-7, Continued

No.	Parameter
10.6	<p>Drilling</p> <p>Type of rig to be used</p> <p>A non-technical summary of drilling operation</p> <p>Well depth and cross section</p> <p>Details of the type of drilling mud to be used, inventory of chemicals, and rough volumes of each type of mud to be used and the volume of mud that will be finally disposal off, mud reuse or recycle options and techniques, mud disposal method</p> <p>Quantities of the cuttings that will be generated and their disposal method</p>
10.7	<p>Coring, well logging, testing:</p> <p>A non-technical summary of each activity</p> <p>Description of flare pit design, location and direction (whether downwind or upwind)</p> <p>Estimate and composition of hydrocarbons that will be flared (including timing and duration of flaring)</p>
10.8	<p>Well control, H₂S</p> <p>Summary of well control methods (BOP etc)</p> <p>Anticipated H₂S levels and contingency plans</p> <p>Other emergency plans such as for oil spills</p>
10.9	<p>Restoration</p> <p>Details of level of restoration and activities involved in case of success or dry well including waste disposal</p>

Exhibit C-8: Examples of Possible Changes to Upstream Projects

No.	Title
<p>Changes of Major Significance requiring approval from EPA <i>(includes changes that increase the magnitude of impacts to a level significantly higher than that assessed in the EA or introduce new potential impacts that were not covered in the EA)</i></p>	
1	Increase in seismic programme by more than 25%
2	Change in seismic survey technique (from dynamite to vibroseis) such that changed and additional impacts on environmental can occur
3	Shifting of well site, processing plant site, access road alignment, pipeline alignment to outside of the study area covered in the EA
<p>Changes of Minor Significance requiring only reporting to EPA for information <i>(includes changes that increase the magnitude of impacts to a level only slightly higher than that assessed in the EA such that the new impacts can be managed with additional mitigation or changes that do not result in any increased or changed impacts or changes that result in reducing impacts)</i></p>	
1	Increase in crew size with concomitant increase in water consumption and waste volumes but the change does not lead to additional impacts and can be managed by increased environmental management and supervision
2	Slight changes in locations of project sites such that no additional impacts can occur

Annexure D

Summary of Environmental Monitoring



Annexure D: Summary of Environmental Monitoring

Exhibit D-1: Summary of Environmental Monitoring in Upstream Projects

Type of Monitoring	Applicability	Timing and Frequency
Phase I: Pre-project		
Pre-project Monitoring	Applicable to projects in which there is a need to collect additional baseline data prior to project implementation	Pre-project monitoring should start and end before start of any physical works at or in the surroundings of the area where pre-project monitoring is proposed
Phase II: Project Implementation		
Compliance Monitoring	Applicable to all projects	Continuous through the project
Effects Monitoring	Applicable to projects where there is uncertainty in impact prediction, probability of significant impacts, or a need to verify impact predictions made in the EA	Timing and frequency may vary and will be defined in the EMP
Phase III: Post project		
Post-project Monitoring	Monitoring of restoration activities applicable to all projects Post-project effects monitoring applicable to projects where there is a probability of significant residual effects remaining after the project or the need to verify residual impacts predicted in the EA	Post-project effects monitoring surveys will start after a lag time to allow environmental conditions to adjust to the post-project conditions

Exhibit D-2: Suggested Format for Effects Monitoring Programme

Monitoring Parameter	Objective of Monitoring/link to impact predicted in the EA	Monitoring Method	Monitoring Location/Area	Timing /Duration/ Frequency	Responsibility	Reporting

Exhibit D-3: Suggested Format for a Non-compliance Register

No	Location	Activity/ Staff	Reported by	Photograph	Category	Description	Significance	Corrective Action	Target Date	Responsibility	Status

Notes

1. Serial number of the non-compliance
2. The place where non-compliance occurred, this can include campsite, a certain mileage along an access road, a certain shot point along a seismic line etc
3. Activity due to which non-compliance occurred or staff responsible for the non-compliance
4. The person who reported the non-compliance
5. Photograph of the non-compliance or its effects
6. Category of the non-compliance such as oil stain, over speeding etc
7. Details of the non-compliance
8. Significance of the non-compliance assigned through a defined criteria
9. Corrective action suggested
10. Target date for corrective action
11. Person responsible for implementing the corrective action
12. Status on the corrective action, such as “open”, “closed”, “going” etc

Exhibit D-4: Sample Checklist for Compliance Monitoring

Description	Yes	No	Remarks
Is the location of camp the same as stated in EA ?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the area of the camp kept to the minimum required?	<input type="checkbox"/>	<input type="checkbox"/>	
Has a distance of 500 m been maintained between camp and communities?	<input type="checkbox"/>	<input type="checkbox"/>	
Have photographs been taken prior to the start of the construction activity?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the camp located in a levelled area?	<input type="checkbox"/>	<input type="checkbox"/>	
Have areas along the camp been visually monitored and show any signs of soil erosion?	<input type="checkbox"/>	<input type="checkbox"/>	
Are there adequate number of waste bins for collection of wastes at the camp?	<input type="checkbox"/>	<input type="checkbox"/>	
Is a soak pit constructed?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the soak pit covered completely?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the soak pit 300m away from the nearby water well or water channel?	<input type="checkbox"/>	<input type="checkbox"/>	
Is the soak pit built in absorbent soil?	<input type="checkbox"/>	<input type="checkbox"/>	

Additional Notes: _____**Date completed:** _____**Name:** _____**Signature:** _____

Exhibit D-5: Suggested Format for Recording Audit Findings

No	Audit Finding	Audit Standard*	Reported By	Source/ Evidence	Corrective Action	Responsibility	Target Date

* audit standard may include the EA, EMP, conditions of approval and any other document/standard agreed prior to undertaking the audit

Exhibit D-6: Suggested Criteria for Performance Evaluation

Environmental Performance	Criteria
Highly Satisfactory	Environmental components are being implemented in a timely and satisfactory manner
Satisfactory	Implementation of the critical aspects of the environmental components is proceeding in a timely and satisfactory manner. There are some problems with certain other aspects, but these are not undermining the progress of implementing the components and are being addressed by the proponent.
Unsatisfactory	There are major problems in implementing some or all of the environmental components of the project, including aspects critical to the success of the components and the project as a whole. However, appropriate measures are being taken by the proponent to address the problems.
Highly Unsatisfactory	As in above, but problems are not being addressed satisfactorily

Exhibit D-7: Typical Contents for Environmental Reports

No.	Reporting Parameter	Description	End-of-project Report	End-of-construction Report	Monthly/quarterly/yearly Report
1	Type of project	Mention the type of project(s) for the report is being submitted i.e. seismic/drilling/pipeline/processing plant	X	X	X
2	Project start and completion dates	Report the start and completion date of projects or project components	X	X	
3	Project activities during reporting period	Mention project activities for the reporting period; this parameter is applicable only to monthly, quarterly and yearly reports in which the proponent can mention progress on project activities or the number of production wells drilled, km of flow lines laid etc in the reporting period			X
4	Changes or additions to the project	Report significant changes or additions to the project described in the EA (for monthly/quarterly and yearly reports this will be applicable only to the activities during the reporting period)	X	X	X
5	Natural Resource Usage				
5.1	Land	Land leased for the project; land released or retained (hectares)	X	X	X
5.2	Water	Water usage for domestic and operations (cum). Source of water	X	X	X
6	Crew size and local workforce	Average crew size and local workforce employed	X	X	X
7	Waste Management	Summary of waste management during the project including handling, storage, reuse/recycle, and disposal	X	X	X
8	Monitoring Results	Summary of non-compliances observed and findings of effects monitoring	X	X	X

Exhibit D-7, Continued

No.	Reporting Parameter	Description	End-of-project Report	End-of-construction Report	Monthly/quarterly/yearly Report
9	Environmental Incident	Report any major oil spill or other environmental incident for the reporting period	x	x	x
10	Restoration	If restoration is done provide a summary of restoration, including photographs of the restored areas. For quarterly and yearly reports for processing facilities mention the number and type of facilities restored in the reporting period e.g. production wells abandoned and restored etc	x	x	x

Notes

- 1- The contents of the reports are only indicative and proponents may include or exclude items based on the nature of their operations and the project areas and agree the report contents and format with the concerned EPA.
- 2- For monthly/quarterly and yearly reports items 3 to 10 will be reported for only the reporting period.

Annexure E

Protected Areas in Pakistan



Exhibit E-1: Pakistan Wildlife Protected Areas Data

Item	National Parks	Wildlife Sanctuaries	Game Reserves
Number of Protected Areas	17	99	89
Total Area	2,735,843 ha	2,832,950 ha	3,487,689 ha
Average Size	160,932 ha	28,615 ha	39,187 ha
% of TCA	30.20 %	31.28 %	38.51 %
% of TLA	3.40 %	3.52 %	4.33 %

Information generated: 8/6/2004

Information source: National Council for Conservation of Wildlife (NCCW)

Total area under wildlife conservation in Pakistan (TCA): 9,056,482 ha

This represents 11.26% of the total land area of Pakistan (803,940 sq. km)

Exhibit E-2: Definitions of Protected Ecosystems

Wildlife Sanctuary

The main features of a wildlife sanctuary include:

- undisturbed breeding ground
- prohibited or regulated public areas (there is no provision of public areas in WS)
- non-exploitation of forest. (except for in Punjab, as many irrigated plantations of Forest Department have been notified as Wildlife Sanctuary and such forest plantations are being exploited)

The government rules pertaining to wildlife sanctuaries require either prohibition or control of the following variables:

- entry or residence,
- cultivate any land
- damage or destroy any vegetation,
- hunt, kill or capture any wild animal or fire any gun or other firearm within three miles of the boundaries or,
- introduce any domestic species of animal or plant,
- introduce any domestic animal or allow it to stray,
- cause any fire, or pollute water.

The level of control will vary for different reserves; the only logical contact to elaborate on this matter will be the relevant provincial forestry and wildlife department.

The Government may, by notification in the official gazette, declare any area to be a wildlife sanctuary and may demarcate it in a manner, as it seems fit. The government may also for scientific purposes, aesthetic enjoyment, or for betterment of wildlife or scenery authorize the doing away with the above-mentioned regulations.

National Park

Some of the key features of the national park classification include:

- protection and preservation of scenery, flora and fauna in its natural state
- an area of outstanding scenic merit and natural interest.

The following acts are prohibited in a national park:

- hunting, shooting, trapping, killing or capturing of any wild animal in a national park or within three miles radius of its boundary;
- firing any gun or doing any other act which may disturb any animal or bird or doing any act which interferes with the breeding places;
- felling, tapping, burning or in any way damaging or destroying, taking, collecting or removing any plant or tree there-from;
- clearing or breaking up any land for cultivation, mining or for any other purpose;
- polluting water flowing in and through the national park

Once an area is identified the specific rules pertaining to that area should be sought from the provincial forestry and wildlife department.

Game reserves

The Government may declare any area to be a game reserve where hunting and shooting of wild animals is not be allowed; except under a special permit, which may specify the maximum number of animals or birds that may be killed or captured in the area and the duration for which such a permits will be valid.

Exhibit E-3: Ramsar Sites in Pakistan

Ramsar Site	Province	Area	Description of Site
Astola (Haft Talar) Island	Balochistan	5,000 ha	An uninhabited island about six km in length, some 25 km south of the desert coast of Balochistan. It is the only significant offshore island along the north coast of the Arabian Sea, and as such maintains the genetic and ecological diversity of the area. The endangered Green turtle (<i>Chelonia mydas</i>) and possibly the Hawksbill turtle (<i>Eretmochelys imbricata</i>) nest on the beach at the foot of cliffs, and it is a very important area for endemic reptiles such as the viper <i>Echis carinatus astoli</i> . The island is said to have an aura of mystery and is venerated by Hindus; there are architectural remains of an ancient temple to the Hindu goddess Kali Devi, as well as a prayer yard constructed for a Muslim saint associated with oceans. It serves as a base for fishermen between September and May, but is unfrequented during the period of rough seas and high tides. Feral cats originally introduced by fishermen to control the endemic rodent population pose an increasing threat to birds' nesting and breeding sites.
Chashma Barrage	Punjab	34,099 ha	Wildlife Sanctuary. A storage reservoir on the Indus River supporting various aquatic plants. Up to 200,000 waterbirds of numerous species use the site for staging and wintering. An especially important staging area in spring and autumn for cranes. Over 50 species of birds, some of which are globally endangered, use the site for breeding. The site is used as storage for irrigation water, electricity generation, livestock grazing, reed harvesting, and fishing. Planned dam construction upstream would affect the water regime, limiting the site's use for water storage.
Deh Akro-II Desert Wetland Complex	Sindh	20,500 ha	Wildlife Sanctuary. A complex of four major habitats, desert, wetland, marsh, and agricultural, 330km northeast of Karachi, representing an example of a natural inland wetland ecosystem comprising 36 lakes and unique desert habitat, which supports a variety of rare and endangered wildlife species. Based in a typical stable sand desert covered with 5m-10m dunes lying in an east-west orientation, the flat-bottomed valleys between them contain lakes, mostly brackish but five freshwater, recharged by seepage from the Nara and Jamrau irrigation canals and by rainwater. The complex plays host to a considerable number of fauna that are rare (e.g., Desert cat <i>Felis libyca</i> , Darter <i>Anhinga melanogaster</i> pennant, Garganey <i>Anas querquedula</i> , Black Ibis <i>Pseudibis papillosa</i>) and endangered (e.g., Marsh crocodile <i>Croodylus palustris</i> , Hog deer <i>Axis porcinus</i> , White-eyed pochard <i>Anthya nyroca</i>), and it supports many indigenous fish species - though commercial fishing is prohibited, subsistence fishing by local people is permitted. Water scarcity during a current long dry spell is considered to be a threat. WWF-Pakistan assisted in preparations for the designation of the site

Exhibit E-4. Continued

Ramsar Site	Province	Area	Description of Site
Drigh Lake	Sindh	164 ha	Wildlife Sanctuary. A small, slightly brackish lake with extensive reed marshes and rich aquatic vegetation situated in the Indus floodplain. An important breeding and wintering area for a wide variety of waterbirds, regularly supporting over 20,000 birds, mostly Anatidae (ducks, geese, swans, etc.), but including 5,000 roosting Black-crowned Night Heron. The surrounding plains are cultivated for rice production.
Haleji Lake	Sindh	1,704 ha	Wildlife Sanctuary. An artificial freshwater lake with fluctuating water levels, fringed by brackish seepage lagoons and supporting abundant aquatic vegetation. One of the most important breeding, staging and wintering areas for waterbirds in southern Pakistan, supporting between 50,000 and 100,000 birds annually, including Dalmatian Pelican, European Wigeon and Black Coot. Thousands of Black-crowned Night Heron roost in the area.
Hub (Hab) Dam	Sindh, Balochistan	27,000 ha	A large water storage reservoir constructed in 1981 on the Hub River on the arid plains north of Karachi. The reservoir supplies water for irrigation in Lasbella District and domestic and drinking water for the city of Karachi. It is an important staging and wintering area for an appreciable number of waterbirds and contains a variety of fish species which increase in abundance during periods of high water. The Mahseer (Tor putitora), an indigenous riverine fish found in the Hub River, grows up to 2m in length and provides for excellent angling. Recent consecutive years of low summer rainfall have reduced the water level. WWF launched a wetland visitors' centre on World Wetlands Day 1999.
Indus Delta	Sindh	472,800 ha	Includes wildlife sanctuaries. The fifth largest delta in the world, formed under largely arid climatic conditions and characterized by high river discharge, moderate tides, and evidently the highest wave energy of any river in the world. The fan-shaped delta consists of creeks, estuaries, mud, sand, salt flats, mangrove habitat, marshes, sea bays, and straits and rocky shores. Its 129,000 ha. of mangrove, mostly <i>Avicennia marina</i> , comprises 97% of the total mangrove area in the country and is said to be the 7th largest mangrove forest in the world. A large number of species are supported, of birds (including the threatened Dalmatian pelican), of fish and shrimps, and of dolphins (Plumbeous dolphin, Finless porpoise, and Bottlenose dolphin), humpback whale, and reptiles. The area is rich in archaeological and religious heritage. Some 40 settlements in the area, with about one million people, find livelihoods largely from fishing.

Exhibit E-4. Continued

Ramsar Site	Province	Area	Description of Site
Indus Dolphin Reserve	Sindh	125,000 ha	A 170 km stretch of the River Indus between the Sukkar and Guddu barrages, providing a home for the 500 remaining individuals of the formerly common Indus dolphin Platanista minor (or P. indii), a blind cetacean endemic to this river. Originally sea creatures, the Indus dolphins adapted to river life as the Indian subcontinent rose. The site is considered essential for the survival of this CITES Appendix I and IUCN Red List species endemic to Pakistan. The area is also home to the historical Sadhu bella Hindu shrine and Satinjo Astan Muslim graveyard.
Jiwani Coastal Wetland	Balochistan	4,600 ha	Located along Gawater Bay around the delta of the Dasht River, a very significant area of mangrove forests extending westward to the Iranian frontier, contiguous with Iran's Govater Bay and Hur-e-Bahu Ramsar site. The site is a particularly important nesting ground for endangered Olive Ridley and Green turtles, especially at four moderately wide and gently sloping sandy beaches in the eastern part of the site. Fishing is the most important human activity, practiced by clans that have migrated from Iran and from farther east in Pakistan as well as descendants of traders and soldiers from North and East Africa and the Gulf. Provincial plans to grant fishing concessions to a US industrial fishing firm and offshore drilling rights to a foreign oil company are viewed with concern by conservation authorities.
Jubho Lagoon	Sindh	706 ha	A large shallow brackish lagoon with associated mudflats and marshes, important for wintering waterbirds (particularly Greater and Lesser Flamingos and Dalmatian Pelicans) and for commercial fisheries. The site is privately owned by local inhabitants, who practice fishing and livestock grazing. WWF launched a wetland visitors' centre on World Wetlands Day 1999.
Kinjhar (Kalri) Lake	Sindh	13,468 ha	Wildlife Sanctuary. The largest freshwater lake in Pakistan, supporting extensive reedbeds and rich submerged and floating vegetation. An internationally important area for breeding, staging and wintering waterbirds, supporting as many as 140,000 birds, including European Wigeon, Black Coot and Common Pochard. The lake is a major source of drinking water for Karachi and supports an important fishery.

Exhibit E-4. Continued

Ramsar Site	Province	Area	Description of Site
Miani Hor	Balochistan	55,000 ha	A large shallow sea bay and estuarine system with several low-lying islands and extensive mangrove swamps and intertidal mud flats, separated from the adjacent Sonmiani Bay in the Arabian Sea by a broad peninsula of sand dunes. The site is the only area of Pakistan's coast where three species of mangroves (<i>Avicennia marina</i> , <i>Rhizophora mucronata</i> , and <i>Ceriops tagal</i>) occur naturally. The Hor receives freshwater input from a number of seasonal streams rising in the hills of eastern Balochistan to the north. The site is important for large concentrations of waterbirds. Smaller fish, shrimp, and crabs are abundant and are both consumed locally and brought to market. The area is archaeologically interesting: Balakot, 16 km to the northeast, was once home to a thriving civilization which flourished around 2000 BC. Domestic waste disposal and accumulated solid waste debris (plastic bags and bottles, etc.) are growing problems. Both IUCN-Pakistan and WWF-Pakistan are very active in the region, in collaboration with local communities, and WWF launched a wetland visitors' centre on World Wetlands Day 1999.
Nurri Lagoon	Sindh	2,540 ha	A very shallow brackish lagoon with barren mudflats on the northern side. The site has consistently recorded very large concentrations of migratory waterbirds on a seasonal basis. Salinity and sedimentation are increasing due to the intrusion of the sea in this area. The privately-owned land provides livelihood to about 3,000-4,000 people in surrounding villages, chiefly through fisheries. Invasive species, such as <i>Typha</i> and occasionally <i>Tamarix</i> , are seen to be hindering the growth and diversity of native flora, and population pressures, including accelerating agricultural and industrial pollution, offer challenges.
Ormara Turtle Beaches	Balochistan	2,400 ha	A sandy beach extending about 10 km along the shores of the Arabian Sea. The site supports a considerable number of marine turtles, particularly the endangered Olive Ridley and Green turtles and possibly the Hawksbill turtle as well. Because the area falls in the subduction zone of the Indian Ocean tectonic plate moving northward, clusters of mud volcanoes have developed along the shore, where gas-charged water escapes to the surface. The vegetation is composed of salt-tolerant and arid area plants which grow in very harsh, freshwater-scarce conditions. Migratory waterbirds visit the site but not in significant numbers. Subsistence and commercial fishing is the primary economic, social, and cultural activity of the local communities, and drying of fish is an important source of employment. Accumulations of plastic debris along the coast cause significant problems, as does the capture of turtles for export.

Exhibit E-4. Continued

Ramsar Site	Province	Area	Description of Site
Rann of Kutch	Sindh	566,375 ha	Wildlife Sanctuary. Part of the great Thar desert and comprising stabilized sand dunes, some more than 170m in height, with broad inter-dunal valleys of alluvial soil, integral with the large Rann of Kutch across the frontier with India, which includes permanent saline marshes, coastal brackish lagoons, tidal mudflats, and estuarine habitats. The site supports many locally and globally threatened species, including the Great Indian bustard (<i>Chloriotis nigripes</i>), Houbara bustard (<i>Chlamydotis undulata</i>), Sarus crane (<i>Grus antigone</i>), and Hyena (<i>Hyaena hyaena</i>) and supports more than 1% of the biogeographical population of flamingos <i>Phoenicopterus ruber</i> and <i>P. minor</i> . Some 500,000 agro-pastoralists live in 330 villages/hamlets in the site area, and rich archaeological remains include three giant temples dating from 1375-1449. Scarcity of water remains the potential threat to the ecosystem. WWF-Pakistan and Sindh authorities have carried out work with GEF funding and a management plan is in preparation.
Tanda Dam	NWFP	405 ha	Wildlife Reserve. A small water-storage reservoir supporting irrigated agriculture and a small fishery. The site is a wintering area for Anatidae (ducks, geese, swans, etc.) and serves as a staging area for various waterbirds. Bird numbers seldom exceed 500 in mid-winter and 2,000 during migration periods.
Taunsa Barrage	Punjab	6,576 ha	Wildlife Sanctuary. A large reservoir on the Indus River, constructed for irrigation purposes. Vegetation includes riverine forest and numerous species of aquatic plants. A very important wintering area for waterfowl, notably Anatidae (ducks, geese, swans, etc.) which breed in the area, and a staging area for some species of cranes and shorebirds. Human activities include commercial fishing, irrigation, reed harvesting, recreation, and in adjacent areas agriculture, livestock grazing, and forestry.
Thanedar Wala	NWFP	4,047 ha	Game Reserve. A stretch of the Kurram River and associated floodplain, consisting of braided river channels and seasonally flooded islands. Reeds and sedges occur, along with extensive thickets of Tamarix. An important route for migratory birds, the site supports small numbers of various species of breeding and wintering waterbirds. Hunting is the main human activity
Uchhali Complex (including Khabbaki, Uchhali and Jahlar Lakes)	Punjab	1,243 ha	Game Reserve; Wildlife Sanctuary. Three separate brackish to saline lakes of fluctuating levels, surrounded by agricultural fields, located in the heart of the Salt Range. An important wintering area for the rare or vulnerable White-headed Duck, Ferruginous Duck, Greylag Goose, and flamingos. Villagers depend on the wetland for their domestic water supply. Human activities include fishing, livestock grazing, recreation, and illegal hunting.

Exhibit E-4: Summary of Protected Antiquities

Province	Number of Monuments/Sites under Provincial Government	Number of Monuments/Sites under Federal Government
Sindh	211	126
Punjab	233	149
Balochistan	-	27
N.W.F.P & Northern Areas	-	87
Total	444	389

Exhibit E-5: World Heritage Sites in Pakistan

Site Name	Province	Description of Site
Archaeological ruins at Moenjodaro	Sindh	The ruins of the huge city of Moenjodaro – built entirely of unbaked brick in the 3rd millennium B.C. – lie in the Indus valley. The acropolis, set on high embankments, the ramparts, and the lower town, which is laid out according to strict rules, provide evidence of an early system of town planning.
Archaeological ruins at Taxila	Punjab	From the ancient Neolithic tumulus of Saraikala to the ramparts of Sirkap (2nd century B.C.) and the city of Sirsukh (1st century A.D.), Taxila illustrates the different stages in the development of a city on the Indus that was alternately influenced by Persia, Greece and Central Asia and which, from the 5th century B.C. to the 2nd century A.D., was an important Buddhist center of learning.
Ruins of Takht-i-Bahi and Sahr-i-Bahlol	NWFP	The Buddhist monastic complex of Takht-i-Bahi (Throne of Origins) was founded in the early 1st century. Owing to its location on the crest of a high hill, it escaped successive invasions and is still exceptionally well preserved. Nearby are the ruins of Sahr-i-Bahlol, a small fortified city dating from the same period.
Historical monuments of Thatta	Sindh	The capital of three successive dynasties and later ruled by the Mughal emperors of Delhi, Thatta was constantly embellished from the 14th to the 18th century. The remains of the city and its necropolis provide a unique view of civilization in Sindh.
Fort and Shalamar Gardens in Lahore	Punjab	These are two masterpieces from the time of the brilliant Mughal civilization, which reached its height during the reign of the Emperor Shah Jahan. The fort contains marble palaces and mosques decorated with mosaics and gilt. The elegance of these splendid gardens, built near the city of Lahore on three terraces with lodges, waterfalls and large ornamental ponds, is unequalled.
Rohtas Fort	Punjab	Following his defeat of the Mughal emperor Humayun in 1541, Sher Shah Suri built a strong fortified complex at Rohtas, a strategic site in the north of what is now Pakistan. It was never taken by storm and has survived intact to the present day. The main fortifications consist of the massive walls, which extend for more than 4 km; they are lined with bastions and pierced by monumental gateways. Rohtas Fort, also called Qila Rohtas, is an exceptional example of early Muslim military architecture in Central and South Asia.

Exhibit E-6: Typical Services and Functions of Protected Areas

Impact Significance	Definition
Culture and heritage sites ⁹	<p>Enables understanding of the human history</p> <p>Many sites play an important role in demonstrating a community's cultural continuity and long term survival</p> <p>Bears economic importance due to associated tourism</p>
Ecosystems ¹⁰	<p><i>Services</i></p> <ul style="list-style-type: none"> ■ Protection of water resources (maintenance of hydrological cycles, regulation and stabilising water runoff and underground water tables, acting as a buffer against extreme events such as flood and drought) ■ Purification of water (e.g. by wetlands and forests) ■ Soils Formation and protection (maintenance of soil structure and retention of moisture and nutrient levels helping to preserve soil's productive capacity) ■ Nutrient storage and recycling (of atmospheric as well as soil-borne nutrients both necessary for the maintenance of life) ■ Pollution breakdown and absorption (by components of ecosystems ranging from bacteria to higher life forms, and ecological processes) ■ Contribution to climate stability (vegetation influences the climate at the macro and micro level) ■ Maintenance of ecosystems (maintaining a balance between living things and the resources - such as food and shelter – they need to survive) ■ Recovery from unpredictable events (such as fire, flood, cyclones and disasters initiated by humans) <hr/> <p><i>Functions</i></p> <ul style="list-style-type: none"> ■ Suppliers of: ■ Food (animals, fish, plants) ■ Genes (a huge resource which is being used for example to improve the quality and quantity of food supplies and the range and depth of medicines) and basic source for domestication of livestock. ■ Medicinal resources (one of the oldest uses of biological resources, the current supplier of many current medicines, such as antibiotics and the potential supplier of many future medicines, such as cancer treatment drugs) ■ Biological control agents (natural pesticides and herbicides) ■ Materials (fibres, coatings such as Shellac, keratins, adhesives, biopolymers, oils, enzymes)

⁹ WB (September 1994)

¹⁰ Department of Environment, Sport & Territories 1993; Bryant 2000 as cited in WB March 2000)

Exhibit E-7, Continued

Impact Significance	Definition
	<ul style="list-style-type: none"> <li data-bbox="526 365 1354 432">■ Wood products (including wood for fuel, construction and paper producing) <li data-bbox="526 436 1354 504">■ Breeding stocks, population reservoirs (providing support systems for commercially valuable environmental benefits and resources) <li data-bbox="526 508 1354 575">■ Future resources (a huge "bank" for discovered and not-yet discovered resources developed to increase human welfare) <li data-bbox="526 579 1354 701">■ Research, education and monitoring facilities (living laboratories for studies on how to get better use from biological resources, how to maintain the genetic base of harvested biological resources and how to rehabilitate degraded resources) <li data-bbox="526 705 1354 730">■ Recreation and tourism facilities <li data-bbox="526 735 1354 835">■ Cultural values (since human cultures co-evolve with their environment, the natural environment provides for many of the inspirational, aesthetic, spiritual and educational needs of people) <li data-bbox="526 840 1354 932">■ Warning signs (biological resources provide "indicators" of, for example, environmental degradation which can help humans mitigate against shortages, disasters)

Exhibit E-7: Impact Magnitude Criteria

Impact Magnitude	Definition
Major negative impact	If, in light of full information, the proposal (either on its own, of together with other proposals) may adversely affect the integrity of a site, in terms of the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species for which it was classified.
Intermediate negative impact	If, in light of full information, the site's integrity will not be adversely affected, but the affect on the site is likely to be significant in terms of its ecological objectives. If, even in the light of full information, it cannot be clearly demonstrated that the proposal will not have an adverse impact on integrity, then the impact should be assessed as a major negative.
Minor negative impact	If neither of the above apply, but some minor negative impact is evident. In the case of internationally recognized sites of biodiversity importance, they may nevertheless require a further appropriate assessment if detailed plans are not yet available
Positive impact	Where there is a net positive wildlife gain. Examples include a mitigation package where previously fragmented areas are united through habitat creation work (the concept of connectivity), a scheme which diverts existing impacts away from a damaged site, and other proposals which do provide general wildlife gain through new design features
Neutral impact	If none of the above apply, that is, no observable impact in either direction

Exhibit E-8: Impact Significance Criteria

Impact Significance	Definition
Extreme	Adverse impacts that are of international significance and thus represent key factors in the decision-making process. Typically no mitigation of the impact is possible. Effects may be such as to prevent a scheme from progressing. Any impact on a site of international biodiversity importance; or high impact on a site of national biodiversity importance
Severe	Adverse impacts that are of national significance and are important factors in the decision-making process. Mitigation of the adverse effects is not usually possible and if it is, there are likely to be residual impacts. Effects may be of such scale as to radically influence project location or design. Medium impact on a site of national biodiversity importance
Substantial	Adverse impacts that are of provincial significance and are important factors in the decision-making process. Mitigation is usually possible to a certain extent but residual impacts are likely to remain. Will influence decision-making process but are not likely to be a deciding factor. Low impact on a site of national importance; or medium to high impact on a site of provincial biodiversity importance.
Moderate	Adverse impacts that are of local significance and are likely to influence the decision-making process only if other factors are not an issue. The scope for mitigation is usually high, especially habitat creation. Low impact on site of provincial biodiversity importance; or medium to high impact on site of local biodiversity importance
Slight	Adverse impacts are so small that they appear to be of little or no significance. Low impact on a site of local biodiversity importance

Annexure F

Public Consultation



Exhibit F-1: Broad Objective of Public Consultation¹¹

Stages in EIA Process Consultation Objectives	
Scoping	Validation of environmental procedures and standards applicable to the project
	Identify stakeholder groups
	Agree on extent and mode of consultation
	Identify key issues to be addressed in the EIA
	Disclose relevant project information
EIA Preparation	Disclose information on study methods and findings
	Agree on proposed mitigation measures
Public Hearing	As above in "EIA Preparation"
	Let stakeholders determine whether their concerns have been adequately addressed
	Finalise mitigation plan
Project Implementation	Inform the public about potentially disruptive events
	Disclose results of environmental monitoring
	Maintain effective complaints procedure
Project Closure	Assess effectiveness of consultation
	Consult stakeholders for their assessment

¹¹ Adapted from WB May 1999

Exhibit F-2: Explanation of Key Stakeholders¹²

Key Stakeholders to Upstream Projects

Local people: Individuals or groups in the local community will want to know what is proposed; what the likely impacts are; that their values are known, understood and taken into account; and that the suggestions they may offer will be carefully considered on their merits. They will want proponents to listen to their concerns and address them. They will also have local knowledge, which can be tapped

Other affected communities: Where a proposal is likely to have indirect impacts at a distance from the proposed works the communities likely to be affected indirectly should also be involved.

Proponents: Many proponents will share some of the objectives listed above (under the sub-heading Local People), and will have others as well. Proponents will wish to shape the proposal to give it the best chance of success. This often involves achieving increased public understanding and acceptance of the proposal through the open provision of information. The design can also be improved through the use of local knowledge and an understanding of local values

Government agencies and local councils: The interests of relevant government agencies, utility service providers and local Councils can be best achieved if they are included in the consultation process. Not only will their requirements become known, but they will better understand the needs and concerns of all the other stakeholders if they are involved in the consultation program. For administrators and decision-makers, an effective public involvement program can mean that the project is less likely to become controversial in the later stages of the process.

NGO's: Involvement of NGO's can often provide a useful broader public perspective on a proposal. Their views can also be very helpful when there are difficulties with involving local people. Care must be taken to clearly define the role of an NGO. Normally NGO's act as an advocate for the environment, but at times they act in other capacities. For instance they may undertake the preparation of Environmental Reports, or may become active in striving to command resources directly. In such cases NGO's may have, or be perceived to have, a conflict of interest, which may mitigate against their effectiveness in the eyes of other stakeholders

Influential people: Communication with influential people is most important. If such people are not well briefed about proposals at an early stage, they may learn about the project at second or third hand, and obtain a distorted impression of the project. An early informative briefing to such people by the proponent will minimise the opportunity of them being misinformed, and becoming opponents of the proposal

¹² Adapted from Pakistan EPA, 1997c

Exhibit F-3: Principles for Effective Community Consultation¹³

Principles for Effective Community Consultation

Make it timely: Consultation should not be so late in the life of an issue that it is tokenistic, or merely confirms decisions already made. The timing should occur when community has the best chance of influencing outcomes

Make it inclusive: Participants should be selected in a way that is not open to manipulation, and should include a cross-section of the population (as individuals and as groups). Random selection offers the best chance of achieving this

Make it community-focused: Ask participants not what they want personally or what is in their self-interest, but what they consider appropriate in their role as citizens

Make it interactive and deliberative: Avoid reducing questions to a simplistic either/or responses. Allow consideration of the big picture, so people can really become engaged

Make it effective: Although decision-making can strive for consensus, complete agreement need not be the outcome. Be clear on how the decisions will be made so that participants know and understand the impact of their involvement. Make sure all participants have time to become well informed about and to understand material they are unlikely to have a prior familiarity with

Make it matter: It is important that there is a strong likelihood that any recommendations, which emerge from the consultative process will be adopted. If they are not, it is important that a public explanation is provided. Faith in the process is important by both the power holders and the participants

Make it well-facilitated: It is important that all participants control the agenda and content because this will give the process more credibility. An independent, skilled and flexible facilitator with no vested interest is essential in order to achieve this

Make it open, fair and subject to evaluation: The consultation method should be appropriate to the target group. Evaluation questions should be formulated in advance. Decide how the 'success' of the consultation will be measured. Include factors beyond the adoption of recommendations. Feedback to the community after consultation is over is essential

Make it cost effective: Community consultation may cost much, but they should be carried out. It may look like a wastage of money for the proponent initially, however the cost of no consultation may be even higher in the form of costly and time consuming litigation eventually. To be cost effective, the consultation process should consider how many and which types of community members should be consulted on a given issue. Some questions will require broader consultation, others more targeted consultation. Costs will vary and are adaptable, but the process selected must be properly resourced

¹³ These principles for effective consultation have been adapted from Carson 1999, UK Cabinet Office 2000 and UK Local Government Association 2000.

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