

**Table 8.1**

**Environmental Management Plan of OIL**

<b>Sl. No.</b>	<b>Activity</b>	<b>Management Measures</b>	<b>Action Required</b>
<b>1.</b>	<b>Land Acquisition</b>	<ul style="list-style-type: none"> <li>Ensuring that all necessary protocols are followed and legal requirements implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Project officials to initiate interaction with the concerned officials and Pollution Control Board, prior to release of actual layout of various facilities at each new development project site to identify necessary permits and the approval mechanism.</li> </ul>
		<ul style="list-style-type: none"> <li>Ensuring that appropriate legal requirements have been met with regard to land occupancy, land ownership or usage rights, notice and compensation, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Apply for approval for land acquisition with proper maps and prescribed fees with due involvement of the State Government officials.</li> </ul>
		<ul style="list-style-type: none"> <li>Establishing and clearly documenting all land agreements with owners, users and state authorities and marking out site boundaries.</li> </ul>	<ul style="list-style-type: none"> <li>Preliminary site survey to be carried out by OIL's civil engineering department to mark the road &amp; site requirement on ground.</li> </ul>
<b>2.</b>	<b>Consent to Establish and Consent to Operate</b>	<ul style="list-style-type: none"> <li>Acquiring necessary approvals from the Assam State Pollution Control Board in a timely manner.</li> </ul>	<ul style="list-style-type: none"> <li>OIL's Production and Permit team to meet the local Pollution Control authorities to apprise them of the plan and to identify and apply for necessary permissions prior to construction phase and prior to operation phase.</li> </ul>
<b>3.</b>	<b>Waste and Effluent Management</b> <ul style="list-style-type: none"> <li>General</li> </ul>	<ul style="list-style-type: none"> <li>Identifying different types of waste anticipated during operations, working out estimated quantities, laying down procedures for collection, handling, treatment and disposal of each type of waste.</li> </ul>	<ul style="list-style-type: none"> <li>Finalize waste management plan.</li> </ul>
		<ul style="list-style-type: none"> <li>Waste management plan to be implemented during operations</li> </ul>	<ul style="list-style-type: none"> <li>Waste management plan to be implemented during operation of new development projects operations be made available for inspection at site to all regulatory bodies.</li> </ul>

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	<ul style="list-style-type: none"> <li>Formation Water</li> </ul>	<ul style="list-style-type: none"> <li>Formation water will be collected in steel tanks, treated and disposed off in disposal wells to be drilled up to a depth of about 1500 m for the purpose.</li> </ul>	<ul style="list-style-type: none"> <li>ETP design will ensure that limits for reinjection in disposal wells are met (Oil &amp; Grease = 10 mg/l and Total Suspended Solids = 100 mg/l) before reinjection at 1000 to 1500 in depth.</li> </ul>
		<ul style="list-style-type: none"> <li>Segregation of process and rain water.</li> </ul>	<ul style="list-style-type: none"> <li>Site drainage design should ensure that process and rain water are effectively segregated and oily water is treated in oil water separator.</li> </ul>
	<ul style="list-style-type: none"> <li>Fuels, Lubricants and Chemicals</li> </ul>	<ul style="list-style-type: none"> <li>Preparing a comprehensive Oil Spill Contingency Plan (OSCP) to handle all major, moderate and minor spills.</li> </ul>	<ul style="list-style-type: none"> <li>Finalize the Oil Spill Contingency Plan (OSCP)</li> </ul>
		<ul style="list-style-type: none"> <li>Keeping all fuels, lubricants and chemicals in well-designed storage facility with regular inventory checking.</li> </ul>	<ul style="list-style-type: none"> <li>Checklist of all drums and containers located within footprint of the storage area.</li> </ul>
		<ul style="list-style-type: none"> <li>Ensuring that OSCP is implemented during operations.</li> </ul>	<ul style="list-style-type: none"> <li>Live risk assessment trainings and awareness raising among all workers associated with mock exercises.</li> </ul>
		<ul style="list-style-type: none"> <li>Storing of used and unused chemicals in a lined and bunded area.</li> </ul>	<ul style="list-style-type: none"> <li>The lined and bunded area for the diesel tank will have extra space to contain used and unused lubricants in drums.</li> </ul>
		<ul style="list-style-type: none"> <li>Executing delivery of fuel to project site under strict supervision and carrying out refueling operations in an area with impervious flooring and surface drainage with oil interceptor.</li> </ul>	<ul style="list-style-type: none"> <li>Keeping an inventory of all fueling and refueling operations.</li> </ul>
		<ul style="list-style-type: none"> <li>Use of suitable delivery trucks and bowsers.</li> </ul>	<ul style="list-style-type: none"> <li>Check all delivery trucks and bowsers for suitability and ensure that they meet safety requirements.</li> </ul>
		<ul style="list-style-type: none"> <li>Impervious liners in place for chemicals, lubricants storage area with drains in periphery.</li> </ul>	<ul style="list-style-type: none"> <li>Impervious liners to be installed in the fuel and lubricant storage area. Fuel/lubricant storage area and DG set area to have drains with oil entrapment mechanism.</li> </ul>

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		<ul style="list-style-type: none"> <li>• Effective bunds capable of containing 110% of the volume of enclosing all potentially contaminating materials to be used for fuel/lubricants storage area.</li> </ul>	<ul style="list-style-type: none"> <li>• Site design to incorporate bund requirement for the fuel/lubricant storage area.</li> </ul>
		<ul style="list-style-type: none"> <li>• Disposal of waste oil and waste chemicals in a controlled manner.</li> </ul>	<ul style="list-style-type: none"> <li>• OIL to arrange for proper disposal of waste to recycling contractors.</li> </ul>
		<ul style="list-style-type: none"> <li>• Oil drip pans wherever there is significant potential for leakage.</li> </ul>	<ul style="list-style-type: none"> <li>• Drip pans will be used.</li> </ul>
		<ul style="list-style-type: none"> <li>• All spills/leaks to be contained, reported and cleaned up immediately.</li> </ul>	<ul style="list-style-type: none"> <li>• Oil Spill Contingency Plan to be in place and implemented.</li> </ul>
		<ul style="list-style-type: none"> <li>• Minor Spills: Minor spills/leakages defined as leaks from vehicles, machinery, equipment or storage containers such that the area and depth of soil contaminated is less than 1 m<sup>2</sup> and 10 cm, respectively.</li> </ul>	<ul style="list-style-type: none"> <li>• Soil contaminated will be scraped and sent to nearest oil disposal facility for proper disposal.</li> </ul> <p>Such spills will be contained and controlled using shovels, sands and native soil. These equipment and materials will be made available at project sites and during the operation. The contaminated soil will be excavated and stored in a bunded area lined with an impermeable base. Depending on the volume, the contaminated soil will be disposed off by specialized treatment such as bioremediation.</p> <p>These spills will be handled and controlled with special care and will require special treatment such as bioremediation.</p>
<b>4.</b>	<b>Noise and Vibration</b>	<ul style="list-style-type: none"> <li>• Checklist of all machineries with record of date of procurement, installation and age.</li> </ul>	<ul style="list-style-type: none"> <li>• Inventory of all machineries to be prepared and submitted to OIL for review.</li> </ul>
		<ul style="list-style-type: none"> <li>• Regular maintenance of all equipments.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance Log Book to be prepared and submitted to OIL for review.</li> </ul>

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		<ul style="list-style-type: none"> <li>• Implement good working practices to minimize noise.</li> </ul>	<ul style="list-style-type: none"> <li>• No machinery running when not required.</li> </ul>
		<ul style="list-style-type: none"> <li>• Wearing of ear plugs/muffs when appropriate.</li> </ul>	<ul style="list-style-type: none"> <li>• OIL to distribute noise protection equipment and ensure utilization by the work force.</li> </ul>
		<ul style="list-style-type: none"> <li>• Use of acoustic enclosure/barrier wall.</li> </ul>	<ul style="list-style-type: none"> <li>• OIL will ensure that proper acoustic enclosure/ barrier wall is designed and constructed to control noise level within permissible level.</li> </ul>
		<ul style="list-style-type: none"> <li>• Development of green belt.</li> </ul>	<ul style="list-style-type: none"> <li>• Site management will ensure that a thick peripheral green belt is developed around each development project boundary for control of noise propagation.</li> </ul>
<b>5.</b>	<b>Air Emissions</b>	<ul style="list-style-type: none"> <li>• Operate all equipment within specified design parameters.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure proper equipment maintenance.</li> </ul>
		<ul style="list-style-type: none"> <li>• Store all dry, dusty material (chemicals, etc.) in sealed containers.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure absence of stockpiles or open containers of dusty materials.</li> </ul>
		<ul style="list-style-type: none"> <li>• Minimize emissions during crude oil production by use of natural gas engines in most of the application.</li> </ul>	<ul style="list-style-type: none"> <li>• Effective separation of oil and gas is to be achieved and the separated oil will be stored in tank farm and separated gas is to be used for power generation, steam generation, oil dispatch pump sets operation and domestic use at project site.</li> <li>• Only minimal quality of very LP gas will be flared in a well designed flare pit in a controlled manner.</li> </ul>
		<ul style="list-style-type: none"> <li>• Use HSD with less than 0.1% S.</li> </ul>	<ul style="list-style-type: none"> <li>• Only low sulphur (S=&lt;0.1%) will be used wherever necessary.</li> </ul>
		<ul style="list-style-type: none"> <li>• Minimize dust generated from truck movement.</li> </ul>	<ul style="list-style-type: none"> <li>• Water sprinkling of roads as required to minimize dust.</li> </ul>
<b>6.</b>	<b>Solid Wastes</b>	<ul style="list-style-type: none"> <li>• Proper documentation and manifestation of all wastes generated.</li> </ul>	<ul style="list-style-type: none"> <li>• Pre-operation inspections to ensure waste disposal facilities are in place.</li> </ul>

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		<ul style="list-style-type: none"> <li>Non-toxic biodegradable waste to be buried</li> </ul>	<ul style="list-style-type: none"> <li>All biodegradable non-toxic wastes at the project site are to be collected and disposed off into two small humus pits (each of 2m x 2m x 1.5m) within the project area away from common use by project persons. The humus pits are to be covered with soil on daily basis to avoid any odor nuisance and to check any contact with the flies or insects.</li> </ul>
		<ul style="list-style-type: none"> <li>Tank bottom sludge is to be recovered periodically and stored in secured pit before safe disposal.</li> </ul>	<ul style="list-style-type: none"> <li>Tank bottom sludge recovered from crude oil storage tanks once in five years will be sold to approved recyclers.</li> </ul>
7.	<b>Socio-Economic</b>	<ul style="list-style-type: none"> <li>Employing local persons as unskilled and semi-skilled workers.</li> </ul>	<ul style="list-style-type: none"> <li>OIL will give preference to locals in jobs as per the policy of OIL.</li> </ul>
8.	<b>Domestic Waste</b>	<ul style="list-style-type: none"> <li>Septic tank and soak pit will be used.</li> </ul>	<ul style="list-style-type: none"> <li>It is expected that less than 0.5 m<sup>3</sup>/d of domestic wastewater (sewage and sullage) will be generated at each project site which will be treated in septic tank and clear overflow will be discharged in a soak pit.</li> </ul>
	Sewage (Black Water)		
	Wastewater from Kitchen and Laundry (Gray Water)	<ul style="list-style-type: none"> <li>Shallow pit will be used.</li> </ul>	<ul style="list-style-type: none"> <li>All gray water to be sent to shallow pits and allowed to evaporate by solar evaporation. Any excess waste water will be sprinkled on the project access road.</li> </ul>
	Food Waste	<ul style="list-style-type: none"> <li>Humus pits will be used.</li> </ul>	<ul style="list-style-type: none"> <li>Food wastes after removal of all plastic, metal and glass material will be disposed in humus pits of suitable size. The humus pits will be covered with soil on daily basis to avoid any odour nuisance and to check any contact with flies or insects.</li> </ul>
	Combustible Waste (Paper, Rags, Packaging Material)	<ul style="list-style-type: none"> <li>Send to approved recycling contractor.</li> </ul>	<ul style="list-style-type: none"> <li>Combustible waste after removal of plastic, metal and glass material will be temporarily stored at each project site and then sent to recycling contractor.</li> </ul>
	Medical Waste (Waste Generated from Clinic)	<ul style="list-style-type: none"> <li>Proper storage and disposal procedure will be used.</li> </ul>	<ul style="list-style-type: none"> <li>Medical waste will be properly separated and stored temporarily at each project site separately from other wastes. It will then be transported to the nearest hospital for proper disposal.</li> </ul>
9.	<b>Recycling Waste (Tin packs, plastic and glass bottles and other metallic materials)</b>	<ul style="list-style-type: none"> <li>Send to approved recycling contractor.</li> </ul>	<ul style="list-style-type: none"> <li>This will be stored temporarily at project site and then sent to recycling contractor.</li> </ul>

