

**CHAPTER 6**  
**ENVIRONMENTAL MONITORING PROGRAM**

**6.0 INTRODUCTION**

Environmental monitoring refers to systematic sampling of air, water, soil, and biota in order to observe and study the environment, as well as to derive knowledge from this process. One of the objectives of Environmental Monitoring is to monitor the performance of a project and the effectiveness of mitigation measures. The project may be a new one or an existing project under expansion or an existing project opted for change in product mix. Another important objective of Environmental Monitoring is to verify the impact of the project on the environment predicted during Environment Impact Assessment (EIA) studies. To ensure the effective implementation of the EMP and weigh the efficiency of the mitigation measures, it is proposed to undertake environmental monitoring both during construction and operation period of the up-coming Commercial project at Noida, UP.

**6.1 PERFORMANCE INDICATORS (PIs)**

In an up-coming project the physical, biological and social components are of particular significance. Hence, the performances of the following indicators are of great significance:

- Air quality
- Water quality
- Noise levels
- Solid Waste Management
- Re-plantation success / survival rate
- Socio-economic prosperity of the people living in the neighborhoods

It is proposed to monitor the following indicators to confirm the effectiveness of the steps taken to mitigate the adverse impact if any:

- Air Quality

- Noise levels
- Water Quality, and
- Flora

For proper environmental management and effective implementation of the mitigation measures during construction and operation phase of the project, it is essential that an Environmental Monitoring Plan be formulated and followed as indicated in **Table 6.1**.

#### **6.1.1 Ambient Air Quality (AAQ) Monitoring**

Ambient air quality parameters recommended for monitoring with regard to constructional activities are PM<sub>2.5</sub>, PM<sub>10</sub>, CO, SO<sub>2</sub>, and NO<sub>2</sub>. Monitoring will be carried out twice a week for one month in each season during construction phase in accordance to National Ambient Air Quality Standards. The locations and pollution parameters to be monitored during construction and operation phase are provided in the Environmental Monitoring Plan in **Table 6.1**.

#### **6.1.2 Noise Level Monitoring**

The measurement of noise levels will be carried out in five locations in accordance to the ambient Noise Standards formulated by MoEF&CC. The Noise level will be monitored on twenty-four hourly basis. Noise will be recorded at “A” weighted frequency using a slow time response mode of the measuring instrument. The names of the location, duration and the noise pollution parameters to be monitored are given in the Environmental Monitoring Plan (**Table 6.1**).

#### **6.1.3 Success of Plantation**

To ensure proper maintenance and monitoring of the proposed plantation activities, a regular survey of the survival rate of the planted trees will be taken up from the start of the operation of the project.

**Table 6.1: Environmental Monitoring Plan**

Environment Component	Project stage	Parameter	Standards	Location	Duration / Frequency
Ground Water Quality	Construction Stage	Drinking water parameters	Drinking water standards (IS 10500)	Project site 500 m upwind direction 500 m downwind direction	Half yearly
	Operation Phase	Drinking water parameters	Drinking water standards (IS 10500)	Project site	Half yearly
Drinking water	Construction Stage	Drinking water parameters	Drinking water standards (IS 10500)	Supply water after treatment	Half yearly
	Operation Phase	Drinking water parameters	Drinking water standards (IS 10500)	Supply water after treatment	Half yearly
Treated wastewater	Operation Phase	pH, BOD, COD, TDS , TSS, DO,	General Standards for discharge of effluents	Outlet of the Sewage Treatment Plant	Half yearly
Air	Construction Phase	SO <sub>2</sub> , NO <sub>2</sub> , CO	National Ambient Air Quality Standards	500 m upwind direction 5000 m upwind direction 500 m downwind direction	Half yearly
	Operation Phase	PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> , NO <sub>2</sub> , CO, O <sub>3</sub>	National Ambient Air Quality Standards	Project Site	Half yearly
Noise	Construction Phase	Noise Level in dB (A)	As per Ambient Noise Standards	500 m upwind direction 5000 m upwind direction 500 m downwind direction	Half yearly
	Operation Phase	Noise Level in dB (A)	As per Ambient Noise Standards	Project site	Half yearly
Rainwater harvesting	Operation Phase	Inspection of storm water drains and rainwater harvesting pits	Design parameters	Project site	Prior to monsoons

## **6.2 DATA MANAGEMENT**

Environmental monitoring has been carried out by the NOIDA TESTING LABORATORIES, Noida, which is duly approved by MoEF&CC/ NABL. All the results will be available at the project site and submitted to the UPPCB as per the requirements for Environmental Clearance.

## **6.3 REPORTING SCHEDULES**

The environment management cell will be responsible for timely conduct of the monitoring activities. The results of the analysis will be intimated to the project head. Any anomaly found in the test results will be investigated and necessary corrective actions will be taken.

A complaint register will be maintained to note any complaint from the staff, visitors or any other stakeholder. Corrective actions will be taken against the above complaints.

## **6.4 EMERGENCY**

High levels of pollutants in any of the components listed in Table 6.1 may create panic among the occupants. Such information will be made available to them through notices. Further, they will be consulted and their views will be given due importance while taking steps to alleviate the pollutants on immediate and long term basis.

**CHAPTER 7**  
**ADDITIONAL STUDIES**

**7.1 GENERAL**

In this chapter an attempt has been made to throw light on certain aspects which may influence the project proponent as well as the people in large number directly or indirectly during the life of the proposed project. These aspects are disaster management, risk assessment and resource conservation.

**7.2 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN**

The up-coming Commercial Project encompasses the lives of a large number of people. The project includes construction of residential and non-residential structures and installation of machineries & equipment that will meet the comfort and needs of the people. The project may pose serious threat to the occupants in case of a mishap. It is therefore necessary to assess the risk involved in the above project and formulate an effective disaster management plan for the safety of life and property.

**7.2.1 Risk Hazard & its control measures**

It has been planned to construct the building blocks by adopting all the safety norms. However, it is not always possible to eliminate the eventualities and random failures of equipment and human errors. Hence, it is necessary to plan major hazard control measures well in advance and mitigate the ill effects and restore normalcy at the earliest. The table below presents list of hazard associated activities during construction and operation phase along with mitigation measures.

**Table 7.1: List of Hazard associated activities during construction and operation phase along with mitigation measures**

Hazard associated activities during construction & operation phase	Mitigation Measures
<b>Manual Handling</b> - Strains and sprains due to incorrect lifting	

<ul style="list-style-type: none"> <li>- Too heavy loads</li> <li>-Twisting - bending - repetitive movement - body vibration.</li> </ul>	<ul style="list-style-type: none"> <li>- Regular Exercise/warm up</li> <li>- Take help from others when needed</li> <li>- Control loads-take rest breaks/no exhaustion - no rapid movement /twisting/ bending / repetitive movement - good housekeeping.</li> </ul>
<p><b>Falls - Slips - Trips</b></p> <ul style="list-style-type: none"> <li>- Falls on same level</li> <li>- Falls to surfaces below</li> <li>- Poor housekeeping</li> <li>- slippery surfaces</li> <li>- uneven surfaces</li> <li>- poor access to work areas climbing on and off plant</li> <li>- unloading materials into excavations wind</li> <li>- falling objects.</li> </ul>	<ul style="list-style-type: none"> <li>- Good Housekeeping</li> <li>- Tidy workplace</li> <li>- Guardrails, handholds, harnesses, hole cover, -- hoarding, no slippery floors/trip hazards</li> <li>- clear/ safe access to work areas</li> <li>- egress from work areas</li> <li>- dust/water controlled</li> <li>- PPE.</li> </ul>
<p><b>Fire</b></p> <ul style="list-style-type: none"> <li>- Flammable liquids/Gases like LPG, Diesel Storage area and combustible building materials</li> <li>- Poor housekeeping</li> <li>- Grinding sparks</li> <li>- Open flames, absence of Fire hydrant network.</li> </ul>	<ul style="list-style-type: none"> <li>- Combustible/flammable materials properly stored/used</li> <li>- Good housekeeping</li> <li>- Fire extinguishers made available &amp; Fire hydrant Network with reserve Fire water (As per NFPA Code)</li> <li>- Emergency Plan in case of Fire or collapse of structure.</li> </ul>
<p><b>Absence of Personal Protective Equipment</b></p> <ul style="list-style-type: none"> <li>- Lack of adequate footwear</li> <li>- Head protection</li> <li>- Hearing/eye protection</li> <li>- Respiratory protection</li> <li>- Gloves</li> <li>- Goggles.</li> </ul>	<ul style="list-style-type: none"> <li>- Head/face</li> <li>- Footwear</li> <li>- Hearing/eye</li> <li>- Skin</li> <li>- Respiratory protection provided</li> <li>-Training</li> <li>- Maintenance</li> </ul>
<p><b>Defective or wrong Hand Tools</b></p> <ul style="list-style-type: none"> <li>- Wrong tool</li> <li>- Defective tool</li> <li>- Struck by flying debris</li> <li>- Caught in or on</li> <li>- Missing guards</li> </ul>	<ul style="list-style-type: none"> <li>- Right tool for the job</li> <li>- Proper use of tools</li> <li>- Good condition/ maintenance guards</li> <li>- Isolation/ proper demarcation of work space</li> <li>- Eye/face protection</li> <li>- Flying debris controlled</li> </ul>
<p><b>Electricity</b></p> <ul style="list-style-type: none"> <li>- Electrocution</li> <li>- Overhead/underground services</li> <li>- Any leads damaged or poorly insulated</li> </ul>	<ul style="list-style-type: none"> <li>- Leads good condition and earthed</li> <li>- No temporary repairs</li> <li>- No exposed wires</li> </ul>

<ul style="list-style-type: none"> <li>- Temporary repairs</li> <li>-No testing and tagging</li> <li>- Circuits overloaded</li> <li>- Nonuse of protective devices.</li> </ul>	<ul style="list-style-type: none"> <li>- Good insulation</li> <li>- No overloading</li> <li>- Use of protective devices</li> <li>- Testing and tagging</li> <li>- No overhead/ underground services</li> </ul>
<p><b>Scaffolding</b></p> <ul style="list-style-type: none"> <li>-Poor foundation</li> <li>-Lack of ladder access insufficient planking</li> <li>-Lack of guardrails and toe boards</li> <li>-Insufficient ties or other means</li> <li>-All scaffolds incorrectly braced or stabilized to prevent overturning.</li> </ul>	<ul style="list-style-type: none"> <li>- All scaffolds correctly braced and stabilized</li> <li>- 3:1 height to base ratio</li> <li>- Firm foundation, plumb and level</li> <li>- Ladder access provided and used</li> <li>- Proper platform (3 planks/675 mm)</li> <li>- Planks secured</li> <li>- Guardrails and toe boards</li> <li>- 900mm to 1100mm high, within 200mm of working face, mid-rail.</li> </ul>
<p><b>Ladders</b></p> <ul style="list-style-type: none"> <li>- Carrying loads</li> <li>-Not secured against dislodgement</li> <li>-Defective ladders</li> <li>-Not sufficient length</li> <li>-Wrong positions</li> <li>- Incorrectly placed (angles, in access ways, vehicle movements.</li> </ul>	<ul style="list-style-type: none"> <li>- Secured against movement or footed</li> <li>- Ladders in good condition</li> <li>- Regularly inspected</li> <li>- Extend 1m above platform</li> <li>- 4:1 angle</li> <li>- Out of access ways, vehicle movements</li> <li>- Not carrying loads</li> <li>- 3 points of contact</li> <li>- No higher than 3<sup>rd</sup> step down</li> <li>- Use for access only, not working platforms</li> </ul>
<p><b>Excavations</b></p> <ul style="list-style-type: none"> <li>- Trench collapse</li> <li>- Material falling in undetected underground services</li> <li>- Falls</li> <li>- Hazardous atmosphere struck by traffic and mobile plant.</li> </ul>	<ul style="list-style-type: none"> <li>- Soil stability known</li> <li>- No water accumulation</li> <li>- Existing services known</li> <li>- Material 600mm from edge</li> <li>- Clear of suspended loads</li> <li>- Hardhats/PPE</li> <li>-Ladders</li> <li>-Public protection</li> <li>- Atmospheric testing</li> <li>- Traffic controls</li> <li>- Emergency Plan.</li> </ul>
<p><b>Gas Cutting and Welding</b></p> <ul style="list-style-type: none"> <li>- Fire</li> <li>- Welding flash, burns, fumes, electrocution in wet conditions</li> </ul>	<ul style="list-style-type: none"> <li>- Welding flash and burns controlled with PPE and shields</li> <li>- Fumes controlled with ventilation and PPE (in good</li> </ul>

<ul style="list-style-type: none"> <li>- Flashback in oxygen set, leaking cylinders, acetylene cylinders lying down</li> <li>- Poorly maintained leads.</li> </ul>	<p>condition and properly positioned), Gas cylinders be kept upright &amp; secured position (properly tied)</p> <ul style="list-style-type: none"> <li>- Combustible materials to be kept at secured place to avoid fire &amp; Fire Extinguishers to be kept in fire prone area with training to people for its use.</li> </ul>
<p><b>Noise</b></p> <ul style="list-style-type: none"> <li>- Unknown noise levels</li> <li>- known noise levels over 85 decibels</li> </ul>	<ul style="list-style-type: none"> <li>- Levels below 85 decibels</li> <li>- Proper protection.</li> </ul>
<p><b>Falling Material</b></p> <ul style="list-style-type: none"> <li>- Fall during carrying/Lifting materials- dislodged tools and materials from overhead work areas.</li> </ul>	<ul style="list-style-type: none"> <li>- Materials to be secured</li> <li>- Kept away from edge</li> <li>- Toe boards</li> <li>- Use of hard hats.</li> </ul>
<p><b>Craneage&amp; Lifts</b></p> <ul style="list-style-type: none"> <li>- Display of carrying capacity i.e. load (No. Of person), incorrectly slung, defective lifting equipment, unsecured loads, craning in close proximity to building people and plant</li> <li>- Falls</li> <li>- Falling materials.</li> </ul>	<ul style="list-style-type: none"> <li>- Periodic testing by competent authority</li> <li>- Correctly slung/secured loads, lifting equipment good condition</li> <li>- Use of proper hand signals</li> <li>- Falls while unloading controlled.</li> </ul>
<p><b>Visitors Presence at site</b></p> <ul style="list-style-type: none"> <li>- Falls</li> <li>- Struck by dropped materials</li> <li>- Road accidents</li> <li>- Insufficient hoarding or fencing</li> <li>- Pedestrian access past site</li> <li>- Mechanical plant movement on and off site.</li> </ul>	<ul style="list-style-type: none"> <li>- Sufficient hoarding</li> <li>- Fencing and barricades</li> <li>- Safe pedestrian access past site traffic management for loading and delivery</li> <li>- Construction separated from occupied areas of projects.</li> </ul>

### 7.2.2 Emergency Response Plan (ERP)

The overall objective of an Emergency Response Plan (ERP) is to make use of the combined resources at the site and outside services to achieve the followings:

1. To localize the emergency and if possible eliminate it at first instant.
2. To minimize the effects of an accident on people and property;
3. Initiate rescueoperation and medical treatment of casualties;
4. Provide safeguardto other people;
5. Evacuate people to safer areas;
6. Inform the statutory authorities and collaborate with them.
7. Bring the incident under control;

8. Preserve relevant records and equipment for enquiry into the cause and circumstances of the emergency;
9. Take steps to prevent reoccurrence

The ERP is thus related to identification of sources from which hazards can emerge and the maximum plausible loss that can take place in the concerned area. The plan takes into account the maximum credible losses and actions to be taken that can successfully mitigate the effects of losses. The ERP emphasizes on planning of emergency needs so that less effort and resources to be needed to control and terminate emergencies, should the same occur or reoccur.

Main hazards identified for the proposed project include hazards pertaining to fires in buildings and fire in diesel storage areas, earthquake and LPG leakage. The ERP pertaining to the above hazards is described in the following section.

### **7.3 RESPONSE IN CASE OF EARTHQUAKE**

#### **A. Response Procedures for Occupants**

##### **If indoors:**

1. Take cover under a piece of heavy furniture or against an inside wall and hold on.
2. Stay inside: The most dangerous thing during the earthquake is to try to leave the building because objects can fall on you.

##### **If outdoors:**

Move into the open, away from buildings, streetlights, and utility wires. Once in the open, stay there until the shaking stops.

##### **If in a moving vehicle:**

Stop quickly and stay in the vehicle. Move to a place away from buildings, trees, overpasses, or utility wires. Once the shaking has stopped, proceed with caution. Avoid bridges or ramps that might have been damaged by the quake.

**After the earth quake**

1. After the earthquake be prepared for aftershocks.
2. Although smaller than the main shock, aftershocks cause additional damage and may bring weakened structures down. Aftershocks can occur in the first hours, days, weeks, or even months after the quake.

**Help injured and trapped persons.**

1. Give first aid to injured persons. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help.
2. Help those who require special assistances. Infants, elderly persons and people with disabilities may require special assistances.
3. Stay out of damaged buildings.
4. Use the telephone only for emergency calls.

**B. Response Procedure for Emergency Team**

1. Formulate an Emergency Response Team for earthquake victims.
2. using public address system, inform people of response procedures discussed above.
2. Inform the authorities for aid.
3. Ensure no person is stuck beneath the debris.
4. Ensure that all occupants standing outside, near the buildings are taken to open areas.
5. Ensure that first aid has been provided to all injured persons.
6. Ambulance and fire tender vehicles are summoned, if necessary.
7. Shift the seriously injured persons to hospitals
8. Check the utilities and storage tanks for any damage.

**7.4 RESPONSE FOR LPG LEAKAGE**

1. The affected area should be evacuated and cordoned off immediately
2. Form an Emergency Response Team for LPG leakage.
3. Shut down the main valves in the gas bank.
4. Ensure that only concerned persons are present in the affected areas and all other persons and visitors are moved to safer area away from LPG leakage.
5. Rescue trapped persons.
6. Check if any trapped persons is unconscious. Move him/her outside and provide first aid.
7. Call Ambulance and shift injured persons to the nearest hospital.
8. Persons living in the nearby buildings must close all the doors and windows to prevent entry of the leaked gas.
7. Source of leakage to be traced and isolated from all the other areas. If required use pedestal fans to bring down the gas concentration.
8. In case of fire follow the instructions given under Serial No. 7.5.

#### **7.5 RESPONSE IN CASE OF FIRE**

1. On sighting a house on fire, it should immediately be informed to Emergency Response Team giving the exact location and type of fire in detail.
2. If the fire is small, use fire extinguisher to extinguish it.
3. Guide the Emergency Response Team staff to the emergency assembly point.
4. The Emergency Response Team will immediately inform the nearest dispensary and security force. If required a fire tender may be summoned.
5. The response team will immediately move to the point of fire and take all necessary steps to extinguish the fire. If the fire is not under control and spreading then the district authorities may
6. The Emergency Response Team must provide immediate relief to the injured at the place of incident. All injured persons should be evacuated and taken to nearest hospital for treatment.

#### **Instructions for occupants**

1. Get out of the building as quickly and safely as possible.

2. Use the stairs to escape. When evacuating, stay low to the ground.
3. If possible, cover mouth with a cloth to avoid inhaling smoke and gases.
4. Close doors in each room to delay the spread of the fire..
5. If smoke pours through the bottom of the door or if it is felt hot, keep the door closed.
6. Open a window to escape or for fresh air while waiting for the rescue team.
7. If there is no smoke at the bottom or top and the door is not hot, then open the door slowly.
8. If there is too much smoke or fire in the hall, slam the door shut.
9. Stay out of damaged buildings.
10. Check that all wiring and utilities are safe.

A state of the art firefighting system has been planned for the project to prevent and control fire outbreaks. The firefighting system will consist of portable fire extinguishers, hose reel, wet riser, yard hydrant, automatic sprinkler system, and manual fire alarm system. The buildings will also be provided with automatic fire detection and alarm system.

## **7.6 RESOURCE CONSERVATION**

The project will lead to utilization of various natural resources. As an environmentally responsible corporate, the developer’s endeavor is to conserve the resources through judicious management and recycling. It will strive to build up the resources where possible.

**Water Resources:** The project will use groundwater resources during operation phase of the project. Taking note of the national water scenario, where availability of fresh water is fast dwindling, and judicious use of the same cannot be over emphasized. The following measures are proposed to be taken for conservation of water:

- a) Limited withdrawal of groundwater: Ground water will be used only during operational phase
- b) Reduced use of water: To minimize the use of available freshwater, various low flow fixtures will be used. Some of these are low flow flushing system, sensor based fixtures, waterless urinals, tap aerators. Besides the above regular awareness campaigns will be held to educate the people in

favor of economic use of water. They will also be encouraged to take the following steps for economic use of water.

- Timely detection and repair of all leakages;
- To turnoff tap while not using the same ;
- To avoid use of running water while washing hands;
- To avoid use of running water for releasing ice tray ahead of time from freezer;
- Turning off the main valve of water while going out of the house;
- To avoid use of hose for washing floors; use of broom may be preferred;
- Watering of lawn or garden during the coolest part of the day (early morning or late evening, hours) when temperature and wind speed are lowest. This reduces losses due to evaporation.
- Planting of native and/or drought tolerant grasses, ground covers, shrubs and trees. Once fully grown, they need not to be watered frequently.
- Avoid over watering of lawns. Good rains eliminate the need for watering the lawns for more than a week.
- Fixing of sprinklers to water the lawn or garden and not the street or sidewalk;
- Avoid installation or use of ornamental water features unless they recycle the water. Avoid use of ornamental water features during drought or hot weather;
- Fixing of high-pressure, low-volume nozzles on spray washers;
- Replacement of high-volume hoses with high-pressure in low-volume cleaning systems;
- Equipping spring loaded shutoff nozzles in hoses;
- Use float-controlled valves on the make-up line, close filling line during operation, avoid overflow;
- Wash vehicles less often, or use commercial vehicles with recycle water;

**Treatment and Recycling:** The wastewater generated at the project site will be treated in an on-site Sewage Treatment Plant. The treated wastewater will be used in flushing and landscaping. The demand for freshwater will reduce substantially by progressive use of treated water.

**Rainwater Harvesting:** The hard surface of the project site increases the runoff as compared to barren land. It is proposed to harvest the rainwater runoff and use the same after filtration. This will not only reduce the burden of storm water management but also give birth to natural water bodies. Apart from open spaces, it is proposed to harvest the roof top rainwater. The storm water will be treated through an oil and grease trap and allowed to flow through layers of sand and gravel for filtration prior to reaching the water table. This will help to avoid groundwater contamination.

**Construction materials:** The up-coming Commercial project will require various kinds of construction materials provided by the nature. These are sand, gravel, clay etc. It is suggested that prior to their actual procurement the need of such materials should be properly assessed. This will not only avoid over exploitation of the mineral but also result in cost-efficiency. The Excavated soil from the proposed project site will be used within the site to the extent feasible. Excess soil will be made available to other construction sites if demanded.

**Use of Energy:** To conserve the energy resources, good practices will be followed during the construction phase such as turning off lights and electrically operated equipments, when not in use. To ensure fuel efficiency the motors and vehicles will be properly maintained and propagate minimum work at night. The principles of energy conservation will be embedded in the buildings through use of energy efficient fixtures, maximum availability of natural light and use of solar energy for street lighting.

## **7.7 RESETTLEMENT AND REHABILITATION**

The project will not lead to displacement of local population. Hence, it does not require any resettlement and rehabilitation study.

## **CHAPTER 8**

### **PROJECT BENEFITS**

#### **8.0 INTRODUCTION**

The upcoming Commercial project “Capital City” promoted by M/s BPTP International Trade Centre Ltd. is located at Plot No.02B, Sector 94, Noida, and Uttar Pradesh. The project will be built on a plot measuring 57,344.10 m<sup>2</sup> (or 14.17 acres). When completed, the project will provide space for Offices, Cinema and Commercial uses.

Important features of the project are as follows:

- ❖ Rain Water Harvesting System to reduce run off loss and to meet the increasing demands for water
- ❖ Fire Fighting system as per NBC
- ❖ Emergency Alarm System
- ❖ Car parking in Basement 1, 2 & 3.
- ❖ Total ECS; 3136
- ❖ Multi-tiered security system
- ❖ Advance fire protection systems
- ❖ Seamless telecommunication networks
- ❖ Integrated Security System
- ❖ Power Backup

#### **8.1 PHYSICAL INFRASTRUCTURE**

The project consists of a Commercial area, Cinema Hall & Retail area. The total population to be benefitted due to the execution of the above infrastructure project has been worked out to 30,509. Care will be taken to provide the occupants and visitors with necessary

facilities as power, water supply, parking spaces, and broad roads that are safe and secure.

## **8.2 SOCIAL INFRASTRUCTURE**

The Commercial project will provide both direct and indirect employment opportunities to the local people. During the construction period the number of persons to be hired will vary according to pace of progress of construction and it will be as low as 50 and as high as 300. During the post construction period as many as 13,084 people will get direct employment to this project. Of this 4,255 (32.52%) will be deployed in Retail area and 8,829 (67.48%) in commercial offices. The above job opportunities will be for those who want to work as delivery boys, washer men, maid servants, cooks, baby keepers, drivers, cleaners, vendors, guards, security personnel, gardeners, electricians, plumber, sweepers, lift men etc. Besides the above the project will pave the way for development of the region by increased maintenance of existing roads, power supply and water supply.

## **8.3 ECONOMIC BENEFITS**

The Commercial project will boost the local economy by way of trade and business. During the construction period the traders dealing with building materials will be benefited immensely as their business will flourish manifold due to increased demand for construction materials. Besides construction materials business activities on other items like grocery, garments, medicines, hotel & restaurants etc., will also increase during the construction and operational period.

## CHAPTER 9

### ENVIRONMENTAL MANAGEMENT PLAN

#### 9.1 GENERAL

Subsequent to identification and prediction of impacts there needs to suggest mitigation measures which would play a vital role in prevention of environmental degradation during construction and operational phase of the Project. This leads to preparation of Environmental Management Plan (EMP), which is an important part of EIA process.

The Environmental Management plan is a site specific plan. It is developed to ensure that the project is implemented in an environmentally sustainable manner, where all contractors and subcontractors, including consultants if any, understand the potential environmental risks arising from the project and take appropriate actions to minimize those risks. EMP also ensures that the project implementation is carried out in accordance with the planned design and by taking appropriate mitigation measures to reduce adverse environmental impacts during project's life cycle.

The upcoming Commercial project will create certain inevitable impacts, mainly during construction phase. However, these impacts will be within permissible limits as indicated in **Chapter 4**. The impacts will be reduced significantly by implementing a well-designed EMP. The potential environmental impacts, which need to be regulated, are mentioned below:

- Air pollution due to emission of particulate matter and gaseous pollutants from operation of D.G. Sets during power failure and vehicular movements.
- Noise pollution due to use of various noise generating equipment as well as vehicular movement;
- Proper water resource management to ensure continuous water supply.
- Generation of Sludge from sanitary/domestic activities;
- Generation of municipal solid wastes from residences, maintenance of roads, parks, common areas including constructional, electrical and plumbing wastes.

- Energy conservation methods
- Maintenance of Building Management Systems and emergency aids.

To ensure better environment in & around the project site, effective EMP has been developed separately for construction and operational phase.

## **9.2 ENVIRONMENTAL MANAGEMENT STRATEGIES**

Strategy for environmental management in construction activity will be based on three-pronged approach comprising of:

- Pollution prevention.
- Pollution control.
- Protection of pollution recipients.

### **9.2.1 Topography and Physiographic**

During development, construction and operation phase of the Project, no significant impact is anticipated on local or regional topography and Physiographic. Hence, exhaustive management plan is not required. It is however, proposed to carry out extensive turfing with local species apart from proposed plantations and greens.

### **9.2.2 Soil**

#### **A. Development & Construction Phase**

During the construction phase, various kinds of wastes will be generated and the same will be disposed off in various ways.

The following measures will be taken to prevent soil contamination at site and ensure efficient waste management:

#### ***Vegetation and top soil management:***

- Remove vegetative cover from the specific site on which construction will take place.
- Plantation will be taken up at the earliest as proposed.
- The top soil will be stripped off from constructional areas and stockpiled at a safe place for later use in landscaping.

- Promote use of organic fertilizers.
- Construction of erosion prevention troughs, if deemed necessary.
- To check the erosion of excavated loose soil produced due to excavation, site preparation and excavation work will be undertaken during dry season after the end of monsoon.

***Construction Debris:***

- Fuel and oil will be stored in cement lined storage yard and handled carefully to prevent soil contamination through leakage or spillage.
- All metal, paper and plastic wastes, debris and cuttings will be collected from the site as soon as particular construction activity is over.
- During construction of flexible pavement, bitumen wastes will be collected (if any) and disposed-off in environmentally sound manner.
- The number, frequency and area of movement of heavy machinery will be restricted.
- Recycling of construction wastes into aggregates for use in the project site will be undertaken.
- Used oil from DG Sets will be stored in HDPE drums in isolated covered facility and disposed-off as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
- Wastes from the worker camps will be collected and disposed-off as per the Solid Waste Management Rules, 2016 dated 08/04/2016.

**B. Operation Phase**

To prevent soil contamination at site, the most important aspect is to manage the solid wastes that will be generated during the operation phase. The Environmental Management Plan for the solid waste focuses on three major components during the life cycle of the waste management system i.e. collection, transportation, and treatment or disposal.

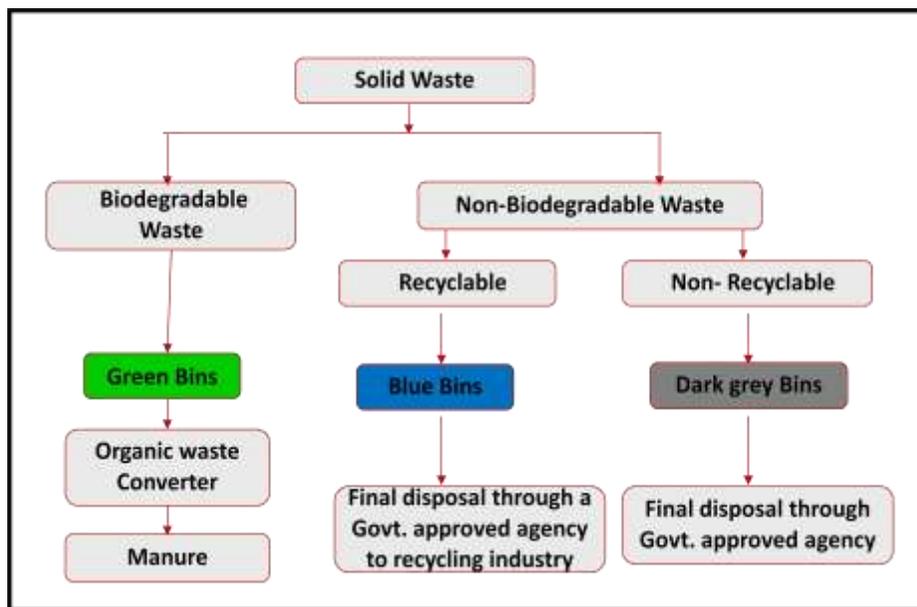
***Collection and segregation of wastes***

- Solid waste generated from project would be collected door to door and segregated into decomposable, recyclable and inert wastes.

- Decomposable wastes will be decomposed and converted into manure for use in horticulture.
- Recyclable waste will be sold to vendors.
- Inert waste, which comprises a very small amount of the total solid waste generated, will be temporarily stored within the project premises.
- Waste bins will be placed at the strategic locations namely inter section of internal roads, parks, common places, etc.
- To minimize littering and foul smell, the waste will be stored in well-designed containers/ bins that will be located at strategic locations to minimize disturbances in traffic flow.
- Enough care will be taken such that the waste collection vehicles are well maintained and generate minimum noise and do not discharge foul smell. It will be ensured that during transportation of the waste, the waste carrying vehicles are fully covered to avoid littering and foul smell.

**Transportation**

Only non-recyclable and non-biodegradable waste will be transported by the Govt. approved agency. The segregation, transportation and disposal of wastes will be done by the authorized agency that will take care of the waste management of the project during the operational phase of the project.



**Figure 9.1 Waste Management Flow Diagram**

### **Disposal**

For disposal/ treatment of waste at the project site during its operational phase, the management will take the services of an authorized agency.

## **9.2.3 Hydrology**

### **9.2.3.1 Surface water Hydrology**

#### **A. Development & Construction Phase**

To ensure adequate passage of the storm water, water channels will be provided in the project area. Further, there will be no excavation during monsoons. Chemicals like paints & varnishes, oil and grease will be stored in cemented areas and they will be fully covered. The wash offs containing the above chemicals will be drained into impervious drains for disposal as hazardous wastes.

#### **B. Operation Phase**

It is proposed to provide a rainwater harvesting system in the project site. The roof tops of the buildings will be connected to the rainwater collection system. This will not only reduce the pressure of storm water management system of the city but also reduce extraction of ground water.

### **9.2.3.2 Ground water Hydrology**

#### **A. Development & Construction Phase**

During the construction period the water requirement will be met through private water tankers. The following steps will be taken to reduce the demand for freshwater:

- Curing water will be sprayed on concrete structures and free flow of water will not be allowed.
- After liberal curing on first day, all concrete structures will be painted with curing chemicals. No water curing will be required after the painting of the concrete structures. This will lead to saving of water.

- The Concrete structures will be covered with thick cloth/gunny bags and then water will be sprayed on them to avoid water rebound and ensure sustained and complete curing.
- Pools will be made using cement and sand mortar to avoid water flowing away from the flat surface, while curing.
- Water ponding will be done on all sunken slabs.

### **B. Operation Phase**

It is proposed to conserve groundwater resources through the combined means of water resource development, minimized water consumption and reuse of treated wastewater to reduce freshwater demand.

## **9.2.4 Water Resource Development**

Taking note of annual rate of precipitation, a storm water drainage system will be developed to carry the runoff. The storm water disposal system for the premises will be self-sufficient to avoid any collection /stagnation of water or flooding of water. The amount of storm water run-off depends upon intensity and duration of precipitation, characteristics of the tributary area and the time required for such flow to reach the drains. The drains will be located near the carriage way on both the sides of the roads. Taking the advantage of road camber (curvature), the rainfall run off from roads will flow towards the drains. Storm water from various plots will be connected to adjacent drain by a pipe through catch basins. Five Rainwater harvesting pits are proposed for recharging the ground water level of the area. The details of Rain water harvesting pits are given in Chapter 2.

### **9.2.4.1 Storm water management system**

Since the storm water collected on site will be harvested for direct use, proper management of this resource is necessary to prevent contamination. Hence, regular inspection and cleaning of storm drains will be carried out. Use of fertilizers and pesticides will be avoided prior to and during monsoon months. Clarifiers or oil/ water separators will also be installed in all the parking areas.

#### **9.2.4.2 Reduce Water Consumption**

To reduce water consumption, awareness campaigns will be organized on the following lines. The message “reduce water consumption” will also be spread amongst the management and maintenance team:

- Installation of water meters conforming to IS standards at inlet and outlet point of water supply.
- To further lower the water consumption, options of Low flow flushing systems, sensor based fixtures, waterless urinals, and tap aerators etc will be explored.
- Leak detection
- Drip irrigation for shrubs and trees
- Use of low-volume, low-angle sprinklers for lawn areas

The message of water conservation will be spread amongst the occupants & staff through awareness campaigns and pamphlets. Following tips will be provided to the occupants for conservation of water.

- Timely detection and repair of all leakages;
- Turning off tap while brushing teeth;
- Use of mug rather than running water for shaving;
- Avoiding/minimizing use of shower/bath tub in bathroom;
- Turning off faucets while soaping and rinsing clothes;
- Use of automatic washing machine only when it is fully loaded;
- Avoid use of running water while washing hands;
- Avoid use of running water for releasing ice tray ahead of time from freezer;
- Turn off the main valve of water while going outdoor;
- Avoid use of hose for washing floors; use of broom may be preferred;
- Watering of lawn or garden during the coolest part of the day (early morning or late evening, hours) when temperature and wind speed are lowest. This reduces losses due to evaporation.
- Planting of native and/or drought tolerant grasses, ground covers, shrubs and trees will be encouraged. Once fully grown, they need not to be watered frequently.

- Avoid over watering of lawns. Good rains eliminate the need for watering for more than a week.
- Set sprinklers to water the lawn or garden and not the street or sidewalk;
- Avoid installation or use of ornamental water features unless they recycle the water and avoid running them during drought or hot weather;
- Fix high-pressure, low-volume nozzles on spray washers;
- Replace high-volume hoses with high-pressure, low-volume cleaning systems;
- Fix spring loaded shutoff nozzles on hoses;
- Fix float-controlled valve on the make-up line, close filling line during operation, provision of surge tanks for each system avoid overflow;
- Wash vehicles less often, or use recycle water for car wash;

#### **9.2.4.3 Re-use of treated wastewater**

Treated wastewater from the site will be recycled for landscaping, flushing and DG Set cooling to further reduce demand for freshwater resources. This will be achieved by treating the wastewater from the site in a proposed Sewage Treatment Plant. The details of the STP are given in **Chapter 2**. The treated wastewater conforming to standards for effluent discharge on land will be reused for various non-potable and non-contact purposes.

#### **9.2.4.4 Surface water Quality**

##### **A. Development & Construction Phase**

To mitigate the impacts of soil erosion during first rain and generation of wastewater from construction worker camps, the following measures are proposed;

- Excavation will be undertaken during dry season and proper management of excavated soils,
- Clearing of all debris from site as soon as construction is over,
- Provision of proper hutment and toilet facilities for construction workers
- Proper disposal of wastewater generated at site.

#### **9.2.4.5 Ground water Quality**

**A. Development and Construction Phase**

To ensure against any groundwater pollution through leaching of soil, solid waste management plan ensuring timely collection of wastes will be followed. The collected wastes will be stored at designated area and disposed-off as per the standard procedures in line with the statutory requirements.

**B. Operation Phase**

The ground water pollution can arise from improper waste handling or by recharge of groundwater through contaminated storm water. A well planned solid waste management as discussed in Chapter 2 is proposed for the operation phase. This will prevent soil or groundwater pollution on this account.

Storm water carries dirt and garbage along its flow. Contamination of this water with spilled oil/grease is especially of concern when recharging is proposed. Hence, preliminary treatment for oil and grease and filtration through layers of sand and gravel is necessary prior to its use.

Landscaping water enters the soil and finally the groundwater. It is thus of utmost importance that only clean water is used for horticulture purposes. The water from the households contains significant amounts of detergent and soap, which is undesirable for plants, soil and groundwater. Hence, it is proposed to treat wastewater from the sites up to tertiary level, and be used for landscaping only thereafter. Regular monitoring of treated wastewater will be carried out to ensure that all parameters are within acceptable levels.

**9.2.5 Air Quality**

**A. Development and Construction Phase**

The construction phase of the Project is spread over 2 to 3 years. This will cause marginal impact on ambient air quality from constructional activities, unloading of construction materials, cement, soil, vehicular movement etc. The main pollutant of concern is PM<sub>2.5</sub> and PM<sub>10</sub> (dust). Following mitigation measures will be adopted during this phase to mitigate the impacts on ambient air:

- Installation of batch plant at isolated place and provide cover shed around plants.
- Loading and unloading of cement and other material will be undertaken in covered shed.
- Provide dust suppression system in unloading area (as per requirement).

- Develop avenue and curtain plantation on the internal roads and peripheral plantation around the site to protect oneself from the movement of dust and other pollutants.
- Cover scaffolding, hosing down road surfaces and cleaning of vehicles will be given priority.
- On-Road- Inspection of black smoke generating machinery.
- Vehicles having pollution under control certificate will be allowed to ply in the project area
- Use covering sheets on trucks to prevent dust dispersion from the trucks.
- Reduce the speed of a vehicle to 20 km/hr to reduce emissions on site.
- All material storages will be adequately covered and contained.
- The workers will be imparted training to reduce idle time of machines that otherwise tends to produce hydrocarbons and carbon monoxide.
- Will adopt best practices for maintenance and repair of all machineries and equipments.

### **B. Operation Phase**

During the operation phase, following measures will be adopted to control pollution due to the Project:

- Adequate stack height for DG Sets
- Traffic pollution management
- Adequate Plantation

**DG Set:** The running of DG sets will result to emission of various pollutants. To achieve natural dispersion, adequate stack height will be provided as per the guidelines of Central Pollution Control Board (CPCB) for DG sets.

**Traffic pollution management:** The Internal roads will be maintained and kept in good conditions to control the dust emissions. People will be encouraged to use low sulphur fuel to minimize air pollution.

**Plantation:** Vegetation is an effective means of controlling air pollution due to its dual action. It acts as a barrier to the source of emission and at the same it acts as a receiver of pollutants by absorbing the same. It is proposed to develop plantation of selected species effective in absorption of expected pollutants. The plantation will be undertaken along the internal roads and on the periphery of the Project site. The following species are proposed to be planted:

- *Cassia fistula* (Amaltas)
- *Delonixregia* (Gulmohar)
- *Bauhinia purpurea*(Kachnar)
- *Dalbergiasissoo*(Shisham)

## **9.2.6 Noise Levels**

### **A. Development and Construction Phase**

During the construction phase, some amount of noise will be generated through the operation of construction machines, excavators, DG set, etc. Following measures will be taken to mitigate the noise at construction site:

- Use of well-maintained equipment fitted with silencers.
- Installation of noise shields near the heavy construction operations
- Acoustic enclosures will be provided to DG sets at the construction site,
- Earmuff and other protection devices will be provided to laborers working in high noise generating machines.
- High noise activities will be carried out during daytime.

### **B. Operation Phase**

The main source of noise during operation phase is intermittent use of DG Sets, which will be used only during power failure or load shedding. Mounting vehicular traffic is the other source of noise pollution. The principles of noise emission control and screening are proposed for the two different scenarios of noise generation.

#### **Noise emission control**

All the D.G. Sets will be provided with acoustic enclosures ensuring 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is higher as per CPCB norms. It will be ensured that the manufacturer provides acoustic enclosures as an integral part of Diesel Generator Sets.

#### **Barriers**

Trees having thick and fleshy leaves with flexible petioles having capacity to withstand vibration will be planted to reduce noise. Heavier branches and trunk of the trees also deflect or refract the

sound waves. The following species are proposed to be planted in the greenbelt at the periphery of the project site.

- *Antocephalouscadamba (Kadam)*
- *Polyathialongifolia (Ashok)*
- *Terminalia arjuna (Arjun)*

### **9.2.7 Biological Environment**

#### **Development and construction phase**

During development and construction phase, no tree will be cut down. Hence, no impact is anticipated on terrestrial ecology. Site clearing will be carried out strictly as per plan. The workers will be advised not to cut and uproot the small trees present in and around the project site for cooking. The workers will also be discouraged to wander in nearby areas where there is thick plantation or dense vegetation.

Further, a green belt will be developed on the periphery of the project site and also along the internal roads during the construction phase. This will act as a curtain to restrict the movement of pollutants from either side of the project and improve site aesthetics.

#### **Operation phase**

During the operation phase, a green belt will be developed and maintained. Ornamental plant species and grasses will be planted in open space within the premises. About 43.88 % of the total area is proposed to be maintained green in the project site. A list of species is provided below for plantation:

<b>S. No.</b>	<b>Botanical Name</b>	<b>Local name</b>
1.	<i>Acacia auriculiformis</i>	Australian wattle
2.	<i>Cassia fistula</i>	Amaltas
3.	<i>Delonix regia</i>	Gulmohar
4.	<i>Bauhinia purpurea</i>	Kachnar
5.	<i>Bauhinia acuminata</i>	Kanchan

6.	<i>Azadirachtaindica</i>	Neem
7.	<i>Thujaoccidentalis</i>	White cedar
8.	<i>Dalbergiasisoo</i>	Sisam
9.	<i>Alstoniaschloaris</i>	Chitwan
10.	<i>Callistemon lanceolatus</i>	Bottle brush
11.	<i>Polyathialongifolia</i>	Ashok
12.	<i>Saracaindica</i>	Ashoka
13.	<i>Antocephalouschinesis</i>	Kadam
14.	<i>Terminalia arjuna</i>	Arjuna
15.	<i>Neriumindicum</i>	Kaner
16.	<i>Hibbiscushirusta</i>	Godhal
17.	<i>Chandani</i>	Chandani
18.	<i>Bassialatifolia</i>	Mahua

### **18.1.1 Demographic and Socio-Economic Environment**

#### **A. Development and Construction Phase**

During the development and construction phase of the Project, number of persons to be hired and deployed directly to the project will vary according to pace of progress of construction and it will be as low as 50 and as high as 300. They include skilled, semiskilled and unskilled workers. Besides the above there will be employment opportunities for a maximum of 50 persons in the informal sector. Every effort will be made to provide the employment opportunities to local people. Creation of employment opportunities for local people is a positive impact of the project from socio-economic angle.

To strengthen the positive impact of the project on socio-economic environment the following steps will be taken:

- All the applicable guidelines under relevant acts and rules related to labor welfare and safety will be followed.
- Proper sanitary and drinking water facilities will be provided to workers living in the construction camps within the project premises. Domestic refuse generated at the construction camps will be disposed-off on a regular basis.
- Workers will be provided with appropriate personal protective equipment (PPEs) while undertaking the assigned work.
- Guarding of unsafe and hazardous machine parts, maintenance of equipment's as hoists and lifts will be ensured.
- Adequate provision of fire extinguishers will be made in the project site.
- First Aid Medical facilities will be made available to the construction workers.

## **B. Operation Phase**

During the operation phase the project seeks to increase the benefits to the local population and contribute towards meeting community's expectation of benefits from the project. The details are as follows:

- ***Trade & Business***

The upcoming project will boost the local economy by way of trade and business. During the construction period the traders dealing with building materials will be benefited immensely as their business will flourish manifold due to increased demand for construction materials. Besides construction materials business activities on other items like grocery, garments, medicines, hotel & restaurants etc., will also increase during the construction and operational period. This is a positive impact of the project as it will provide employment opportunities to the local people

- ***Employment Opportunity***

During the post construction period as many as 13,084 people will get direct employment to this project. Of this 4,255 (32.52 %) will be deployed in Retail area and 8,829 (67.48 %) in commercial offices. Besides the above the project will provide employment opportunities to about 250 persons in the informal sector. The Commercial project will boost the local economy by way of trade and business. During the construction period the

traders dealing with building materials will be benefited immensely as their business will flourish manifold due to increased demand for construction materials. Besides construction materials business activities on other items like grocery, garments, medicines, hotel & restaurants etc., will also increase during the construction and operational. The General recruitment procedures will be transparent, public and open to all. The Recruitment procedures will be made known at locally prominent locations in advance and there will be no discrimination on the basis of gender, caste or other factors. Lastly, the contractors will be required to abide by the Indian labour laws pertaining to standards on employee working conditions, minimum wages for workers, safety and welfare measures.

### ***Infrastructure Development***

The project will pave the way for various infrastructure development projects that includes roads, parks, play grounds, bus shelters etc. This is a positive impact of the project, as it will create further employment opportunities for the local job seekers.

- ***. Improved working conditions***

The project will provide safe working conditions for the labor and other workers employed at the facility during construction and operation phase. Conditions of employment will address issues like minimum wages and medical care for the workers.

## **18.1.2 Vehicle Parking and Traffic Management**

### **A. Development and Construction Phase**

To ensure that heavy vehicles transporting construction material from the site does not burden the local traffic, it is proposed to:

- Plan the movement of the heavy vehicles avoiding the peak hours (day time).
- All the vehicles bound for the project site will be provided with parking space such that there is no waiting time at the access roads.

## **B. Operation Phase**

It is ensured that there will be no influx of vehicles at the Project entrance from the construction site or from access road. The available width will provide sufficient merging space for the vehicles while meeting the road.

Adequate provision will be made for parking of cars and other vehicles. Besides the above, the wide internal road will provide space for off street parking.

### **18.1.3 Energy Conservation**

The Project has been designed in such a way that natural light and air will be adequate. The Project will be made energy efficient through use of low energy consuming fixtures. Energy conservation will be achieved through various means as indicated below:

#### ***Site Plan and building design***

- Maximum utilization of solar light.
- Public areas will be cooled by natural ventilation as opposed to air-conditioning
- Maximum use of natural light through building design
- The orientation of the buildings will be done in such a way that maximum daylight is available
- The water bodies and green areas will be spaced in such a way so that there is significant reduction in the temperature.

#### **Energy Saving**

- Energy efficient lamps will be provided within the project complex.
- Constant monitoring of energy consumption and fixing of targets for energy conservation
- Adjustment of the settings of illumination levels to ensure minimum energy used for desired comfort level

#### **Awareness**

- Promoting awareness on energy conservation
- Training of staffs on methods of energy conservation
- Management and Maintenance of the entire System

Management and maintenance is an important issue for a Project. During the construction phase M/s BPTP International Trade Centre Ltd. will take care of the implementation of environmental management plan. They will review the effectiveness of mitigation measures adopted by contractors and sub-contractors from time to time. The buildings will be provided with water sprinklers and fire alarms and there will be provision for adequate number of fire extinguishers. The Backup services will be provided for all emergency equipment's and machineries.

Operation, Management and Maintenance (OMM) of all internal services will be undertaken by M/s BPTP International Trade Centre Ltd. and the same will be handed over to the local Municipality/designated authority in due course.

### **Institutional Capacity Building**

- a. Reporting:** For effective implementation of any system/ plan, a systematic reporting system is essential. An Environmental Management Cell will be set up by the project proponent for implementation of the proposed Management Plan. Reporting of the results of all the management and monitoring plans will be submitted to the designated Project Head. The reports will be reviewed and the parameters exceeding their limits will be identified and the reason for the same will be investigated. Subsequently, the requisite mitigation plan will be implemented as per the investigation report(s).

The Environment Management Cell will be a permanent organizational set up responsible for conducting environmental monitoring and effective implementation of mitigation measures. The major duties and responsibilities of Environmental Management Cell will be as follows:

- To implement the environmental management plan
  - To ensure regulatory compliances with all relevant rules and regulations
  - To ensure regular operation and maintenance of pollution control devices
  - To minimize environmental impact of various operations by strict adherence to the EMP
  - To initiate environmental monitoring as per approved time schedule
- b. Review and interpretation** of monitored results and corrective measures taken in case the monitored results are above the specified limit.

- c. Documentation** of good environmental practices and applicable environmental laws for ready reference
- d.** Maintain environmental related records
- e.** Coordination with regulatory agencies, external consultants, monitoring laboratories
- f.** Maintenance of detail records of public complaints and action taken.

### **Hierarchical Structure of Environmental Management Cell**

The normal activities of the EMP cell will be supervised by a dedicated person who will report to the Project Head.

### **Awareness and Training**

Training and awareness programs are important means of human resource development. They help to achieve sustainable operation of the facility and environment management. For successful implementation of the project, relevant EMP will be communicated to occupants, staffs and contractors.

The occupants must be made aware of the importance of waste segregation and its disposal, water conservation and energy conservation. People will be made aware of the importance of waste segregation and its disposal, water and energy conservation by holding periodic Integrated Society meetings. They will also be made aware of their duties.

### **Environmental Audits and Corrective Action Plans**

To confirm whether the implemented Environmental Action Plan is adequate and effective, periodic environmental audits will be carried out by the Environmental Division of M/s BPTP International Trade Centre Ltd. This will be followed by Correction Action Plan (CAP) to do away with various adverse issues identified during the course of audit

## **18.2 OVERALL MITIGATION MEASURES AND ENVIRONMENTAL MANAGEMENT PLAN**

The overall impact assessment of anticipated environmental impacts and mitigation measures adopted during the construction and operation phases of the project have been summarized in **Table 9.1.**



**Table 9.1: Impact Assessment and mitigation measures proposed to be adopted during the construction and operation phases of the project**

Sl. No.	Environmental Components	Potential Impacts	Potential source of Impact	Controls through EMP & Design	Impact Evaluation	Remedial Measures
1.	Groundwater Quality	Ground water contamination	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>▪ Wastewater generated from the hutment of Labor</li> </ul>	1. Modular STP 2. Mobile toilets	No significant impact as majority of laborers deployed are from the local areas	-
			<u>Operation Phase</u> <ul style="list-style-type: none"> <li>▪ Sewage treatment, sludge disposal on land.</li> </ul>	<ul style="list-style-type: none"> <li>• Sewage will be treated in Sewage Treatment Plant. Sludge will be used in horticultural as manure.</li> </ul>	No significant negative impact on ground water quality is envisaged.	In an unlikely event of soil and ground water contamination, remediation measures will be taken.
2.	Groundwater Quantity	Ground Water Depletion	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>▪ Ground water will not be used during construction phase. Hence no impact during construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Not Applicable</li> </ul>	Not Applicable	-

Sl. No.	Environmental Components	Potential Impacts	Potential source of Impact	Controls through EMP & Design	Impact Evaluation	Remedial Measures
			<p><u>Operation Phase</u></p> <ul style="list-style-type: none"> <li>▪ Excessive use of Ground water due to scarcity of fresh water.</li> </ul>	<ul style="list-style-type: none"> <li>• Recycling of wastewater to reduce freshwater requirement</li> <li>• Storm water collection for Water Harvesting.</li> <li>• Awareness Campaign on economic use of water.</li> <li>• Augmentation of fresh water supply</li> <li>• Use of Ground water only during emergency</li> </ul>	<p>No adverse impact on ground water table since ground water will be tapped only</p>	-

Sl. No.	Environmental Components	Potential Impacts	Potential source of Impact	Controls through EMP & Design	Impact Evaluation	Remedial Measures
4.	Air Quality	Dust Emissions	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>All kinds of construction activities including digging of the land for both shallow and deep pile foundation</li> </ul>	<ul style="list-style-type: none"> <li>Dust suppression through water sprinkling using water trucks, handheld sprayers and automatic sprinkler systems.</li> <li>The vehicles carrying loose construction materials will be covered.</li> <li>The Contractors will be advised to provide dust masks to the labor.</li> </ul>	Generation of dust will be temporary and will settle fast due to dust suppression techniques to be put into practice. Hence, the impact of dust emissions will be under control	-
		Emissions of PM, SO <sub>2</sub> , NO <sub>2</sub> and CO	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>Operation of construction equipment and vehicles during site development.</li> </ul>	<ul style="list-style-type: none"> <li>Construction will be undertaken at accelerated rate.</li> <li>Continuous maintenance of machinery and Equipment's.</li> </ul>	No significant impact	Regular monitoring of emissions and steps will be taken to control emissions

Sl. No.	Environmental Components	Potential Impacts	Potential source of Impact	Controls through EMP & Design	Impact Evaluation	Remedial Measures
			<u>Operation Phase</u> <ul style="list-style-type: none"> <li>▪ Operation of D.G. Set</li>   <li>▪ Emissions from vehicular traffic.</li> </ul>	<ul style="list-style-type: none"> <li>• Use of low Sulphur diesel.</li> <li>• Height of Stacks as prescribed by CPCB.</li>   <li>▪ Green belt will be developed to reduce PM levels.</li> </ul>	No adverse impact is envisaged since D.G. Set will be used only as power back-up.	
5.	Noise Environment	Noise emissions	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>▪ Operation of construction machinery &amp; equipment</li> <li>▪ Vehicles plying in the site carrying construction materials and work force.</li> </ul>	<ul style="list-style-type: none"> <li>• Noise producing Equipment’s will be fitted with silencers and maintained.</li> <li>• Will provide noise shields near heavy construction site.</li> <li>• Construction activity will be restricted during day time.</li> <li>• Personal Protective Equipment (PPE) like helmets, earmuffs and earplugs will be provided during construction period.</li> </ul>		

Sl. No.	Environmental Components	Potential Impacts	Potential source of Impact	Controls through EMP & Design	Impact Evaluation	Remedial Measures
			<u>Operation Phase</u> <ul style="list-style-type: none"> <li>▪ Noise due to vehicle movement.</li> <li>▪ Noise from D.G. sets operation.</li> </ul>	<ul style="list-style-type: none"> <li>• Peripheral plantations will be undertaken.</li> <li>• Will provide Acoustic Enclosures on D.G. Sets.</li> </ul>	<p>No significant noise emission</p> <p>Short-term exposure within permissible limit.</p>	
6.	Land Environment	Soil contamination	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>▪ Emergence of Construction debris.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction debris will be collected and suitably used on site as per construction waste management plan.</li> </ul>	<p>Impact will be local and insignificant. Waste generated will be reused for construction activities.</p>	--

Sl. No.	Environmental Components	Potential Impacts	Potential source of Impact	Controls through EMP & Design	Impact Evaluation	Remedial Measures
			<u>Operation Phase</u> <ul style="list-style-type: none"> <li>▪ Dumping of municipal solid waste in the open.</li> <li>▪ Handling of used oil from D.G. Sets.</li> </ul>	<ul style="list-style-type: none"> <li>• Solid waste from the site will be collected on daily basis and disposed off as municipal wastes. The segregation, transportation and disposal of wastes will be handled by a separate agency duly authorized by government.</li> <li>• Used oil generated will be sold to authorized recyclers</li> </ul>	<p>Environmental impact will be negligible if properly handled and disposed off.</p> <p>No impact</p>	--
7.	Biological Environment (Flora and Fauna)	Removal of Flora and Fauna from the site.	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>▪ Site development and construction.</li> </ul>	<ul style="list-style-type: none"> <li>• The project site comprises of abandoned agricultural land. No notable flora and fauna found.</li> </ul>	No negative impact	--
		Increase in Green Cover	<u>Operation Phase</u> <ul style="list-style-type: none"> <li>▪ Plantations along the periphery of the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Will undertake plantation of species that are native to the area, fast growing and with good canopy cover.</li> </ul>	Positive impact	--

Sl. No.	Environmental Components	Potential Impacts	Potential source of Impact	Controls through EMP & Design	Impact Evaluation	Remedial Measures
8.	Socio -Economic Environment	Population displacement and economic impact	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>▪ Population dispersal due to acquirement of land</li> <li>▪ Construction activities</li> </ul>	No population dispersal as no land has been acquired by the project proponent  • Employment for laborers	No negative impact  Positive impact	--
			<u>Operation Phase</u> <ul style="list-style-type: none"> <li>▪ Residential accommodation</li> <li>▪ Employment opportunities</li> <li>▪ Increased demand for goods &amp; services.</li> </ul>	• Residential accommodation for those who had approached for the same. • Project will provide employment in IT enabled services. • Boost to local market for increased demand for goods of daily requirements.	Positive impact	--
9.	Traffic Pattern	Increased Vehicular traffic	<u>Construction Phase</u> <ul style="list-style-type: none"> <li>▪ Heavy vehicle movement during construction phase.</li> </ul>	• Control of Heavy vehicle movement during daytime. • Adequate parking facility	No negative impact	

Sl. No.	Environmental Components	Potential Impacts	Potential source of Impact	Controls through EMP & Design	Impact Evaluation	Remedial Measures
			<u>Operation Phase</u> <ul style="list-style-type: none"> <li>▪ Increased traffic</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle movement will be regulated inside the project area</li> <li>• Adequate parking space will be provided to the residents as well as to staffs and workers who will visiting the area for duty</li> </ul>	No negative impact	

**CHAPTER 10**  
**SUMMARY AND CONCLUSION**

**10.1 PROJECT BACKGROUND**

M/s BPTP International Trade Center Ltd. has decided to execute an “IT Enabled Services” project at Plot No. 02B, Sector 94, Noida, Uttar Pradesh. As per EIA Notification dated 14<sup>th</sup> September, 2006 and subsequent amendments all Townships and Area development projects covering an area greater than or equal to 50 ha and or built up area greater than or equal to 1, 50,000 m<sup>2</sup> are designated as category 8 (b) projects and the same require EIA&EMP Reports to obtain prior environmental clearance from respective State Environmental Impact Assessment Authority (SEIAA). Also all projects under item 8(b) shall be appraised as Category B1 projects. The up-coming Commercial project falls under Category 8 (b) as per the above Notification and requires Environmental Clearance from the Uttar Pradesh Environment Impact Assessment Authority since the built up area is 2,73,130.2m<sup>2</sup>, which is greater than the above cut off area measuring 1, 50,000 m<sup>2</sup>. Accordingly, an EIA/EMP study has been carried out by ENVIRTA Sustainable Solutions India Pvt.Ltd., Noida and the details are summarized below.

For this study, the impact zone is confined to an angular radius of 5 km from the project boundary. For the purpose of certain environmental components, the radius has been extended up to 10 km as well. The EIA has been conducted to establish the baseline environmental situation in the study area, assessment of potential impacts on various environmental and social parameters, formulation of mitigation measures so as to keep negative impacts within acceptable limits and strengthen the positive impacts to make it more sustainable.

The ‘Executive Summary’ summarizes the findings of the EIA study to help the authority in decision making. It also provides project related information both to general public as well as to EIA authority. The summary of the report highlights the baseline environmental status of the study area, key environmental issues and their likely impacts. It also lists the mitigation measures proposed to be taken by the project proponent to ease the negative impacts.

**10.2 PROJECT SITE**

The project site is well connected to the road network. The nearest highway is Noida – Greater Noida Expressway which is very close to the project site. The NH24 is approx.8.24 km NNW from the project site. The nearest Railway Station is Dadri Railway Station which is approx.4.71 km SW from the project site towards Southwest direction. The nearest Airport is Indira Gandhi International Airport, which is approx 20.92 km away from the project site towards West direction.

### 10.3 PROJECT FEATURES

The Salient Features of the project are provided in the table below:

**Table 10.1: Salient Features of the project**

Estimated Population	30,509 (Fixed + Floating)	
Fresh Water Requirement during operation phase (KLD)	Staff	197
	Visitors	105
Recycled Water Requirement during operation phase (KLD)	Staff	393
	Visitors	157
Source of water	Municipal Supply (NOIDA)	
Wastewater (KLD)	791	
Power Demand	19.2 MVA	
Power Back-up (kVA)	11 DG Sets (10 x 2000 kVA +1 x 1000 kVA)	
Source of Power	UPPCL	
Solid Waste Generation (kg/day)	5232	
Parking Required as per MoEFCC and Noida Bye laws (ECS)	2931	
Parking Proposed (ECS)	Basement I	890 ECS
	Basement II	1109 ECS
	Basement III	1137 ECS
	Total	3136 ECS
Total Project Cost (Rs.Crores)	INR 1004.15 Cr	

The project will be implemented over a span of two to three years from the commencement of construction.

### 10.4 ENVIRONMENTAL SETTING OF THE STUDY AREA

The baseline environmental status was assessed based on primary and secondary data collected either through in-site field observation or obtained from various government and non-

government organizations such as Irrigation Department, India Meteorological Department (IMD), Central Ground Water Board, Geological Survey of India, State Ground Water Department, State Pollution Control Board, Census of India and Local Forest Department. The baseline status has been established by analysis of primary and secondary data and the predicted impacts are discussed below. The mitigation measures have also been suggested along with.

#### **10.4.1 Land Environment**

As per Area development Plan the 2021, project site has been earmarked for development of Special Economic Zone.

The construction phase of a area development project poses the threat of soil contamination and soil erosion. Inadequate solid waste management may also cause soil contamination during operation phase. The estimated waste generation during operation **phase is 5,232 kg/ day.**

During construction phase, all excavation related work will be avoided during the monsoon months. All wastes from the project site will be regularly removed and disposed-off/sold. An efficient solid waste management system has been proposed, which will comprise of door-to-door waste collection, segregation of solid waste within the site, and their disposal. Solid waste will be disposed of by selling recyclable wastes to vendors.

#### **10.4.2 Water environment**

The project site is located at Plot No. 02B, Sector-94, Noida, District GautamBudh Nagar, Uttar Pradesh. The water requirement during construction phase will be met through supplies by private water tankers. A combination of efficient water management, reuse of treated wastewater and rainwater harvesting to replenish groundwater is proposed to have a positive bearing on the water environment of the region. A Sewage Treatment Plant (STP) of 955 KLD capacities will be set up to treat the wastewater.

#### **10.4.3 Air Environment**

During construction phase, the major air pollutant of prime concern are PM 2.5 and PM10. The impact of other emissions such as SO<sub>2</sub>, NO<sub>2</sub>, and CO are not significant because the nature of sources is such that the emissions are distributed spatially as well as temporal. The monitored

average PM2.5 and PM10 level exceeded NAAQS at all the five locations. The levels of PM 2.5, PM10, NO2, SO2 and CO at all the five locations were within the standards prescribed by NAAQS at all the five locations. Thus dust emissions from construction activities will require comprehensive mitigation measures and best construction practices.

Adequate stack heights are proposed for 11 DG Sets (10 x 2000 kVA +1 x 1000 kVA) above the ground to provide for sufficient dispersion of pollutants. Water sprinklers will be used to suppress dust during construction period. During the operation phase, green belt and green area development will be taken up to restrict and absorb air pollutants.

#### **10.4.4 Noise Environment**

Noise levels were observed at four locations within the study area. The Levels of noise monitored does not the limits of 55 dB (A) during daytime and 45 dB (A) at night time.

The noise emitted from heavy-duty construction equipments during construction period if found high shall require occupational preventive measures and temporary noise barriers for noise reduction. The construction period being four to five year’s duration, will require significant mitigation measures such as restricted loud noise activities during daytime, provision of Personal Protective Equipments (PPEs) and acoustic enclosures for D.G. Set.

During the operation phase, noise pollution will be checked through acoustic enclosures of DG Sets and green belt plantation.

#### **10.4.5 Biological environment**

There is no protected area, reserved forest or sanctuary in the study area. There is also no felling of trees. The project will have 25,162.92m<sup>2</sup> of green area. Additionally, there will be avenue plantations, green walls and roof tops. The proposed landscaping will include native species that will attract local birds and insects, reduce pollution and improve aesthetics and micro-climate of the region.

#### **10.4.6 Socio-economic environment**

The Project “Capital City” does not call for any land acquisition and no change in the existing

land use pattern. The execution of the project will not disturb the people living in the area as there will be no blasting and large scale digging. The project will generate employment opportunities for both skilled and unskilled workers in the vicinity, which will produce multiple effects on the life and economy of the local people. Thus from socio-economic point of view the project is beneficial to the people and can be executed with no hesitation.

#### **10.4.7 Energy efficiency**

Electricity will be supplied by Uttar Pradesh Power Corporation Limited. The total connected load is around 19.2 MVA. There is provision for seven DG sets with total capacity of 21,000 kVA (10 x 2,000kVA + 1 x 1,000 kVA) for necessary power back up in Commercial Project. The DG sets will be equipped with acoustic enclosure to minimize noise generation and adequate stack height for proper dispersion of all gaseous pollutants in the form of smoke.

Various provisions have been made to reduce the energy efficiency of the building to attain the distinction of ‘Green Building’, such as use of solar energy, provision of low energy fixtures, design features to maximise sunlight and use of materials to improve energy efficiency.

#### **10.4.8 Other**

**Resource Conservation:** A concerted effort will be made towards resource conservation by way of using recycled building materials, fly-ash bricks (up to 35%), reduced water consumption and improvement in energy efficiency of the building.

**Indoor Air Quality:** Special attention will be given on maintaining indoor air quality through use of low VOC paints, provision of adequate ventilation, proper storage of chemicals and cleaning materials.

**Safety:** A network of manned security gates, security men, closed circuit TV and intercom facilities are proposed to ensure safety of the occupants. The buildings will also be provided with adequate fire tenders, fire alarms and water sprinklers.

### **10.5 ENVIRONMENTAL MANAGEMENT PLAN**

Adequate environmental management measures will be taken during the entire planning, construction and operating period of the project. The aim is to minimize adverse environmental

impacts, if any and ensure sustainable development of the area.

For effective and consistent functioning of the Commercial Project, an Environmental Management System (EMS) will be introduced. Under the EMS an Environmental Management cell will be set up, which will be responsible for effective implementation of the EMP, environmental monitoring, training of staffs, conduct of awareness campaigns, environmental audits and maintenance of records.

Consequent to environmental impact assessment, the potential adverse impacts will be mitigated to an acceptable level. This will be possible by implementation of various measures as stated in the EIA report and EMP. Some of the benefits of the project are as follows:

- Use of solar energy for street lighting
- Provision of green walls and green terraces
- Green Building certification
- Use of fly ash bricks.
- Use of steel manufactured from recycled content
- Provide permeable paving to control surface water runoff
- Rainwater harvesting
- Meeting of all the requirements for buildings in moderate earthquake prone areas.
- Provision of fire alarms and water sprinklers
- Provision of welfare schemes to workers
- Extending educational and healthcare facilities to the local people
- Commitment to engage local people and businessmen for maintenance and repair work

Hence, it may be concluded that the project will have significant positive economic and social impact on the local community without bearing any significant adverse environmental impact.

**CHAPTER 11**

**DISCLOSURE OF CONSULTANTS ENGAGED**

**11.1 INTRODUCTION**

<b>Project Name: Commercial Project “Capital City”</b>		
Name and address of the Consultant	Envirta Sustainable Solutions India Pvt. Ltd. Unit no. 2412, B – 36, Express Trade Tower 2, Sector 132, Noida	QCI-NABET Accredited ISO 9001:2008 Certified Organization.
Personnel involved in preparation of EIA/EMP report	Mr. Vishal Sharma (Co-Cordinator)	
	Mr. Arun (EIA Coordinator)	
	Miss Aditi Mishra (AFAE- NV, AP)	
Base line data	Noida Testing Laboratories.	NABL Certified

**11.2 LIST OF COORDINATORS & FUNCTIONAL AREA EXPERTS INVOLVED**

EIA Coordinator	Mr. Arun
FAE-WP	Mr. Vishal Sharma
FAE-AP	Mr. Arun
FAE-AQ	Mr. Arun
FAE-LU	Miss. Poonam Manglam
FAE-EB	Mr. Arun
FAE-NV	Mr. Arun
FAE-SE	Mr. K.N Dutta
FAE-HG	Mr. Radhakrishnamoorthy
FAE-G	Mr. Radhakrishnamoorthy
FAE-S	Dr. S.R. Maley
FAE-RH	Mr. Anil Choumal
FAE-SHW	Dr. S.R. Maley

Accreditation certificate from Quality Council of India, QCI for the company is attached as *Annexure VIII (a)*. Accreditation certificate from NABL for Noida Testing Laboratory is attached as *Annexure VIII (b)*.

**CHAPTER 12**  
**CORPORATE ENVIRONMENTAL RESPONSIBILITY**

**1.1 PROCEDURES FOR ENVIRONMENTAL COMPLIANCE**

M/s BPTP International Trade Center Ltd. will fulfill all the conditions related to environmental policies and laws through its Environmental Consultancy Group. The details of compliances under various Environmental Act and Rules are given in **Table 12.1** below.

**Table 12.1: Compliance under various Environmental Acts & Rules**

S. No.	Environmental Acts & Rules	Compliances
1	The Environment (Protection) Act, 1986 and EIA Notification dated 14.09.2006	<ul style="list-style-type: none"> <li>• Obtaining Environmental Clearance (EC) from State Environment Impact Assessment Authority (SEIAA)/MOEF- before the start of construction</li> <li>• Submission of Six-monthly Report of Compliance of Stipulated EC Conditions to MOEF/SEIAA/other authority as mentioned in EC order- Twice a year: 1<sup>st</sup> June and 1<sup>st</sup> December</li> <li>• Submission of Environmental Statement (ES) in Form-V to State Pollution Control Board (SPCB)- Once in a year by 30<sup>th</sup> September</li> </ul>
2	The Environment (Protection) Rules, 1986	<ul style="list-style-type: none"> <li>• Monitoring of stack emission and compliance to Emission Limits for DG sets</li> <li>• Monitoring of STP effluent and compliance to Standards for Discharge of Effluents</li> <li>• Monitoring of air quality and compliance to National Ambient Air Quality Standards</li> <li>• Monitoring of DG noise level and compliance to Noise limits for DG sets</li> </ul>
3	The Water (Prevention & Control of Pollution) Act, 1974, and The Air (Prevention & Control of Pollution) Act, 1981	<ul style="list-style-type: none"> <li>• Obtaining Consent to Establish (NOC) from UPPCB before establishing a project</li> <li>• Obtaining Consent to Operate (CTO) from UPPCB and its periodic renewal</li> </ul>
4	Noise Pollution (Regulation and Control) Rules, 2000	<ul style="list-style-type: none"> <li>• Monitoring of ambient noise quality and compliance to Ambient Noise Standards</li> </ul>

S. No.	Environmental Acts & Rules	Compliances
5	Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016:	<ul style="list-style-type: none"> <li>• Obtaining Authorization for storage &amp; disposal of hazardous waste (in Form-1) from UPPCB and its periodic renewal</li> <li>• Submission of Annual Return for hazardous waste (in Form-4) to UPPCB- Once in a year by 30th June</li> <li>• Disposal of hazardous waste to authorized recycler (once in every three months)</li> <li>• Maintaining records of disposal and transportation</li> <li>• Maintaining proper storage space with display board</li> </ul>
6	Water (Prevention and Control of Pollution) Cess Act, 1977 and Water (Prevention and Control of Pollution) Cess Rules, 1978	<ul style="list-style-type: none"> <li>• Submission of Monthly Returns for Water Cess (Form-1) to UPPCB for extraction of groundwater- once a month before 5th of current calendar month</li> <li>• Payment of Cess when claimed by UPPCB</li> </ul>
7	Solid Waste Management Rules, 2016	<ul style="list-style-type: none"> <li>• Segregation of solid wastes in biodegradable and recyclable at the point of generation and store into separate colour coded bins.</li> <li>• Disposal of wastes to authorized vendors</li> </ul>