Executive Summary – Environment Impact Assessment – Bidkin Industrial Area

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1.0 Introduction

The Government of India (GoI) has proposed the development of a Dedicated Freight Corridor (DFC) between Delhi and Mumbai covering a total length of 1483 km and is passing through six states of India. The corridor is envisaged to influence the pattern of development and industrialization of the region. To tap the development potential of the proposed freight corridor, a band spanning 150 kilo meters wide on both sides of the freight corridor has been identified as Influence Region and is proposed to be developed as Delhi-Mumbai Industrial Corridor (DMIC).

The vision for DMIC is to create strong economic base with globally competitive environment and state-of-the-art infrastructure to activate local commerce, increase foreign investment and promote several large scale developments. To achieve this objective, 24 industrial nodes including 11 Investment Regions (IR) and 13 Industrial Areas (IA) has been identified along the length of the DMIC.

A special purpose company, Delhi Mumbai Industrial Corridor Development Corporation Limited (DMICDC), has been created under Ministry of Commerce (MoC), Government of India to coordinate the project planning, development and implementation to undertake the planning and development of seven Industrial nodes across the country.

Each industrial city (Investment Region / Industrial Area) will be implemented by a Special Purpose Vehicle (SPV), set up as a joint venture company between the DMIC Trust and the respective State Government / State Nodal agencies.

The Nashik Sinnar Igatpuri Investment Region (NSIIR), Maharashtra comprises of two initial projects namely, Shendra Industrial Area and Bidkin Industrial Area. This report presents the executive summary of the Environmental Impact Assessment (EIA) report prepared for the Bidkin Industrial Area (BIA). BIA proposed to have several components including transportation and communication network, social amenities, commercial spaces, public and semi-public areas, an integrated township and industries.

DMICDC acts as an intermediary for the purpose of development and establishment of infrastructure projects and facilities in India through developing and disseminating appropriate financial instruments, negotiating loans and advances of all nature, and formulating schemes for mobilization of resources and extension of credit for infrastructure.

Maharashtra Industrial Development Corporation (MIDC) is the nodal agency responsible for coordination between the DMICDC and Maharashtra government for proposed Bidkin project. A Node/City level SPV has been formed as a joint venture between the Government of India (GoI) and Government of Maharashtra (GoM) under the name 'Aurangabad Industrial Township Limited (AITL)'.

The Bidkin Industrial Area (BIA) is located within the Paithan tehsil of Aurangabad district in the state of Maharashtra. The delineated region for BIA comprises of an area of 3179.1 hectares, spread over 8 villages selected after excluding forest areas, large existing settlements and already existing industries. The delineated region includes rural hinterland mainly comprising of rain fed agricultural lands which remains fallow for most part of the year and scrub lands. There are two existing industrial areas near the proposed site, i.e., Chitegaon-Bidkin industrial area, which is about 5 km to

the North West (NW) and the Shendra Industrial Area, which is approx. 20 kms to the north of the site. These two existing Industrial Areas are well connected to the city of Aurangabad by Paithan Road (SH-148), Jalna Road (SH-178) and NH-211.

The proposed BIA has been planned as a mixed land use development, comprising of residential, commercial, social amenities and industrial land uses. The industrial mix proposed for Bidkin Industrial Area (BIA) includes industries such as Food and Beverages; Motor Vehicle, Trailer & Semi Trailers; Basic Metals; Machinery & Equipment; Fabricated Metal Products; Rubber & Plastic Products; Electronics; Electrical equipment; Pharmaceuticals, medical, chemical and botanical products; Non Metallic Mineral Products; Transport equipment; Textile and Chemical Products etc.

2.0 Site Selection

Three alternatives for site selection were considered for development of the proposed BIA. A detailed feasibility analysis was carried out to delineate final area for the development of BIA. The analysis was based on a ranking system taking into account topography and land use, water resources and their availability, socio-economic factors, environmental sensitivity and connectivity. The final site selection was arrived after delineating catchment area of Sukhna reservoir, avoiding all patches of hilly areas which are ecologically active. The site selected is to the east of village Bidkin and abuts a portion of Paithan road on the south west side of the site. Land use of the selected site is predominantly rain fed agriculture which remains fallow for most part of the year. The hill towards northern boundary of the site is largely barren land, denuded of vegetation cover by over-grazing and collection of timber/ firewood. Jayakwadi Dam is at a distance of 20 km from the southern boundary and Sukhna Dam and its catchment between NH-211 and SH-178 are excluded from site. There are no major rivers running through or close to the site. The site has good connectivity from SH-148 (Paithan Road) and National Highway (NH) 211. NH-211 connects the site to the airport, railway station and city of Aurangabad.

3.0 Project Description

The Bidkin Industrial Area (BIA) is at an aerial distance of ~12 km south of the Aurangabad City. The site selected for development slopes from northeast to southwest direction with difference in elevation of about 90 meters across a distance of about 7 to 8 km. Three water bodies in the form of ponds exist within the project area. Small Settlements under villages Surwadi and Narsingh Tanda, falling within the project boundary will be retained and will not be disturbed.

The proposed BIA has been planned as a mixed land use development, comprising of residential, commercial, social amenities and industrial land uses. The delineated BIA comprises mostly of rural settings which includes predominantly rain fed agriculture which remains fallow for most part of the year. The north and west of the project site consists of hilly terrain. No protected area or eco sensitive area is reportedly present within the study area.

The BIA is envisaged to be developed in three phases over a period of fifteen (15) years, starting in 2016. All the three phases identified for development are divided into period of 5 years where Phase I is 2016-2020, Phase II is 2021-2025 and phase III is 2026-2030. The infrastructure for the project may be taken up concurrently as per the project requirement.

Initial developments are proposed near village Bidkin in the southern direction of the site that can be accessed by Paithan Road to cut down on start-up costs. This will be supplemented by simultaneous development of key infrastructure facilities.

The industrial areas within BIA are proposed as large contiguous parcels such that they can accommodate very large tenants and are planned to be developed in three clusters i.e. North Cluster, Central Cluster and Southern Cluster.

Depending on the types of employment base the proposed industrial sector is likely to generate, four (4) types of housing are proposed within BIA.

- Low Income Group (LIG) – Single Worker Housing
- Low Income Group (LIG) – Family Housing
- Middle Income Group (MIG) Housing
- High Income Group (HIG) Housing

There are two major Commercial area clusters in the Bidkin IA, one in the northern part of the site near the city center and one at the southern entrance of the site from Paithan road. Apart from these two clusters, smaller commercial areas are strategically proposed at the northern residential cluster and in industrial areas.

Civic amenities that will provide services to residents, and at the same time generate additional activity in the area, include Schools, Hospitals, Convenience Shopping, Hotels, Recreational Club, Community Hall, etc.

Open spaces have been incorporated into the concept master plan to provide a comprehensive system of 'green' infrastructure that offers direct access to green spaces throughout and surrounding the Bidkin IA.

The total population for the entire Bidkin IA has been estimated to be 2,85,910 comprising of captive population (generated from industrial employment) and additional population (based on density ratios mentioned in URDPFI guidelines).

The BIA will involve development of ~1607 ha of industrial area and will generate vast employment opportunities. It has been estimated that by 2030, the proposed BIA will generate about 1,00,481 industrial jobs comprising of both direct and indirect employment.

Water Demand

The water requirement for the construction phase will include water for construction activities such as curing and formation of concrete mixtures and water for domestic consumption. For the construction camp housing approx. 700 workers, about 42 m^3/day of water will be required @ 60 litres per person per day (lpcd). Water supply from MIDC and local sources will be the main source of water during construction phase. The total water demand during of BIA Phase 1, phase 2 and 3 is 26, 42 and 43 MLD, respectively.

Water Sources

The main source of water identified for BIA is Jayakwadi Dam Reservoir. The dam is located at Paithan, approximately 20 km from the site. An intake of required capacity is proposed at the selected intake point at the Jayakwadi Dam Reservoir. Water will be transmitted from the source to the area of use through a closed conduit, mainly ductile iron pipes with proper protection against corrosion. Water Treatment Plant (WTP) of capacity 70 MLD is proposed to be installed for treatment of water. The total water demand for the project is 111 MLD out of which 67 MLD is fresh water demand. 44 MLD of the water demand is for non-potable uses which will be met through reuse of treated wastewater.

Wastewater Treatment

The total industrial wastewater expected to be generated from the industries coming up in each phase are 7MLD in phase 1, 11 MLD in Phase 2 and 11 MLD for Phase 3. The wastewater from industries and sewage from residential areas will be treated separately in Effluent Treatment Plants (ETP) and Sewage Treatment Plants (STP), respectively. Phase wise capacity of STP and ETP proposed to be developed at BIA is as given below:

- phase 1 -capacity of STP is 11 MLD and ETP is 7 MLD,
- phase 2 -capacity of STP is 13 MLD and ETP is 11 MLD and
- phase 3 -the capacity of STP is 13 MLD and ETP is 11 MLD.

Provision of having combined ETP/STP plants will also be explored, if found possible, four (04) such wastewater treatment plants of adequate capacity will be provided. The treated wastewater from the sewage treatment plant, effluent treatment plant and wastewater treatment plant will be recycled to meet the demand for non-potable water. 44 MLD of the treated wastewater will be reused in the project thus reducing the fresh water demand from Jayakwadi. Because various industries will have different types of industrial effluent, only industrial wastewater of a predefined quality will be permitted to enter the equalization tank of the effluent treatment plant. For any kind of specific treatment, industries will need to treat industrial wastewater in their own captive wastewater treatment facilities and discharge the wastewater of predefined quality into the collection system.

The excess treated wastewater shall be utilised for irrigation and the remaining will be discharged to ponds in development area.

Storm Water Management

There are six major natural streams/nallahs crossing the project site and one stream passing in close proximity to the project boundary on eastern side. All the six major natural drainage channels and three water bodies/ponds are proposed to be conserved and designed appropriately keeping in mind the natural flow pattern and prevention due to serious flooding/ hazards to project site after development. For this purpose, the project area has been divided into various rain water drainage zones considering the natural topography, internal and external contributory areas. All the drainage channels and ponds will be designed for 100 year flood.

Power Requirement

Power will be primarily required for operation of heavy construction machinery and equipment. Power requirement during construction phase will be will be sourced from the 33/11 kv Bidkin substation, 33/11 kv Chitegaon substation, 33/11 kv Balagaon substation and 33/11 kv Dhorkin substation. Power requirement for residential, industries, commercial, amenities, green areas proposed within the development have been considered for calculating power demand for operation phase and it is estimated to be 1000 MVA for the complete development. Power requirement during operation phase will be sourced from 765 kV substation at Chitepimpla Gaon of Power Grid Corporation of India Limited (PGCIL) and 400 kV substation at Thaptitanda.

Solid Waste Management

The waste generation during construction phase will include construction and demolition waste and municipal waste from labour colonies. It is estimated that about 210 kg of municipal waste will be

generated daily from the labour colony during construction phase. The waste from the labour colonies will mainly comprise of municipal waste and sewage from the toilets.

The quantities of waste likely to be generated during operational phase of BIA have been estimated on the basis of population and land use characteristics. Apart from municipal waste and industrial waste, solid waste in the form of dried sludge will also be generated from sewage treatment plant and effluent treatment plant. It is expected that about 250 TPD of municipal solid waste (MSW) shall be generated from various areas planned in Bidkin Industrial Area during operation phase. Industrial areas proposed within BIA will also generate solid waste, liquid waste and/or gases, which might be hazardous and non-hazardous waste in nature. The handling and management of hazardous waste will be guided by Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008, MoEFCC. Non-hazardous industrial wastes will be sold to recyclers. It is recommended to set up an Integrated Waste Management Facility (IWMF) within Bidkin Industrial Area for municipal solid waste processing and disposal and will comprise of biomethanation or composting for treatment of wet waste. The Integrated Solid Waste Management facility has been proposed at Nandalgaon Village, within the project site boundary. The total area for this facility is 10 hectares.

It is estimated that about 415 tonnes of industrial waste will be generated daily from industrial clusters planned in BIA. Hazardous waste that will be generated from industrial area will be collected as per the norms and will be transported to hazardous waste treatment, storage and disposal facility (TSDF) at Ranjangaon which has a TSDF.

Landscape

An area of ~358 ha has been earmarked for open spaces within BIA. It is estimated to plant around approximately 71,640 native tree species within BIA, along the roads and in open spaces.

4.0 Baseline Environment

The baseline environmental status for Bidkin Industrial Area and the study area extending upto 10 kms from the project site boundary has been assessed using primary data collection and secondary data review. One season primary monitoring was carried out during study period September 2015 - November 2015. The baseline data generation included site visits, primary environmental monitoring, ecological surveys, social surveys and interviews, processing of satellite imagery and secondary data review from established sources such as Indian Meteorological Department, Census of India etc. The details given below:

Topography: The BIA project site falls largely within the Deccan Plains and is relatively flat, with small areas of hilly land lying to the north and west of the project site that reach a height of over 838 meters towards northwest. The area being a part of the Deccan plateau is sloping southwest with 469 meters being the lowest point. The land between the hillocks in the northern part of study area forms a valley draining to the Sukhna Reservoir. Land to the south of the site falls away gently sloping towards the Nath Sagar Reservoir (formed by the Jayakwadi Dam).

Land Use: In general, the existing land use of the study area (10km radius) of BIA is dominated by rain-fed agricultural land that is likely irrigated through small tanks in the region. This productive land is concentrated around drainage channels and reservoirs. Agricultural land farther from these water features is generally non-irrigated and dependent on rainfall.

Physiography and Drainage: Site selected for the proposed development comprises mostly of rain-fed agricultural land. Site selected has a gentle slope from northeast to southwest. Six major natural

stream/nallahs are crossing the project site and one stream is passing in close proximity to the project boundary on eastern side. Jayakwadi Dam is located south of the project site at an aerial distance of ~ 20 km.

Climate and Meteorology: The climate of the area is characterized by a hot summer and a general dryness throughout the year except during the south west monsoon season, which is from June to September while October and November constitute the post-monsoon season. The winter season commences towards the end of November. The average temperature in the study area during monitoring period (September, 2015 – November, 2015) was 25°C while the maximum temperature went up to 35°C. The minimum temperature during monitoring period dipped to 15°C. The relative humidity in the area ranged between 98% and 19%. The average humidity value in the area was recorded at 56.4%. High levels of humidity were due to the light showers of rain that occurred few hours a day during the monitoring period.

Ambient Air Quality: Ambient air quality was monitored at 6 locations for a period of twelve weeks for PM_{10}, $PM_{2.5}$, SO_2, NOx, CO, HC and O_3. The PM_{10} and $PM_{2.5}$ values were in the range of 40.9-58.1 µg/m^3 and 12.5-18.2 µg/m^3 and were within standards. SO_2 and NOx levels were observed to be in the range of 6.5-8.5 µg/m^3 and 11.6-16.1 1µg/m^3 and were well within the standards. Maximum and minimum concentration of CO was observed to be 0.38 mg/m^3 and 1.36 mg/m^3 and was well within the standards. All other parameters were observed to be below detection limits.

Water Resources and Quality: As per studies by Central Ground Water Board, the scope of groundwater development in Aurangabad is about 55% and falls under Safe category. Ground water monitoring was undertaken at 3 locations and TDS and total hardness levels exceeded the desirable limits as per IS 10500. Surface water samples were also collected from 3 locations. The samples from Sukhna Dam were found to be fit for Propagation of Wild life and Fisheries while the one collected from a pond was found to be fit for irrigation. None of the samples were found to be fit for drinking purposes.

Ambient Noise Levels: The noise levels at three out of the six locations were found to be within the prescribed CPCB standards of 55 dB(A) and 45 dB(A) for day and night time respectively. Noise level at Bidkin and Gadiwat was found to exceed the prescribed limit for night time while at village Chittegaon noise level was found to exceed both day time and night time standards.

Soil Quality: The study area is covered with mostly red sand and gravel with moderate amounts of red-loam and occasional black loam tracts. Soil Samples were collected from six (6) locations. The soil texture was found to be sandy loam in the study area. The porosity of the soil samples ranged from 11.9 – 36.3% and permeability ranged from 0.010 to 0.068 cm/sec. Heavy metals such as zinc, copper, iron, lead, chromium and manganese were found in the soil samples. Value of NPK (Nitrogen-Phosphorus-Potassium) in the soil samples ranges from 75.94 mg/kg (village Godiwat) to 180.25 mg/kg (village Nandalgaon).

Traffic Density: Traffic density in the study region was monitored on State Highway No. 148 (SH-148). Traffic at observed roads had significant volume of two wheelers followed by LCV, HCV and three wheelers. Non-motorised vehicles constitute 6% of the total traffic volume. High volume of two wheelers can be attributed to people going to work place in Aurangabad and Paithan.

Ecological Environment: The ecological assessment carried out within the area delineated as the project site as well as the area extending 10 km outwards from the boundary of this project site. The

area, although not pristine, plays an important role as part of the catchment of the Jayakwadi Reservoir. The Jayakwadi bird sanctuary is about 12 km from the southern edge of the site. Natural habitats of the area are concentrated along the water-flows that drain the area. Species such as *Ficus glomerata, Kirganellia reticulata, Pongamia pinnata and Syzigium cumini* are typically found in the beds or on the banks of such streams, rivulets and canals. Most of the farmlands remain fallow for most part of the year as the agriculture is rainfed. Uncultivated areas and farm-bunds bear native scrub vegetation mainly composed of *Acacia leucophloea, Acacia nilotica, Balanites aegyptica, Capparis decidua, Euphorbia spp. and Ziziphus spp.* The thickets of scrub and the stream-bank groves provide refuge to animals such as Hanuman Langur, Wild Pig, Jackal, Blackbuck, Grey Mongoose, Indian Fox, Indian Hare and Monitor Lizard.

Social Environment: As the study area falls within the administrative area of the (tehsil) study area fall in Aurangabad district Paithan Taluka. The socio-economic and demographic profile of the study area will include one (01) district, one (01) tehsil and eight (08) villages. As per the District wise Poverty Estimates for Maharashtra published by the Planning Commission, in 2009, 46.5% of the total (rural) population in Aurangabad District has been estimated to be below the poverty line.

The Ministry of Rural Development, Government of India in 2014-15 initiated the Intensive Participatory Planning Exercise (IPPE) to determine the backwardness index in sub districts across the country; Aurangabad District has a ranking of 436 amongst other districts while Paithan tehsil has a backwardness of 3159 amongst the tehsils in the country.

As per the consultations held in the study area villages, it was ascertained that the main occupation amongst the working population is agriculture. The main crops grown are cotton, corn, Jowar, Tuar Pulses, millets (Bajra), Sorghum (Jowar), onions and chickpea. A small percentage of the community also owns fruit orchards, and grows Pomegranate and Sweet Lime (Mosambi) on commercial basis.

A significant number of respondents reported to be working as daily wage labourers (unskilled) in nearby industries. They earn a daily wage of approximately INR 250 – 300 per day. However, youngsters from these villages were reported to increasingly opt for and complete diplomas and degree trainings, thereafter joining the skilled workforce in nearby industries, police and revenue services. It is also reported that there is also a high migration of young population to other towns and cities.

5.0 Construction Phase: Impacts Assessment and Mitigation Measures

Air Quality: The potential sources of air pollution include: 1) Fugitive dust emissions from land clearing, soil excavation and vehicle movement on unpaved roads and construction activities 2) Fugitive dust from improper storage of raw material, excavated soil and debris, 3) Emissions from operation of diesel generators at the construction campsites, 4) Emissions from use of heavy construction equipment and vehicles at the construction site and 5) Dust from operation of batching plant. All measures will be undertaken to ensure that all parameters of air pollutants are within the limits set by CPCB.

The Construction phase of the project will be monitored by the Project SPV (AITL) and Project Management Consultant (PMC)/ Contractor engaged by the project proponent. A Construction Management Plan shall be developed for each of the Contractors with a detailed layout of site plan. The site plan shall include provisions for covered storage of raw material, arrangements for dust suppression (water supply, vehicles, pumps, pipes etc.) and identified route for movement of vehicle

within the site. Officials of AITL along with PMC/ Contractor shall implement all the control measures at site.

Noise Quality: if adequate measures are not taken, the noise generation during such large-scale construction activities can have significant impact on the health of construction workers. However, the disturbance to existing habitations is expected to be limited as adequate area will be left between habitations and development as per DC rules. During construction, it can be expected that most wildlife and bird species occupying the immediate vicinity of the construction site will initially be affected. However, construction activities will be of short duration (in the context of the Project life cycle) and, therefore, it is not likely that significant effects will occur. All the construction machineries may not be operational at the same time during various stages of construction. However, the measures will be taken to restrict the noise levels to CPCB norms during the construction phase.

The Construction Management Plan for each activity shall identify all high noise processes and construction schedule shall be prepared rationally. Provisions shall be made for all high noise generating activities to be restricted from 10:00pm in night to 6:00am in morning; a construction noise attenuation plan as needed on an activity to activity basis to reduce noise-related impacts at nearby sensitive receptors to the extent feasible shall be prepared. The plan shall identify need for sheet barriers, distance of equipment, location of machinery etc. Prior consultation shall be undertaken with nearby residents that may likely be affected by noise or vibration generating activities. However as mentioned earlier, noise levels will be maintained as per CPCB standards, in this area.

Water Quality: The project activities will involve alteration of topography due to localized levelling of terrain besides small drainage channels may get diverted or lost due to change in topography, construction of access roads, pipeline etc. The alteration of drainage pattern can lead to localized flooding and undesired health issues associated with water logging. However, proper drainage will be designed to mitigate undesirable impacts.

The construction activities will result in disturbance of topsoil rendering it vulnerable to erosion and runoff. The potential impact on water quality can be due to escape of excavated soil along the existing channels where the loose silt and sand could be washed along the surface drainage.

The Construction Management Plan for each activity shall identify suitable areas for storage of construction material, storm water drainage facility at the construction site, sanitation facility for workers including wash water besides guidelines on optimal use of water; Explore authorized tanker water suppliers for construction to ensure minimal use of ground water; and isolate all key existing drainage channels and ensure adequate mechanism to prevent any contamination prior to mobilization of workers.

Landscape and Topography: The land use of the area will gradually change over a period of 15 years from rural to urban, with industrial, commercial, residential and mixed land use. The anticipated change over the period of time will result in increase of built up area and decrease in fallow and agricultural land. This will lead to change in the local livelihood pattern for the project affected villages and will bring about change in occupational pattern locally, with more people learning and adapting to new skills for suitable employment.

The change in topography will be mostly at the micro-level due to levelling of area or modification of terrain. The construction activities such as excavation works for foundations of various project-components, development of drains, providing proper slopes across the area etc. and ultimately for erection of the associated structures and buildings will result in increase in run off, creation of urban heat island.

The mitigations area to ensure that all control measures such as plan for drainage, retention of natural drains, development of green areas as suggested in Master Plan are implemented. Construction activities for each activity shall be planned to involve minimal disturbance to topography and to retain natural elements to the extent possible; and land surface contours shall be restored after construction of all trunk infrastructure facilities.

Soil Resources: Three major impacts on soil resources that are generally associated with construction activities. These include: soil erosion, soil compaction and soil contamination. The construction activities will include site clearing and earthwork which will result in top soil removal and will disturb the soil surfaces.

The construction activities will include storage, handling and disposal of petroleum based products such as lubricants, hydraulic fluids, or fuels. If no care is taken, the improper storage, handling and disposal of these products may pose a risk of potential leakage and contamination of the land. The maintenance of heavy machinery and equipment involves replacement of machine oil, greasing and other such activities that may contribute to soil contamination, if not handled properly. The mitigation measures shall include diversion of runoffs using dikes, berms, drainage swales or ditches. The method of choice will depend on the size of the drainage area and the steepness of the slope. Prior to commencement of bulk earthwork the topsoil (upper 15 cm) will be removed and preserved for reuse in landscape development onsite for top dressing of the road and embankments and slopes and also for development of the landscape greens. This will ensure that loss of good quality top soil is avoided. Proper routing and adequate capacity of the storm water run-offs drains with catch pits shall be provided at all construction areas. A retention wall or bund will be provided around the storage areas for excavated soil to check the loss of soil with storm water in case of rain.

Ecology: Generally the main ecological impacts during the construction phase of any project result from removal of the present vegetation cover, alteration of the existing topography, and other environmental facets like air, water and soil quality, ambient noise and vibrations etc. .

The natural vegetation of the project area, as described in the ecological baseline report, directly acts as a habitat for various animals, mainly small terrestrial mammals, birds and reptiles. It indirectly creates microhabitats for many smaller animals such as earthworms, snails, beetles and butterflies by creating shade, retaining soil-moisture and stabilizing soil around the rooting-zone.. Removal of the vegetation will thus may result in loss of such faunal habitats. This impact can be mitigated by selectively removing only the most obstructive trees and shrubs, post-construction restoration of ground-cover wherever feasible, and compensatory in-situ plantation of native species.

Alteration of the existing topography may alter the existing drainage pattern of the land-surface. Existing water-flows may get disrupted resulting in water-logging in present-day dry areas or drying up of present-day waterbodies, either seasonal or perennial. Thus, the various land levelling or grading activities are likely to change the existing water regime of the area, leading to loss or

degradation of existing habitats. This impact will be mitigated by the landscape approach used for the masterplan plan which will ensure preservation of the key water-channels. Reduced percolation of water, increased surface run-off and increased soil-erosion, resulting from compaction of soil-layers and paving, concretization or building over of soil-surfaces, alters the existing soil-moisture and water-recharge, as well as, the natural turbidity and siltation of water-bodies. All these changes can lead to degradation of the ephemeral seasonal monsoon habitats typical to this region. This impact can be mitigated by confining vehicular movement to pre-designated routes, opting for seamed paving instead of seamless covering of soil-surfaces, wherever possible, and leaving as much soil-surface as possible in the form of planted open-spaces.

Sudden alteration, especially increase in the ambient noise or vibrations and interruption of the night-darkness by artificial light can all disrupt the natural biological cycles of plants and animals, a phenomenon linked to disease and reproductive failure in sensitive species. This impact will be mitigated by avoiding significant construction - activities during the night-time. The noise levels in the area will be maintained as per CPCB standards during the day and night.

Traffic and Transport: It is estimated that each construction phase will involve a movement of 50-200 additional trucks per day for transportation of materials. The additional traffic during construction phase will add on to the traffic along highways and may lead to traffic congestions. . Also the turning movement of vehicles carrying construction material may lead to further increase in travel time.

AITL through its PMC/ Contractor shall assess the need for strengthening of access roads, village roads, bridges, culverts etc. prior to commencement of the construction activity. The setting up of labour camp site, this shall be done after a visual survey of the area. Where road widths are insufficient, either temporary widening of the road with gravel or full depth widening of the pavement structure shall be undertaken. Access roads to the construction sites shall be developed well in advance to facilitate smooth movement of traffic. Wherever possible, rerouting of construction traffic to wider, less-restrictive road shall be assessed.

Socio Economics: The land required for BIA comprises partly of land parcels already in possession of MIDC while the remaining will be private land acquired under the MIDC Act after negotiations on willing buyer willing seller basis. Land acquisition is in the process of getting completed with more than 90% of villagers confirming of receiving compensation after providing their consent. All compensations and Rehabilitations will be as per the R&R Policy of MIDC. The project proponent and its subcontractors will try and utilize the facilities available from the nearby market and shops to support the local economy to the extent possible. However, there will be no binding on the contractors to utilize the local facilities.

Employment of labourers for the project will depend on the skill sets of individual with respect to the requirements of the contractors or the project proponent. However, efforts will be made to encourage employment of people from the local community wherever possible. Employment opportunities for vulnerable section of the society such as economically weaker class and families with small land holdings shall be encouraged.

6.0 Operation Phase: Impacts and Mitigation Measures

The environmental and social impacts associated with operation phase of the proposed Industrial Area will depend on the activities and the proposed land use.

Ambient Air Quality: The major impacts on ambient air could l be due to Stack emission from industries, fugitive emission from industrial processes, emissions from increase in traffic volume and emission from power backup/ DG sets,.

The responsibility of implementing various air emission measures applicable to respective industries will be with the individual projects. Also compliance of Industries to various legal requirements and conditions of consents and approvals will be the responsibility of Individual industry.

All industries expressing interest in the Industrial area will be required to comply with emission standards as prescribed MPCB/CPCB or any agency as applicable. AITL or its representatives will be responsible for maintenance and upkeep of adequate green buffers and green area along the roads. AITL shall explore smarter options (smart signals, staggered timings etc.) periodically to improve flow of traffic on road.

Water Resource and Quality: if no mitigative measures are taken, Increase load on fresh water sources along with unplanned disposal of industrial waste water generated and residential sewage are considered as key concerns for any large operating site. Inadequate management of storm water, spills, leaks from industries, storage areas can lead to contamination of natural water resources and ground water aquifers.

AITL shall ensure that the STPs, ETPs and WWTPs are installed and commissioned in advance of the activities generating effluent. The treated wastewater from the treatment plants will be recycled shall be supplied to meet the demand for non-potable water. Online monitoring system shall be implemented for checking leakages in water transportation system. Periodic assessment of water supply infrastructure shall me made to estimate any loss in transport. AITL shall promote rain-water harvesting and use of recycled water for all its utilities within the Industrial area. About 44 MLD of the treated wastewater will be reused in the project thus reducing the fresh water demand from Jayakwadi. The treatment of sewage from part of Aurangabad town and utilization for non-potable purposes could be considered to reduce demand for fresh water.

AITL or its representatives shall monitor the quality of surface water and ground water through the following: Maintenance and upkeep of the ETPs, STPs and WWTPs on regular basis to ensure compliance of treated water as per applicable standards; Undertake period inspection of the industrial area to ensure that no waste/wastewater is disposed illegally or into existing water bodies; Consult with other government agencies like MPCB, State Ground water Board etc. on a periodic basis to understand any change in quality of water;

Ecology: The main ecological impacts during the operational phase are likely to be in the form of the reduction, fragmentation and degradation of the erstwhile habitat area available to the local flora and fauna occurring within and around the upcoming industrial area.

This continuing and long-term impact can be best mitigated by strict implementation of all standard ecology and biodiversity conservation measures such as development and maintenance of -buffers around individual industries, avenue plantations along the industrial area's roads and planting of trees in designated recreation zones in the area. The effectiveness of such plantations could be further enhanced by opting to use only native species of trees, shrubs, climbers and herbs, as far as possible.

Noise Quality: if no mitigation measures are taken, there could be Increase in noise levels in residential areas and adjoining villages Generation of noise is also expected from increase in vehicular movement and operation of industries.

The AITL will ensure that adequate buffer is maintained between Industries and residential areas as per applicable DC rules. No industrial activities are undertaken in areas kept for development of villages. Maintenance of plantation along all key roads and identification of key areas of concern will be undertaken.

Traffic and Transportation: The proposed road circulation shall provide for safe, convenient, and efficient movement of people and goods integrated into a motorized and non-motorized transport system following a hierarchy of road networks. AITL shall ensure and verify that all roads are constructed as per the master plan design. AITL shall monitor the efficacy and safety of the roads at regular intervals based on inputs from the traffic department. AITL shall promote use of public transport through public communication and incentives to commuters. All individual projects shall be as to develop parking facilities as per the Development Control Regulations and unauthorized parking shall be discouraged. Intelligent transport system shall be explored for traffic management, fleet operation, user information and all other relevant parameters.

Solid Waste Generation: The municipal Solid waste generation for the year 2030 has been estimated to be around 250 MTD. Inadequate collection and treatment of domestic waste can lead to unhygienic conditions, odour problem. Non-hazardous industrial wastes will be handled and managed and shall be sold to authorized recyclers. It is recommended to set up an Integrated Waste Management Facility (IWMF) within Bidkin Industrial Area for municipal solid waste processing and disposal and will comprise of biomethanation or composting for treatment of wet waste. The Integrated Solid Waste Management facility has been proposed at Nandalgaon Village, within the project site boundary. The total area for this facility is 10 hectares.

It is estimated that about 415 tonnes of industrial waste will be generated daily from industrial clusters planned in BIA. Hazardous waste that will be generated from industrial area will be collected as per the norms and will be transported to existing hazardous waste treatment, storage and disposal facility (TSDF) at Ranjangaon.

Contamination of soil and groundwater can result from improper disposal of sludge and industrial waste. AITL shall ensure that the constructions of waste management facilities are complete prior to operation of the Industrial Area. AITL shall periodically assess the sufficiency of existing facilities and need for expansion or exploring tie-ups with external facilities. AITL shall monitor the grievances recorded at the SWM facility by local community and resolve them in a time bound manner. Periodic awareness campaign shall be organised by AITL on reuse, recycling and efficient management of waste for Industries and residences. AITL to ensure adequate greenbelt with 3-tier vegetation (with thick foliage) is provided around the SWM facility to ensure noise mitigation and good aesthetics.

Socio Economic: There will be positive impact from increased employment and business opportunities. Improvement in infrastructure, increased income levels, stabilization of the rural economy is also envisaged. There is potential for unplanned secondary development in the adjoining areas leading to unhygienic surroundings.

AITL will ensure measures for Corporate Social Responsibility to continuously engage with community and address their grievances on a regular basis. AITL shall periodically discuss with

relevant agencies on any unplanned development around the Industrial area and restriction of the same. It is recommended to include a mechanism in place to train and improve the skill sets of the local community and improve their prospect of jobs with the project..

7.0 Environment Management Plan

The Environment Management Plan with the mitigation measures and management strategies for construction and operation phases of the proposed project has been prepared which shall be implemented by AITL through its designated officers.

The proposed mitigation measures have been prepared considering all possible strategies oriented towards effective environmental management including pollution prevention and control, waste minimization and management, and residual attenuation for the proposed project.

Institutional Framework – For the Bidkin Industrial Area, MOU has been signed between Maharashtra Industrial Development Corporation (MIDC) and Delhi Mumbai Industrial Corridor Development Corporation (DMICDC) to form a Special Purpose Vehicle (SPV) in the name of Aurangabad Industrial Township Limited (AITL).

AITL will be responsible for implementation of EMP and also will be responsible for seeking approvals and consents from the govt. departments. All legal and regulatory processes will be followed as per requirement. Individual industries will comply with their own requirements based on the industry type and comply with requirements of CPCB/ MPCB norms.

8.0 Environmental and Social Monitoring –It is proposed that monitoring of the environmental, social and other aspects related to the project should be undertaken by two mechanisms: Internal monitoring mechanism and External monitoring mechanism. The internal monitoring will be conducted by designated project officials of AITL the external monitoring will carried to ensure that the monitoring activities are carried out as per the plan, norms and schedule, in a transparent manner. This will include reporting to State and Central agencies (CPCB/MPCB) as per the legal requirement.

9.0 Conclusion: The EIA study has assessed the overall significance of environmental and social impacts likely to arise from the proposed development. The overall impacts from the proposed activities have been assessed to be moderate to minor when appropriate mitigation measures are implemented with proper planning and design.

AITL shall put in place a robust mechanism with adequate resources to implement the suggested mitigation measures and management plans. The measures will help prevent pollution in the area and conservation of natural resources. The proposed development will have social benefits by improvement of infrastructure in the area, in terms of road, power supply, water supply, waste management, transportation etc. The advent of industrial operations and parallel developments would create aspirations of increasing technical knowledge and educational progress among the local community.

There would be an increase in the number of men and women opting for higher education and skill trainings in the face of demand from the industrial sector. It is recommended that AITL undertake CSR activities in the villages falling in the study area to enhance the lives of the affected population.