Environmental Impact Assessment & Environment Management Plan

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1 INTRODUCTION

1.1 BACKGROUND

The Global Environmental Facility (GEF) along with the World Bank and Ministry of Housing and Urban Affairs (MoHUA) has initiated the GEF-V project which is termed as "Efficient and Sustainable City Bus Services (ESCBS)" to provide Sustainable City Bus Services in Medium sized cities (with population between 1M and 4M). The main objective under the GEF-V Project is to improve the efficiency and attractiveness of city bus transport and reduce greenhouse gas emissions in the demonstration cities through improved maintenance facilities and practices, efficiency in operations and greater user responsiveness.

Chandigarh is one of the four cities selected for implementing demonstration projects based on a competitive process followed by The World Bank to short-list the cities under this programme. The cities require a framework for City Bus Modernization Plan (CBMP) and Detailed Project Report (DPR) under Technical Assistance (Component 2A) to be developed for further processing.Component 2A of the demonstration project involves support of physical improvements targeted at modernizing the city bus services including proposals for modern Depot Equipment for Improved maintenance and life of buses and modern Intelligent Transport System (ITS) and Management Information System (MIS). To prepare the CBMP and a DPR, Chandigarh Transport Undertaking has selected IBI Consultancy India Private Limited as its consultant. As part of the scope of work for the project an environmental impact assessment of the project as is required as follows:

- Assess the environmental and social impacts of the project and suggestmitigation measures as required.
- Report on the current status of gender initiatives and further action plan.
- Propose monitorable measures to evaluate the impact of the project.

This section pertains to the environmental impact assessment and mitigation measures.

1.2 ENVIRONMENTAL REGULATORY STRUCTURE

The principal environmental regulatory agency in India is the Ministry of Environment & Forests and Climate Change (MoEFCC), New Delhi. MoEFCC formulates environmental policies and gives clearances for projects undervarious sectors. The Ministry of Environment and Forests and Climate Change (MoEFCC) has set up regional offices, with each region having an office.Central Pollution Control Board (CPCB) is a statutory authority attached to the MoEFCC and located in New Delhi. Its main responsibilities include planning and implementing water and air pollution programs; advising the Central Government on water and air pollution programs; setting air and water standards; and co-coordinating with the various State Pollution Control Boards.

In Chandigarh UT, Central Pollution Control Board has delegated all of its powers and functions under the Water (Prevention & Control of Pollution) Act, 1974; Air (Prevention & Control of Pollution) Act, 1981 to Chandigarh Pollution Control Committee in the year 1992.

The Committee is responsible to manage, prevent and control water pollution, air pollution and preservation of the quality of air in U.T. of Chandigarh. The functions of the Committee are specified in detail under section 17(1) and (2) of the water (Prevention and Control of Pollution) Act, 1974 and air (Prevention and Control of Pollution) Act, 1981.

Chandigarh Pollution Control Committee has the mandate for environmental regulation at the UT level, with emphasis on air and water quality. The Committee is responsible for planning

and executing UT-level air and water initiatives; advising the government on air, water and industry issues; establishing standards based on National Minimum Standards; enforcing and monitoring of all activities within the UT under the Air Act, the Water Act and the Water Cess Act, etc.; conducting and organizing public hearings for projects as defined by the various Acts and as stipulated by the Amendment (April 1997) to the EIA Act and issuing No-objection Certificates (NOC) for projects. The NOC from the CPCC in pursuant to the Water (Prevention and Control of Pollution) Act of 1974, the Water Cess Act of 1977 and the Air (prevention and Control of Pollution) Act of 1981 is mandatory for industrial projects.

1.3 APPLICABILITY OF ENVIRONMENTAL REGULATIONS AND POLICIES TO THE PROJECT

Relevant legislations applicable to the project are explained as follows:

Environmental Protection Act 1986 and Environmental Protection Rules, 1986 amended in 1993

The Environment (Protection) Act, 1986 is an umbrella legislation that authorizes the central government to protect and improve environmental quality, control and reduce pollution from all sources, and prohibit or restrict the setting and /or operation of any industrial facility on environmental grounds. The Environment (Protection) Ruleslay down procedures for setting standards of emission or discharge of environmental pollutants.

As per EPA rules, the Central Government may take into consideration the following factors while prohibiting or restricting the location of industries and carrying on of processes and operations in different areas:

- Standards for quality of environment in its various aspects laid down for an area.
- The maximum allowable limits of concentration of various environmental pollutants (including noise) for an area.
- The likely emission or discharge of environmental pollutants from an industry, process or operation proposed to be prohibited or restricted.
- The topographic and climatic features of an area.
- The biological diversity of the area which, in the opinion of the Central Government needs to be preserved.
- Environmentally compatible land use.
- Net adverse environmental impact likely to be caused by an industry, process or operation proposed to be prohibited or restricted.
- Proximity to a protected area under the Ancient Monuments and Archaeological Sites and Remains Act, 1958 or a sanctuary, National Park, game reserve or closed area notified as such under the Wild Life (Protection) Act, 1972 or places protected under any treaty, agreement or convention with any other country or countries or in pursuance of any decision made in any international confcrcnce1 association or other body.
- Proximity to human settlements.
- Any other factor as may be considered by the Central Government to be relevant to the protection of the environment in an area.

Several components and activities associated with the project will come under the purview of this umbrella legislation and the acts, rules and amendments that were made under the above-mentioned provisions, a few are mentioned below while the others are elaborated under the specific acts in the following sections.

The wastewater from the depots that is discharged from the Depots will have to follow the standards stipulated in the rules as provided in **APPENDIX - C.**

Noise standards for automobiles have been notified in Part 'E', Schedule-VI of Environment (Protection) Rules, 1986, as amended on 19th May, 1993 and are provided in **APPENDIX - D.** Those pertaining to buses will be applicable to the fleet in the city.

Noise limit for diesel generator sets (up to1000 KVA) manufactured on or after the 21st January, 2005 has been set under the Environmental Protection Rules and are provided in **APPENDIX - E.** The Ministry of Environment & Forests has notified noise limits for diesel generator sets (upto 1000 KVA) applicable at the manufacturing stage vide GSR 371(E), dated 17.5.2002 and its amendments. As per this notification the new diesel generator sets (up to 1,000 kVA) manufactured on or after 1.1.2005 shall be provided with integral acoustic enclosures at the manufacturing stage and shall comply with noise limit of 75 dBA at 1 m (Sound Pressure Level).The notification also prescribes that for the existing generator sets (up to 1,000 KVA), as well as, all generator sets more than 1,000 kVA that the noise level shall be controlled by providing an acoustical enclosure or by treating the room acoustically at the user's end. It further prescribes that the aforesaid acoustic enclosure or acoustic treatment of the room shall be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on the higher side. At the user's end the State Pollution Control Boards / Pollution Control Committees shall implement the rules. Generators used at the depots will have to adhere to the above norms.

Environmental Impact Assessment Notification, 2006

This is the major national level legislation based on which the requirement for mandatory environmental clearance on the basis of a detailed Environmental Impact Assessment of the project is gauged. As per this EIA notification 2006, projects or activities are categorized as A or B based on their potential to impact the environment. Category 'A' projects which are high impact projects in the Schedule shall require prior Environmental clearance from the Ministry of Environment and Forests on the recommendations of an Expert Appraisal Committee. All projects or activities included, as Category 'B' in the Schedule will require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority.

While City Bus Modernization Plan by itself does not come under the purview of EIA Notification, depot development proposed under the plan can come under building and construction projects are included in item no: 8(a) of schedule of MOEFCC notification2006 with following categorization:

Categorization of the Project under EIA Notification 2006

TYPE OF PROJECT	CATEGORY A	CATEGORY B	GENERAL CONDITION
Building and Construction projects	-	≥20000 sq.mts and <1,50,000sq.mts. of built-up area#	#(built up area for covered construction; in the case of facilities open to the sky, it will be the activity area)

None of depot projects under this project require environmental clearance under this notification as the built-up area is less than 20000 sqmts. However additional depots, Central Workshop project and City Bus Interchange station components that will be taken up in the future, will need to be screened for applicability of this act based on the specific scale of the individual projects.

Water (Prevention & Control of Pollution) Act, 1974

The Water (Prevention and Control of Pollution) Act, 1974 resulted in the establishment ofthe Central and State/UT level Pollution Control Boards, whoseresponsibilities include managing water quality and effluent standards, as well asmonitoring water quality, prosecuting offenders and issuing licenses for construction andoperation of certain facilities similarly. The Act vests regulatory authority in the state boards and empowers these boards to establish and enforce effluent standards for factories discharging pollutants into bodies of water.

In compliance with the directions under section 18 (1) b of this act, industries were classified as Red/Orange and Green by CPCC for the consent mechanisms. There are three types of consent issued under the provisions of Water (P & CP) Act 1974 and Air (P & CP) Act, 1981.

1. Consent to Establish:All the industries and activities needing consent must obtain consent to establish before actual commencement of the works for establishing the industry/activity.
2. Consent to Operate:This consent needs to be taken before actual commencement of production including trial production. This consent is valid for certain duration.
3. Renewal of Consent to Operate:The consent to operate is renewed after certain period.

An application for obtaining consent from the state board is required for establishing an industry, process or operation which is likely to discharge effluent to a stream, well, sewer or land under Section 25 of the Act in Form XIII or Form III A.

Every person carrying on an industry, operation or process requiring consent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) or under section 21 of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) or both or authorization under the Hazardous Wastes (Management and Handling) Rules, 1989 issued under the Environment (Protection) Act, 1986 (29 of 1986) shall submit an environmental audit report for the financial year ending the 31st March in Form V to the concerned State/UT Pollution Control Board on or before thethirtieth day of September every year, beginning 1993.

As per the official order of Chandigarh Pollution Control Committee dt 21/5/2014, 'Integrated Road Transport Workshop and Authorized service centers' are listed under the Red Category, Item 68.None of the depots are reported to have obtained /renewed consent to operate from CPCC in the prescribed format.

Water (Prevention & Control of Pollution) Cess Act, 1977

The Water Cess Act of 1977 was passed to help meet the expenses of the Central and State water boards. The Act creates economic incentives for pollution control through a differential tax structure (higher rates applicable to defaulting units) and requires local authorities and certain designated industries to pay a Cess (tax) for water consumption. To encourage capital investment in the pollution control, the Act gives a polluter a 25% rebate of the applicable Cess upon installing effluent treatment equipment and meeting the applicable norm.

Air (Prevention & Control of Pollution) Act, 1981, Air (Prevention &Control of Pollution) Rules, 1983

The Air (Prevention and Control of Pollution) Act, 1981, empowers the Chandigarh Pollution Control to enforce air quality standards set by the CPCB. 'Any industry, operation or process or an extension and addition thereto, which is likely to discharge sewerage or trade effluent into the environment or likely to emit any air pollution' into the atmosphere will have to obtain consent of the State Pollution Control Board under the provisions of Water (P & CP) Act, 1974 and Air (P & CP) Act, 1981.Industries are required to obtain a Consent to establish/operate in the prescribed forms. As per the official order of Chandigarh Pollution Control Committee dated 21/5/2014, 'Integrated Road Transport Workshop and Authorized service centers' are listed under the Red Category, Item 68.

Noise (Pollution Control & Regulation) Rules, 2000

To regulate and control noise pollution, the Government has issued various notifications under the Environment (Protection) Act, 1986. The Noise Pollution (Regulation & Control) Rules, 2000, specifies the ambient noise standard for residential, commercial, industrial and silence zone area for day time and night time. The UT designates an authority, which includes District Magistrate, Police Commissioner or any other officer designated for the purpose of maintaining ambient air quality standards as per the rules in force any time. The project attracts provisions of these rules in case of construction and operation activities towards regulation of noise.

The Depots are expected to maintain the noise levels prescribed for industrial area (75 dBALeq day and 70 dBALeq night). Silence zone is defined as an area comprising not less than 100 meters around hospitals, educational institutions and courts. None of the depots fall under the silence zone.

Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

Responsibility of the occupier for management of hazardous and other wastes:

(1) For the management of hazardous and other wastes, an occupier shall follow the following steps, namely:-

(a) prevention;

(b) minimization;

(c) reuse,

(d) recycling;

(e) recovery, utilisation including co-processing;

(f) safe disposal.

(2) The occupier shall be responsible for safe and environmentally sound management of hazardous and other wastes.

(3) The hazardous and other wastes generated in the establishment of an occupier shall be sent or sold to an authorized actual user or shall be disposed of in an authorized disposal facility.

(4) The hazardous and other wastes shall be transported from an occupier's establishment to an authorized actual user or to an authorized disposal facility in accordance with the provisions of these rules.

(5) The occupier who intends to get its hazardous and other wastes treated and disposed of by the operator of a treatment, storage and disposal facility shall give to the operator of that facility, such specific information as may be needed for safe storage and disposal.

(6) The occupier shall take all the steps while managing hazardous and other wastes to-

(a) contain contaminants and prevent accidents and limit their consequences on human beings and the environment; and

(b) provide persons working in the site with appropriate training, equipment and the information necessary to ensure their safety.

Grant of authorization for managing hazardous and other wastes.-

Every occupier of the facility who is engaged in handling, generation, collection, storage, packaging, transportation, use, treatment, processing, recycling, recovery, pre-processing, co-processing, utilization, offering for sale, transfer or disposal of the hazardous and other wastes shall be required to make an application in Form 1 to the State Pollution Control Board and obtain an authorisation

from the State Pollution Control Board within a period of sixty days from the date of publication of these rules.

The bus depots have storage of new and used oil, grease, new and used coolants, automobile paints, AC gas filling units, new and old tyres, new and old batteries etc. Detailed inventory and information on the quantities at each depot are currently not available and should be collected and recorded to assess the applicability of the rules.

Battery (Management & Handling) Rules, 2001 and amendments

Responsibilities of consumer or bulk consumer.- (1) It shall be the responsibility of the consumer to ensure that used batteries are not disposed of in any manner other than depositing with the dealer, manufacturer, importer, assembler, registered recycler, reconditioner or at the designated collection centres.

(2) It shall be the responsibility of the bulk consumer to –

(i) ensure that used batteries are not disposed of in any manner other than by depositing with the dealer/manufacturer/registered recycler/importer/ reconditioner or at the designated collection centres,- and

(ii) file half-yearly return in Form VIII to the State Board .

(3) Bulk consumers to their user units may auction used batteries to registered recyclers only.

Batteries are stored, serviced and used at all depots and hence this act is applicable for the project.

The Motor Vehicles Act, 1988

In 1988, the Indian Motor Vehicles Act empowered the State Transport Authority (usuallythe Road Transport Office) to enforce standards for vehicular pollution and preventioncontrol. The authority also checks emission standards of registered vehicles, collects roadtaxes, and issues licenses. In August 1997, the Pollution Under Control Certificate (PUC)programme was launched in an attempt to crackdown on the vehicular emissions in theStates.Section 110 of this Act empowers the Central Government to make rules regarding equipment and inbuilt safety measures to be provided in motor vehicles at the manufacturing point such as safety belt, standards of component, controlling air and noise pollution etc., so as to bring uniformity of standards. Theprovision to the section provides that any rules relating to the matters dealing with the protection of environment, so far as may be, shall be made after consultation with the Ministry of the Government dealing with environment. In pursuance of the powers so conferred, Central Motor Vehicle Rules, 1989 have been framed by the Central Government to provideamong others for penalty for violation of noise pollution standards.Provision of Sec. 190 (2) provides that any person who drives or causes or allows to be driven, in any public place a motor vehicle, which violates the standards prescribed in relation to road safety, control of noise and air pollution, shall be punishable.These rules are applicable to the City Buses.

The Punjab Capital (Development and Regulation) Act 1952

Development within the city is being managed through various kinds of development controls. Development controls within the city have its genesis in 'The Capital of Punjab (Development and Regulations) Act.Sections 4 of the said Act, empowers Chief Administrator to issue such directions, as may be considered appropriate in respect of any site or building for the proposes of proper planning or development of Chandigarh.This is applicable to the proposed new depot development at Raipur Kalan.

The Punjab Capital (Development and Regulation) Building Rules,1952

Under the provisions of above-mentioned Act, The Punjab Capital (Development and Regulation) Building Rules 1952 have been formulated. These Building Rules, various administrative procedures were formulated such as procedure of submission of building application, planning and architectural controls, materials and structural controls, drainage control etc. Building plans of all private buildings in the city are sanctioned in accordance to these Building rules. Occupancy certificates are issued only to buildings which are built as per sanctioned plans and various types of penalties are also imposed in accordance to these building Rules.

These rules have been amended from time to time keeping pace with the advancements in building technology, genuine needs of the masses and various provisions in the referral publication such as NBC.This is applicable to the proposed new depot development at Raipur Kalan.

Chandigarh Tree Preservation Order 1952

These rules were framed to preserve the protected trees, group of trees or woodland areas which form the green cover of the City. The rules prohibit cutting of trees in any part of the woodlandarea shown in the zoning plan. Though there are a few trees at the Raipur Kalan site, it is not in the woodland zone, hence not applicable to the proposed new depot development.

Construction and Demolition Waste Management Rules, 2016

Duties of the waste generator

(1) Every waste generator shall prima-facie be responsible for collection, segregation of concrete, soil and others and storage of construction and demolition waste generated, as directed or notified by the concerned local authority in consonance with these rules.

(2) The generator shall ensure that other waste (such as solid waste) does not get mixed with this waste and is stored and disposed separately.

(3) Waste generators who generate more than 20 tons or more in one day or 300 tons per project in a month shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar and shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodeling work and keep the concernedauthorities informed regarding the relevant activities from the planning stage to the implementation stage and this should be on project to project basis.

(4) Every waste generator shall keep the construction and demolition waste within the premise or get the waste deposited at collection center so made by the local body or handover it to the authorized processing facilities of construction and demolition waste; and ensure that there is no littering or deposition of construction and demolition waste so as to prevent obstruction to the traffic or the public or drains.

(5) Every waste generator shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities; Waste generators who generate more than 20 tons or more in one day or 300 tons per project in a month shall have to pay for the processing and disposal of construction and demolition waste generated by them, apart from the payment for storage, collection and transportation. The rate shall be fixed by the concerned local authority or any other authority designated by the State Government.

The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996

All the establishments who carry on any building or other construction work and employ10 or more workers are covered under this Act. All such establishments are required to payCess at rate not exceeding 2% of the cost of construction as may be notified by Government. The employer of the establishment is required to provide safety measures atthe Building or Construction work and other welfare measures, such as Canteens, First-aidfacilities, Ambulance, Housing accommodation for workers near the workplace etc. Theemployer to whom the Act applies has to obtain a registration certificate from theRegistering Officer appointed by the Government.

Motor Transport Workers Act 1961

The Act aims to provide for the welfare of the Motor Transport Workers and to regulate the conditions of their work. The employer of a Motor Transport Undertaking is required to get the undertaking registered under the provisions of the Act.

The Ancient Monuments and Archaeological Sites and Remains Act, 1958

According to this Act, area within the radii of 100m and 300m from the "protectedproperty" are designated as "protected area" and "controlled area" respectively. Nodevelopmental activity (including building, mining, excavating, blasting) is permitted in the*"protected area" and development activities likely to damage the protected property are notpermitted in the "controlled area" without prior permission of the Archaeological Survey ofIndia (ASI), if the site/remains/ monuments are protected by ASI. There are no ASI heritage Monuments in the study area.

Factories Act, 1948

The Factories Act and Amendment in 1987was the first to express concern for the working environment of the workers. The amendment of 1987 has sharpened its environmental focus and expanded its application to hazardous processes.The permissible levels for noise exposure for work zone area have been prescribed under the Model Rules of the Factories Act, 1948 and applicable at all depot sites.

Petroleum Act, 1934

The Act provides to consolidate and amend the law relating to the import, transport, storage, production, refining and blending of petroleum. As per the Act “petroleum" means any liquid hydrocarbon or mixture of hydrocarbons, and any inflammable mixture (liquid, viscous or solid) containing any liquid hydrocarbon.

The Act is applicable for the project as diesel is also a hydrocarbon and falls in "petroleum Class B", meaning it has a flash-point of twenty-three degrees Centigrade and above but below sixty-five degrees Centigrade.

Certification of Depots for installing of Refueling Stations: The new depots that are proposed for construction under the project will have to acquire a license to store fuel and install dispensing machines for diesel from the Chief Controller of Explosives (CCoE), Petroleum And Explosives Safety Organization (PESO), as the amount of diesel that is expected to be stored at the depots will be higher than specified in section 7 of the Act.

In case, of usage of CNG, the Implementing Agencies will have to take certification of the gas cylinders, once in every three years from the CCoE. To obtain this license certain basic design requirements include – provision of unrestricted accessibility to the refueling station, its location underground and away from the boundary wall, provision of fire-fightingequipment to prevent fire hazards, water tanks etc.

Some of the other legislations applicable to the project are

- Workmen's Compensation Act 1923
- Contract Labour (Regulation and Abolition) Act, 1970
- Minimum Wages Act, 1948
- Payment of Wages Act, 1936
- Equal Remuneration Act, 1979
- Inter-State Migrant Workmen’s (Regulation of Employment and Conditions of Service) Act, 1979
- Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996

Rainwater Harvesting

Municipal Bye-laws require Provision in all projects to incorporate RWH. As per bye laws, all the buildings which are or will be constructed on plot of one kanal and above shall have rain waterharvesting system to recharge ground water installed as per the specifications given by the Administration. Allthe existing buildings in the one kanal and above category shall install rain water harvesting system to rechargethe ground water within two years from the date of issuance of notification dt 16/10/2008.

As per the Development Controls and regulations in the Chandigarh Master Plan 2013 use of recycled water will be compulsory for all non-potable usesfor all large buildings with an area of more than 2000 sq. m. in all new developments." All industrial complexes with an area of more than 2000 sq.m should make plumbing and infrastructure provision for enabling localized sewage treatment, use of recycled water for flushing, washing and for watering gardens. All building plans and land development plans with an area of more than 2000 sq. m. now have to indicate the onsite wastewater treatment and disposal arrangements and water reuse infrastructure including the plumbing plans etc. Separate systems have to be provided for sewage and sludge treatment to facilitate reuse of sludge water for gardening and washing purposes. This may require suitable storage facilities that are to be indicated on the building plans. However in view of thehigher water table and shallow aquifers in the Southern sectors(CSE REPORT), The Master Plan cautions that the mandatory rain water harvesting needs to Bereviewed.The Municipal Corporation has decided to undertake systematicrainwater harvesting in Sector 26 on a trial basis as per acomprehensive rain water harvesting plan prepared by the Centrefor Science & Environment (CSE), New Delhi. This plan has proposed recharging of the deep aquifers by constructing recharge structuresalong the city's storm water drain network for tapping the rainwater flowing through it. This should be combined with buildingsurface or underground water storage structures for landscaping/horticultural use.

None of the depots have rainwater harvesting installed currently. The new depot at Raipur Kalan should have provision for rainwater harvesting as per the existing Development Control in the Chandigarh Master Plan 2013.

Extraction of Ground Water

Municipal Bye-laws require permission of Chandigarh Administration for withdrawal of ground water in Capital Project Areas. The major water requirement at the depot is for bus washing systems. None of the depots extract groundwater directly for their use. However, the water for bus washing at Depot 2 is being catered by tube wells provided by the Chandigarh Administration.

National Auto Fuel Policy and Emission Norms

Emission norms were introduced in India in 1991 for petrol and 1992 for diesel vehicles. These were followed by making theCatalytic convertermandatory for petrol vehicles and the introduction of unleaded petrol in the market. In 2002, the Mashelkarcommittee proposed a road map for the roll out ofEuro based emission normsfor India, which was accepted by the Government of India. It also recommended a phased implementation of future norms with the regulations being implemented in major cities first and extended to the rest of the country after a few years. Based on the recommendationsof the committee, the National Auto Fuel policy was announced officially in 2003. The roadmap for implementation of the Bharat Stage norms was laid out till 2010. The policy also created guidelines for auto fuels, reduction of pollution from older vehicles and R&D for air quality data creation and health administration. Bharat stage emission standards and their timelines are set by the Central Pollution Control Board under the ministry of environment and forests.

Emission Standards for Four wheel Vehicles

STANDARD	REFERENCE	DATE	REGION
India 2000	Euro 1	2000	Nationwide

Bharat Stage II	Euro 2	2001	NCR*, Mumbai, Kolkata, Chennai
		2003.04	NCR*, 13 Cities†
Bharat Stage III	Euro 3	2005.04	NCR*, 13 Cities†
		2010.04	Nationwide
Bharat Stage IV	Euro 4	2010.04	NCR*, 13 Cities†
† Mumbai, Kolkata, Chennai, Bengaluru, Hyderabad, Ahmedabad, Pune, Surat, Kanpur, Lucknow, Sholapur, Jamshedpur and Agra* National Capital Region (Delhi)			

The above standards apply to all new 4-wheel vehicles sold and registered in the respective regions. In addition, theNational Auto Fuel Policy introduces certain emission requirements for interstate buses with routes originating or terminating in Delhi or the other 10 cities.

Chandigarh is yet to be included in the fold of Bharat Stage IV.34 of the CTUs buses still have only BS II compliance, though by 2010 all were expected to be BS III compliant nationwide. These are planned to be phased out only in a years' time. An expert committee, tasked by the petroleum ministry to suggest standards and timelines forswitchingto higher qualityfuelandemission normsin the country, has recommended upgrade to the intermediate BS-IV+ norms across India by April 1, 2017 followed by introduction of BS-V fuel on April 1, 2021. All the new buses that are sanctioned under the JNURM are BS IV compliant.

National Urban Transport Policy (NUTP)

GoI in April 2006 announced a National Urban Transport Policy (NUTP). The policy focuses on the need to "**move people – not vehicles**" and ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents. The emphasis is on encouraging greater use of public transport, establishing effective regulatory, institutional and enforcement mechanisms, and improve planning and management of transport systems. The policy recommends greater involvement of the private sector and innovative financing mechanisms to enhance efficiency and reduce the impact on the public budget. It seeks to reduce travel demand by encouraging better integration of land use and transport planning. NUTP encourages capacity building, both at the institutional and individual level.

The major applicable legislations for the project is summarised in the following table:

S.NO	LEGISLATION	APPLICABILITY
1.	Environmental Protection Act 1986 and Environmental Protection Rules, 1986 amended 1993	Various components of the project shall come under the purview of this umbrella legislation.
2.	Environmental Impact Assessment Notification, 2006	Not applicable for the depots currently being considered. Additional depots, Central Workshop project and City Bus Interchange Station components that will be taken up in the future, will need to be screened for applicability of this act based on the specific scale of the individual project.

S.NO	LEGISLATION	APPLICABILITY
3.	Water (Prevention & Control of Pollution) Act, 1974, Air (Prevention & Control of Pollution) Act, 1981, Water (Prevention & Control of Pollution) Cess Act, 1977	As per the official order of Chandigarh Pollution Control Committee dt 21/5/2014, 'Integrated Road Transport Workshop and Authorized service centers' are listed under the Red Category, Item 68. Consent to establish is required from the Chandigarh Pollution Control Committee for the new depot. Consent to Operate needed for other depot in prescribed format. .The Committee is responsible for grant of consent for using an outlet for discharge of Trade/Sewage effluent, monitoring of effluent/sewage treatment plants and for using an emission outlet, monitoring of emissions, prosecutions. The Committee has also powers under section 33-A to issue an order to any authority which includes disconnection of power/water supply. The Cess Act of 1977 have been enacted with a view to provide for the levy and collection of cess on water consumed by the persons carrying out certain industries and by local authorities, with a view to augment the resources of the Central Board and the State Pollution Control Boards. The Cess collected is deposited in the consolidated fund of India out of which about 80% is reimbursed to Chandigarh Pollution Control Committee, which forms its funds.
4.	Battery (Management & Handling) Rules, 2001	Applicable towards collection, channelization and recycling of used lead acid batteries. These rules inter-alia make it mandatory for consumers to return used batteries. All manufacturers / assemblers / re-conditioners / importers of lead acid batteries are responsible for collecting used batteries against new ones sold as per a schedule defined in the rules. Such used lead acid batteries can be auctioned/sold only to recyclers registered with the Ministry on the basis of their possessing environmentally sound facilities for recycling/recovery. Batteries are stored, serviced and used at all depots

S.NO	LEGISLATION	APPLICABILITY
		and hence this act is applicable for the project.
5.	Factories Act	Applicable in terms of health, welfare and wages for workers at workshops and depots.
6.	Petroleum Act, 1934	The new depot that are proposed for construction under the project will have to acquire a license to store fuel and install dispensing machines for diesel from the Chief Controller of Explosives (CCoE), Petroleum and Explosives Safety Organisation (PESO) based on the capacity of diesel to be stored at the sites.
7.	Ancient Monuments and Archaeological Sites and Remains Act, 1958	Not applicable for current depot sites under the project. Future locations for bus shelters or depots/Central workshop will have to be chosen after considering the proximity to the above sites.
8.	Rainwater harvesting (Order/Notification dated 16.10.2008 of Chandigarh Administration)	All the buildings which are or will be constructed on plot of one kanal and above shall have rain water harvesting system to recharge ground water installed as per the specifications given by the Administration. All the existing buildings in the one kanal and above category shall install rain water harvesting system to recharge the ground water within two years from the date of issuance of notification dt 16/10/2008.
9.	Manufacture, Storage & Import of Hazardous Chemical Rules, 1989; Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008	Exhaustive inventory and detailed information on the quantities at each depot to be prepared before operation of depots for applicability
10.	The Buildings and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	Applicable for new depot construction sites
11.	Noise (Pollution Control & Regulation) Rules, 2000	The bus depots are expected to maintain the noise levels prescribed for industrial area (75 dBA Leq during the day and 70 dBA Leq at night).

S.NO	LEGISLATION	APPLICABILITY
12.	The Motor Vehicles Act, 1988,	Provision of Sec. 190 (2) provides that any person who drives or causes or allows to be driven, in any public place a motor vehicle, which violates the standards prescribed in relation to road safety, control of noise and air pollution, shall be punishable. These rules are applicable to the City Buses of Chandigarh.

1.4 WORLD BANK OPERATIONAL POLICY

Applicability of World Bank Operational Policies are as indicated in the table below:

S. No	Operational Policy	Applicability
1	OP/BP 4.02: Environmental Action Plans	Applicable Environmental Management Action Plan has been prepared for new depot at Raipur Kalan, Depot 1, Depot 2 and Depot 3
2	OP/BP 4.04 Natural Habitats	Not Applicable The Project does not involve conversion or degradation of critical or other natural habitat.
3	OP/BP 4.10 Indigenous People	Not Applicable No indigenous people are impacted due to the Project.
4	OP/BP 4.11 Physical Cultural Resource	Applicable Environmental baseline has been assessed and mitigation measures are suggested, and Environmental Management Plan has been prepared.
5	OP/BP 4.12 Involuntary Resettlement	Not Applicable
6	OP/BP 4.36 Forest	Not applicable
7	OP/BP 4.09 Pest Management	Not applicable

2 PROJECT DESCRIPTION

The proposed Project includes construction of new depot at Raipur Kalan of plot area 6.448 acres and construction in 3 floors of Basement, Ground Floor and First Floor. Electrical sub station, scrapyard, Security room, security cabin.

Depot-1, Depot-2, Depot-3 and Depot-4 have been proposed for augmentation of capacity and facility. These are described below.

2.1 MODERNIZATION OF DEPOT 1

Depot no 1 is for operation of Long Route/Inter-State buses. It is situated at Industrial Area, Phase-I, Chandigarh and near to Depot no.2 and Administrative Block of Chandigarh Transport Undertaking.

Total Area of the Depot	3.02 acres (as per survey plan)
Location	Industrial Area Phase-1 Chandigarh with Long/Lat as 30.711,76.811.
Total Fleet	168 nos. (79 nos HVAC buses and 89 nos Ordinary buses)
Depot Capacity	
Depot Connectivity	It is well connected to the main roads.

Infrastructure:-

Depot 1 consists of following along with well-establishedInfrastructure: -

1). Main Stores for storing Spare parts of all the buses being operated by CTU except Depot no 4(On CMC with M/s Tata Motors)

2). Box Branch and Cash Branch of Depot no 1 and 2 for issuing of ETMs to conductors and depositing of cash.

3). Duty Section and Emergency Purchase Section.

4). Different shops i.e. electric shop, engine shop etc for maintenance of buses

5). Inspection Pits for maintenance of buses

6). Stores for condemn material/spare parts.

7). Well connected to City Drainage System

Depot -1 is operational and one of the oldest depot and it requires up-gradation of Infrastructure. The following works have been proposed in Depot-1. Out of said works, some works are under progress. The status of work is also given below.

S.No.	Nature of work	Remarks
1.	Prefabricated Structures	1st lot (completed) 2nd lot started and under progress
2.	Washing area to be repaired after filling during Rainy Season, Water got trapped in Low lying area	Got repaired but again blocks. Being looked up by Engineering deptt. As per sr. no. 8 below.
3.	Renovation of Complete Depot i.e, white washing, Painting and replacement of glass etc.	Under progress
4.	Roof tiles terracing as well as repair required due to leakage from no. of places during rainy season	Not started yet
5.	Cement concreting (floor) repair of Depot at no. of places*	Not started yet
6.	Existing inspection Pits to be repaired and two new pits along with shed are required for AC buses	Pits repaired. New pits yet to be constructed.
7.	Renovation of Toilet	Work Completed
8.	New storm line to be laid for washing of buses along with re-circulating arrangements of water for washing of Buses	Not started Yet
9.	Installation of fire fighting system	Work under progress
10.	High mast lights required	High mast light not feasible but LED fitted inand around Workshop.
11.	Complete rewiring Replacement of MCB's, MCCB's change over switch(complete renovation)	Under Progress

Following are the Equipment/Tools which are already installed/available in the depot:-

S.No.	Nomenclature	Quantity
1.	NITROGEN GENERATOR & INFLATOR	01 nos
2.	TUBE-LESS TYRE CHANGING MACHINE	01 nos.
3.	Brake Lining Riveting Machine	01 nos
4.	Trolley type Gear Box Lifter	02 nos
5.	CCTV Cameras	16 nos

Tools & Equipment to be procured (Depot-I)

Sr.No	Nomenclature/Name of the item	Quantity required	Remarks
1.	HYDRAULIC TROLLEY JACK (10 TON)	02	
2	SPREY PAINT GUN	01 nos.	Required
3	AIR COMPRESSOR 1.5 HP TANK CAPACITY 45 LTR.	01nos.	Required
4	AIR PIPE LINE PLASTIC	50 mtr.	Required
5	SINGLE PHASE PORTABLE WELDING PLANT (220V FREQUENCY 50/60 HZ	01 nos	
6	ANGLE CUTTING MACHINE 14" 2200W (FOR CUTTING OF SAW/METAL/CHANNEL/ANGLES)	01 nos.	Required
7	SANDER MACHINE	01 nos.	Required
8.	ROTARY DRILL MACHINE (600W) 20 MM	01 nos.	Required
9.	MULTI METER (DIGITAL)	02 nos.	Required
10.	DC AMP CTAMP METER AC/DC UP TO 300 AMP (500 V)	01 nos.	Required
11.	HYDRAULIC TROLLEY LIFTER (FOOT OPERATED) (1 TON CAPACITY))	01 nos.	Required
12.	FAST BATTERY CHARGER	01 NOS.	Not Required
13.	BATTERY CHARGER 96 V (FOR 8 BATTERY)	01 NOS.	Not Required
14.	VACUUM CLEANER (15 LTR.) 1500 WATT	01 Nos.	Required
15.	GEAR BOX FOR HYRDAULIC DRUM LIFTER	01 Nos.	Required
16.	MIG WELDING PLANT 3PH (400/50 HZ)	01 nos.	Required
17.	ELECTRIC HAND GRINDER 4" HEAVY DUTY	01 Nos.	Required
18.	HYDRAULIC PRESS (60 TON)	01 Nos.	Not Required
19.	GEAR BOX HYDRAULIC JACK (2 TON HEAVY DUTY)	01 nos.	Not Required
20.	DIFFERENTIAL LIFTING HYDRAULIC TROLLEY JACK (1 TON)	01 nos.	Not Required
21.	DISTILLED WATER PLANT/UNIT (MINI) (CAPACITY 6LTRS PER HOURS)	01 nos.	Not Required
22.	BATTERY TESTER 10 AMP/96V	01 nos.	Required

2.2 MODERNIZATION OF DEPOT 2

Depot no. 2 is for operation of Local/Tri-city routes/buses. It is situated at Industrial Area, Phase-I, Chandigarh and near to Depot no.1 and Administrative Block of Chandigarh Transport Undertaking.

Total Area of the Depot :-	7.46 acres
Location :-	Industrial Area Phase-1 Chandigarh with Long/Lat as 30.710,76.810.
Total Fleet :-	170 nos. (80 nos AC buses and 90 nos Ordinary buses) under SPV called Chandigarh City Bus Services Society
Depot Capacity :-	Approximately 200 buses.
Depot Connectivity:-	It is well connected to the main road.

Infrastructure:-

Depot 2 consists of following along with well established Infrastructure:-

1). Stores for storing Spare parts of buses being operated by Depot no. 2

2). Duty Section and Emergency Purchase Section.

4). Different shops i.e. electric shop, engine shop etc for maintenance of buses

5). Inspection Pits for maintenance of buses

6). Stores for condemn material/spare parts.

7). Well connected to City Drainage System

Depot -2 is operational and it also requires up-gradation of Infrastructure. The following works have been proposed in Depot-2. Out of said works, some works are under progress. The status of work is also given below

S.No.	Nature of work	Remarks
1.	Scooter Parking open area near tyre retreading plant and at back side of canteen block to concrete	Work done
2.	Renovation of old Inspection Pits near washing area along with adjustment of Ramp Inclination so as to make it workable for low floor buses(repair of Roof shed)	Work done
3.	Prefabricated Structure	Work completed
4.	Inspection pits in existing shed of CTU Chandigarh	Work done
5.	Replacement of Roof sheets of existing of shed	Work completed
6.	Providing fixing 60 mm thick Paver blocks	Work completed
7.	Cement concreting (Floor) repair of Depot at number of places	Not yet started

S.No.	Nature of work	Remarks
8.	Replacement of Shed/Sheets required in workshop near Engine shop, Inspection pit area and testing inspection pit area along including providing rain water pipe for shed area and engine shop area	completed
9.	Water logging in rainy season near washing area and inspection pits area so additional road gullies to be provided	Work Completed (but still the problem has not been resolved).
10.	Installation of fire fighting system	Work in progress
11.	Renovation of tube well operator room	Work Completed
12.	Renovation of Toilets	Work completed
13.	High mast light required	Work completed
14.	All lights on boundary wall replaced	Work completed (but few of lights not working)
15.	Providing lighting arrangement (Service shed and Mini workshop)	Work completed
16.	Providing Area lighting and road lighting	Work completed
17.	Prefabricated structure wiring work	Work completed

Following are the Equipment/Tools which are already installed/available in the depot:-

Sr. No.	Name of the Equipment	Quantity	Remarks
1	Air Compressor	2	Procured
2	Nitrogen Generating Machine	1	Procured
3	Diesel Generator (DG) set (200 KVA)	1	Procured
4	Automatic Bus Washing Machine	2	Procured
5	Fuel Injection Pump & Calibration Machine	1	Procured
6	Lathe Machine	1	Procured
7	Tyre Retreading Plant (TRP)	1	Procured
8	Skid Mounted Effluent Treatment Plant	1	Procured

	(ETP)		
9	Recovery Van	1	Procured
10	Relief Van	1	Procured
11	Auto Electrical Test Bench (for alternator and self starter motor)	1	To be procured
12	Hydraulic Jack 10 Tonne Cap	1	To be procured.
13	Single Phase PortableWelding Plant (220VFrequency 50-60 Hz)	1	Required
14	Fast Battery Charger (12-24 V DC)	1	Required
15	Fork lifter diesel engine (for shifting of heavy assemblies)	1	Required
16	Grease Gun Heavy duty with compressor (50-100 kg greasing capacity)	1	Required
17	Smoke meter (pollution testing machine)	1	Procured
18	Pneumatic Socket set/compact tool kit (heavy duty)	4	Required
19	Pneumatic Bit Drive set	4	Required
20	Socket combination set	4	Required
21	MIG Welding plant	1	Required

2.3 MODERNIZATION OF DEPOT 3

Depot no. 3 is for operation of Local/Tri-city/Sub-Urban routes. It is situated at Sector-25 Chandigarh at back side of Cremation Ground and near Garbage Processing Plant.

Total Area of the Depot :- 3.95 acres

Location :- Sector- 25, Chandigarh with Long/Lat as 30.753,76.746.

Total Fleet :- 165 nos.(59 nos HVAC buses and 106 nos Ordinary buses)

Depot Capacity :- Approximately 200 buses.

Depot Connectivity:- It is well connected to the main road.

Infrastructure:-

Depot 3 consists of following along with well established Infrastructure:-

1). Stores for storing Spare parts of buses being operated by Depot no. 3

2). Duty Section and Emergency Purchase Section.

4). Different shops i.e. electric shop, engine shop etc for maintenance of buses

5). Inspection Pits for maintenance of buses

6). Stores for condemn material/spare parts.

7). Well connected to City Drainage System

8).Installed with Solar Power Plant at workshop building roof toop.

9). Box Branch for issue of ETMs and cash branch for collection of cash.

Depot -3 is operational and it also requires up-gradation of Infrastructure. The following works have been proposed in Depot-3. Out of said works, some works are under progress. The status of work is also given below

S.No.	Nature of work	Remarks
1.	Rough Cost Estimate for providing and fixing 60 mm thick paver blocks in parking and backside are of the office, kota stone flooring in various shops	Work done
2.	Rough Cost Estimate for tile terracing at roof of workshop carriage, box branch, cash branch, all shops of workshop	Work Under Process
3.	Rough Cost Estimate for providing cement concrete flooring after dismantle top layer of existing damaged crecked flooring	Work Under Process
4.	Rough Cost Estimate for providing structure of various size tapered roof one side height 3mm and other side 2.7 mm	Tender Under Process
5.	Corona Pit Prefabricated shed length 126 and width 55 feet	Drawing Completed
6.	A service prefabricated shed length 75 and width 45 feet	Drawing Completed
7.	Rough Cost Estimate for proposed emergency entry / exist gate	Drawing Completed
8.	Corona Pit (repairing uncompleted)	
9.	Requirement of Civil Work and public health work for installation of 2 nos. automatic bus washing plant	Work Done
10.	RCE for providing and fixing of 6 nos. water tankers 5000 feet capacity each on rcc pedertal for the work count of 2 nos. of flooring of automatic washing plant	Work Done
11.	RCE for the work of providing, fixing testing and commissioning of fire fighting system	Work Under Process
12.	RCE for renovation of existing toilet block at 1st floor above workshop	Work Done
13.	Regarding Boundary Line Pipe near Gaushalla inter the sewage water in workshop area	Yet to be started
14.	Water logging in rainy season near washing area and inspection pits area so additional road gullies to be provided	Work Completed
15.	Installation of fire fighting system	Work in progress
16.	Renovation of tube well sump (reservoir)	Work Completed
17.	Renovation of Toilets 1st floor, garage area	Work completed

S.No.	Nature of work	Remarks
18.	High mast light installed 02 nos.	Work completed (floor work incomplete)
19.	All lights on boundary wall replaced	Work completed

Following are the Equipment/Tools which are already installed/available in the depot:-

Sl No.	Nomenclature / Name of the Item	Quantity Required	Presently installed in Depot III
1	Hydraulic Trolley Jack (10 tons)	4 No	2 No
2	Spray paint gun	1 No	Required
3	Air Compressor1.5 HP Tank Capacity 25-to- 45 Ltrs	1 No	Required
4	Air Pipe line Plastic	100 meters	Required
5	Single Phase PortableWelding Plant (220VFrequency 50-60 Hz)	1 No	1 No
6	Angle Cutting Machine 14* 2200W (for cutting of saw/ Metal/channel/angles)	1 No	1 No
7	Sander Machine	1 No	Required
8	Rotary drill machine (600W) 20 mm	2 No	1 No.
9	Multi Tester Meter (Digital)	1 No	Required
10	DC AMP CTAMP Meter AC/DC up to 300 amp (500V)	1 No	Required
11	Hydraulic Trolley Lifter (FOOT OPERATED) (1Ton Capacity)	2 No	1 No.
12	Nitrogen Generator and Inflator	1 No	1 No
13	Fast battery Charger	1 No	Required
14	Battery Charger 96V (For 8 Batter)	1 No	1 No
15	Vacuum cleaner (15 Litre) 1500 Watts	1 No	1 No
16	Gear Box for hydraulic Drum Lifter	1 No	Required
17	MIG Welding Plant 3PH (400/50 Hz)	1 No	1 No
18	Electric Hand Grinder 4* heavy duty	1 No	Required
19	Tubeless Tyre Changing Machine	1 No	1 No
20	Hydraulic Press (20 Ton)	1 No	1 No
21	Gear box hydraulic Jack (2 Ton Heavy Duty)	1 No	Required

Sl No.	Nomenclature / Name of the Item	Quantity Required	Presently installed in Depot III
22	Differential LiftingHydraulic Trolley (1Ton)	1 No	Required
23	Grease Gun with compressor fitting 50 Kg	1 No	Required
24	Distilled Water Plant/ unit (Mini) capacity 6 litres per hour	1 No	Required
25	Socket Set (Pneumatic)	4 No	Required
26	Bit Drive set (Pneumatic)	4 No	Required
27	Socket combination set (Pneumatic)	4 No	Required
28	Wheel Alignment Machine	1 No	1 No
29	Alternator and starter motor testing auto electrical test bench 3 phase	1 No	1 No
30	Automatic Bus washing machine	2 No	2 No
31	Automatic under Chassis washing machine	2 No	2 No
32	Fork lifter diesel engine (for shifting of heavy assemblies)	1 No	Required
33	Truck for spare parts	1 No	Required
34	Engine Lifting Crane	1 No	Required
35	Diesel Generator (DG) set (200 KVA)	1 No	1 No
36	Smoke meter (pollution testing machine)	1 No	1 No
37	Lathe Machine Big and Small	02 No	1 NO. (unserviceable)/Required
38	FIP Machine	01 No.	1 NO. (unserviceable)/ Not Required
39	SKID MOUNTED EFFLUENT TREATMENT PLANT	01 No.	Required

2.4 MODERNIZATION OF DEPOT 4

Depot 4 has been contracted to M/s TATA Motors for maintenance of 100 nos buses. So there will not be any construction work in this depot so it has been excluded from the study.

2.5 CONSTRUCTION OF DEPOT 5 – RAIPUR KALAN

Depot 5 is Raipur Kalan. The development of depot will take place in two phases. Civil construction and infrastructure construction will be in the first phase. The procurement of depot equipment and tools will be in second phase. The duration of the construction will be about 2 years.

Total Area of the Depot :-	6.75 acres
Location :-	Industrial Area, Phase-3,Raipur Kalan, Chandigarh with Long/Lat as 30.683,76.827.
Depot Capacity :-	Approximately 167 buses.
Depot Connectivity:-	It is well connected to the main road.

At the back side of area there is a residential area for which noise barriers have been planned to be installed as can be seen in the plan annexed.

Further, Entrance of the buses in the depot has been planned in such a way that there is no queue on the main road while in-shedding the buses inside the depot.

In the basement of the workshop cum Administrative block staff car/scooter parking has been planned.

The proposal includes

1. Construction of workshop cum administrative block having basement 16093 square meter, Ground floor 5593 square meter and first floor 2625 square meter.
2. Electrical substation of 60 square meter,
3. Scrap yard 162 square meter
4. Yard master/ security room 16 square meter
5. Security cabin of 15 square meter.
6. Covered Area with basement = 24311 SQ. MTR.(261586.36 SQ. FT.)
7. Covered area without basement = 8218 SQ. MTR.(88426 SQ. FT.)

Infrastructure:-

Depot 5 will consist of following along with well established Infrastructure:-

1). Stores for storing Spare parts of buses being operated by Depot.

2). Duty Section and Emergency Purchase Section.

4). Different shops i.e. electric shop, engine shop etc for maintenance of buses

5). Inspection Pits for maintenance of buses

6). Stores for condemn material/spare parts.

7). Well connected to City Drainage System

8).Installed with Solar Power Plant at workshop building roof toop.

9). Box Branch for issue of ETMs and cash branch for collection of cash

10). Provision for Charging of Electric buses.

Fpllowing are the name of items

Sr. No	Nomenclature/Name of the item	Quantity required
1.	GENERATOR SET 200 KVA	01
2	AIR COMPRESSOR 60 H.P.	01
3	NITROGEN GENERATOR MACHINE	01
4	SKID MOUNTED EFFLUENT TREATMENT PLANT	01
5	AUTOMATIC BUS WASHING SYSTEM (MOVING BRUSH TYPE)	01
6	FUEL INJECTION PUMP TEST BENCH	01
7	LATHE MACHINE	01
8.	FULLY BUILT BREAKDOWN RELIEF VAN	01
9.	FULLY BUILT RECOVERY VAN (TRUCK)	01
10	TYRE WHEEL RETREADING PLANT	01
11.	AIR COMPRESSOR 15 H.P.	01

Sr. No	Nomenclature/Name of the item	Quantity required
1.	GENERATOR SET 200 KVA	01
2	AIR COMPRESSOR 60 H.P.	01
3	NITROGEN GENERATOR MACHINE	01
4	SKID MOUNTED EFFLUENT TREATMENT PLANT	01
5	AUTOMATIC BUS WASHING SYSTEM (MOVING BRUSH TYPE)	01
6	FUEL INJECTION PUMP TEST BENCH	01
7	LATHE MACHINE	01
8.	FULLY BUILT BREAKDOWN RELIEF VAN	01
9.	FULLY BUILT RECOVERY VAN (TRUCK)	01

10	TYRE WHEEL RETREADING PLANT	01
11.	AIR COMPRESSOR 15 H.P.	01

3 ENVIRONMENTAL BASELINE DATA

The environmental baseline data for the study area of Chandigarh City has been compiled from secondary sources and field visits.

3.1 CLIMATE

The climate of Chandigarh can be classified as subtropical with hot summer and cold winter except during monsoon season. The extreme weather conditions will have a bearing on the public transportation systems in the city, considering the exposure of the users to the extreme conditions while walking to and waiting at bus stops as well as during travel. There are four seasons in a year. The hot weather season starts from mid-March to last week of the June followed by the southwest monsoon, which lasts up to September. The transition period from September to November forms the post monsoon season..

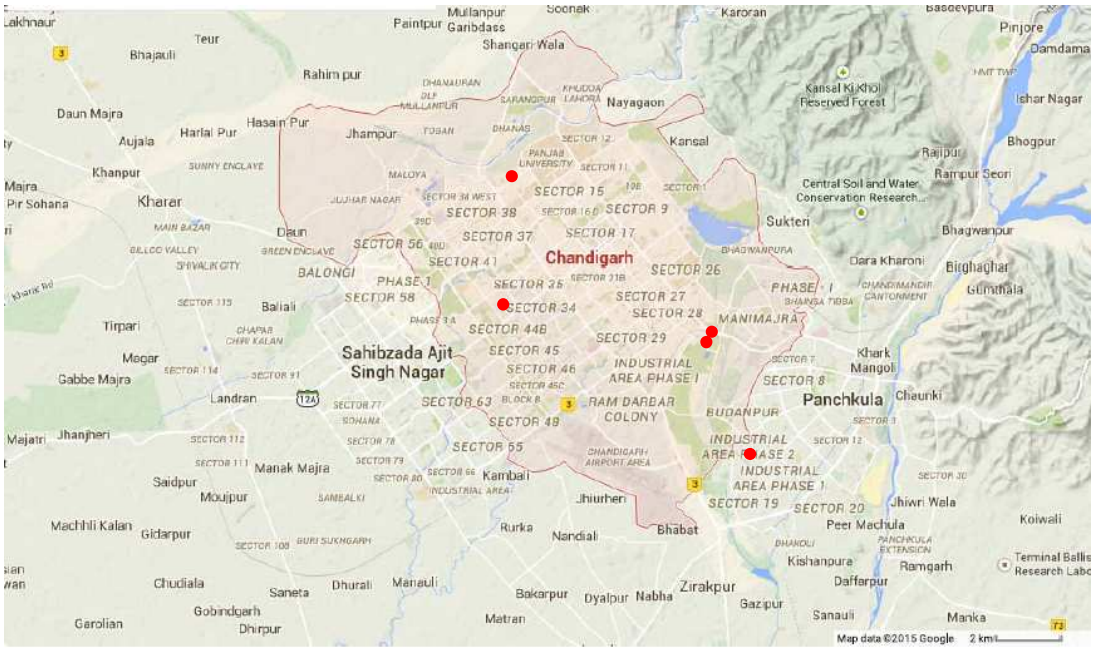
The geographical and climate profile of Chandigarh is as indicated in the table below.

Parameters	Value
Geographical Area	140 sq. km (14000 Ha) (26 sq. km of Sukhna wildlife Sanctuary)
Longitude	76^0 47'14 E
Latitude	30^0 44' 14 N
Altitude	304 – 365 m above MSL with 1% drainage gradient
Annual rainfall (2017)	974 mm Monsoon July - September
Temperature Winter Min	7^0C – 11 ^{0} C (Nov 2017 – Feb 2018) Lowest Temperature - 3^0C (Jan2018)
Temperature Summer Max	35 ^{0}C –39 ^{0}C (April 2017 – July 2017) Highest Temperature – 45 ^{0}C (June 2017)
Prevailing Winds	From North west to south east in winter and reverse in summer

Source: http://chandigarh.gov.in/knowchd_general.htm accessed on 11.06.2020

3.2 TOPOGRAPHY

The Union Territory of Chandigarh is located in the foothills of the Shivalik hill ranges in the north. It is occupied by Kandi (Bhabhar) in the north east and Sirowal (Tarai) and alluvial plains in the remaining part. The city is at an altitude of 304 to 365 meters above MSL with 1% drainagegradient. City's natural slope is from north east towards south but there arecertain low gradient area in the city like sector 11, 24, part of sector 15 and part of sector 35, Mauli Jagran, Gobindpura area of Manimajra etc. None of the depots are located in these low gradient areas.



Topographic Setting of Depots

3.3 LAND USE

Chandigarh union territory is located about 165 miles (265 km) north of New Delhi, the territory is bounded by the state of Haryana on the east and by the state of Punjab on all other sides.

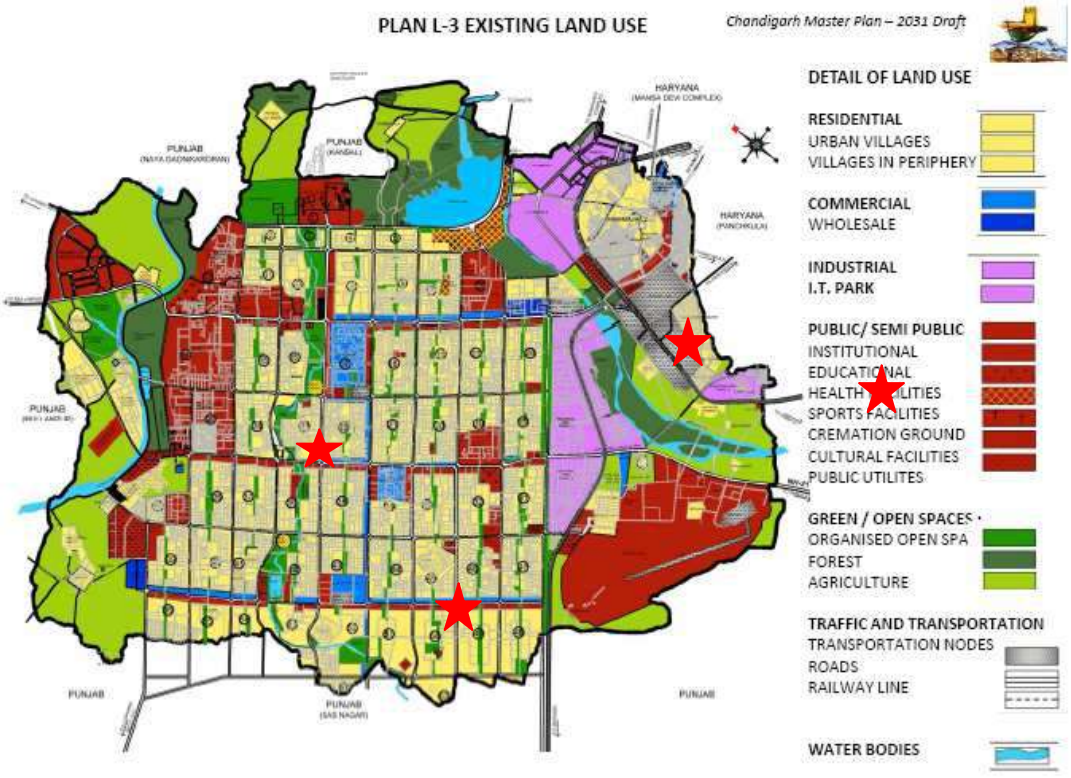
Maximum land use of Chandigarh is in urban category. State of Environment Chandigarh2018report by Department of Environment Chandigarh Administration, hascategorized the total area of Chandigarhbased on land use. Details are indicated in the table below.

Land use Type	Area (in acres)
Residential area	10672.16
Commercial area	1339.73
Transport	2046.1
Industrial area	1326.5
Public / semi-public	2968.79
Recreational	2428.47
Public Utility	302.33
Railway land	136.29
Defense	1573
Forest land	2113.97
Vacant	2046.1

Green belt	277.29
WTP / STP	302.33

Source: State of Environment Chandigarh - 2018

The location of the depots in the existing land-use map is shown in the following map:



Land use Map of Chandigarh

Depot 1 and 2 are in Industrial Area Phase 1 and the proposed new depot at Raipur kalan is in Industrial Area Phase 2. Depot 2 is located next to a reserve forest area along the river.

Surrounding Land use at Depot 1 and Depot 2

The proposed new depot at Raipur Kalan is situated in the boundary of Punjab State and is next to a residential area in Punjab.

Surrounding Land use at Proposed Depot at Raipur Kalan

This is not a conflicting land use as the location of the depot is proposed in industrial are Phase III of Union Territory of Chandigarh and is earmarked by Town Planning Department, Chandigarh. The depot is adjacent to residential area of state of Punjab which is outside the boundary of the depot.. The conflicting activities requires to be mitigated by providing mitigation measures that include providing noise barrierto prevent propagation of noise in residential area. The other impacts of effluent, storm water and solid waste will not be allowed to enter into the residential areaand no other facility of the residential area will be used for the construction and operation of depot. A suitable measurehas been provided in the EMP to handle the waste and effluent generated from the

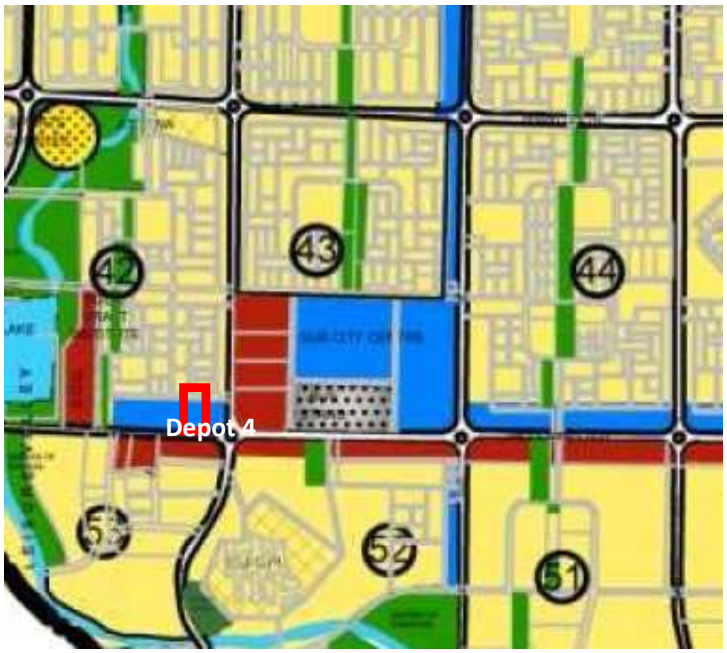
depot. The statutory land use is not conflicting, and it does not require to change the land use pattern for construction of depot.

Depot 3 and 4 are located under designated land use of Transportation nodes. Depot 3 is located next to the cremation ground. However, some residential quarters associated with the function is located next to the depot.

Surrounding Land use at Depot 3

Land Use map showing surrounding Land use at Depot 3

Depot 4 is located alongside the Interstate bus terminal and is flanked on two sides by designated commercial areas, though currently these are vacant.



Location of Depot 4 with designated Commercial Areas at its sides

3.4 GEOMORPHOLOGY AND SOILS

Four physiographic units are encountered in Chandigarh; The Siwalikrange trending NW-SE forms the northeastern boundary of Chandigarh and is exposed in a small patch on the northeastern side. Southwestern slopes of the foothills are covered with loose talus material deposited by hill torrents forming alluvial fans. The soils in UT Chandigarh are loamy sand at surface and calcareous sandy loam in subsurface layers. The hard clay forms pan at depths varying between 20 and 30m. In northern parts the soil is sandy to sandy loam where as it is loamy to silt loam in southern parts. The soils in Chandigarh are light yellowish brown to pale brown in color. Soils are calcareous and normally have kankar.

3.5 HYDRO GEOLOGY AND GROUND WATER

State of Environment Report Chandigarh 2018 indicates the status of ground water. Details are as indicated in the table below.

Status of Ground Water	2015	2016	2017
Annual replenishable ground water resource (MCM)	2156 ham	2159 ham	2159 ham
Available ground water resource	1940 ham	1943 ham	1943 ham
Balance ground water	1940 ham	1943 ham	1943 ham
Provision for Industrial / Domestic and other uses and natural disaster etc.	216 ham	216 ham	216 ham

Source: State of Environment Report Chandigarh 2018

The pre-monsoon and post monsoon ground water level range Below Ground Level (bgl) from the year 2013 to 2017 is indicated in the table below.

Year	Pre-monsoon water level range (m bgl)	Post monsoon water level range (m bgl)
2013	4.62 – 22.49	2.98 – 20.50
2014	2.05 – 21.48	2.55 – 20.50
2015	3.07 – 38.47	2.72 – 39.67
2016	3.09 – 30.97	2.82 – 28.85
2017	3.75 –42.52	2.44 – 41.16……

Chandigarh is recipient to heavy rainfall during the months of July to September and receives an annual rainfall of almost 1000 mm which calculates to 36.28 MGD per annum and this water is the source for recharging of ground water.

To reduce dependence on ground water a legal framework has been laid by the Chandigarh administration to make provision of rainwater harvesting mandatory while granting the additional covered area to all plots above 500 sqm area with order / notification dated 16.10.2008.

3.6 SURFACE WATER

Chandigarh is drained by two seasonal rivulets viz Sukhna Choe in theeast and Patiala-Ki-Rao Choe in the west. The central part hastwo minor steams. The stream passing through the central part is called N-Choe and theother Nala which initiates at Sector 29.

The N-choe or Attawa Choe originates near Punjab Civil Secretariat in Sector 2, Chandigarh and passes Rose Garden, through sectors 16, 23, 36, 41, 42 to village Kajheri. It then flows to Mohali Burail Jail and on to Phase 9 Mohali, 10, PCA Stadium, Sector 66, 67, and to the Chilla and Mohali villages. The stream then flows towards Patiala district and enters the Ghaggar river inHaryana.

The drainage system in Chandigarh comprises of a hierarchy of natural and man-madedrains and water bodies that ultimately discharge surface run-off into'N' choe. Numerous'N' choe constituting the major storm water drainage system for the area drain the City.The 'N' choes are the major carriers of storm water. Currently, storm water drains in thecity are constructed and maintained by the Municipal Corporation.

All depots are connected to the drainage system of the city.Depots 1 and 2 are located near Sukna Choe and the bus wash area directly drains into city drains.

The Surface Water System in Chandigarh

The adjoining area of Chandigarh is traversed by a number of major rivers, namely Sutlej, Ravi and Beas. There are, as well, a number of minor rivers, for example the Ghaggar, which are essentially seasonal. The drainage stream from Chandigarh flows into these streams. These minor rivers have some flow only during monsoon and dry up during the remaining part of the year.

3.7 SEISMICITY

Chandigarh and nearby areas fall under seismic zone IV signifying high susceptibility to earthquakes. It is close to the high-risk Kangra area of Himachal.The region also has dangerous

"active fault lines" beneath Southeastern sectors of Chandigarh like Sectors 47 to 51 and Sectors 15 and 38, besides Kaimbwala (near Sukhna Lake), Jagatpura and eastern part of Mohali have come under earthquake-prone areas.According to a recent study by the Geological Survey of India (GSI), this part of Chandigarh is more vulnerable as compared to its vicinity.

3.8 AIR QUALITY

Chandigarh is a well-planned city and is known for its architectural planning and landscaping. The rapid increase in population and vehicles have led to increase in pollution levels and thus posed a challenge. Studies have shown that the air quality in Chandigarh is mostly affected by vehicular pollution in the city. The fleet of vehicles is over 2 per capita household[1].

The major contributors of air pollution in Chandigarh are as follows:

- Vehicular density
- Roadside dust
- Burning of dry leaves
- Litter from trees and gardens of the city
- Operation of generator set in certain areas adjoining the city
- Stubble burning in specific season of the year in the neighboring areas of Chandigarh.

The report “Greening Chandigarh Action Plan – 2019-20” indicates that increase in no. of vehicles from 2,58,843 in 1991 to about 11.82 lakh vehicles in 2018. Compared to the neighboring cities / towns of Punjab and Haryana, the ambient air quality in Chandigarh is better. As per the monitoring data of Chandigarh Pollution Control Committee, SO_2 and NOx levels in Chandigarh are low but PM_{10} and $PM_{2.5}$ levels at times are matter of concern. The ambient air quality of Chandigarh is monitored at 5 locations namely sector 17, Industrial area, Punjab Engineering College, Government college IMTECH Sector 29 and Kaimbwala Village.

Annual average ambient air quality data at above 5 locations in Chandigarhare indicated in the table below.

Zone	Parameter	Revised Permissible Limit (µg/m^3)	Annual Average 2018 (µg/m^3)
Sector 17	RSPM	60	95
	PM 2.5	40	46
	SO_2	50	2
	NO_x	40	19
Industrial Area	RSPM	60	125
	PM 2.5	40	58
	SO_2	50	2

[1]Action Plan for Control of Air pollution in non-attainment city of Chandigarh, Chandigarh Administration, 2018

	NO_x	40	25
Punjab Engineering College	RSPM	60	100
	PM 2.5	40	46
	SO_2	50	2
	NO_x	40	16
Government College IMTECH Sector 39	RSPM	60	106
	PM 2.5	40	52
	SO_2	50	2
	NO_x	40	18
Kaimbwala Village	RSPM	60	103
	PM 2.5	40	50
	SO_2	50	2
	NO_x	40	14

Source: Greening ChandigarhAction Plan 2019-20, http://chandigarh.gov.in/greencap/gcap-2019/gap-intro-19.pdf

3.9 WATER QUALITY

The ground water quality of Chandigarh city in the year 2017 in terms of toxic elements, as per the State of Environment Chandigarh report 2018 is presented in the table below.

Source	Lead (Pb)mg/l	Cadmium (cd) mg/l	Manganese (Mn) mg/l	Iron(Fe) mg/l	Chromium (Cr) mg/l	Arsenic (As) mg/l
Water samples of tap water	0.009 – 0.015	0.006 – 0.007	0.000 – 0.030	0.013 – 1.390	-	-
Water samples of hand pump	0.000 – 0.110	0.004 – 0.006	0.001 – 0.800	0.100 – 3.430	-	-
Water samples of tube well	0.000 – 0.022	0.004 – 0.007	0.003 – 0.360	0.000 – 2.890	-	<0.01

Source: State of Environment Report Chandigarh 2018

The surface water quality has been tested on a monthly basis for the year 2018 at the following points:

1. Sukhna Choe exit point from Chandigarh,
2. N Choe exit point from Chandigarh,
3. Patiala Ki Rao Drain exit point from Chandigarh
4. Sukhna Lake

Annual range (Jan to Dec 2018)for parameters analyzed is indicated in the table below.

Parameters	Permissible Limit	Sukhna Choe	N Choe	Patiala ki rao	Sukhna lake

pH	5.5 to 9.0	7 – 7.5	6.6 – 7.4	7.2 – 7.8	7.4 – 8.2
Conductivity µs/cm	-	719 - 1018	551 - 724	910 - 1092	208 – 287
DO mg/l	-	0 – 2.2	Nil - 1	Nil	4.8 – 9.9
COD mg/l	250	148 - 546	82 - 261	125 - 709	13 – 64
BOD mg/l	30	64 - 270	49 - 161	53 - 437	1 - 4
NO_3- N mg/l	10	1.1 – 4.3	1.2 – 6.3	1.1 – 7.4	0.2 – 4.9
NH_3-N mg/l	50	20 - 41	15 - 29	23 - 51	0.49 – 1.89
Phosphate mg/l	5	1.4 – 3.94	1.03. – 3.3	BDL – 4.4	BDL – 0.24
TSS mg/l	100	136 - 418	37 - 149	301 - 586	12 - 112
TDS mg/l	-	199 - 580	259 - 390	438 - 689	138 - 286
TFS mg/l	-	283 - 565	236 - 324	415 – 30159	86 - 290
Turbidity NTU	-	148 - 300	92 - 160	210 – 31000	22 - 140
TH as $CaCO_3$ mg/l	-	106 - 270	190 - 242	230 – 340	96 - 160
Ca as $CaCO_3$ mg/l	-	84 - 162	100 - 142	152 - 210	72 - 130
Mg as $CaCO_3$ mg/l	-	22 - 120	72 – 110	50 - 140	30 – 80
Sulphate mg/l	-	51 - 85	51 – 74	32 - 85	11 - 29
Chloride mg/l	-	33 - 70	40 - 50	48 - 65	11 - 30
P – Alkalinity mg/l	-	Nil	Nil	Nil - 22	Nil - 12
Total alkalinity as $CaCo_3$	-	308 - 514	224 - 282	418 - 520	94 - 164
Fluoride mg/l	2	BDL – 0.22	BDL – 0.28	BDL – 0. 32	BDL – 30
Colour (Hazen)	-	30 - 50	20 - 30	30 - 60	5 - 10
Boron mg/l	-	0.15 – 0.25	0.12 – 0.21	0.16 – 0.28	0.06 – 0.19
TKN mg/l	-	1.5 – 7.3	3.9 - 26	4.3 – 8.9	3.7 – 6.5
Potassium mg/l	-	4 - 12	2 – 22	15 - 41	6 - 11
Sodium mg/l	-	16 - 48	17 – 47	55 - 89	23 - 48
Total Coliform MPN/100	-	2.7×10^4 - 7.6×10^6	3.2×10^4 – $7.6\ 10^6$	1.1×10^5 – 1.8×10^7	< 2 – 2×10^5
Faecal Coliform MPN / 100	-	1.1×10^4 – 3.2×10^6	1.8×10^4 – 8.0×10^6	9.3×10^4- 1.1×10^7	< 2 – 1.4×10^5

Source: State of Environment Report Chandigarh 2018, Chandigarh ENVIS

Depot 1 does not have washing facility, hence ETP is not required, however grease trap has been provided. Wastewater from the depot will be discharge into municipal drain which leads to STP. The effluent of STP is used for land discharge for irrigation.

Depot 2 and 3 have washing facility and ETP. Treated effluent is discharged into municipal drain which leads to STP.

So, the impacts on water environment specifically on the natural stream is insignificant and does not require any additional mitigation measures or monitoring plan which is not provided in the ESMP for depot 1, 2, 3 and Raipur Kalan.

The drinking water supply of the city is derived from the Bhakra Main Canal as well as the ground water sources. There are 155 tube wells discharging directly into Under Ground Reservoirs (UGRs) located at the prominent places under the control of water works and spread over the city. The ground water is appropriately mixed and supplied along with the treated water from the treatment plants.

3.10 NOISE LEVELS

Data was obtained from http://chandigarhenvis.gov.in/ on noise assessment carried out various locations in Chandigarh. The spatial variation of noise at the Inter State Bus Terminus, which is located next to Depot No 4, was also determined by measuring noise levels at different locations. The maximum noise level observed was 82 dB (A) and minimum was 69 dB (A) with an average of 76 dB (A).These are higher than the desirable levels of 65 dB (A). Noise levels inside the CTU repair workshop at Depot 3 were also measured. The average noiselevel recorded was 75 dB (A) with a maximum of 95 dB (A) and minimum of 65 dB (A). These are high enough to cause physical discomfort to the workers.

The noise levels were also measured inside a CTU bus. The average noise level observed was 85 dB (A) with a maximum of91 dB (A) and a minimum of 79 dB (A). This can cause discomfort to passengers sitting inside the bus as the permissible limits as per GoI norms is 85 dB (A) at 1 m from the bus outside.

3.11 BIOLOGICAL ENVIRONMENT

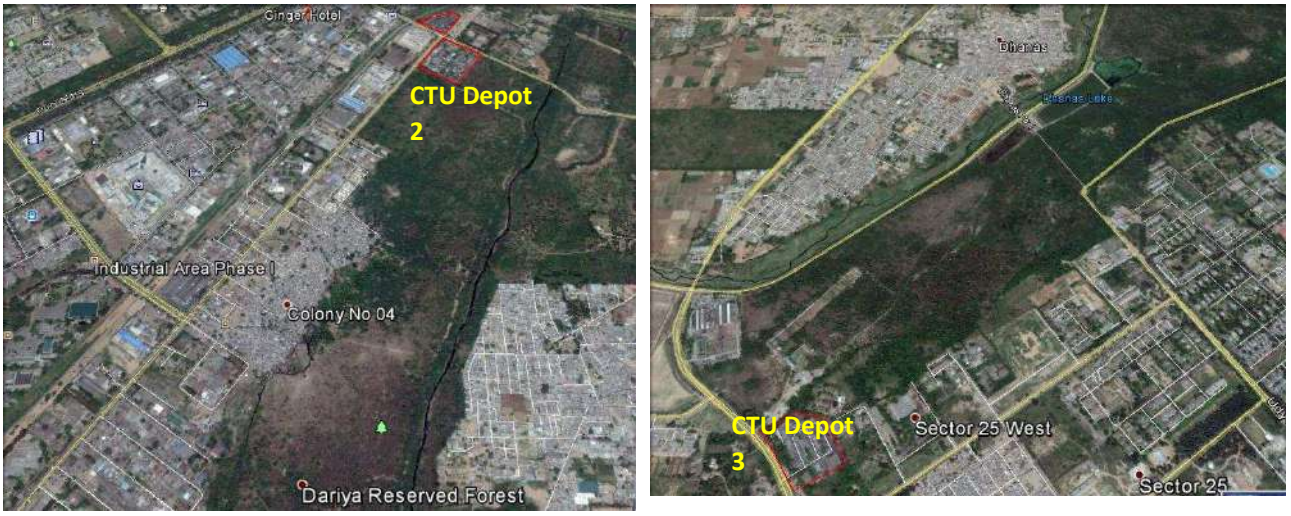
The major ecological feature in the study area are the Siwalik hills and the Sukhna Sanctuary. Total forest area in U.T.Chandigarh is 3245.30 hectares as shown in the following table:

SR.NO.	NAME OF THE FORESTS	AREA IN HECTARES
1.	Sukhna Wildlife Sanctuary	2610.99
2.	Lake Reserve forests	105.57
3.	Sukhna choe Reserve forests	387.12
4.	Patiali-ki-Rao forests	136.19
5.	Forest area at Brick kiln Manimajra	5.53
	Total:	**3245.30**

Forests in Chandigarh

Major forest type occurring in the Union Territory is Tropical Dry Deciduous. The common trees are Acacia and bamboo. There is no trace of chir (Pinus roxburghii) and sal (Shorea robusta) in the Chandigarh Shivalik Hills, however, some patches of these trees do exist in the Morni Shivalik Hills. The trees are less in number with xerophytes, thorny and spiny species, predominating throughout the range. Scattered trees of the other species grow in small groups except for the closed forests where the tress are in abundance.

Depot 2 is located adjacent to and flanked by the reserve forest of Dariya on two sides.Depot 3 is located close to the Patiala ki Rao Choe forest area



Forest locations Near Depot 2 and 3

3.12 STAKE HOLDER ENGAGEMENT

Stakeholder Engagement plan includes the identification of stakeholder, its nature of engagement and subsequently development of stakeholder engagement plan. The key stakeholders identified are given below.

i. Local Community – The project does not have project affected people directly impacted by the project by acquisition of land or assets. The local community shall be affected by construction and operation of bus depot. These include community located within close vicinity of the project.
ii. Bus users – The bus users are also stakeholder of this project.
iii. Department of Architecture – The department of Architecture has been entrusted by the government to design the depot.
iv. Municipal Corporation – water supply, health and sanitation, solid waste management , sewerage system, fire and emergency services, storm water drainage, street lighting.
v. Chandigarh State Pollution Control Committee – Obtain consent to establish and consent to operate for the depots.
vi. Police Department – Security and safety of the depots

3.13 PUBLIC CONSULTATIONS

User Satisfaction Survey were carried in Chandigarh by MDRA in February 2014. The findings of the same have been elaborated in the earlier chapters. Stake holder consultation was initiated by CTU and the advertisements inviting the public was placed in local newspaper, though CTU did not receive any response from the same.

ਹੋਰ ਜਾਣਕਾਰੀ ਯੂਨੀਵਰਸਿਟੀ ਵੈਬਸਾਈਟ www.punjabiuniversity.ac.in ਤੋਂ ਉਪਲਬਧ ਹੈ। 180/ਬੀ.ਪੀ.ਆਰ.

ਦਿਨਾਂਕ 28-6-2014

ਵਾਤਾਵਰਨ ਤੇ ਸਮਾਜਿਕ ਪ੍ਰਬੰਧਨ ਫਰੇਮ ਵਰਕ ਬਾਰੇ ਮੁਹਾਟਾਦਾ

ਗਲੋਬਲ ਇਨਵਾਇਰਨਮੈਂਟਲ ਫੈਸੀਲਿਟੀ (ਜੀ ਈ ਐਫ.)-ਯੂਰੀਸੀਏਟ ਐਂਡ ਸਸਟੇਨੇਬਲ ਸਿਟੀ ਬੱਸ ਟਰਾਂਸਪੋਰਟ ਸਰਵਿਸ ਪ੍ਰਾਜੈਕਟ (ਦੀ ਐਸ ਸੀ ਬੀ ਐਸ ਪੀ.) ਨੂੰ ਲਾਗੂ ਕਰਨ ਵਾਸਤੇ ਪ੍ਰਾਜੈਕਟ ਸਿਟੀਜ਼ ਦੇ ਰੂਪ ਵਿੱਚ ਚੰਡੀਗੜ੍ਹ ਟਰਾਂਸਪੋਰਟ ਅੰਡਰਟੇਕਿੰਗ (ਸੀ.ਟੀ.ਯੂ.) ਦੀ ਚੋਣ ਕੀਤੀ ਗਈ ਹੈ। ਪ੍ਰਾਜੈਕਟ ਦਾ ਉਦੇਸ਼ ਭਾਰਤ ਦੇ ਸ਼ਹਿਰੀ ਟਰਾਂਸਪੋਰਟ ਸਿਸਟਮਾਂ ਵਿੱਚ ਸਿਟੀ ਬੱਸ ਆਪ੍ਰੇਸ਼ਨਜ਼ ਨੂੰ ਉਤਸ਼ਾਹ ਦੇਣਾ ਹੈ। ਭਾਰਤ ਸਰਕਾਰ ਦਾ ਸ਼ਹਿਰੀ ਵਿਕਾਸ ਮੰਤਰਾਲਾ (ਐਮ.ਓ.ਯੂ.ਡੀ.) ਪ੍ਰਾਜੈਕਟ ਨੂੰ ਲਾਗੂ ਕਰਨ ਲਈ ਜ਼ਿੰਮੇਵਾਰ ਪ੍ਰਮੋਨਿਯੀ ਹੈ।

ਸੀ.ਟੀ.ਯੂ. ਲਈ ਪ੍ਰਾਜੈਕਟ ਦੇ ਤਹਿਤ ਸਬ ਕੰਪੋਨੈਂਟਸ ਵਿੱਚ ਨਵੇਂ ਡਿੱਪੂ ਦੀ ਉਸਾਰੀ, ਚੁਨਿੰਦਾ ਤਕਨੀਕੀ ਸਹਾਇਤਾ ਸਟੱਡੀਜ਼ ਸਹਿਤ ਸਿਟੀ ਬੱਸ ਸਰਵਿਸਿਜ਼ ਨੂੰ ਸੁਵਿਧਾਵਾਂ ਪ੍ਰਦਾਨ ਕਰਨ ਲਈ ਮਾਡਰਨ ਬੱਸ ਡਿੱਪੂ ਉਪਕਰਣਾਂ ਤੇ ਆਈ ਟੀ ਐਸ./ਐਮ.ਆਈ ਐਸ. ਉਪਕਰਣਾਂ ਦੀ ਖਰੀਦ ਕਰਨਾ ਸ਼ਾਮਲ ਹੋਵੇਗਾ। ਪ੍ਰਾਜੈਕਟ ਨੂੰ ਭਾਰਤ ਸਰਕਾਰ, ਰਾਜ ਸਰਕਾਰ ਤਰਾਂਟਸ ਦੇ ਮਾਧਿਅਮ ਨਾਲ ਜੀ ਈ ਐਫ. ਅਤੇ ਸੀ.ਟੀ.ਯੂ ਦੇ ਆਪਣੇ ਫੰਡਾਂ ਦੇ ਸੁਮੇਲ ਨਾਲ ਫੰਡ ਪ੍ਰਾਪਤ ਹੋਣਗੇ।

ਵਿਸ਼ਵ ਬੈਂਕ ਦੀਆਂ ਵਾਤਾਵਰਨ ਤੇ ਸਮਾਜਿਕ ਨੀਤੀਆਂ ਅਤੇ ਪ੍ਰਾਜੈਕਟ ਨਾਲ ਸਬੰਧਤ ਰਾਜਾਂ ਬਾਰੇ ਭਾਰਤ ਸਰਕਾਰ ਦੀਆਂ ਲਾਗੂ ਹੋਣ ਵਾਲੀਆਂ ਪ੍ਰਕਿਰਿਆਵਾਂ ਦੀਆਂ ਲੋੜਾਂ ਦੇ ਅਨੁਰੂਪ ਪ੍ਰਾਜੈਕਟ ਪਲਾਨਿੰਗ, ਡਿਜ਼ਾਈਨ ਅਤੇ ਇੰਪਲੀਮੈਂਟੇਸ਼ਨ ਦੇ ਏਕੀਕਰਨ ਲਈ ਇਕ ਵਾਤਾਵਰਨ ਤੇ ਸਮਾਜਿਕ ਪ੍ਰਬੰਧਨ ਫਰੇਮ ਵਰਕ (ਈ ਐਸ ਐਮ ਐਫ.) ਤਿਆਰ ਕੀਤਾ ਗਿਆ ਹੈ। ਦੀ ਐਸ ਸੀ ਬੀ ਐਸ ਪੀ. ਨੂੰ ਲਾਗੂ ਕਰਨ ਨਾਲ ਵਾਤਾਵਰਨ ਤੇ ਸਮਾਜਿਕ ਸੁਰੱਖਿਆ ਤੋਂ ਹੋਣ ਵਾਲੇ ਅਸਰ ਨੂੰ ਦੂਰ ਕਰਨ ਵਾਸਤੇ ਦੀ ਐਸ ਐਮ ਐਫ. ਅਧੀਨ ਸਿਧਾਂਤ ਅਤੇ ਦਿਸ਼ਾ-ਨਿਰਦੇਸ਼ ਤੈਅ ਕੀਤੇ ਗਏ ਹਨ।

ਦੀ ਐਸ ਐਮ ਐਫ. ਦਾ ਡਰਾਫਟ ਤਿਆਰ ਕੀਤਾ ਗਿਆ ਹੈ ਅਤੇ ਹੁਣ ਸੀ.ਟੀ.ਯੂ. ਵੈਬਸਾਈਟ http://chdctu.gov.in 'ਤੇ ਆਨਲਾਈਨ ਸੁਲੱਭ ਹੈ ਅਤੇ ਡਾਇਰੈਕਟਰ ਟਰਾਂਸਪੋਰਟ, ਯੂ.ਟੀ., ਚੰਡੀਗੜ੍ਹ ਪਲਾਟ ਨੰ. 701, ਇੰਡਸਟਰੀਅਲ ਏਰੀਆ, ਫੇਜ਼-I, ਚੰਡੀਗੜ੍ਹ ਦੇ ਦਫਤਰ ਵਿੱਚ ਹੀ ਸਮੀਖਿਆ ਲਈ ਸੁਲੱਭ ਹੈ।

ਸਾਰੇ ਚਾਹਵਾਨ ਸਟੇਕ ਹੋਲਡਰਾਂ ਨੂੰ ਦੀ ਐਸ ਐਮ ਐਫ. ਡਰਾਫਟ ਦੀ ਸਮੀਖਿਆ ਕਰ ਲਈ ਬੇਨਤੀ ਕੀਤੀ ਜਾਂਦੀ ਹੈ ਅਤੇ ਉਹ ਇਸ ਨੂੰ ਲਾਗੂ ਕਰਨ ਲਈ ਵਿਵਹਾਰਕ ਅਤੇ ਅੰਤਰ ਰੂਪ ਦੇਣ ਵਾਸਤੇ 11.7.2014 ਨੂੰ 17.00 ਵਜੇ ਤੱਕ ਆਪਣੇ ਵਿਚਾਰ, ਰੁਚੀ, ਟਿੱਪਣੀਆਂ ਅਤੇ ਸ਼ਿਕਾਇਤਾਂ, ਜੇਕਰ ਹੋਣ ਦੱਸੇ ਅਨੁਸਾਰ ਪਤੇ 'ਤੇ ਭੇਜਣ। ਵਿਚਾਰ ਡਾਇਰੈਕਟਰ ਟਰਾਂਸਪੋਰਟ, ਯੂ.ਟੀ., ਚੰਡੀਗੜ੍ਹ, ਪਲਾਟ ਨੰ. 701, ਇੰਡਸਟਰੀਅਲ ਏਰੀਆ, ਫੇਜ਼-I, ਚੰਡੀਗੜ੍ਹ ਨੂੰ ਲਿਖਤੀ ਰੂਪ ਵਿੱਚ ਜਾਂ ctu-chd@nic.in 'ਤੇ ਈਮੇਲ ਕੀਤੇ ਜਾ ਸਕਦੇ ਹਨ।

ਦੀ ਐਸ ਐਮ ਐਫ. 'ਤੇ ਚਰਚਾ ਕਰਨ ਲਈ ਜਨਤਕ ਬੈਠਕ 18.7.2014 ਨੂੰ ਸਵੇਰੇ 11.00 ਵਜੇ ਡਾਇਰੈਕਟਰ ਟਰਾਂਸਪੋਰਟ, ਯੂ.ਟੀ., ਪਲਾਟ ਨੰ. 701, ਇੰਡਸਟਰੀਅਲ ਏਰੀਆ, ਫੇਜ਼-I, ਚੰਡੀਗੜ੍ਹ ਦੇ ਦਫਤਰ ਵਿੱਚ ਹੋਵੇਗੀ। ਸਾਰੇ ਚਾਹਵਾਨ ਸਟੇਕ ਹੋਲਡਰਾਂ ਨੂੰ ਹਿੱਸਾ ਲੈਣ ਲਈ ਸੱਦਾ ਦਿੱਤਾ ਜਾਂਦਾ ਹੈ।

ਸਹੀ/-
ਡਾਇਰੈਕਟਰ ਟਰਾਂਸਪੋਰਟ
ਕੇਂਦਰ ਸ਼ਾਸਤ ਪ੍ਰਦੇਸ਼, ਚੰਡੀਗੜ੍ਹ

...ot any tender without assigning any reason.

Sd/-
Chief Executive Officer,
Cantonment Board, Ambala

Punjabi Rojana
28-06-2014

पर्यावरण तथा सामाजिक प्रबंधन फ्रेमवर्क के लिए डिस्क्लोजर

चण्डीगढ़ ट्रांसपोर्ट अंडरटेकिंग (सीटीयू) ग्लोबल एन्वायरनमैंटल सुविधा (जीईएफ) कुशल तथा सस्टेनेबल सिटी बस ट्रांसपोर्ट सर्विस प्रॉजैक्ट (ईएससीबीएसपी) को लागू करने के लिए एक प्रॉजैक्ट सिटी के तौर पर चयनित किया गया है। प्रॉजैक्ट का उद्देश्य भारत के अर्बन ट्रांसपोर्ट सिस्टम में सिटी बस आप्रेशन को उत्साहित करना है। शहरी विकास मंत्रालय (एमओयूडी) भारत सरकार, प्रतिनिधि प्रॉजैक्ट को लागू करने का जिम्मेदार है।

प्रॉजैक्ट के अधीन सीटीयू के लिए सब-कम्पोनैंट में नए डिपो का निर्माण, आधुनिक बस डिपो इक्विपमैंट तथा आईटीएस/एमआईएस इक्विपमैंट की चुनिंदा तकनीकी सहायता अध्ययन के साथ सिटी बस सेवाओं की सुविधा हेतु खरीद शामिल है। प्रॉजैक्ट की फंडिंग भारत सरकार, राज्य सरकार जीईएफ से प्राप्त ग्रांटों तथा सीटीयूज फंडों के सम्मिश्रण से होगी।

प्रॉजैक्ट प्लानिंग, डिजाइन तथा इम्प्लीमैंटेशन में एन्वायरनमैंटल तथा सामाजिक विचारधारा जोड़ने के लिए एक एन्वायरनमैंटल एवं सोशल मैनेजमैंट फ्रेमवर्क (ईएसएमएफ) तैयार किया गया है जोकि जीओएल प्रॉजैक्ट राज्यों में लागू प्रोसीजरों की आवश्यकताओं की कतार में है एवं विश्व बैंक की एन्वायरनमैंटल तथा सामाजिक नीतियों के अनुसार है। ईएसएमएफ, ईएससीबीएसपी की इम्प्लीमैंटेशन के कारण एन्वायरनमैंटल तथा सोशल सेफगार्ड के लिए नियम तथा गाइडलाइनें प्रदान करता है।

ईएसएमएफ का एक ड्राफ्ट तैयार किया गया है तथा वर्तमान में सीटीयू वैबसाइट http://chdctu.gov.in पर ऑनलाइन उपलब्ध है तथा रिव्यू के लिए कार्यालय निदेशक ट्रांसपोर्ट यू.टी. चण्डीगढ़, प्लाट नं. 701, इण्डस्ट्रीयल एरिया फेज-1, चण्डीगढ़ में भी उपलब्ध है।

सभी इच्छुक स्टेकहोल्डरों से निवेदन है कि ड्राफ्ट ईएसएमएफ पर विचार करें तथा अपने विचार, जरूरतें, कामैंट तथा शिकायतों का यदि कोई हो 11.07.2014 को 17.00 बजे अपने विचार मुहैया कराएं ताकि बताने/एन्कार्पोरेट करके ईएसएमएफ को अंतिम रूप दिया जा सके। विचार ई-मेल द्वारा ctu-chd@ nic.in पर ई-मेल किए जा सकते हैं या लिखित रूप में निदेशक ट्रांसपोर्ट यू.टी. चण्डीगढ़, प्लाट नं. 701, इण्डस्ट्रीयल एरिया फेज-1, चण्डीगढ़ को भेजे जा सकते हैं।

ईएसएमएफ पर विचार करने के लिए एक सार्वजनिक मीटिंग 18.07.2014 को प्रातः 11.00 बजे कार्यालय निदेशक ट्रांसपोर्ट यू.टी., प्लाट नं. 701, इण्डस्ट्रीयल एरिया फेज-1, चण्डीगढ़ में आयोजित की जाएगी। सभी इच्छुक स्टेकहोल्डर को भाग लेने का आमंत्रण है।

निदेशक ट्रांसपोर्ट
यूनियन टैरीटरी चण्डीगढ़

DPRUT/27.06.14

Stakeholder Consultation

A repeated consultation has been conducted and the list are given below.

Meeting held in the office of W/Secretary Transport UT Chandigarh Administration
Date – 24.09.2018
Attendees :

1. Chairman W/Secretary Transport, Chandigarh Administration
2. Sh. Amit Talwar, PCS, Additional Secretary Transport-cum director transport, U.T. Chandigarh
3. Sh. Sanjeeb Singh, Sub divisional Engineer, O/o Chief Engineer, U.T. Chandigarh
4. Sh. Amit Gupta , General Manager CTU Chandigarh
5. Sh. Sanjeeb Kumar, Architect, U.T. Chandigarh
6. Ms. Gagandeep Kaur Dhillon, Assistant Architect, U.T. Chandigarh

Meeting held in the office of W/Secretary Transport UT Chandigarh Administration
Date – 24.09.2018
Attendees:

1. Chairman W/Secretary Transport, Chandigarh Administration
2. Sh. Amit Talwar, PCS, Additional Secretary Transport-cum director transport, U.T. Chandigarh
3. Sh. Amit Gupta , General Manager CTU Chandigarh
4. Sh. C.B.Ojha, S.E. O/o Chief Engineer, U.T. Chandigarh
5. Sh. Rajinder Singh, Senior Architect, U.T. Chandigarh
6. Sh Sanjeeb Kumar, Architect, U.T. Chandigarh
7. Ms. Gagandeep Kaur Dhillon, Assistant Architect, U.T. Chandigarh

The outcome of the meetings held are given below

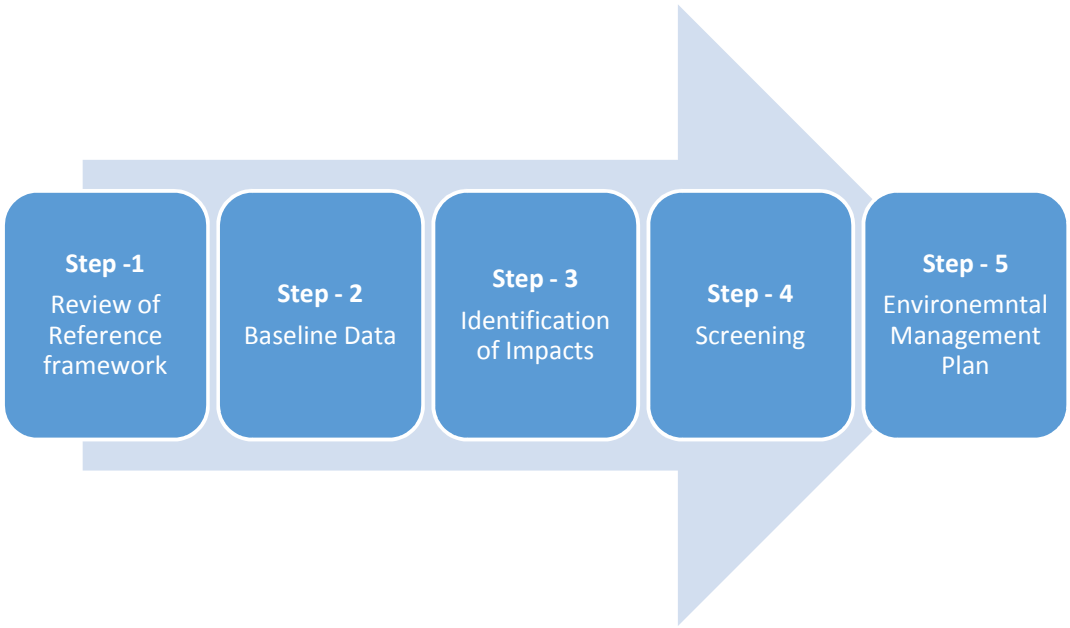
- A rough cost estimate of the depot may be prepared in right earnest. In case the same crosses the 50.00 Cr limit, the same may be sent to the Secretary, MoHUA being the line ministry for approval (as per the delegation of financial power).
- The Scenario in long run is going to be E-mobility, the civil structure be adopted to home heavy cabling to bus point from substation although electric work shall be done only when we get electric bus over long run.
- Hard noise barrier will be provided along the boundary of the adjacent residential area;
- Effluent treatment plant and rainwater harvesting, and ground water recharge structure will be provided in the Raipur Kalan as advised by the World Bank Team;
- Road safety at the entry and exit of the depot, the matter have been examined by the Architecture Department of Urban Planning Department upon suggestion of CTU to consult the traffic police department to control the speed of the vehicles and to take care of conflicts with buses while entering the CTU depot, Raipur Kalan. Locations of speed breakers have been proposed on minor roads. At pedestrian crossing sign board with yellow blinkers may be provided as per IRC norms. At locations where maximum number of pedestrian crossing occur a tabletop pedestrian crossing is proposed.

4 ENVIRONMENTAL IMPACTS

Many of the components of the City Bus Modernization Plan (for example, ITS, Fare Integration etc.) are expected to have negligible direct impact on the environment. Components like bus fleet augmentation, though contributing to the emission levels in the city; has an overall positive impact owing to the corresponding potential decrease in private vehicular emissions. This is especially pertinent since there is an increasing trend in private vehicle ownership in the city, which contributes to the air pollution. A major part of the negative impacts associated with the plan arises from the existing depots and the proposed depot for servicing the vehicles. The location of a Central Workshop, City Bus Interchange Station and the future depots has not been identified as not required except Raipur Kalan Depot and does not come under the purview of the current project. Hence the main focus on the impact assessment is on the activities associated with the current depot sites at four locations and the proposed depot at Raipur Kalan.

4.1 METHODOLOGY

The overall methodology will be as indicated in the figure below



Detailed methodology or the steps identified for conducting Environmental impact Assessment for the existing depots1, 2 and 3 and the new depot at Raipur Kalan are discussed below.

4.1.1 Review of Legislation and Policies

The following reference frameworks are considered for the proposed study:

- Central and Union territory level applicable environmental legislations
- World Bank Safeguard policies
- General World Bank EHS guidelines

The list of applicable environmental legislations and world bank policies are as indicated in the table below.

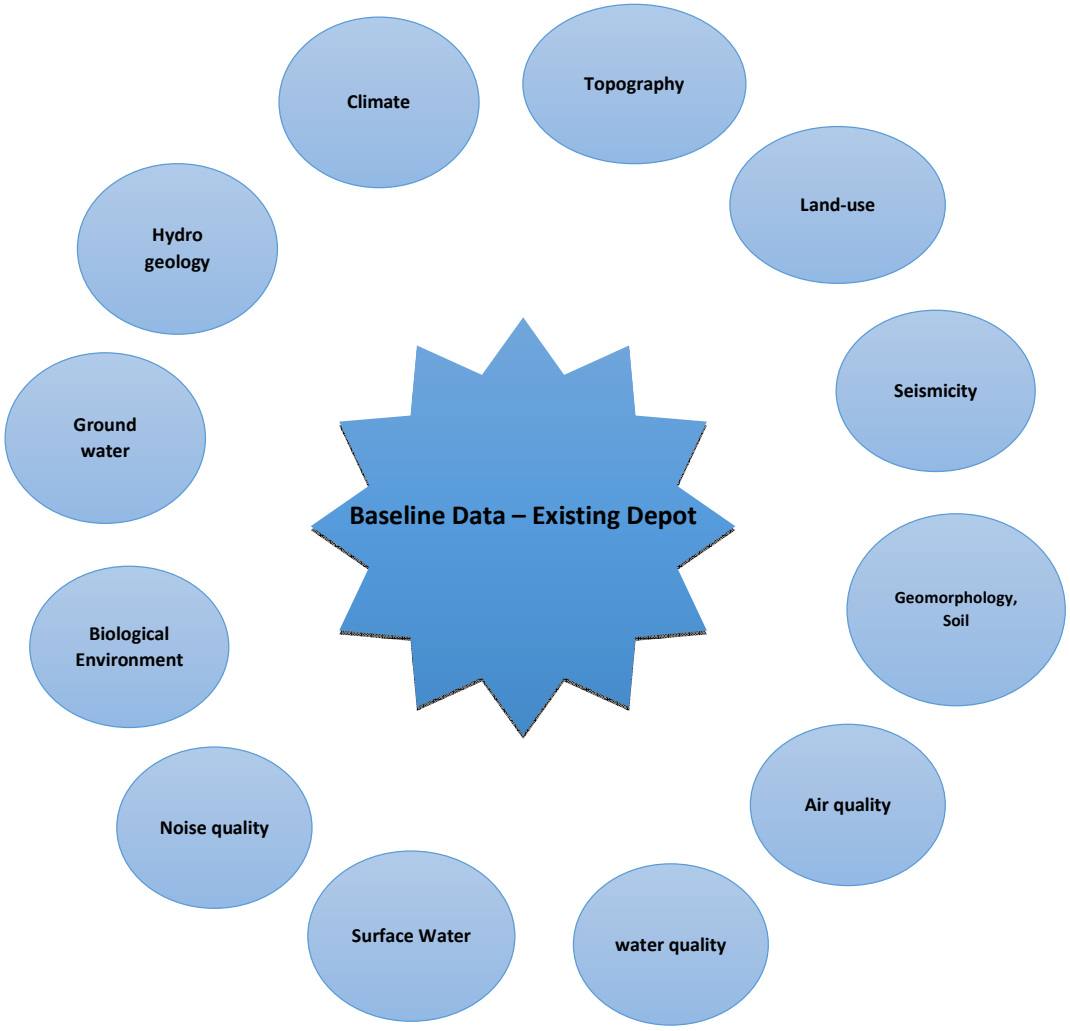
S. No	Legislation / Policies
Applicable Environmental legislations (Central and Regional Level)	

S. No	Legislation / Policies
1	Environmental Protection Act 1986 and Environmental Protection Rules, 1986 amended 1993
2	Environmental Impact Assessment Notification, 2006
3	Water (Prevention & Control of Pollution) Act, 1974, Water (Prevention & Control of Pollution) Cess Act, 1977
4	Air (Prevention & Control of Pollution) Act, 1981
5	Noise (Pollution Control and Regulation) Rules, 2000
6	Battery (Management & Handling) Rules, 2001
7	The Factories Act, 1948
8	The Petroleum Act, 1934
9	Ancient Monuments and Archaeological Sites and Remains Act, 1958
10	Rainwater harvesting (Order/Notification dated 16.10.2008 of Chandigarh Administration)
11	Manufacture, Storage & Import of Hazardous Chemical Rules, 1989; Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008
12	The Buildings and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996
13	The Motor Vehicles Act, 1988,
14	The Punjab Capital (Development and Regulation) Act 1952
15	The Punjab Capital (Development and Regulation) Building Rules,1952
16	Chandigarh Tree Preservation Order 1952
17	Construction and Demolition Waste Management Rules, 2016
18	National Auto Fuel Policy and Emission Norms
Applicable World Bank Policies	
1	OP/BP 4.02: Environmental Action Plans
2	OP/BP 4.11 Physical Cultural Resource

The existing and applicable environmental legislation of Government of India and Union Territory of Chandigarh and applicable World Bank's safeguard policies triggered by the project was conducted to understand the requirement and level of sensitivity of the proposed Project.

4.1.2 Existing Depot

Baseline data for the existing depot of Chandigarh city has been complied based on secondary sources and filed visit.



4.1.2.1 New Depot – Raipur Kalan

For new depot at Raipur Kalan, primary data shall be generated before start of construction for setting baseline condition.

4.1.3 Impact Identification

Potential impacts were identified during pre-construction, construction and operation stage of the project for the following environmental receptors such as land, land-use, air quality, water source and quality, energy demand, noise quality, ecology, cultural heritage, occupational health and safety and community.

4.1.3.1 Existing Depot

Impact identification for the existing depot was conducted based on observations made during field visit to the depots to understand the present condition of the depot and identify potential impacts due to proposed augmentation and modernization plan.

4.1.3.2 New Depot – Raipur Kalan

For the proposed new Raipur Kalan depot, impact identification was conducted based visit to proposed site, discussion with CTU officials and review of developmental plan.

Visit to the proposed site

Consultation with CTU Officials

Review of Developmental Plan

4.1.4 Screening

Screening matrix has been developed for type of impacts on various environmental parameters and activities proposed in the depots. This help to assign level significance to impacts identified on environmental parameters due to the proposed activities in the existing and new depot.

4.1.5 Environmental Management Plan

- Environmental Management Plan has been formulated to recommend mitigation measures for identified environmental impacts along with responsibilities assigned to each mitigation measures.
- Environmental monitoring plan has been proposed to ensure proper implementation and monitoring of mitigation measures.

  The cost for implementing the mitigation measures and carrying out environmental monitoring has also been worked out.

4.2 SCREENING

The screening of environmental impact assessment has been conducted considering construction and operation of bus depot in absence of mitigation measures based on the screening, the significance of impact has been defined in subsequent paragraphs.

Types of impacts considered in the screening process:

1. No impact – no impact is considered when the particular activity does not have impact on the environmental attributes. Hence, it doesnot require physical mitigation, management interventions to avoid, minimize or mitigate impacts, and monitoring.
2. Insignificant impacts –the insignificant impact of a particular activity on environmental attributes are either acceptable or some interventions are required to avoid minimize and mitigate impacts. It does not require monitoring
3. Significant impacts – the significant impact of a particular activity of proposed project on environmental attributes requires mitigation measures to avoid, minimize, mitigate and compensate impacts.

Raipur Kalan

Type of Impacts	Land use	Ambient Air Environment	Water environment	Noise level	ecology	Cultural Heritage	Occupational Health and Safety	Community Health and Safety
Pre-construction								
Land requirement	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Utility Diversion	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Statutory clearances	No Impact	Significant	Significant	No Impact	No Impact	No Impact	No Impact	No Impact
Site preparation	No Impact	insignificant	No Impact	No Impact	No Impact	No Impact	insignificant	insignificant
Construction								
Construction material	No Impact	insignificant	No Impact	insignificant	No Impact	No Impact	insignificant	insignificant
Water for construction	No Impact	No Impact	insignificant	No Impact	No Impact	No Impact	No Impact	No Impact
Sand for construction	No Impact	No Impact	No Impact	No Impact	insignificant	No Impact	insignificant	No Impact
Construction camp	No Impact	insignificant	insignificant	insignificant	No Impact	No Impact	Significant	Significant
Workers camp	No Impact	No Impact	significant	No Impact	insignificant	No Impact	No Impact	significant
Disposal of construction waste	No Impact	insignificant	insignificant	No Impact	significant	No Impact	insignificant	Significant
Handling of fuel and lubricants	No Impact	insignificant	significant	No Impact	No Impact	No Impact	significant	significant
Operation of construction machineries	No Impact	insignificant	No Impact	insignificant	No Impact	No Impact	significant	significant
Operations								
Storage of flammable materials like chemicals oil, gas cylinders	No Impact	Significant	Significant	No Impact	No Impact	No Impact	significant	significant
Storage, use or disposal of new or used coolant	No Impact	No Impact	insignificant	No Impact	No Impact	No Impact	No Impact	No Impact
Storage of new / used tyres	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	significant	significant
Storage and disposal of batteries	No Impact	insignificant	No Impact	No Impact	No Impact	No Impact	significant	No Impact
Storage and disposal of	No	insignificant	insignificant	No Impact	No Impact	No Impact	No Impact	No Impact

Type of Impacts	Land use	Ambient Air Environment	Water environment	Noise level	ecology	Cultural Heritage	Occupational Health and Safety	Community Health and Safety
used cleaning rags	Impact							
Storage and disposal of other materials like drums, packaging materials	No Impact	insignificant	insignificant	No Impact	No Impact	No Impact	No Impact	No Impact
Use of electrical equipment, air compressors and tools	No Impact	insignificant	insignificant	No Impact	No Impact	No Impact	significant	No Impact
Movement of buses from access road to depot	No Impact	significant	No impacts	significant	No Impact	No Impact	insignificant	significant
Movement of buses within depot	No Impact	significant	No impacts	significant	No Impact	No Impact	significant	No impact
Bus washing	No Impact	No impact	significant	No impact	No impact	No Impact	No Impact	No impact
Use of generators	No Impact	Insignificant	insignificant	insignificant	No impact	No impact	No Impact	No impact
Spray painting	No Impact	significant	insignificant	No impact	No impact	No impact	significant	No impact
Washing of maintenance shed floors	No Impact	No impact	significant	No impact	No impact	No impact	No impact	No impact

Other Operational Depot

Type of Impacts	Land use	Air quality	Water quality	Noise level	ecology	Cultural Heritage	Occupational Health and Safety	Community Health and Safety
Operations								
Storage of flammable materials like chemicals oil, gas cylinders	No Impact	In significant	insignificant	No Impact	No Impact	No Impact	insignificant	significant
Storage, use or disposal of new or used coolant	No Impact	No Impact	insignificant	No Impact	No Impact	No Impact	No Impact	No Impact
Storage of new / used tyres	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	insignificant	insignificant
Storage and disposal of batteries	No Impact	insignificant	No Impact	No Impact	No Impact	No Impact	significant	No Impact

Storage and disposal of used cleaning rags	No Impact	insignificant	insignificant	No Impact	No Impact	No Impact	No Impact	No Impact
Storage and disposal of other materials like drums, packaging materials	No Impact	insignificant	insignificant	No Impact	No Impact	No Impact	No Impact	No Impact
Use of electrical equipment, air compressors and tools	No Impact	insignificant	insignificant	No Impact	No Impact	No Impact	Insignificant	No Impact
Movement of buses from access road to depot	No Impact	insignificant	No impacts	insignificant	No Impact	No Impact	insignificant	significant
Movement of buses within depot	No Impact	insignificant	No impacts	insignificant	No Impact	No Impact	insignificant	No impact
Bus washing	No Impact	No impact	insignificant	No impact	No impact	No Impact	No Impact	No impact
Use of generators	No Impact	Insignificant	insignificant	insignificant	No impact	No impact	No Impact	No impact
Spray painting	No Impact	insignificant	insignificant	No impact	No impact	No impact	insignificant	No impact
Washing of maintenance shed floors	No Impact	No impact	insignificant	No impact	No impact	No impact	No impact	No impact

4.3 IMPACTS ON LAND

During construction stage the following impacts are anticipated at the Raipur Kalan depot site:

- Soil erosion due to clearing and grubbing works
- Impact due to construction waste disposal
- Soil erosion at borrow areas for construction.

Impacts on landforms are not anticipated at any of the existing depot sites, all sites being on flat and on level ground. The existing storm water drains at depots 1, 2 and 3 are found to be clogged and inefficient in draining the area. The existing depot no. 2 is reported to encounter flooding during monsoon. It is important that the storm water drainage system in these depots be revamped, since flooding of the depot causes mixing of potential contaminants with rainwater.

Potential leakages from stored batteries at depots, especially electrolyte fluid in used batteries could have lead that has a potential to contaminate the soil. Management measures mentioned for storing batteries and management of spills and leaks mentioned in the EMP can reduce this impact. Other project components like bus fleet augmentation, bus shelter constructions etc. also are not likely to have any significant impact on land. Similarly, oil spills and dumping of wastes like old tube lights can contaminate soil. Mitigation measures for the same have been detailed out in the EMP section.

4.4 IMPACT ON LAND USE

The land use adjacent to the proposed depot at Raipur Kalan is residential, which falls in the adjacent state of Punjab.during the construction stage, air and noise impacts are anticipated.. This can impact the residential areas surrounding it. However, these are temporary impacts and can be mitigated by appropriate environmental management measures. No major negative impacts are anticipated on the surrounding land uses at other depots. Housing of the staff of cemetery adjoining Depot 3 will also not be impacted as the impacts will be limited to the depot boundary.

At the proposed depot site at Raipur Kalan, large underground pipelines with inspection chambers located intermittently were observed near the site. However, CTU confirmed that these are beyond the site boundary and along the proposed new road as per the Master Plan for the city, hence there is no impact due to the same.

4.5 IMPACT ON WATER SOURCES

The major water requirement at the depots is for bus washing systems. Based on the actual no. of bus fleets for each depot and considering water consumption of 200 liters /bus (based on

water usage for bus wash using similar systems by BEST in Mumbai) the water requirement for bus wash per day is indicated in table below. . Approximately 10,000 liters /day is estimated for other requirement including staff rooms, toilets, and maintenance areas etc.,

Considering that the main source of this water is treated water from Chandigarh Administration, it is imperative that this requirement is limited to the extent possible. Vehicle wash water recycle system should be incorporated in the bus washing areas and underground tank of adequate capacity should be provided to store recycled water for bus wash to reduce the impact on water sources.

Bus washing water required based on bus fleet for each existing depot is as indicated in the table below.

Depot	Bus Fleet	Bus washing Water requirement (liters)@200 liter per bus per day and for office operation toilet and maintenance @ 500 liters per day per depot
Depot 1	168	10,000 (there is no washing facility in Depot 1 all buses of Depot 1 are washed in Depot 2)
Depot 2	170	77,600 (Depot 2 + Depot 1 bus wash)
Depot 3	165	43,000
Raipur Kalan	167 (approx.)	43,400

4.6 IMPACT ON WATER QUALITY

During construction stage the following impacts have been identified at Raipur Kalan depot site:

- Impact on water environment due to improper disposal of construction waste.
- Impact on surface water due to disposal of constriction waste in water streams
- Water pollution due to improper handling of fuel and lubricants
- Water pollution due to sewage generated from labor camps.

The activities at the depots have a potential to negatively impact surface as well as ground water quality in the absence of mitigation measures.

Wastewater is generated at depots from washingfloors and buses.The most common chemicals used in the bus depots, which has a potential of entering the wastewater streams are:

- Lubricating oils (including waste oil) and grease
- Brake fluid and other hydraulic fluids
- Coolants
- Fuels
- Chemicals solvents and other cleaning fluids.

In Depot 2 drain from bus washing area was damaged as shown in the following photograph. Internal drainage system is poorly maintained and barely functional at all depots except depot no 4. These drains will be repaired as per regular maintenance of the depot.

Water stagnation is common during monsoon at depot No 2 due to the inadequately designed drainage system.Considering that the low elevation of the site with respect to the road and the flooding situation in the monsoon, it is recommended that the storm water drainage system may be reconstructed or repaired.

The impact of mosquitoes breeding in the stagnant water is significant. Introduction of vehicle wash water recycle system will reduce the load on the storm water drainage system considerably. Good housekeeping practices are critical to prevent water stagnation and mosquito breeding in the old tyres. This is particularly significant considering the residential areas in the influence zone of the proposed new depot at Raipur Kalan.

Wastewater from maintenance sheds may contain heavy metals, solvents, oil and grease, diesel and othermaterials that could be hazardous.Spent solvents used in degreasing operations can be particularly hazardous to the waste water streams. Spray painting operations involve waste paint, solvents/thinners, paint sludge, primer waste, etc. which may be hazardous as they contain heavy metals, such as arsenic, lead and chromium. Used oil can contain toxic substances such as arsenic,

benzene, cadmium, lead, and zinc. The average consumption at depots based on earlier studies at depots, considering 100 buses being serviced in each, is approximately 500 liters of oil per month, 100 kg of chassis grease, 250 liters of power steering oil and125 kg of grease per month.

. There is no bus washing facility at depot 1 and all the buses of depot 1 and 2 are being washed at depot 2. A new ETP has been installed at depot to treat the effluent generated. Treated effluent from the depot is recycled.

Depot No 4 had proper used oil storage and disposal systems as indicated in the following photograph. The drums are stored in covered area and after filtering is drained into large storage drum, which is auctioned off at an average interval of one month. However, bureaucratic issues related to auctioning of the spent oil have resulted in large quantities, as many as 400 barrels, piling up at the other depots. There is no organized storage facility or system for the storage of the spent oil resulting in spillage caused by movement, accidental hits by moving buses and leakage. This is a major environmental and safety hazard.

Brake fluids contaminated with any solvents, brake cleaners or carburetor cleaners can also be hazardous. Considering that part of Chandigarh Municipality's water requirement is met by ground water resources, it is imperative that possible contamination from these materials is strictly monitored. By minimizing the amount ofwastewater that is generated, the amount of wastewater and sludge thatmust be managed or discharged can be reduced. Oil interceptors have to be introduced at all outfall points in the depot sites. This will reduce the traces of contaminants getting washed into the open drains and finding its way into the rivers during rains as well as while washing maintenance shed floors. Introduction of good housekeeping measures and environmental management measures can ensure that the water streams from the site have least environmental impact.

Depot 1 does not have washing facility, hence ETP is not required, however grease trap has been provided. Wastewater from the depot will be discharge into municipal drain which leads to STP. The effluent of STP is used for land discharge for irrigation.

Depot 2 and 3 have washing facility and ETP. Treated effluent is discharged into municipal drain which leads to STP

So, the impacts on water environment specifically on the natural stream is insignificant and does not require any additional mitigation measures or monitoring plan which is not provided in the ESMP for depot 1, 2, 3 and Raipur Kalan

4.7 IMPACT ON AIR QUALITY

Depot infrastructure component of the project is likely to have a few negative impacts affecting its immediate environment. During construction stage, increased air pollution is anticipated. However, these are temporary impacts and can be mitigated by appropriate environmental management measures. The following impacts have been identified during construction stage of Raipur Kalan depot:

- Generation of dust during the transportation of construction material.
- Emission due to operation of construction vehicles and machineries at site.
- During spray painting operations, air pollutants including volatile organic compounds (VOC's) are released into the environment.This could pose a health hazard to the workers unless precautionary measures like masks are used.

Depot modernisation may have potential impacts on the air quality of surrounding areas from bus movements, the functioning of the depots will result in change in emission levels in the area due to change in the fleet strengths. None of the existing depots have sensitive land uses in its vicinity, and moreover they are located close to open areas, hence no major impacts are anticipated on air quality. However, at the new depot of Raipur Kalan there are residential areas adjoining the site and the increase in emission has a potential to impact it negatively.

Considering the proposed number of buses in this depot to be 130, the emission levels due to the introduction of these bus movements in the vicinity of the residential area has been estimated using ARAI's emission factors for HCV buses.

Emission factors for HCV buses

NORMS	CO(G/KM)	NOX(G/KM)	HC (G/KM)	PM(G/KM)
Post 2005 HCV Diesel	3.92	0.16	6.53	0.3

Source: Emission Factors for Indian Use Vehicles,2nd AAI – Summit, Emission Volume,25th November 2013

While the Route Rationalization Planning project undertaken by CTU has recommended the fleet requirement and composition for the period from 2015 to 2024in detail, for the current depot modernization for calculating the emission load at the depot all buses are assumed to be of standard type. The total emission load at Raipur Kalan depot due to the introduction of bus fleet is indicated below:

Emissions at Depot Site Due To Bus Movement

Depot	CO(g/km)	NOx(g/km)	HC (g/km)	PM(g/km)
Raipur Kalan	509.6	20.8	848.9	39

Other proposals proposed under the CBMP vision plan for improving the bus services will have a positive impact on the city's environment. Bus fleet augmentation can have a positive impact on air quality of the city as it reduces personal transport and traffic congestion on the city roads. All the other proposals towards improving the bus transport system in the city like route rationalization, additional bus shelters, multi-modal integration, ITS, MIS, ERP system introduction etc. will also contribute to a shift in the transport usage from private vehicles to public transport. The

environmental benefit is not only in terms of reduced fuel consumption and carbon foot print, but also in terms of reduced air pollution, particularly greenhouse gas emissions. The introduction of hybrid buses will be a positive impact on the environment in terms of reduced emissions as well as noise.

The boost to public transport system will be a major positive step to reduce the impacts caused by the increased traffic.

4.8 Impact on Energy Consumption

Reduction in overall fuel consumption is a significant positive impact of an efficient public transport system. Considering the upward mobility of the urban class in the city and the potential shift from the present two wheelers to cars, the number of passengers carried per liter of fuel by the bus system is comparatively higher.

Currently the depots have training programs provided to the bus drivers for improving fuel economy. However there is no monitoring of its effect on actual fuel economy improvement nor is there any provision for incentives for rewarding good performance from drivers. There is a need to monitor and provide inputs on improving the fuel economy and energy efficiency both in technical and managerial aspects based on performance of EPKM.

4.9 Impact on Noise Levels

Impact due to the project on noise level can be during construction stage as well as during the operation stage. The potential noise levels from various equipment and activities in the depot sites during both the stages are indicated in the following table.

Noise levels from Depot Activities

EQUIPMENT/ACTIVITY	AVERAGE NOISE POTENTIAL IN DBA
Bus movement	85
Compactors(rollers),Front loaders, Concrete mixers,Cranes(movable), Vibrators and Saws	75
Compressor (air)	78
Refrigerator Unit	73
Ventilation Fan	79
Welder/Torch	74

During the construction stage there could be an increase in noise levels at the depot locations. Construction activities are expected to produce noise levels in the range of 75-80 dB(A) within the depot location

Depot locations will have noise generating activities and the typical noise issues in the depots include:

- Overall noise from operation of machinery, noise generated by air compressors, extraction systems, generators, fans etc.
- Movement of vehicles in and around the premises
- Noise during the night since the buses will be serviced during the night.

For point sources with sound power level Lw, located near the ground, the sound pressure Level (Lp) at any distance r (in m) from that source is calculated from the equation

$$L_p = L_W - 20\log_{10}(r) - 8\ \text{dB}$$

The noise levels from the buses were taken as the source noise level as it contributes to the major share of noise generated in the depot. It was assumed as point sources since the movement is limited to a confined area, largely towards parking. Considering a minimum distance just outside the depot, from the source point as 1.5 m, the maximum predicted noise levels just outside the depot boundary was computed from the above equation as 73.478 dB,

Movement of buses is thus a potential negative impact to the residential area at depot proposed at Raipur Kalan, especially considering that a major part of the movement is likely to take place during early morning and late night hours. Provision of tree buffers along the boundary walls and effective traffic management practices and no horns policy can reduce the impacts.

Noise attenuation at source level will not be effective so mitigation measures in transmission of noise by providing noise barrier will be effective. So, by providing noise barrier along the depot boundary of sufficient length and height shall be provided to mitigate noise impact at theresidential area side.

There are two options for noise barrier namely soft barriers and hard barrier. Since the estimated noise generated will in the range of 75-80 dB(A) which has to be brought down up to 45 dB(A). Soft barrier / vegetation will not be effective and hence hard barrier / physical barrier needs to be provided.

Generators should be maintained at the prescribed noise levels and provided within enclosures.

Currently Government of India, Ministry of Urban Development, and Urban Transport Division has not provided any noise specifications under the Recommendatory Urban Bus Specifications for Bus Procurement under JnNURM. However interior and external noise levels can be included by CTU as criteria while choosing the proposed bus fleet under its expansion scheme. Induction of electric buses in the fleet also will reduce the noise impacts considerably.

4.10 IMPACT ON BIOLOGICAL ENVIRONMENT

No significant impact is anticipated on the biological environment of the city.Bus shelters located along the city roads may have trees, which shall not be removed. There are a few trees at the Raipur Kalan depot site and these shall be protected when the depot is constructed.

4.11 IMPACT ON CULTURAL HERITAGE

No impact is expected on this aspect, due to the proposals under this project.

4.12 IMPACT ON OCCUPATIONAL HEALTH AND SAFETY

Vehicle exhaust fumes, dust, noise and odors are a significant occupational health and safety risk at all depots. Considering the extensive storage and use of flammable materials like oil, lubricants, solvents, gas cylinders etc. potential fire hazard is also significant. Exposure to chemicals, for example during spray painting, is another impact on the workers. Flies and mosquitoes are also an issue at the existing depots, especially since the work is carried out during day and night.

Noise levels at workshops were observed to be very high. Data obtained from http://chandigarhenvis.gov.in/ on noise assessment carried out inside the CTU repair workshop at Depot 3showed that the average noise level recorded was 75 dB (A) with a maximum of 95 dB (A) and minimum of 65 dB (A). These are high enough to cause physical discomfort to the workers. At the fuel injection pump workshop noise levels around 90 dBA was observed and workers are exposed to it continuously for an hour. This is a health hazard affecting hearing, but can be mitigated by providing ear muffs to the workers and strict enforcement of its use.

Welding goggles are not being used currently at the depots, which is a potential risk to eyes. None of the depots had provision for filtered water.

Toilets were inadequate at all depots. Separate toilet for ladies are provided only at depot no 3. Hygiene conditions at the toilets were extremely poor, with toilets not having provision for running water or proper sewage disposal.

Workers in the evening and night shifts are also affected by mosquitoes. The stagnation of water at the old tyre storage areas has created breeding areas for mosquitoes.

During operational stage of Raipur Kalan depot impact on occupational health and safety of workers due to emission at the basement parking is identified. The impact of indoor air quality in the basement shall be mitigated by extracting air from the basement through exhaust. Aperture has been planned for basement of the depot for installation of extraction fans.

4.13 IMPACT ON COMMUNITY HEALTH AND SAFETY

The following impacts have been identified on the community during the construction stage of Raipur Kalan depot:

- Noise impacts during construction activities
- Dust generation due to construction activities
- Air pollution due to burning of fossil fuel in labour camps.
- Risk of transmission of disease due to migrant labour.
- Conflict between migrant labour and local community for utilization of community facilities such as parks, water source etc.

During operational stage of Raipur Kalan Depot, community impact is identified due to breading of mosquitoes in old tyres and similar impacts are identified for other depots i.e, depot 1, 2 and 3. Other impacts during operational stage shall includenoise impact due to movement of buses from access road to bus depot.

5 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

In order to address the impacts predicted in the earlier section, various mitigation measures, monitoring actions and a reporting schedule are suggested in this section. Environmental enhancement is also an important component of EMP. The EMP assigns the responsibilities for various actions identified to limit the adverse impacts of theproject. An environmental monitoring plan and an institutional framework have been proposedas part of the EMP for proper implementation and monitoring of mitigation measures. The costfor implementing the proposed environmental mitigation measures and carrying out theenvironmental monitoring has been worked out and is presented as part of the EMP fornecessary budgetary allocations as part of the project cost. Environmental Management Plan and its costs will be incorporated in the BOQ.

5.1 MITIGATION **MEASURES** AND ENVIRONMENTAL MANAGEMENT ACTION PLAN

In order to implement variousenvironmental requirements, all mitigation and enhancement measures have been listed in an Environmental Management Action Plan (EMAP) Tables below:

5.1.1 Environmental Management Action Plan for Depot Infrastructure Construction -NEW DEPOT AT RAIPUR KALAN

Table : Environmental Management Action Plan for Depot Infrastructure Construction -NEW DEPOT AT RAIPUR KALAN

S. No	Project Stage	Project Component / Activity	Impact	Impact Mitigation / Environmental Management Measures	Responsibility
1	Pre-Construction Stage	Obtain mandatory environmental/ regulatory clearances	-	Consent to establish is required from the Chandigarh Pollution Control Committee for the new depot and applicable Cess to be paid. Sanction of Building Plans License to store fuel and install dispensing machines for diesel from the Chief Controller of Explosives (CcoE), Petroleum and Explosives Safety Organisation (PESO) based on the capacity of diesel to be stored at the sites as per Petroleum Act, 1934	CTU PIU
2	Pre-Construction Stage	Generation of baseline data prior to commencement of construction	-	Generation of ambient air quality, noise level, surface water quality and ground water quality	Contractor
3	Pre-construction stage	Operation of bus maintenance at basement	Impact on Indoor Air Quality	Provide exhaust facility at underground level in Raipur Kalan	CTU to provide in the tender document
4	Pre-construction stage	Use of concrete making ground impermeable to infiltration of water into aquifers.	Impact on Ground water	Provide rainwater harvesting and ground water recharge pits	CTU to provide in the tender document
5	Pre-construction stage	Arrangement for Construction Water	Impact on water source	The contractor shall source the requirement of water preferentially from surface water bodies, as lakes and tanks in the project area with the permission of the authority. The contractor shall be allowed to pump only from the surface Water bodies. Boring of any tube wells shall be prohibited	Contractor
6	Pre-construction stage	Noise generation from operation of workshop	Impact on Noise level Impact on local community due to noise generated from Depot workshop operation	Provide noise barrier along the residential area side	CTU to provide in the tender document
7	Pre-construction stage	Site Clearance at Raipur Kalan Depot site	Loss of topsoil	Stock piling of topsoil and reuse for landscaping.	Contractor of construction works
8	Pre-construction stage	Site Preparation	About 8-10 trees are available within the boundary of the Raipur Kalan depot site.	All efforts will be made to avoid felling of any trees. Existing trees in Raipur Kalan Depot site will be transplanted or felling after taking permission of the competent authority.A	CTU/Contractor

				compensatory plantation in the ratio of local legislative requirement or 1:10 will be done in case of felling of trees.	
9	Pre-construction stage	Sand (all river and stream beds used directly or indirectly for the project)	Impact on riverine ecosystem due to sand mining	The contractor shall identify sand quarries with requisite approvals for the extraction of sand. In case of selection of new sites for sand quarrying, the Contractor shall obtain prior approval and concurrence from Competent District Authority and the Engineer. Where the supplier of sand is another party, the authentic copy of lease agreement that has been executed between the local Tahsildar and the supplier must be submitted to the project authority or SPV of the project, before any procurement is made from such a site.	Contractor
10	Pre-construction stage	Construction Camp Locations – Selection, Design & Layout	Impact on local community or ecosystem	Construction camps shall not be proposed: (i) Within 1000m of Ecologically sensitive areas (ii) Within 1000m from the nearest habitation to avoid conflicts and stress over the infrastructure facilities, with the local community.	Contractor
11	Pre-construction stage	Pre-construction Community consultation	Any unforeseen impacts on community	Conduct community consultation near the project site	CTU / Contractor
12	Construction Stage	Transporting Construction Materials	Impact on Air Quality Generation of dust during transportation and air borne soil erosion	All vehicles delivering materials to the site shall be covered to avoid spillage of materials. All existing highways and roads used by vehicles of the contractor, or any of his sub -contractor or suppliers of materials and similarly roads which are part of the works shall be kept clean and clear of all dust/mud or other extraneous materials dropped by such vehicles. The unloading of materials at construction sites close to settlements shall be restricted to daytime only.	Contractor
13	Construction stage	• Working with material mixing, construction vehicles, earthwork • Emission from Construction Vehicles, Equipment and Machineries	Impact on Air Quality	The contractor shall take every precaution to reduce the level of dust (SPM and RSPM) from, material storage yards, and construction sites (including earthwork, dismantling, scarification and material mixing sites) by sprinkling of water, mist spray, encapsulation of dust source and erection of screen / barriers. The suspended particulate matter value at a distance of 40m from a unit located in such a cluster should be less than 500 µg/m3 Air pollution monitoring shall be conducted as per the Pollution Monitoring Plan and results shall be used to strengthen/rectify problematic areas.	Contractor
14				Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm to the emission standards specified by the CPCB. The contractor shall maintain a separate file and submit PUC certificates for all vehicles/equipment/ machinery used for the project. Monitoring results shall also be submitted to project authority/SPV as per the Pollution Monitoring Plan in the specified format.	Contractor

15	Construction stage	Construction of Depot	Impact on air, water and soil quality Air, water, soil contamination, land use incompatibility	• All noise generating construction activities shall be carried out only during day-time at Raipur Kalan depot site. • All construction equipment and machinery shall be maintained to the prescribed emission and noise standards (ref. Annexure F). Noise monitoring shall be carried out and the noise standards prescribed for industrial area (75 dBA Leq during the day and 70 dBA Leq at night) to be adhered to. • Dust suppression during the construction stage shall be ensured through sprinkling of water regularly. • Construction activities shall be avoided during monsoon period. • Construction debris shall be disposed only at disposal sites located away from environmentally sensitive areas and ground water recharge areas, identified prior to start of dismantling or construction activities in the project area. • Construction Management Plan shall be prepared for the site; integrating it with traffic management plan for the surrounding areas to ensure that the construction activities do not create traffic congestion.	CTU PIU/ Project Consultant/design consultant
16	Construction Stage	• Disposal of construction waste in water streams • Handling fuel and lubricants • Labour Camp Management Potable Water Supply	Impact on Water Quality • Water Pollution from Construction Wastes • Water Pollution from Fuel, Lubricants and Chemicals • And Impact on health and safety of labours	The Contractor shall take all precautionary measures to prevent the wastewater generated during construction from entering water bodies or the irrigation system. All waste arising from the project are to be disposed off in the manner that is acceptable to the Chandigarh Pollution Control Committee or as directed by Engineer	Contractor
17				Contractor shall ensure that all vehicle/ machinery and equipment operation, maintenance and fueling shall be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors shall be provided for vehicle parking, wash down and fueling areas as per the design provided. Contractor shall arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites approved by the Engineer. All spills and collected petroleum products shall be disposed off in accordance with MoEF and Chandigarh Pollution Control Committee guidelines.	Contractor
18				The Contractor shall construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing. Within the precincts of every workplace in an accessible place, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996). The contractor shall also guarantee the following: • Supply of sufficient quantity of potable water (as per IS) in every	Contractor

				workplace/labor camp site at suitable and easily accessible places and regular maintenance of such facilities. If any water storage tank is provided that shall be kept such that the bottom of the tank is at least 1mt. from the surrounding ground level. • If water is drawn from any existing well, which is within 30mt. proximity of any toilet, drain or other source of pollution, the well shall be disinfected before water is used for drinking. • All such wells shall be entirely covered and provided with a trap door, which will be dust proof. A reliable pump shall be fitted to each covered well. The trap door shall be kept locked and opened only for cleaning or inspection, which will be done at least once in a month. Testing of water shall be done every month as per parameters prescribed in IS 10500:1991. Compliance to EMP shall be reported to Engineer every week. Engineer shall inspect the labour camp periodically, to ensure compliance of the EMP.	
19	Construction Stage	Operation of plants and machineries	Impact on Noise Quality Noise from Vehicles, Plants, and Equipment	The Contractor shall confirm the following: All plants and equipment used in construction shall strictly conform to the MoEF/ CPCB noise standards. All vehicles and equipment used in construction shall be fitted with exhaust silencers. Servicing of all construction vehicles and machinery shall be done regularly and during routine servicing operations, the effectiveness of exhaust silencers shall be checked and if found defective shall be replaced. Limits for construction equipment used in the project such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws shall not exceed 75 dB (A) (measured at one meter distance from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986. . Engineer shall be required to inspect regularly to ensure the compliance of EMP.	Contractor
20	Construction Stage	• Waste Disposal • Clearing and Grubbing • Earth from Borrow Areas for Construction	Impact on Soil Quality Impact due to soil erosion. flooding at the borrow area site and creation of unsafe environment for local community	The contractor shall provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner as per the Comprehensive Solid Waste Management Plan approved by the Engineer . Unless otherwise arranged by local sanitary authority. The contractor must make arrangements for disposal of night soils (human excreta) either by suitably approved by the local medical health or municipal authorities or as directed by Engineer as provided by the contractor.	Contractor
21				Site clearance and removal must be carried out before the construction work starts. All works shall be carried out in a manner such that the damage or disruption to environmental attributes is minimum. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from Engineer.	Contractor

22				No borrow area shall be opened without permission of the Engineer. Borrow pits shall not be dug continuously in a stretch. The location, shape, and size of the designated borrow areas shall be as approved by the Engineer.	Contractor
23	Construction Stage	Sources of Materials/ Earth	Extraction of materials/Earth can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	Prioritize sites already permitted by the Mining Department; i) If other sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and to obtain the approval ii) Identification of borrow and operation of borrow area will be as per the environmental requirements. The rehabilitation of borrow area will be done by the contractor before closure of the borrow area.	Contractor
24	Construction Stage	Construction work while handling material and storage	Drainage and Flood Control	Contractor shall ensure that no construction materials like earth, stone, ash, or appendage disposed off so as not to block the flow of water of any water course and cross drainage channels. Where necessary adequate mechanical devices to bailout accumulated water from construction sites, camp sites, storage yard, excavation areas are to be pre-settled and arranged well in advance of the rainy season besides providing temporary cross drainage systems.	Contractor
25	Construction stage	Construction wastes disposal	Impact on soil quality Solid/ liquid waste generated from the construction work may impact soil or water environment due to contamination of soil and water due to improper disposal	Preference shall be given for reuse of the excavated soil. Location of disposal sites shall be finalized prior to completion of the earthworks. The Engineer shall approve these disposal sites conforming to the following (a) These are not located within designated forest area (b) The dumping does not impact natural drainage courses (c) No endangered/rare flora is impacted by such dumping. (d) Settlements are located at least 1.0km away from the site.	Contractor
26	Construction stage	Labour Camp Management Sanitation and Sewage System	Impact on Occupational Health and Safety	The contractor shall ensure that – • The sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place • Separate toilets/ bathrooms, wherever required, screened from those from men (marked in vernacular) are to be provided for women	Contractor

				• Adequate water supply is to be provided in all toilets and urinals • All toilets in workplaces are with dry-earth system (receptacles) which are to be cleaned and kept in a strict sanitary condition • Night soil is to be disposed-off by putting layer of it at the bottom of a permanent tank prepared for the purpose and covered with 15 cm. layer of waste or refuse and then covered with a layer of earth for a fortnight. Adequate health care is to be provided for the work force during the entire phase. • Contractor shall follow all relevant provisions of the Factories Act, 1948 and the Building & other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction & maintenance of labor camp. • The contractor shall provide, if required, erect and maintain necessary (temporary) living accommodation and ancillary facilities during the progress of work for labour to standards and scales approved by the Engineer • Construction camps shall not be proposed within 1000m from the nearest habitation to avoid conflicts and stress over the infrastructure facilities, with the local community. The location, lay out and basic labour camp shall be submitted to Engineer prior to them construction. The construction shall commence only upon the written approval of the Engineer – In charge	
27	Construction stage		• Impact on Occupational Health and Safety • First Aid • Safety hazards and accidents due to electrical short circuited and fire Impact on occupational Health and Safety Occupational hazards which can arise during work	The contractor shall arrange for A readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone. Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital Equipment and trained nursing staff at construction camp.	Contractor
28		• Construction work First aid requirements • Risk from Electrical Equipment(s) • Health and Safety of Workers		The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that – • No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public. • All necessary fencing and lights shall be provided to protect the public in construction zones. • All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected, and properly maintained as per IS provision and to the satisfaction of the Engineer	Contractor
29				• Develop and implement site-specific health and safety plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment like helmet, gumboot, safety belt, gloves, nose musk and	Contractor

				ear plugs; (c) health and safety training for all site personnel; (d) documented procedures to be followed for all site activities; and documentation of work-related accidents; • Provide medical insurance coverage for workers; • Secure all installations from unauthorized intrusion and accident risks; • Provide supplies of potable drinking water; • Provide clean eating areas where workers are not exposed to hazardous or noxious substances; • Provide health and safety orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; • Provide visitor orientation, if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Ensure moving equipment is outfitted with audible back-up alarms; • Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the public as appropriate; and • Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.	
30	Construction stage	Sand from approved sand mines	Impact on river ecosystem and hydrology where sand mining is improper.	Sand shall be procured from approved sand mine location	Contractor
31	Construction Stage	Community Health and Safety.	Impact on Community	Depot site at Raipur Kalan is situated adjacent to residential area. The nighttime work should be avoided	Contractor
32		Construction stage Community consultation		Conduct community consultation near the project site	CTU / Contractor
33	Operational Stage	• Dust generation due to movement of buses • Spray painting	Impact on air quality	Except for areas specified for tree plantation, all areas in the depot should be paved	CTU PIU
34				• Proper training in the correct use of applying paint can reduce VOC emissions. Train employees on the proper cleaning and maintenance of equipment. • Use solvents with low or no VOC content.	Environmental and Social Officer, Depot Manager

				• Do all spray painting in an enclosed area and provided workers with mask filters. • Cover solvent tanks when not in use to reduce evaporation.	
35				• Open air incineration of wastes will not be carried out in the depot sites • Mark all storage and usage areas of inflammable materials as a no smoking area. • Transport, store, use and secure cylinders in upright position. • Ensure proper ventilation at the ground level in locations where gas is in use. • Avoid physical damage to the cylinders. • Never weld near the cylinder. • Investigate immediately if there is smell of gas/ leakage. • Make sure that there is no other unrelated fire in the vicinity of the cylinder.	Environmental and Social Officer, Depot Manager
36	Operational stage	• Washing of maintenance shed floors • Bus washing	Impact on surface water quality	• As far as possible dry floor cleaning methods like sweeping and vacuuming should be used. • Train employees to use water efficiently. • Prevent drips and spills from reaching the floor. If a small spill does occur, clean it immediately with mops. Spills shall not be cleaned by hosing them down with water.	Environmental and Social Officer, Depot Manager
37				Install water recycling unit in bus washing systems. The depot shall have ETP to treat the effluent generated from the depot. ETP treatment system shall include bar screen, oil and grease trap, chemical coagulation and flocculation, sand filter and carbon filter. Treated effluent shall be stored in storage tanks and reused for washing purpose.	CTU PIU
38	Operational stage	Bus washing	Impact on ground water quality	Install water recycling unit in bus washing systems. Rain water harvesting pits shall be provided at site, rain water harvesting shall be designed for the peak hour rainfall and shall be able to capture the peak storm water quantity by storing and percolation.	CTU PIU
39	Operational stage	• Storage and disposal of other materials like parts/drums/packaging materials • Storage/disposal of used cleaning Rags • Storage/disposal of Batteries	Impact on Soil and Water quality Potential leakages from stored batteries affecting soil and water	• It is important that all parts contaminated with grease or oil are kept in drip trays in a covered area with a sealed floor • Metals such as lead, copper and steel, which should be stored in a secure container for collection by a metal recycler. • Paper, card board, used wooden crates, boxes, glass, metal drum, plastic material ,metal (pipes, sheet metal, structural steel etc.), electrical items(wires, cables etc.), packaging material (thermocol, laminated sheets etc.) and rubber waste shall be disposed-off to an authorized scrap vendors for effective recycling and reusing purpose.	Environmental and Social Officer, Depot Manager

40				Rags soiled by oil/grease and solvents should be stored in covered drums and disposed to authorized agencies.	Environmental and Social Officer, Depot Manager
41				Indoor storage is recommended for lead-acid batteries. Store batteries on an acid-resistant rack If stored outside, should be stored on impermeable surfaces, covered to prevent acid run-off and should have secondary containment Keep a neutralizing agent such as baking soda nearby, in case of leaks or spills. Use an authorized recycler for disposing batteries	Environmental and Social Officer, Depot Manager
42	Operational Stage	Storage of new/used solvents /chemicals /oil/grease	Impact on air and water quality	• Inventory of all chemicals including oils and gases used/stored in depots to be made and assessed for applicability of statutory legislative applicability and requirements. • Keep lids on containers of solvent-based chemicals to reduce evaporation. • Store used solvent in sealed drums, until collected, reused or recycled. • The drum should be stored in a bunded, covered area. Under no circumstances should evaporation be used to dispose of spent solvents. • Floor drains shall not be provided where hazardous materials are stored.	Environmental and Social Officer, Depot Manager
43	Operational Stage	Storage, use and disposal of new/used Oil (engine/brake) at Depots	Impact on water and soil Potential oil spills on drains from depots reaching pubic storm water drains and river.	Work on vehicles that involve transferring or dispensing of oils, should be carried out inside the building or within a roofed, bounded area. Workers to be trained to place drip pans underneath leaking vehicles to collect dripping oil and pour oil from drip pan into the used oil drum. Use large drum funnels or fill tubes when filling used oil drums. Used oil must be stored in sturdy, leak proof drums labeled “USED OIL.” Oil storage drums should have proper containment in case there is a leak or spill- storage yards in the depot for oil storage should have bunding with either an impervious concrete hump or flexible rubber hump and regularly checked to ensure that bunds are sound. Inspect used oil storage drums on a regular basis for leaks or spills. Other waste shall not be mixed with used oil. Train workers on the importance of spill prevention when servicing vehicles. Spills shall not be cleaned by hosing down with water. If spills do occur, clean up oil spills only with rags. Send used oil for recycling to authorized recycling units at regular	Environment and Social Officer, Depot Manager, CTU PIU/ Project Consultant

			Contamination of soil.	intervals. Schedule to be fixed for the same based on average quantity generated. Oil interceptors should be provided at regular intervals along the storm water drains in the depot sites and also at the outlet to public storm water drains and rainwater harvesting pipes. Oil interceptors should be checked on a monthly basis to make sure they are working properly. This includes cleaning out the sludge and disposing it properly to an approved facility. Mark all drains on the site that connect to the storm water system after oil interception to increase awareness of the pollution risk and enable immediate identification in the event of a spill. By minimizing the amount of wastewater that is generated, the amount of wastewater and sludge that must be managed or discharged can be reduced. Bus wash systems shall incorporate water recycling in it. •Oil storage areas should be paved and impervious.	
44	Operational Stage	Servicing and repair work	Impact on water quality Contamination of public storm water drains and rivers	Perform vehicle maintenance work in areas away from depot storm water drains. Service sheds to be designed so that activities that need water/liquids for washing and cleaning are separated from maintenance areas, which shall be bunded. If internal drains are provided in maintenance sheds, these shall be blocked while carrying out maintenance work. Oil interceptors to be provided at bus wash area outlet.	Environmental and Social Officer, Depot Manager
45	Operational Stage	Storage, use and disposal of new/used Coolant	Impact on water quality Contamination of storm water drains/river	•Work on vehicles that involve transferring or dispensing of coolants substances should be carried out inside the building or within a roofed, bunded area. •Used coolants should not be drained directly into storm water drains. •Store used coolant in sealed drums in a bunded, covered area, and dispose to authorized agents.	Environmental and Social Officer, Depot Manager
46	Operational Stage	• Use of electrical equipment's, air compressors and tools • Movement of Buses on the access road to Depot • Movement of buses in the depot • Movement of materials • Use of generators	Impact on noise quality and traffic congestion	•Locate all noise generating activities away from the side close to the residential area in the adjoining plot.	Environmental and Social Officer, Depot Manager
47				•Maintain equipment, air compressors, to reduce noise (Ref Annexure F for stipulated standards) •Use air compressors indoors to reduce disturbance outside. •Workers to be provided with earmuffs	Environmental and Social Officer, Depot Manager
48				•Buses shall not be parked outside the depot boundaries. •Train Drivers not to use horns near while entering and exiting the depot Formulate a traffic management plan for the morning and night period when maximum bus movement to and from the depot is	Environmental and Social Officer, Depot Manager

				expected	
49				• Entry point of Raipur Kalan depot shall be located away from residential area side. • Provide a 3 meter green buffer with tree plantations along the wall adjoining the neighboring residential area, to reduce noise and dust impacts • Offices, canteens, resting rooms etc. which can be away from Bus movement paths and can be located on the side close to residential area	CTU PIU
50				Ensure that trolleys (for in-house parts movements) have rubber or poly urethane wheel to avoid adverse noise generation while movements.	Environmental and Social Officer, Depot Manager
51				Keep generators in acoustic noise enclosures.	Environmental and Social Officer, Depot Manager
52	Operational Stage	Storage of inflammable materials (chemicals, oil A/C gas cylinders etc.)	Fire hazard	• Storage of flammable materials and battery shall be away from locations along the High Tension Lines at depot No 2 and 3, as well as away from the residential area near depot 3 and Raipur Kalan depot. Provide fire extinguishing equipment sufficient to extinguish any probable fire, adequate water supply at ample pressure as per national standards and trained persons required to operate the fire extinguishing equipment provided • Designate fire officers at each site. • Fire safety notices to be placed at prominent locations. Display sufficient warning signs. • Install fire alarm wherever required and test regularly. • Display escape route maps prominently on each side. • Provide sufficient exit signs at prominent locations for directing people to and routes. • Train workers about the escape route and assembly point/s. • Carryout fire drill periodically. • Fire extinguishing equipment provided shall be properly maintained and inspected at regular intervals of not less than once in a year by the responsible person and a record of such inspection is maintained • Store liquids according to the manufacturer's requirements – for example, solvents should be stored away from heat, flames, direct sunlight, oil or other flammable liquids. Incompatible chemicals shall not be stored together.	Environmental and Social Officer, Depot Manager
53	Operational Stage	Occupational Health and Safety	Occupational Health and Safety	• Suitable personal protective equipment like face shield and goggles, shall be provided for the protection of eyes and used by the worker	Environmental and Social Officer, Depot

				engaged in operations like welding, cutting, chipping, grinding or similar operations which may cause hazard to his eyes • Workers to be provided with earmuffs • Water purifying systems shall be provided for drinking water to the staff • Toilets with piped water supply to be provided at all depots. Separate toilets shall be provided for male and female staff. Toilets to be cleaned twice a day to maintain hygiene. • Emergency Full body Shower and emergency eye wash fountain to be provided at each site • Provide electric fly catcher machines at maintenance sheds and canteens. • Environmental awareness training programs for workers and other staff on site. • Safety audits to be carried out periodically • Initiate award program for employees who come up with good pollution prevention ideas	Manager
54	Operational Stage	Storage of new/used Tyres	Impact on local community Water stagnation and mosquito breeding	• Store as few tyres as possible at the depot by ensuring that discarded ones are hauled away on a regular basis. Send old tyres to authorized recyclers. Prepare a fixed schedule for the same. • Keep tyres stored indoors, or keep tyre piles covered in order to prevent entrapment of water.	Environmental and Social Officer, Depot Manager

5.1.2 Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
1	Pre-construction stage	Obtain mandatory environmental/ regulatory clearances	-	Consent to Operate in prescribed format from the Chandigarh Pollution Control Committee.	CTU PIU

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
		Consent to Establish and Consent to Operate			
2	Pre-construction stage	Construction of concrete floor causing ground impermeable to infiltration of water into aquifers.	Impact on water quality Natural recharge of ground water is impacted	Provide rainwater harvesting and ground water recharge pits	CTU to provide in the tender document
3	Pre-construction stage	Arrangement for Construction Water	Impact on water source	The contractor shall source the requirement of water preferentially from surface water bodies, as lakes and tanks in the project area with the permission of the authority. The contractor shall be allowed to pump only from the surface Water bodies. Boring of any tube wells shall be prohibited	Contractor
4	Pre-construction stage	Sand (all river and stream beds used directly or indirectly for the project)	Impact on riverecosystem due to sand mining	The contractor shall identify sand quarries with requisite approvals for the extraction of sand. In case of selection of new sites for sand quarrying, the Contractor shall obtain prior approval and concurrence from Competent District Authority and the Engineer. Where the supplier of sand is another party, the authentic copy of lease agreement that has been executed between the local Tahsildar and the supplier must be submitted to the project authority or SPV of the project, before any procurement is made from such a site.	Contractor
5	Construction stage	Transporting Construction Materials	Impact on air quality Generation of dust during transportation and air borne soil erosion	All vehicles delivering materials to the site shall be covered to avoid spillage of materials. All existing highways and roads used by vehicles of the contractor, or any of his sub -contractor or suppliers of materials and similarly roads which are part of the works shall be kept clean and clear of all dust/mud or other extraneous materials dropped by such vehicles. The unloading of materials at construction sites close to settlements shall be restricted to daytime only.	Contractor
6	Construction stage	Working with material mixing, construction vehicles, earthwork	Impact on air quality	The contractor shall take every precaution to reduce the level of dust (SPM and RSPM) from material storage yards, by sprinkling of water, mist spray, encapsulation of dust source and erection of screen / barriers. Air pollution monitoring shall be conducted as per the Pollution Monitoring Plan and results shall be used to strengthen/rectify problematic areas.	Contractor
7	Construction Stage	Emission from Construction Vehicles, Equipment and Machineries	Impact on air quality	Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm to the emission standards specified by the CPCB. The contractor shall maintain a separate file and submit PUC	Contractor

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
				certificates for all vehicles/equipment/ machinery used for the project. Monitoring results shall also be submitted to project authority/SPV as per the Pollution Monitoring Plan in the specified format.	
8	Construction Stage	Retrofitting and Rehabilitation Works	Impact on air water and soil quality	• All noise generating construction activities shall be carried out only during day time • All construction equipment and machinery shall be maintained to the prescribed emission and noise standards (ref. Annexure F). Noise monitoring shall be carried out and the noise standards prescribed for industrial area (75 dBA Leq during the day and 70 dBA Leq at night) to be adhered to. • Dust suppression during the construction stage shall be ensured through sprinkling of water regularly. • Construction activities shall be avoided during monsoon period. • Construction debris shall be disposed only at disposal sites located away from environmentally sensitive areas and ground water recharge areas, identified prior to start of dismantling or construction activities in the project area. • Construction Management Plan shall be prepared for the site; integrating it with traffic management plan for the surrounding areas to ensure that the construction activities do not create traffic congestion.	CTU PIU/ Project Consultant
9	Construction Stage	Handling fuel and lubricants	Impact on water quality Water Pollution from Fuel, Lubricants and Chemicals	• Contractor shall ensure that all vehicle/ machinery and equipment operation, maintenance and refuelling shall be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors shall be provided for vehicle parking, wash down and refuelling areas as per the design provided. • Contractor shall arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites approved by the Engineer. All spills and collected petroleum products shall be disposed off in accordance with MoEF and Chandigarh Pollution Control Committee guidelines.	Contractor
10	Construction stage	Construction wastes disposal	Impact on water and soil quality due to improper disposal	• Location of disposal sites shall be finalized prior to completion of the earthworks. The Engineer shall approve these disposal sites • conforming to the following (a) These are not located within designated forest area(b) The dumping does not impact natural drainage courses(c) No endangered/rare flora is impacted by such dumping. (d) Settlements are located at least 1.0km away from the site.	Contractor

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
11	Construction Stage	Sources of Materials/ Earth	Impact on water quality and ecosystem	• Prioritize sites already permitted by the Mining Department; • If other sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and to obtain the approval and • Identification of borrow and operation of borrow area will be as per the environmental requirements. • The rehabilitation of borrow area will be done by the contractor before closure of the borrow area.	Contractor
12	Construction stage	Waste Disposal	Impact on soil quality	The contractor shall provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner as per the Comprehensive Solid Waste Management Plan approved by the Engineer . Unless otherwise arranged by local sanitary authority. The contractor must make arrangements for disposal of night soils (human excreta) either by suitably approved by the local medical health or municipal authorities or as directed by Engineer as provided by the contractor.	Contractor
13	Construction stage	Clearing and Grubbing	Impact due to soil erosion.	Site clearance and removal must be carried out before the construction work starts. All works shall be carried out in a manner such that the damage or disruption to environmental attributes is minimum. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from Engineer.	Contractor
14	Construction stage	Operation of plants and machineries	Impact on noise quality Noise from Vehicles, Plants, and Equipment	The Contractor shall confirm the following • All plants and equipment used in construction shall strictly conform to the MoEF/ CPCB noise standards. All vehicles and equipment used in construction shall be fitted with exhaust silencers. □ Servicing of all construction vehicles and machinery shall be done regularly and during routine servicing operations, the effectiveness of exhaust silencers shall be checked and if found defective shall be replaced. • Limits for construction equipment used in the project such as concrete mixers, cranes (moveable), vibrators and saws shall not exceed 75 dB (A) (measured at one meter distance from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986. • Engineer shall be required to inspect regularly to ensure the compliance of EMP.	Contractor
15	Construction	• Labor Camp	Impact on health and	• The contractor shall provide, if required, erect and maintain	Contractor

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
	Stage	Management Accommodation • Labor Camp Management Potable Water Supply • Sanitation and Sewage System	safety of labors	necessary (temporary) living accommodation and ancillary facilities during the progress of work for labour to standards and scales approved by the Engineer • Contractor shall follow all relevant provisions of the Factories Act, 1948 and the Building & other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction & maintenance of labor camp. • Construction camps shall not be proposed within 1000m from the nearest habitation to avoid conflicts and stress over the infrastructure facilities, with the local community. The location, lay out and basic labour camp shall be submitted to Engineer prior to them construction. The construction shall commence only upon the written approval of the Engineer - In charge.	
16				• The Contractor shall construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing. within the precincts of every workplace in an accessible place, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996). The contractor shall also guarantee the following: • Supply of sufficient quantity of potable water (as per IS) in every workplace/labor camp site at suitable and easily accessible places and regular maintenance of such facilities. If any water storage tank is provided that shall be kept such that the bottom of the tank is at least 1mt. from the surrounding ground level. • If water is drawn from any existing well, which is within 30mt. proximity of any toilet, drain or other source of pollution, the well shall be disinfected before water is used for drinking. • All such wells shall be entirely covered and provided with a trap door, which will be dust proof A reliable pump shall be fitted to each covered well. The trap door shall be kept locked and opened only for cleaning or inspection, which will be done at least once in a month. • Testing of water shall be done every month as per parameters prescribed in IS 10500:1991. Compliance to EMP shall be reported to Engineer every week. Engineer shall inspect the labour camp periodically, to ensure compliance of the EMP.	Contractor
17				The contractor shall ensure that - • The sewage system for the camp are designed, built and operated	Contractor

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
				in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place • Separate toilets/ bathrooms, wherever required, screened from those from men (marked in vernacular) are to be provided for women • Adequate water supply is to be provided in all toilets and urinals • All toilets in workplaces are with dry-earth system (receptacles) which are to be cleaned and kept in a strict sanitary condition • Night soil is to be disposed off by putting layer of it at the bottom of a permanent tank prepared for the purpose and covered with 15 cm. layer of waste or refuse and then covered with a layer of earth for a fortnight. Adequate health care is to be provided for the work force during the entire phase.	
18	Construction stage	Health and Safety of Workers	Occupational hazards which can arise during work	• Develop and implement site-specific health and safety plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment like helmet, gumboot, safety belt, gloves, nose musk and ear plugs; (c) health and safety training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; • Ensure that qualified first-aid can be provided always. Equipped first-aid stations shall be easily accessible throughout the site; • Provide medical insurance coverage for workers; • Secure all installations from unauthorized intrusion and accident risks; • Provide supplies of potable drinking water; • Provide clean eating areas where workers are not exposed to hazardous or noxious substances; • Provide health and safety orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; • Provide visitor orientation, if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; • Ensure moving equipment is outfitted with audible back-up alarms; • Mark and provide sign boards for hazardous areas such as	Contractor

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
				energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the public as appropriate; and • Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.	
19	Construction Stage	Risk from Electrical Equipment(s)	Safety hazards and accidents due to electrical short circuited and fire	The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that – • No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public. • All necessary fencing and lights shall be provided to protect the public in construction zones. • All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected, and properly maintained as per IS provision and to the satisfaction of the Engineer	Contractor
20	Construction stage	Construction work	First Aid	The contractor shall arrange for A readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone. Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital Equipment and trained nursing staff at construction camp.	Contractor
21	Construction stage	Community Health and Safety.	Disturbance to local community	Depot site at Raipur Kalan is situated adjacent to residential area. The night time work should be avoided	Contractor
22	Operational Stage	• Spray painting • Movement of Buses in the Depot	Impact on air quality	• Proper training in the correct use of applying paint can reduce VOC emissions. Train employees on the proper cleaning and maintenance of equipment. • Use solvents with low or no VOC content. • Do all spray painting in an enclosed area and provided workers with mask filters. • Cover solvent tanks when not in use to reduce evaporation.	Environmental and Social Officer, Depot Manager
23				Functional areas in the depot should be paved.	CTU PIU

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
24	Operational Stage	• Storage of new/used solvents/chemicals/oil/grease • Storage/disposal of used cleaning Rags	Impact on air and water quality	• Inventory of all chemicals including oils and gases used/stored in depots to be made and assessed for applicability of statutory legislative applicability and requirements. • Keep lids on containers of solvent-based chemicals to reduce evaporation. • Store used solvent in sealed drums, until collected, reused or recycled. • The drum should be stored in a bunded, covered area. Under no circumstances should evaporation be used to dispose of spent solvents. • Floor drains shall not be provided where hazardous materials are stored.	Environmental and Social Officer, Depot Manager
25				Rags soiled by oil/grease and solvents should be stored in covered drums and disposed to authorized agencies.	Environmental and Social Officer, Depot Manager
26	Operational stage	• Use of generator set • Storage/disposal of • Batteries	Impact on soil and water quality Potential leakages from stored batteries affecting soil and water	Train workers to prevent spills when filling diesel. If spills do occur, clean up oil spills with rags. Used rags should be stored and disposed separately. Generator area should be bunded with either an impervious concrete hump or flexible rubber hump and regularly check that bunds are sound.	Environmental and Social Officer, Depot Manager
27				Indoor storage is recommended for lead-acid batteries. Store batteries on an acid-resistant rack If stored outside, should be stored on impermeable surfaces, covered to prevent acid run-off and should have secondary containment Keep a neutralizing agent such as baking soda nearby, in case of leaks or spills. Use an authorized recycler for disposing batteries	Environmental and Social Officer, Depot Manager
28	Operational Stage	• Bus washing • Washing of maintenance shed floors Storage, use and disposal of new/used Coolant	Impact on ground water source Impact on water quality and source Quantity/qualityof storm water drains and rivers from large quantity of wastewater from depots	• Install water recycling unit in bus washing systems. • Install rain water harvesting pipes at other general drainage areas as per CPWD manual and procedures for installation of a appropriate rain water harvesting and ground water recharging system	CTU PIU
29				• Install water recycling unit in bus washing systems. • The water recycling system shall be capable of reclaiming water from the bus washer and processing it by means of settling pits, in-line	CTU PIU

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
				filters, etc. and must be able to continuously supply and adequate amount of water for the high- pressure pump. • Routine bus washing areas should be separate from other 'parts washing' with separate drainage streams. Use dedicated parts cleaners to wash small parts.	
30				• As far as possible dry floor cleaning methods like sweeping and vacuuming should be used. • Train employees to use water efficiently. • Prevent drips and spills from reaching the floor. If a small spill does occur, clean it immediately with mops. Spills shall not be cleaned by hosing them down with water.	Environmental and Social Officer, Depot Manager
31				Work on vehicles that involve transferring or dispensing of coolants substances should be carried out inside the building or within a roofed, bunded area. Used coolants should not be drained directly into storm water drains. Store used coolant in sealed drums in a bunded, covered area, and dispose to authorized agents.	Environmental and Social Officer, Depot Manager
32	Operational Stage	Storage, use and disposal of new/used Oil (engine/brake) at Depots	Impact on water and soil quality Potential oil spills on drains from depots reaching pubic storm	• Work on vehicles that involve transferring or dispensing of oils, should be carried out inside the building or within a roofed, bounded area. • Workers to be trained to place drip pans underneath leaking vehicles to collect dripping oil and pour oil from drip pan into the used oil drum. Use large drum funnels or fill tubes when filling used oil drums. • Used oil must be stored in sturdy, leak proof drums labeled "USED OIL." Oil storage drums should have proper containment in case there is a leak or spill- storage yards in the depot for oil storage should have bunding with either an impervious concrete hump or flexible rubber hump and regularly checked to ensure that bunds are sound. • Inspect used oil storage drums on a regular basis for leaks or spills. • Other waste shall not be mixed with used oil. • Train workers on the importance of spill prevention when servicing vehicles. • Spills shall not be cleaned by hosing down with water. If spills do occur, clean up oil spills only with rags. • Send used oil for recycling to authorized recycling units at regular	Environment and Social Officer, Depot Manager, CTU PIU/ Project Consultant

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
			water drains and river. Contamination of soil.	intervals. Schedule to be fixed for the same based on average quantity generated. • Oil interceptors should be provided at regular intervals along the storm water drains in the depot sites and also at the outlet to public storm water drains and rainwater harvesting pipes. • Oil interceptors should be checked on a monthly basis to make sure they are working properly. This includes cleaning out the sludge and disposing it properly to an approved facility. • Mark all drains on the site that connect to the storm water system after oil interception to increase awareness of the pollution risk and enable immediate identification in the event of a spill. • By minimizing the amount of wastewater that is generated, the amount of wastewater and sludge that must be managed or discharged can be reduced. Bus wash systems shall incorporate water recycling in it. • Oil storage areas should be paved and impervious.	
33	Operational Stage	Storage and disposal of other materials like parts/drums/packaging materials	Impact on soil and water quality Soil and water contamination	• It is important that all parts contaminated with grease or oil are kept in drip trays in a covered area with a sealed floor • Metals such as lead, copper and steel, which should be stored in a secure container for collection by a metal recycler. • Paper, card board, used wooden crates, boxes, glass, metal drum, plastic material ,metal (pipes, sheet metal, structural steel etc.), electrical items(wires, cables etc.), packaging material (thermocol, laminated sheets etc.) and rubber waste shall be disposed-off to an authorized scrap vendors for effective recycling and reusing purpose.	Environmental and Social Officer, Depot Manager
34	Operational Stage	Service and repair work	Impact on water quality Contamination of public storm water drains and rivers	• Perform vehicle maintenance work in areas away from depot storm water drains. Service sheds to be designed so that activities that need water/liquids for washing and cleaning are separated from maintenance areas, which shall be bunded. • If internal drains are provided in maintenance sheds, these shall be blocked while carrying out maintenance work. • Oil interceptors to be provided at bus wash area outlet.	Environmental and Social Officer, Depot Manager
35	Operational Stage	• Use of generator set • Movement of materials • Use of electrical equipment's, air compressors and tools • Movement of Buses on	Impact on noise quality and traffic congestion	Keep generators in acoustic noise enclosures.	Environmental and Social Officer, Depot Manager
36				Ensure that trolleys (for in-house parts movements) have rubber or poly urethane wheel to avoid adverse noise generation while movements.	Environmental and Social Officer, Depot Manager

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
37		the access road to Depot		• Maintain equipment, air compressors, to reduce noise • Use air compressors indoors to reduce disturbance outside. • Workers to be provided with earmuffs	Environmental and Social Officer, Depot Manager
38				• Buses shall not be parked outside the depot boundaries. • Train Drivers not to use horns near while entering and exiting the depot Formulate a traffic management plan for the morning and night period when maximum bus movement to and from the depot is expected	Environmental and Social Officer, Depot Manager
39	Operational Stage			Storage of flammable materials and battery shall be away from locations along the High Tension Lines at depot No 2 and 3, as well as away from the residential area near depot 3 and Raipur Kalan depot	Environmental and Social Officer. Depot Manager, CTU PIU/ Project Consultant
40		Storage of inflammable materials (chemicals, oil A/C gas cylinders etc.)	Fire hazard	• Provide fire extinguishing equipment sufficient to extinguish any probable fire, adequate water supply at ample pressure as per national standards and trained persons required to operate the fire extinguishing equipment provided • Designate fire officers at each site. • Fire safety notices to be placed at prominent locations. Display sufficient warning signs. • Install fire alarm wherever required and test regularly. • Display escape route maps prominently on each side. • Provide sufficient exit signs at prominent locations for directing people to and routes. • Train workers about the escape route and assembly point/s. • Carryout fire drill periodically. • Fire extinguishing equipment provided shall be properly maintained and inspected at regular intervals of not less than once in a year by the responsible person and a record of such inspection is maintained. • Store liquids according to the manufacturer's requirements – for example, solvents should be stored away from heat, flames, direct sunlight, oil or other flammable liquids. Incompatible chemicals shall not be stored together.	Environmental and Social Officer, Depot Manager
41	Operational Stage			• Open air incineration of wastes will not be carried out in the depot sites • Mark all storage and usage areas of inflammable materials as a no smoking area. • Transport, store, use and secure cylinders in upright position.	Environmental and Social Officer, Depot Manager

Table : Environmental Management Action Plan for Depot Infrastructure Improvement -DEPOT 1, 2 and 3

S. No	Project stage	Project component / activity	Impact	Impact mitigation / Environmental Management Measures	Responsibility
				• Ensure proper ventilation at the ground level in locations where gas is in use. • Avoid physical damage to the cylinders. • Never weld near the cylinder. • Investigate immediately if there is smell of gas/ leakage. • Make sure that there is no other unrelated fire in the vicinity of the cylinder.	
42	Operational Stage		Occupational Health and Safety	• Suitable personal protective equipment like face shield and goggles, shall be provided for the protection of eyes and used by the worker engaged in operations like welding, cutting, chipping, grinding or similar operations which may cause hazard to his eyes • Workers to be provided with ear muffs • Water purifying systems shall be provided for drinking water to the staff • Toilets with piped water supply to be provided at all depots. Separate toilets shall be provided for male and female staff. Toilets to be cleaned twice a day to maintain hygiene. • Emergency Full body Shower and emergency eye wash fountain to be provided at each site • Provide electric fly catcher machines at maintenance sheds and canteens. • Environmental awareness training programs for workers and other staff on site • Safety audits to be carried out periodically • Initiate award program for employees who come up with good pollution prevention ideas.	Environmental and Social Officer, Depot Manager
43	Operational stage	Use of electrical equipment, air compressors and tool	Occupational Health and Safety Electric shock / fire	• Train all workers about electrical safety and to shut down the equipment that is sparking or getting over heated or emitting smoke at the time of operation, if it is not the normal way of working of such machines.	Environmental and Social Officer, Depot Manager
44	Operational Stage	Storage of new/used Tyres	Impact on community and OHS Water stagnation and mosquito breeding	• Store as few tyres as possible at the depot by ensuring that discarded ones are hauled away on a regular basis. Send old tyres to authorized recyclers. Prepare a fixed schedule for the same. • Keep tyres stored indoors, or keep tyre piles covered in order to prevent entrapment of water.	Environmental and Social Officer, Depot Manager

5.2 INSTITUTIONAL ARRANGEMENTS FOR THE IMPLEMENTATION OF EMAP

Similar to the SUTP, ESCBS is to be implemented and monitored by the steering committee and the MoUD, GoI by a Project Management Unit (PMU). AS per the Environmental and Social Management framework of the World Bank, a three-tier management structure is envisaged to enable effective communication and distribution of responsibilities between the three primary stakeholders namely the GoI, State Government and CTU. Currently there is no provision in the organizational structure and institutional mechanism of CTU for implementing and overseeing environmental and safety issues of the City Bus system. The PIU will also have an Environment and Social Officer nominated to address the environmental and social issues arising in the project design and implementation as per the ESMF and Project EA/SAfrom relevant agency.

The supervision responsibility of the EMP lies with CTU. CTU will ensure that the construction agency that is selected for building the depots will follow the guidelines of the EMP document. The designated officials will be supervising the same to ensure the inclusion of the EMP measures. Raipur Kalan Depot is currently under review.Roles and responsibilities of the respective environment and social officers in PIU are discussed in detail in the sections below.

Environment and Social Officer of CTU shall assist the Environment and Social Safeguard Experts at the Project Management Unit. An Engineer of the PIU set up by CTU shall be given an additional charge of overseeing the implementation of ESMF as well as any other environmental and social provisions as deemed fit for project implementation as per the regulations of the World Bank and Government of India. The Terms of Reference for Environmental and Social Officer shall be as indicated in the box below.

PIU'S ENVIRONMENTAL & SOCIAL OFFICER

PIU'S ENVIRONMENTAL & SOCIAL OFFICER
CTU shall nominate one officer with relevant experience in infrastructure projects as Environmental and Social Officer to undertake the following responsibilities. **Roles & Responsibilities** • Review the EA/ SA Documents prepared by the consultants and ensure adequacy under the World Bank Safeguard policies • Ensure that the project design and specifications adequately reflect the recommendations of the EIA/ SIA • To ensure the environmental clauses are adequately placed / reflected in the contractors bidding document for implementation of the Environmental Management Plan (EMP) • Co-ordinate application, follow up processing and obtain requisite clearances required for the project, if required • Prepare compliance reports with statutory requirements. • Develop, organize and deliver training programme for the PIU staff, the contractors and others involved in the project implementation, in collaboration with the PMU • Review and approve the Contractor's Implementation Plan for the environmental measures, as per the EIA and any other supplementary environmental studies that may need to be carried out by the PIU • Liaise with the Contractors and the PIU / State Implementing agency on implementation of the EMP • Liaise with various State Government agencies on environmental, resettlement and other regulatory matters • Continuously interact with the NGO's and Community groups that would be involved in the project • Establish dialogue with the affected communities and ensure that the environmental concerns and suggestions are incorporated and implemented in the project • Review the performance of the project through an assessment of the periodic environmental monitoring reports submitted by the PMC; provide a summary of the same to the Project Director, and initiate necessary follow-up actions • Provide support and assistance to the Government Agencies and the World Bank to supervise the implementation of the EMP during the construction as well as operation stages of the project

Source: Draft ESMF for the Global Environment Facility 5 Project on Efficient and Sustainable City Bus Services (ESCBS)PCIB

5.3 STAKEHOLDER ENGAGEMENT PLAN

A stakeholder engagement plan has been developed for the proposed depot at Raipur Kalan, Chandigarh. Details are given below

Stakeholder	Nature of Engagement	Plan
Community	People living near the depot area	CTU will establish grievance redressal mechanism where any aggrieved person can approach the depot manager with their grievances and it will be resolved
	Bus users	CTU will plan user satisfaction

		survey as and when required.
Chandigarh Pollution Control Committee	Regulatory requirement of Consent to Establish and Consent to Operate.	CTU will obtain consent to establish and consent to operate from Chandigarh Pollution Control Committee. Reporting will be done as per the condition of the consent.
Utilities Department	The utilities departments like electricity department, municipal corporations shall be engaged for the obtaining necessary permission and use of facility.	Meetings will be scheduled with the line department and necessary documents and reports will be developed.

5.4 REPORTING MECHANISM

Report	Prepared by	Approved by
Quarterly environment and social monitoring report	Contractor will prepare and submit quarterly environment and social monitoring report which includes: • Impacts and mitigation measures • Air water and noise testing results. • Grievances reported and resolved • Status of permits and license. • Accidents and incidence reporting	PIU/ CTU

5.5 ENVIRONMENTAL MONITORING:

To ensure the effective implementation of the EMP, it is essential that an effective monitoring programme be designed and carried out. The purpose of the monitoring programme is to ensure that the envisaged purpose of the EMP and desired benefits to the target population are achieved. The broad objectives of the monitoring programme are the following:

- To evaluate the implementation of mitigation measures proposed in the EMP;
- To evaluate the adequacy of Environmental Impact Assessment;
- To suggest improvements in management plan, if required; and
- To satisfy the legal and community obligations

The following components of the environment shall be monitored at the depots and Central Workshop:

- Air quality
- Water quality

- Noise levels
- Tree plantation

For each of the environmental components, the monitoring plan specifies the parameters to be monitored; locations of monitoring; frequency of monitoring and duration. The monitoring plan also specifies the applicable standards, and implementation and supervising responsibilities.

Air, Noise and Water Quality monitoring shall be carried out at the depots by an agency/lab approved by the Pollution Control Board, as per CPCC norms and report submitted annually to CPCC.

Table 5-1: Environmental Monitoring Plan

AIR QUALITY MONITORING	
Parameter	PM, SO_2,NO_x, CO and Pb
Sampling Method	High volume air sampler .Use method specified by CPCB for analysis
Performance Indicators	National Ambient Air Quality (NAAQ) Standards set by CPCB
Frequency	Thrice(except monsoon) per year during Construction stage and Operation stage
Duration	Continuous 24 hours / or for 1 full working day
Locations	At each Depot
Measures	Wherever air pollution parameters increase above specified standards, additional measures as decided by the environmental officer shall be adopted
Implementation	Contractor through CPCC approved monitoring agencies during Construction Stage. PIU through CPCC approved monitoring agencies during Operation Stage
Supervision	Environmental Officer, PIU
WATER QUALITY MONITORING	
Parameter	pH, BOD, COD, TDS, Pb, Oil & Grease, Detergents, Cu, Cd, Zn, SE, As, Hg, Ammoniac nitrogen, Mn, Fe, V, Phenolic compoundsand Cr for Surface water. PH, TDS, Total hardness, Sulphate, Chloride, Fe, and Pb for groundwater.
Sampling Method	Grab sample collected from source and analysis as per standard methods for examination of water and Waste water
Performance Indicators	Indian standards for Inland Surface Water (IS: 2296, 1982) and for Drinking water (IS: 10500,1991)
Frequency	Thrice a year during construction stage and operation stage
Duration	One – time grab sampling
Location	Out fall points at each depot
Measures	At location of increased water pollution, all inflow channels shall be checked for pollution loads and channel delivering higher pollution loads shall be terminated from disposal into the water source till issue is addressed.
Implementation	CPCC approved monitoring agencies, with prior notice to Environmental Officer
Supervision	Environmental Officer, PIU

NOISE LEVEL MONITORING	
Parameter	Noise level on dB(A) scale
Sampling Method	Measure equivalent noise levels using an integrated noise level meter
Performance Indicators	Noise Pollution (Regulation and Control) Rulers, 2000
Frequency	Thrice each year during construction and operation stage
Duration	Reading to be taken at 15 seconds interval for 15 minutes every hour for 24 hours and then averaged
Location	One Outdoor location in depot , one neat DG set
Implementation	CPCC approved monitoring agencies, with prior notice to Environmental Officer
Supervision	Environmental Officer, PIU
SURVIVAL RATE OF PLANTATION	
Parameter	Survival rate
Sampling Method	Visual observation
Performance Indicators	90% survival rate
Frequency	Thrice each year till the tree reaches 2 m height
Location	Along the boundary wall of Raipur Kalan Depot adjoining the residential area
Implementation	Contractor
Supervision	Environmental Officer, PIU

Reportingformats recommended in the **APPENDIX – F**shall be adopted.

Capacity Building and Training: The Environmental and Social Officer involved in the project shall be provided the basic training required for environmental awareness followed by specific aspects of City Bus/depot projects along with Environmental implications for the project. The training should cover basic principles of environmental assessment and management; mitigation plans and programmes, implementation techniques, monitoring methods and tools. Specific issues of Urban Environmental Management would need to be undertaken in separate sessions. Typical modules that should be present for the training session are:

- Sensitization of the project implementing agencies on environment and social aspects
- Introduction to Environment, Social and Resettlement Aspects
- Environment, social and resettlement Considerations in Urban Development Projects
- Review of EA/EMP & SIA and integration into design
- Improved co-ordination within Nodal departments
- Special issues in ESCBS
- Role during construction
- Monitoring &reporting system

The environment and social officer of the PIU set up by CTU as well as depot managers shall attend the above sessions and workers/drivers for orientation sessions.

5.6 TOTAL COST ESTIMATES OF ENVIRONMENTAL MANAGEMENT PLAN

The cost estimates worked out for the measures recommended for environmental impact mitigation and environmental enhancement for individual depots has been provided in the earlier section. Monitoring cost is an annually recurring cost and only the cost for the first year has been included.

The cost of incorporating environmental management measures as well as Environmental Monitoring Costs (for the first year) for all depots together is approximately worked out to be INR 1,56,47,000**.**

5.6.1 Cost Estimates for implementation of Environmental Management Plan at Raipur Kalan Depot

The cost estimates have been worked out for the measures recommended for environmental impact mitigation and environmental enhancement. Monitoring cost is an annually recurring cost and only the cost for the first year has been included.

S.NO	ITEM	Block Cost (INR)
1	Rain water harvesting system including laying of pipelines, sedimentation tank and rainwater harvesting pits/tubes	Covered under depot construction Cost
2	Construction of Noise Barrier to be covered under depot construction cost. Length of 300 m along the residential side @ INR 10500 / sq. m	94,54,000
3	Effluent treatment plant	10,00,000
4	Installation of Water Recycling Plant at Bus Washing systems including treatment systems, civil works for tanks and pipelines	Covered under depot equipment costs
5	Oil intercepting chamber at outfall points, maintenance shed drains and rainwater recharging tubes, four numbers @ Rs 25,000/unit	100,000
6	Tree Plantation along the periphery (200 numbers @ Rs 1000 /tree including tree guards and maintenance for1 year)	200,000
7	Training/Environmental Awareness Programs /year (lump-sum)	40,000
8	Protective gear for workers (safety goggles, gloves, face shields, ear muffs) Lump sum	50,000
9	Emergency full body safety shower & eye wash fountain	10,000
10	Fire safety equipment	Included in project costs
11	Installation of electric fly catching machine 3 numbers @Rs 5000	15000
12	Drinking Water Purifiers, 2 numbers @ Rs 16,000	32000
13	Public Consultation 1 No. prior to start of construction and 2 nos. during construction	1,50,000
14	Traffic Management at entry and exit (speed breakers, yellow blinkers, tabletop pedestrian crossing)	4,00,000
Baseline data of depot specific		

S.NO	ITEM	Block Cost (INR)
15	Air Quality prior to start of construction of depot @ Rs 10,000	10,000
16	Noise Levels prior to start of construction of depot @Rs 2,500	2,500
17	Water Quality (Surface and ground water quality)prior to start of construction of depot @Rs 10,000	20,000
	Environmental Monitoring Costs (annual)	
18	Air Quality year thrice a year @ Rs 10,000	30,000
19	Noise Levels thrice a year @Rs 2,500	7,500
20	Water Quality thrice a year @Rs 10,000	30,000
	TOTAL	**1,15,47,000**

5.6.2 Cost Estimates of implementation of Environmental Management Plan at Depot 1

S.NO	ITEM	Block Cost (INR)
1	Rehabilitation/repair of existing storm water system	250,000
2	Rain water harvesting system including laying of pipelines, sedimentation tanks and rainwater harvesting pits/tubes, lump sum	200,000
3	Protective gear for workers (safety goggles, gloves, face shields, ear muffs) Lump sum	50,000
4	Emergency full body safety shower & eye wash fountain	10,000
5	Fire safety equipment	Included in project costs
6	Installation of electric fly catching machine @ 3 numbers	15,000
	Environmental Monitoring Costs (annual)	
7	Air Quality year thrice a year @ Rs 10,000	30,000
8	Noise Levels thrice a year @Rs 2,500	7,500
9	Water Quality thrice a year @Rs 10000	30,000
	TOTAL	**5,92,500**

5.6.3 Cost Estimates for implementation of Environmental Management Plan at Depot 2

S.NO	ITEM	Block Cost (INR)
1	Construction of new storm water drainage system in Depot 2	2,000,000
2	Rain water harvesting system including laying of pipelines, sedimentation tanks and rainwater harvesting pits/tubes	200,000
3	Installation of Water Recycling Plant at Bus Washing systems including treatment systems, civil works for tanks and pipelines @ Rs 5,00,000/depot	Covered under depot equipment costs
4	Water pumps for dewatering at depot 2	100,000
5	Oil intercepting chamber at outfall points, maintenance shed drains and rainwater recharging tubes, four numbers @ Rs 25,000/unit	100,000
6	Training/Environmental Awareness Programs /year (lump-sum)	40,000
7	Protective gear for workers (safety goggles, gloves, face shields, ear muffs) Lump sum	50,000
8	Emergency full body safety shower & eye wash fountain etc.	10,000
9	Fire safety equipment	Included in project costs
10	Installation of electric fly catching machine 3 numbers @ Rs 5000	15,000
11	Drinking Water Purifiers, 2 numbers @ Rs 16000	32,000
12	Construction of new toilet blocks	Covered under project costs
	Environmental Monitoring Costs (annual)	
13	Air Quality year thrice a year @ Rs 10,000	30,000
14	Noise Levels thrice a year @Rs 2,500	7,500
15	Water Quality thrice a year @Rs 10000	30,000
	TOTAL	**2,614,500**

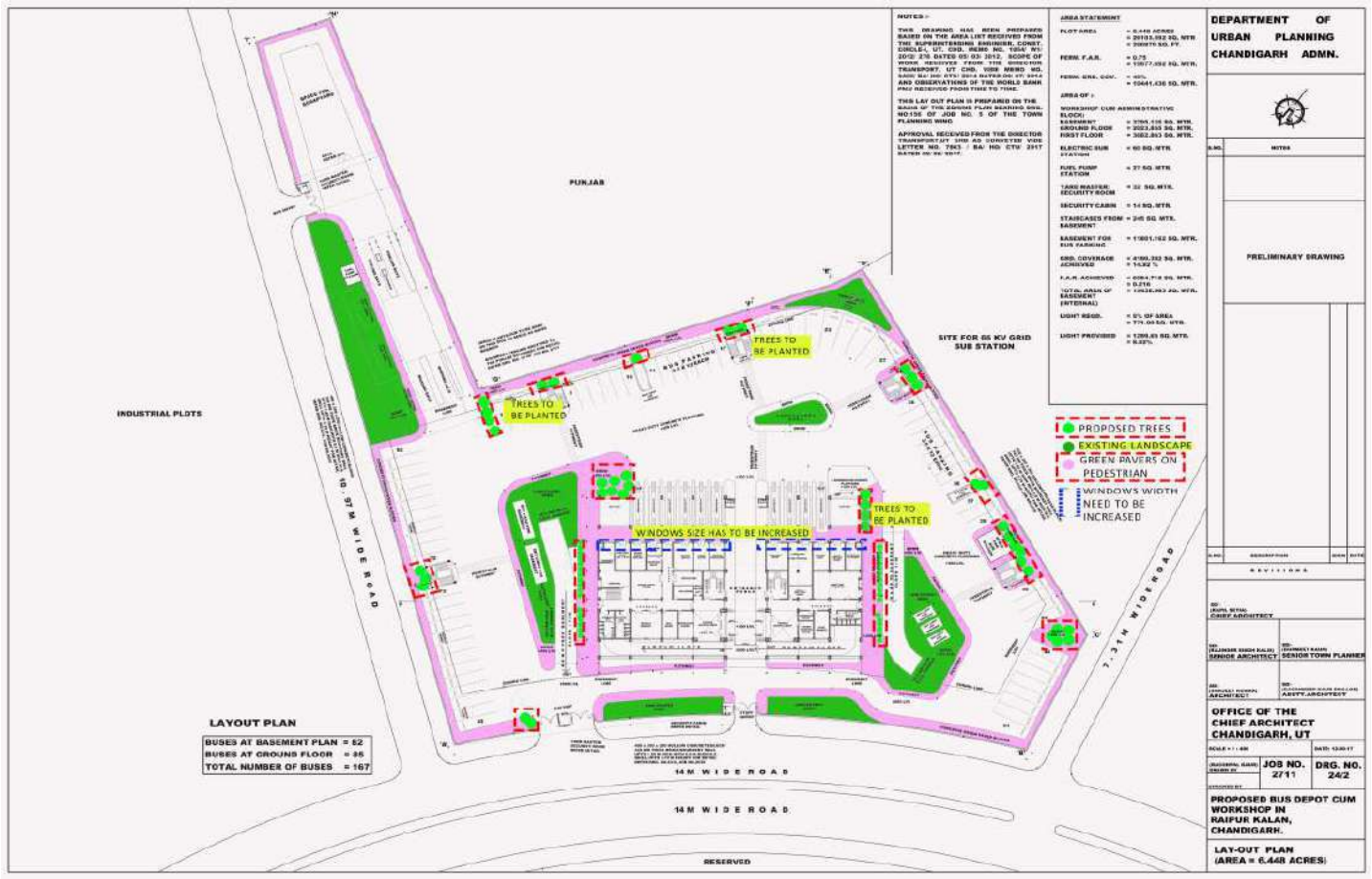
5.6.4 Cost Estimates for implementation of Environmental Management Plan at Depot 3

S.NO	ITEM	Block Cost (INR)
2.	Rehabilitation/repair of storm water systems	250,000
3.	Rain water harvesting system including laying of pipelines, sedimentation tanks and rainwater harvesting pits/tubes lump sum	200,000
4.	Installation of Water Recycling Plant at Bus Washing systems including treatment systems, civil works for tanks and pipelines at all depots @ Rs 5,00,000/depot	Covered under depot equipment costs

6	Oil intercepting chamber at outfall points, maintenance shed drains and rainwater recharging tubes four numbers @ Rs 25,000/unit	1,25,000
8.	Training/Environmental Awareness Programs /year (lump-sum)	400,00
9	Protective gear for workers (safety goggles, gloves, face shields, ear muffs) Lump sum	50,000
10.	Emergency full body safety shower & eye wash fountain etc.	10,000
11.	Fire safety equipment	Included in project costs
12.	Installation of electric fly catching machine 3 numbers @ Rs 5000	15,000
13.	Drinking Water Purifiers, 2 numbers @ Rs 16,000	32,000
14.	Construction of new toilet blocks at all depots	Covered under project costs
	Environmental Monitoring Costs (annual)	
15.	Air Quality year thrice a year @ Rs 10,000	30,000
16.	Noise Levels thrice a year @Rs 2,500	7,500
17	Water Quality thrice a year @Rs 10000	30,000
	TOTAL	**789,500**

6 APPENDIX- A

Proposed Layout of Raipur Kalan Depot



7 APPENDIX- B

CTU CITY BUS SERVICE ROUTE DETAILS[2]

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
		PGI TO PGI via – 14/15, 15 Mkt., 16 Mkt., ISBT-17, 18 Mkt.,				
1	1A	19 Mkt., 27 Mkt., 28 Mkt., CTU W/Shop, Railway Station, Railway Crossing, HB Chowk, Manimajra, MM Town, M Complex, Railway Lights, 26 Grain Mkt., GGSC-26, 7-A/7-B, 7/8, 8 Mkt., 9 Mkt., 10 Mkt., 11 Mkt., OPD PGI	JNNRUM 7.35 A.M to 19.35 hrs.	20 Min	30 KM	5
2	1C	**PGI TO PGI via –** OPD PGI, Sec-11, 10, 9, 8, 8/7, 7-A/7-B, GGC-26, Grain Mkt., Railway Crossing, M Complex, MM Town, ManiMajra/29, HB Chowk, Railway Station, CTU W/Shop, Sec28, 27, 19/18, ISBT-17, 16 Mkt., 15 Mkt., 14 Mkt., 14/15, PGI	JNNRUM 7.45 A.M. to 19.05 hrs.	20 Min	30 KM	5
		Mani Majra to Mani Majra, Via – Indira Colony, M.M. Town, M/Complex, Rly. Cross, 26 G. Mkt, 19/7, 18/8, 22/17, 16/10,				
		15/11, 14/12, Khuda Lahora, Sarangpur, Barrier Dhanas, Dadu	5.30 A.M.to			
3	2A	Majra, CTU Workshop, 25/24, 24/15, 23/16, ISBT-17, 18/21,	20.50hrs upto ISBT	20 Min	36	6
		19/20, 27/30, 28/29, Elante Mall,Colony No-4, CTU Workshop, Railway Station, R/Cross, H.B. Chowk, Manimajra.	17			
4	2B	**PGI to I.T Park via –** New OPD,PEC, 10/16/HSP, 17/16, ISBT17, 17/18, 8/18, 7/19, 26/27, 26 Grain Mkt, CTU w/s, R/Station, R / Crossing, HB Chowk, M.Majra, Indra Colony, K.Garh.	7:00 A.M. to. 19:00 hrs. F I.T.Park 8.15 A.M. to 20.15	30 Min	22	5

[2]http://chdctu.gov.in/PDF/cturoutes.pdf

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
			hrs.			
		Mani Majra to Mani Majra via H. Board, Rly. Station, CTU Workshop, Colony No-4,Elante Mall, 28/29, 27/30, 19/20, 18/21, ISBT-17, 16/23, 15/24, 24/25, CTU Workshop, Dadu				
5	2C	Majra, Dhanas, Sarangpur Barrier, Khuda Lahora, 14/12,	5:35 A.M. to	20Min	38	6
		11/15, 10/16, ISBT-17. 8/18, 7/19, Grain Mkt., Rly. Crossing, M/Complex, M.M Town, Indira Colony, M. Majra.	21:05hrs.			
6	2D	**PGI TO IT Park VIA - Via-**New OPD 11/15, 10/16,ISBT-17, 8/18, 26/27, Grain Market, CTU Workshop, R. Station, R. Crossing, H Board, Manimajra, Indira Colony, Kishangarh.	7:05 A.M. F PGI to IT Park 17:15 hrs. 8:05 A.M F MM to 16:35 hrs.	35 Min.	18	2
		Manimajra to Dhanas via Housing Board, R/Crossing, Railway				
		Station, CTU workshop, G.Mkt-26, 27/26, 19/7, 18/8, 17/22,	Manimajra 6:00 to			
7	2E	16/10, New OPD, PGI,Khuda lohra,S.P.Barrier	17:30 hrs. And PGI	30 Min.	24 Km	5
			06:50 to 18:10 hrs.			
	2F	**PGI to Panchkula Sec-20 via-**O.P.D., 16 Hosp, 16/10, ISBT-17,	6.00.a.m.F PKL to.	20Min	22	8
		8/18, 7/19, 26/27, Grain Mkt., TPT Chowk, R/Cross, H.B.	20.40. Hrs. 6.00 a.m F			
8		Chowk, 11/15, 12/11, Rally Chowk, ISBT- Panchkula Chowk,	S. B to 20.40			

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
			hrs.			
		Sec-4, 20, 21				
		ISBT-43 TO ISBT-43 , via 42 Mkt, 41 Mkt, Franko,Old Barrier				
		(Mohali), Ph-6/56, Maloya,38west,DMC,Dhanas,S.P.B, Khuda	JNNRUM			
9	4-A	lohra, PGI, 11/15, 16Hospital,ISBT17,	7.00 A.M. to 16.00	30 Min.	31 KM	4
		Aroma,34/35,44/43,ISBT43.	Hrs.			
		ISBT-43 TO ISBT-43 via – 43/44 Mkt., 35/34Mkt,				
		Aroma,22/17,16Hospital,15/11,Pgi,Khuda	JNNRUM			
10	4-C	lohra,S.P.B,Dhanas,DMC,38west,Maloya,56/6Ph,Mohali Old	8.45 A.M to 17.45	30 Min.	31 KM	4
		Barrier, Franko, 41Mkt, 42Mkt.	hrs.			
		RAMDARBAR TO RAMDARBAR via-Sec-47, 31/47, 31/32,				
11	5-A	29/30, 27/28, 27/26, 19/, 18/8, 17/9, 16/10, 15/11, PGI,, 14/15, 24/25, 37/38, 40/38, 39/38W, Maloya, 39 Mkt., 40 Mkt., 41 Mkt., 42 Mkt., ISBT-43, 44 Mkt., 45 Mkt., 46 Mkt., 47 Mkt.	JNNRUM 6.30 A.M. to 19.25 hrs.	20 Min	36 KM	5
12	5-C	**RAMDARBAR TO RAMDARBAR via-**43/44, 44 Mkt., 45 Mkt., 46 Mkt., 47 Mkt., Ramdarbar fist & last time both sie Ramdarbar to Ramdarbar via 47 Mkt., 46 Mkt., 45 Mkt., 44 Mkt., ISBT-43, 42 Mkt., 41 Mkt., 40 Mkt., 39 Mkt., Maloya, 39/38, 38W/40, 38/37, 25/24, 14/15, PGI, 11/15, 10/16, 9/17, 8/18, 19/7, 26/27, 28/27, 29/30, 31/32, 31/47, Sec-47	JNNRUM 6.30 A.M to 19.15 hrs.	20 Min	36 KM	5

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
		ISBT-17 TO ISBT-17 via 22/17, 22/23, 23 Mkt., 24 Mkt.,				
		24/25, 38/25, 38West, Maloya, 38W/39, 38 Mkt., 37 Mkt.,				
		36/37, 42/41, 42 Mkt., ISBT-43, 43/44, 42/43, Attawa, 36/35,	**JNNRUM**			
		35 Mkt., 34 Mkt., 33 Mkt., 32 Mkt., 31 Mkt., Ramdarbar, Indl.				
13	**7-A**		**6.30 A.M. to 20.40**	**20 Min**	**34KM**	**4**
		Area Ph-II, Tribue Chowk, 29 Mkt., 29/30, 32/30, 32 Hospital,	**hrs.**			
		20/30, 20 Mkt., 21 Mkt., Aroma, 22 Mkt., 23/22, ISBT-17.				
14	**7-B**	**PGI to High Ground via** G.H. Sec-16, 17/16, ISBT-17, Aroma, Sec-20, 30/32 – Hospital, Tribune Chowk, Hallo Majra, Airport, Zirakpur. (Route closed)	**F ISBT-17 07:10 A.M. and F H.G. 16:40 hrs.**	**Route Closed**	**25**	**1**
		ISBT-17 TO ISBT-17 via Aroma, 21 Mkt., 20 Mkt.,30/20,				
		30/32, 32 Hospital, 30/29, Tribune Chowk, Indl Area Oph-=II,				
		Ramdarbar, 31 Mkt., 32 Mkt., 33 Mkt., 34 Mkt., 35 Mkt.,	**JNNRUM 7.00 A.M**			
15	**7-C**	Attawa, ISBT-43, 43/44, 42, 41/42, 36/37, 37 Mkt., 38 Mkt.,	**to 19.35 hrs.**	**20 Min**	**34KM**	**4**
		39/38W/ Maloya, 38W, 25/38, 25/24, 24 Mkt., 23 Mkt.,				
		23/22, ISBT-17				
16	**8-A**	**Mohali Railway Station To PGI via** 11/10, 49/48, 48 Mkt., 47 Mkt., 46Mkt., 45 Mkt., 44 Mkt., ISBT-43, 43/44, 35/34,. 22/17, 16/10, OPD, PGI.	**6:30 A.M. to 20:00 hrs. from PGI**	**30 Min**	**22**	**5**

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
		Mansa Devi to Mansa Devi Via –M.majra, H.B Chowk, TPT				
		Chowk, Grain Mkt., 26/27, 27/19, 20/30, 32/33, 45/46,				
		49/50, 63/64,67/68, Mauli,66,Ph.II,48/Jagatpur, 48 Mkt.,	**6:10 A.M. F MM. to**	**30-35**		
17	**9-A**	49/48, 46/47, 47 Mkt.,IndAreaph-II,R/DarbarInd-ph-II.	**20:10 Hrs upto Sec-**	**Min**	**40**	**4**
		Tribune Chowk 29 Ind. Area-I 28 petrol pump, CTU w/shop, R/Station, R/Cross, HB Chowk, Manimajra.	**66**			
18	**9-C**	**Mansa Devi to Mansa Devi Via –** Manimajra,, H.B. Chowk, R/Cross, Rly. Station, CTU Workshop, Petrol Pump-28, 29/Indl. Area-I, Tribune Chowk, Ind.phII, Ram Darbar,47 Mkt., 47/46, 48/49, 48 Mkt.,Jagatpur/48,Ph11,Sec66,Mauli,68/67, 63/64, 49/50, 45/46, 32/33, 20/30, 27/19, 26/27, G.Mkt, TPT Chowk, HB Chowk, Manimajra	**6:50 A.M.to 20:50 hrs. upto Rly.Stn.**	**30-35 Min**	**40**	**4**
		ISBT-43 to Mansa Devi via 44/51, colony No. 5, Sec-45 Mkt, 46 mkt., 47 mkt., Ram Darbar, Tribune Poultry Farm, CTU w/s,				
			06.00 A.M. F ISBT-43			
19	**10**	Rly. Stn., H.Board lights, Mani Majra, Mansa Devi.		**30 Min.**	**19**	**5**
			and last 19:30			
20	**17**	**ISBT-43 to Airport via** 42/43, Attawa, 36/35, 23/22, ISBT-17, Aroma, 20 Mkt., 30 Mkt., 29 Mkt., Indl. Area Ph-1, Hallo Majra, Air Port	**6:00 A.M. F ISBT-43 to 20:00. Hrs.**	**30 Min.**	**17**	**4**
21	**18**	**ISBT-43 to Kaimbwala via** 44/43, 42/43, Attawa, 36/35, 23/22, ISBt-17, 17/18, 9/8, 9 Mkt., 9/10, MLA Flats, Sectt., High Court, Kaimbwala.	**7:50 A.M. F ISBT-43 to 16:35. Hrs. 7:30**	**40 min**	**15**	**3**

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
			A.M. to 17:30 hrs. f Kaimbwala			
22	18-A	**ISBT-43 TO Lake via 44/43, 42/43, Attawa, 36/35, 23/22, ISBT**17, 17/18, 9/8, 9 Mkt., 9/10, MLA Flats, Sectt., High Court, Lake.	08:10 from ISBT-43 and 20:10 from ISBT43	40 Min.	15	3
		I.S.B.T-43 to Mansa Devi via-Sec-22/23, ISBT-17, Aroma,				
	19A	21Mkt, 20Mkt, 19/27, 27 Mkt ,28 Mkt,CTU W/s, R/Station, R/	6:00 A.M. F ISBT-43			
23	(AC)	Cross, Modern Complex, M.M.Town, Mani Majra, Mansa Devi.	To. 20:30 hrs.	30 min	20	5
24	20	**Chandigarh to Kharar via** Sector -17, Aroam, 20/21, 33/34, 45/46, ISBT Sector -43, Mohali Ph.-7, Sohana, Lakhnaur, Landran, Sante Majra, Kharar.	5:30 to 20:00 upto Landran & F Kharar 6:10 to 20:30 hrs.	15 Min.	28	9
25	20/78	**ISBT-17 To Banur Via**- ISBT-43, Mohali Ph.-7, Landran, Gige Majra.	17:10 hrs.& F Banur 06:30 A.M.	01.40 hrs.	40	1
26	22	**ISBT-43 TO I.T PARK via** Sec-43/43, 36/35, 23/22, ISBT-17, 17/18, 18 Mkt., 19 Mkt., 27 Mkt., 28 Mkt., CTU W/Shop, Railway Station, Railway Crossing, HB Chowk, Manimajra, Kishangarh, IT Park.	ISBT-43 6:00 A.M. to 19:00 hrs. and F IT Park 07:10 to 20:10 hrs.	20 Min	20 KM	7
		ISBT-43 to Khuda Alisher via 43/44, 35/34, 22/21, 22/17, 16				
		hospital, PGI, OPD, Engg. College, Naya Gaon, Khuda alisher.	F ISBT-43 05:55			

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
			A.M.			
27	23-A			15 min.	19	8
			to 20:25 hrs.			
	24-A	**ISBT-17 to ISBT-17 – Via** Sec-22/23, 35/36, Attawa, ISBT- 43,	5:45 A.M. to. Whole	Day	12	3
		43/44, 35/34, 35/22, 23/22, ISBT-17	night 20:30. Hrs.	time 15 min		
28				Night 01.00 hrs.		
29	24-C	**ISBT-43 to ISBT-43 –via** Atawa, 36/35, 23/22, ISBT-17, Aroma, 34/35, 44/43, ISBT-43.	06:00 A.M.to whole night 20:30. Hrs.	Day time 15 min	12	3
		ISBT-17 To Khidrabad via GH-16,15/11,PGI,Khuda	F ISBT-17			
		Lohra,SPB,Mullanpur,Parol,Majra,Block Sailba,Khera,Jhinde	06:30 AM to 18:30.			
30	25			36 min	28	5
		Majra.	F K-Bad 5:15 AM			
			17:00.			
31	26	**PGI to Dhakoli Railway Phatak via** 11/15, 10/16, ISBT-17, 18/21, 19/20, 27/30, 28/29, Coloy No. 4, CTU w/shop, Railway Station, CTU.W/S,Colony No-4, Hallomajra, Airport, Zirakpur, Bauli Sahib, Vasant Vihar, Dhakoli	F Dhakoli 06:00 A.M. to 20:35 hrs. & F PGI 06:00 A.M. to 20:35 hrs.	35 Min.	22	4

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
32	27	**Sarangpur to Derabassi via** Dhanas, Kisan Bhawan, Attawa, ISBT-43, 43/44, Attawa, kisan 102ccomm, 23/22, ISBT-17, Aroma, 21/34, 20/33, 30/32, Tribune, Hallomajra, Airport, Zirakpur, Singpura, Bhankharpur.w.e.f. 12.02.2014	07:20 A.M. to 20:05 hrs.	45 min.	30 Km	4
		ISBT-43 to ISBT-43 via Attawa, Kisan Bhawan, 36/23, 37/24,				
		38/25, DMC, Dhanas, Sarangpur Barrier, Khuda Lahora, PGI,				
33	28	OPD, 2/11, 10/16, ISBT-17, Aroma, 34/35. 43/44.	07:00 A.M. to 19:00 hrs.	30 Min.	20	3
34	28-A	**ISBT-43 to IsbT-43 via** 43/44, 35/34, Aroma, 22/17, 16/10, 11/2, OPD, PGI, Khuda Lahora, Sarangpur Barrier, Dhanas, DMC, 25/38, 24/37, 23/36, Kisan Bhawan, Attawa.	06:15 A.M. to 20:15 hrs.	30 Min.	20	3
35	28-C	**Maloya to Mansa Devi via**D.Majra Vil, 39/40, 38 West,37 Mkt., 36 Mkt., 35/36, Kisan Bhawan, 23/22, ISBT-17, Sec8/18, 7/19, 26/27, G. Mkt., CTU, w/s, R/S, HBC, Manimajra.	F Maloya 05:45 A.M. to 20:00 hrs.	45 Min.	25	4
36	30	**ISBT-17 to Nada Sahib- Via**-22/23, 22Mkt, 20Mkt, 19/27, 26/27, G. Mkt, R/Cross, H.B, Chowk, M.Majra, M.H, Old Pkl, Nada Sahib	6:05 A.M. F ISBT-17 to. 20:25 hrs. 6:35 A.M. F Nada Sahib to 20:35 hrs.	20 Min.	18	7
		ISBT-43 to Cantonment- via 43/42, Attawa, 36/35, Bajwara				
		Chowk 21/34, 20/33, 30/32, , Piccadilly Tribune Chowk,	6:10 F ISBT-43 to			
		Poultry Farm, Colony No. 4, CTU Workshop, Railway Station,	21:10 hrs. upto MM			
37	30-A			30 min	22	5

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
		Housing Board Chowk, Mani Majra, MH, Tank Chowk,	6:25 F Cantonment			
		Cantonment.	To 20:25 hrs.			
		ISBT-43 to Sector-4 Pkl- via 42/43, Attawa, 36/35, 23/22,				
		ISBT- 17, Aroma, 21 Mkt., 20 Mkt., 19/27, 27 Mkt., Grain	6:15 A.M. F ISBT	20-25		
38	30B	Mkt., Railway Crossing, Housing Board Chowk, 11/15, 12/11,	43.to 21:10 hrs. 6:10	min	23	7
		Raily Chowk, ISBT- Panchkula	F PK to 20:50 hrs..			
39	32	**ISBT-17 to Dera Bassi via** Madhya Marg, G. Mkt, HBC, Mani Majra, M.H., Old Panchkula, Nada Sahib, Ramgarh, Mubarikpur.	F ISBT-17 05:45 A.M to 18:30 hrs.	45 Min.	30	4
40	32A	**Palsora to Mansa Devi- via** 40/41,41 Mkt., 42 Mkt., ISBT-43, 43/44, Attawa, 36/35, 23/22, ISBT-17, 17/18, 8/18, 7/19, 26/27, Grain Mkt., Railway Crossing, Housing Board Chowk, Mani Majra, Mansa Devi	6:00 A.M. F Palsora to 19:45 hrs.6:15 A.M. F Mansa Devi to 20:30 hrs.	45 min	24	4
		PGI to Derabassi via New OPD, 10/11, Aroma, Picaddily				
		Chowk, Tribune, Hallomajra, Airport, Zirakpur, Bhankarpur,	07:15 A.M. to 19:40			
41	34	Mubarakpur.	Hrs. f PGI 06:30 to	45 Min.	30	4
			20:50 f Dera			

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
			Bassi			
		Chandigarh ISBT-17 to Kharar via Aroma, 35/22, Kisan	**5:30 to 21:10 hrs.& F**			
		Bhawan, Attawa, 36/42, 37/41, 41/40, Furniture Mkt., Ph.-2,		**01.00**		
42	**35**		**Kharar 6:40 to 21:10**		**10 Min.**	**12**
		Ph.-1, Ph-6, Balongi, Daun, Desu Majra, Kharar.	**Hrs.**	**hrs.**		
43	**35-A**	**PGI to Kharar via** 15/14, Sec- 24, 38/25, 38 West, Sec-39, Phase-6 Mohali, Blongi, Daun, DesuMajra, Mundi Kharar	**F PGI 7:15 to 17:15 hrs.& F Kharar 7:15 to 17:15 hrs.**	**01.00 hrs.**	**60 Min**	**2**
		Chandigarh ISBT-17 to Kharar via Aroma, 35/22, Kisan	**5:30 to 21:10 hrs.& F**			
		Bhawan, Attawa, ISBT-43, Sec-42 Collage, Furniture Mkt., Ph.		**01.00**		
44	**35B**		**Kharar 6:40 to 21:10**		**10 Min.**	**12**
		2, Ph.-1, Ph-6, Balongi, Daun, Desu Majra, Kharar.	**Hrs.**	**hrs.**		
		MOHALI PH-11 TO PGI VIA – Ind. Area Ph-9, Mohali, Sec				
		66/67, 67/68, 68 Outer, 69/68,Sec-69/68, Kumbra, Educ.				
			F Mohali Ph-XI 7:00			
		Board, Forti's Hospital, Mohali Bus Stand, Ph-7, Chawla				

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
			Ph-11 to 20:30 and F			
45	39	Hospital, 61/52, YPS Chowk, Sec-52/51, ISBT-43, 42/43, 36/35		20 Min	24 Km	8
			PGI 08:00 A.M. to			
		(Attawa), 23/22, ISBT-17/22, 22/17, 16/10(G.Hospital),				
			20:30 hrs.			
		11/10,11/2, New OPD, PGI, University.				
46	40	**ISBT-17 to Khizrabad via** –ISBT – 17**,** 16/10, PGI, Lahora, sarang pur Berrier, Mullan pur , Parol, Block,Majri,Manakpur,Kubhari.	F ISBT-17 6:50 to 19:50 F k.Bad 5:40 AM to 18:20	60 min	31 Km	3
47	71	**ISBT-43 to Kaimbwala – via** 43/44, 34/35, 23/22 ISBT-17, 17/18, 18 Mkt., 19Mkt., 27 Mkt., Grain Mkt., Railway Crossing, Modern Complex, Indira Colony Mani Majra, Swastic Vihar, Mansa Devi, Saketri, Kaimbwala.	6:00 A.M. f ISBT-43 to. 20:30.hrs. upto MM 7:00 A.M. to 20:00 hrs. F Kaimbwala	30 min	24	4
48	75	**Ramdarbar to Dhanas via** Sec-47 Mkt., ec-46 Mkt., Sec45/46, Sec-32/33, Sec-20/30, Sec-20 Mkt., Aroma, Sec-22/17, GH-16, OPD, PGI, Khuda Lahora, SP Barrier, Dhanas Colony.	F Dhanas 07:10 A.M. to 18:25 hrs.	1 hr. 15 Min.	22	2
49	79	**PGI to Chhatbir Zoo via** New OPD, 2/11, 10/16, ISBT-17, Aroma, Sec-21 Mkt.,20 Mkt., 20/30, GH-32,Tribune Hallo Majra, Airport, Zirakpur, Dyalpura Vill Chatt, Chhatbir Zoo.	7:10 A.M. to 17:40 P.M. from ISBT-17 F Chatbir 8:10 A.M. to 18:10 hrs.	1 hr. 30 Min.	28	2

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
50	85	**PGI to Mauli Jagran via** OPD, 2/11, 10/11, 10/16, 17/16, Sec17, Mkts. 18, 19, 27, 26 G. Mkt., CTU w/shop, R/station, R/Crossing, Modern Complex Road, Housing Board Lights.	09:00 F PGI to 15:00 hrs.	01:00 hrs.	17	2
		PGI to Mohali Ph XI via OPD, Sec-16 GH, 16/17, ISBT-17,				
		Aroma, Sec-21/22, Sec-34/35, Sec-44/43, ISBT-43, 44, 45,	8:10 A.M. F PGI to	1 hr. 30		
51	123-A	45/46, 49/50, Ph-10/9, Mauli, Science City, White House, Ph-XI.	17:10 hrs.	Min.	28	2
		PGI.to.Mohali,R/Station.via.11Mkt,10/16,17/16,ISBT	8:20 A.M. F PGI to			
		17,Aroma,34/35,44/43,ISBT	17:40 hrs. F Mohali			
52	132	43,53/52,YPS,Chowk,Sec.51,50,49Mkt,48Mkt,outer48,Mohali	Ph-11 07:20 A.M. to	35 Min.	22	4
		.ph-II	16:30 hrs.			
		Dhanas to Airport via SP Barrier, Khuda Lahora, PGI , New	7:40 A.M. F Airport			
		OPD, GH –16 , ISBT –17, Aroma, Sec-21 Mkt. Sec-20-Mkt,Sec	to 17:40 hrs. F	1 hr. 15		
53	143	– 30 Mkt. , SEC-29 Mkt., Elante Mall, Poultry Farm, Ind. Area	S.Barrier 07:40 A.M.	Min.	21	2
		Ph-I, Hallo majra, Airport.	To 17:40 hrs.			
54	201	**ISBT-43 to Airport via 44/43, 34/35,K.Bhawan 23/22, ISBT-17, Aroma, 21 Mkt., 20 Mkt.,30Mkt,29Mkt, Elante Mall,P.Farm,Hallo majra, Airport.**	Attached with Air Flight timings 07:35 F ISBT-43 & 19:20	1.00 hrs.	17	2

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
			F Airport			
		ISBT-43 TO HIGH COURT(R.Garden) VIA – Attawa, Kisan Bhawan, 22/23, ISBT-17, 17/18, KC, 17/9, UT Sectt., MLA Flat,				
		Pb. & Hr. Civil Sectt., High Court, R.Garden,(Sunday upto Lake)	7:20 A.M. to 17:30			
55	202	HIGH COURT TO ISBT-43 Via – Pb. Hr. Civil Sectt., MLA Flat, UT	hrs. And F H.C 08:05	20 Min	14 KM	4
		Sectt., 16/17, ISBT-17, 22/23, Kissan Bhawan, Attawa.	A.M. to 18:15 hrs.			
		ISBT-43 TO MANSA DEVI VIA – Attawa, 22/23, ISBT-17, 17/18, 18 Mkt., 19 Mkt., 27 Mkt., 28 Mkt., CTU W/shop,				
		R/Station, HB Chowk, Manimajra.	06:45 A.M. to 19:15			
56	203	MANSA DEVI TO ISBT-43 Via – HB Chowk, R/Station, TPT	hrs. F M.M. 7:45	20 Min	20 KM	6
		Chowk, 28 Mkt., 27 Mkt., 19 Mkt., 18 Mkt., 18/17, Neelam, ISBT-17, 17/22, 22/23, Attawa, ISBT-43.	A.M. to 20:25 hrs.			
		ISBT-43 TO PGI VIA –44/43, 35/34, picadaly,Aroma, 22/17,	F ISBT-43 7:00 A.M.			
57	205	16/10, 16 Hospital, New OPD, PGI.	To 18:40 hrs. and F	20 Min.	10 Km	4
			PGI 7:45 A.M. to			

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
			18.40 hrs.			
		ISBT-43 to IT Park via 44/43, 36/35,k.Bhawan, 23/22, ISBT	ISBT-43 6:45 A.M.			
		17, 8/18, 7/19, 26/27, G.Mkt.-26, CTU W/S,R.Station,	to 19:05 hrs. F IT			
58	206A	M.M.Town Light Point, K.Garh,IT Park.	Park 07:45 A.M. to	20 Min	17 Km	7
			20:25 hrs.			
59	208	**IBST-43 To PGI via** Sec-42/43,attawa chowk,36/35 K.Bhawan,sec-23/22,sec-16/17,sec-16/10 HSP,PEC,New OPD,PGI	Sec-48 8:20 A.M. to 16:50 and F H.C. 8:20 A.M. to 17:50 hrs.	30 Min.	9 Km	4
60	210	**ISBT-43 to High court via** 43/44, Attawa, Kissan Bhawan, 23/22, 23 Mkt., 24 Mkt., 14/15, PGI, OPD, 2/3, Sectt., High Court.	7:20 A.M. to 17:30 hrs.	20 Min.	14	5
61	211	**Cantonment to PGI via** Manimajra Housing Board Lights, R/Crossing, Grain Mkt., 28/27, 29/30, 30 Mkt., 20 Mkt., 21 Mkt., Aroma, 22/17, 16/10, OPD PGI.	7:00 A.M to 20:45 hrs.	1 hr. 15 Min.	22	2
62	212	**Zirakpur to PGI via** Airport, Hallomajra, Tribune, 32/30, 33/20, 34/21, Aroma, 22/17, 16/10, OPD, PGI.	F PGI 6:00 A.M. to 19:30 hrs.	30 Min.	17	4
		Mohali Ph-6 to Mansa Devi via 56/55, 41/40, 41 Mkt., 42 Mkt., ISBT-43, 43/44, 42/43, Attawa, Kissan Bhawan, 23/22,				
		ISBT-17, 8/18, 7/19, 26/27, Grain Mkt., TPT Lights, CTU W/s ,	F.M.D 6:10 A.M. to			
63	213			30 Min.	27	6

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
		R.Station, R/Crossing, HBC Lights, Manimajra.	19:40 hrs.			
		ISBT-43 to Nada Sahib via 43/44, 35/34, 23/22, ISBT-17, 18				
		Mkt., 19 Mkt., 27 Mkt., 28 Mkt., Indl. Area Ph-1, R/Station,	F ISBT-43 6:00 A.M.			
64	214	R/Crossing, HBC Lights, Manimajra, M/Hospital, Old	to 19:45 hrs. upto	45 Min.	25	4
		Panchkula.	ISBT-17			
		ISBT-43 to Zirakpur via 43/44, 42/43, Attawa, 36/35, Kisan Bhawan, 23/22, ISBT-17, Aroma, Sec-21, 20 Mkt., 30 Mkt., 29				
65	216	Mkt., Cabel Factory, Hallo majra, Airport, Zirakpur	06:15 ISBT-43 to	30 Min.	17	4
			19:45 Hrs.			
		ISBT-43 to ISBT-43 via 43 Mkt., 42 Mkt., 41 Mkt., 40/41,	F ISBt-43 6:50 A.M.			
		38/37, 25/24, 14/15, PGI, New OPD, PEC /2/11, Sectt., High	to 18:20 hrs. and			
66	239	Court/R.Garden, MLA Flat, U.T.Sectt./10/9, 16/17, ISBT	ISBT-17 7:50 A.M. to	30 min.	24 Km	4
		17,Aroma,Sec-34/35,44/43.	19:20 hrs.			
67	240	**ISBT-43 to Mansa Devi via** 44/43, 35/34, 35/36/K.Bhawan, Sec-23/22, ISBT-17, Aroma, 21 Mkt., 20 Mkt., 30 Mkt., 29 Mkt., Elante Mall/Ind. Area Ph-I, Colony No. 4, CTU W/S, Railway Station, Railway Crossing, HB Chowk, Mani Majra, Mansa Devi	ISBT-43 6:25 to 17:45 hrs. and M. Devi 7:35 to 18:15 hrs.	20 Min.	22 Km	7

S.No.	R. No.	Description of Route	Departure Time Starting Point	Freq.	Length in KM	No. Of Buses
68	241	**ISBT-43 to Mansa Devi via** ISBT-43, Sec-51/52, Colony No. 5, Sec-44/45, 45 MKt., 45/46, 32/33, 20/30, 19/27, 27 MKt., Sec26 G. MKt., R/Station, R/crossing, HB chowk, Mani Majra, Mansa Devi.	7:00 to 18:30 and F M.Devi 8:00 to 19:30 hrs.	30 Min.	18	4
		Landran to PGI via Lakhnour, Sohana, IVY, Ph3/5, Madanpur				
		Chowk, Ph-2, Furniture Mkt light point, 42/53, ISBT43,	ISBT-43 07:40 to			
69	242	44/43,35/34, Aroma, 22/17, 16Hospital, 11/10,OPD,PGI.	17:30 and F PGI	30 Min	24	5
			8:40 to 18:20			
		NIGHT BUS SERVICE				
70	24A	**ISBT-17 to ISBT-43** via 22/23, 35/36, Attawa, 43/42, ISBT-43, 43/44, 35/34, 35/22, 23/22, ISBT-17	21:00 P.M. To 05:30 A.M.	45 Min.	12	1
71	24C	**ISBT-43 to ISBT-17 via** 42/43, Attawa, 36/35, 23/22, ISBT-17, Aroma, 21/22, 34/35, 44/43, ISBT-43.	21:30 P.M. to 05:45 A.M.	45 min.	12	1
		ISBT-43 to Railway Station via Attawa, 22/23, ISBT-17, Sec-18				
		Mkt., 19 Mkt., 27 Mkt, 27/28, Grain Mkt., TPT area, Rly. Stn.	21:00 P.M. to 05:00			
72	37		A.M.	45 Min.	18	1
73	252	**PGI TO IT PARK via 16 Hospital 16/17, ISBT 17, Aroma, 21, 20, 19/27, 27 Mkt , 28 Mkt., CTU workshop, Railway Station, Rly Crossing, Modern Complex, M.M. Town.**	13:40 to 23:00 hrs.	1.10 hrs.	25 Km	2
74	254	**ISBT 43 TO IT PARK via** 44/43, 43/42, 36/35, 23/22, ISBT-17, 18 mkt., 19 mkt., 27 mkt., 27/28, 28 Mkt., CTU workshop, Railway Station, Rly. Crossing, Modern Complex, M.M. Town.	13:15 to 23:55 hrs.	1.10 hrs.	25 Km	2

8 APPENDIX- C

GENERAL STANDARDS FOR EFFLUENT DISCHARGE

The waste water from the depots that is discharged to the public drains will have to follow the standards stipulated in the Environmental Protection Rules as provided below:

GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS PART-A : EFFLUENTS

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
1.	Colour and odour	See 6 of Annexure-I	—	See 6 of Annexure -I	See 6 of Annexure-I
2.	Suspended solids mg/l, Max.	100	600	200	(a) For process waste water- 100 (b) For cooling water effluent 10 percent above total suspended matter of influent.
3.	Particulate size of suspended solids	Shall pass 850 micron IS Sieve	—	—	(a) Floatable solids, max. 3 mm. (b) Settleable solids, max. 850 microns.
[2]4.	***	*	—	***	—
5.	pH Value	5,5 to 9,0	5,5 to 9,0	5,5 to 9,0	5,5 to 9,0
6.	Temperature	shall not exceed 5°C above the receiving water temperature	—	—	shall not exceed 5°C above the receiving water temperature

		(a)	(b)	(c)	(d)
7.	Oil and grease mg/l Max.	10	20	10	20
8.	Total residual chlorin mg/l Max.	1.0	–	–	1.0
9.	Ammonical nitrogen (as N), mg/l Max.	50	50	–	50
10.	Total Kjeldahl Nitrogen (as NH_3) mg/l, Max.	100	–	–	100
11.	Free ammonia (as NH_3) mg/l, Max.	5.0	–	–	5.0
12.	Biochemical Oxygen demand [1][3 days at 27°C] mg/l max.	30	350	100	100
13.	Chemical Oxygen Demand, mg/l, max.	250	–	–	250
14.	Arsenic (as As), mg/l, max.	0.2	0.2	0.2	0.2
15.	Mercury (as Hg), mg/l, Max.	0.01	0.01	–	0.01
16.	Lead (as Pb) mg/l, Max.	0.1	1.0	–	2.0
17.	Cadmium (as Cd) mg/l, Max.	2.0	1.0	–	2.0
18.	Hexavalent Chromium (as Cr+6), mg/l max.	0.1	2.0	–	1.0

S. No.	Parameter	Standards			
		Inland surface water	Public Sewers	Land for irrigation	Marine coastal areas
1	2	3			
		(a)	(b)	(c)	(d)
19.	Total chromium (as Cr.) mg/l, Max.	2.0	2.0	–	2.0
20.	Copper (as Cu) mg/l, Max.	3.0	3.0	–	3.0
21.	Zinc (As Zn.) mg/l, Max.	5.0	15	–	15
22.	Selenium (as Se.) mg/l, Max.	0.05	0.05	–	0.05
23.	Nickel (as Ni) mg/l, Max.	3.0	3.0	–	5.0
[1]24.	* * *	*	*	*	*
[1]25.	* * *	*	*	*	*
[1]26.	* * *	*	*	*	*
27.	Cyanide (as CN) mg/l Max.	0.2	2.0	0.2	0.2
[1]28.	* * *	*	*	*	*
29.	Fluoride (as F) mg/l Max.	2.0	15	–	15
30.	Dissolved Phosphates (as P), mg/l Max.	5.0	–	–	–
[2]31.	* * *	*	*	*	*
32.	Sulphide (as S) mg/l Max.	2.0	–	–	5.0
33.	Phenoile compounds (as C_6H_5OH) mg/l, Max.	1.0	5.0	–	5.0
34.	Radioactive materials :				
	(a) Alpha emitter micro curie/ml.	10^{-7}	10^{-7}	10^{-8}	10^{-7}
	(b) Beta emitter micro curie/ml.	10^{-6}	10^{-6}	10^{-7}	10^{-6}
35.	Bio-assay test	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
36.	Manganese (as Mn)	2 mg/l	2 mg/l	–	2 mg/l
37.	Iron (as Fe)	3 mg/l	3 mg/l	–	3 mg/l
38.	Vanadium (as V)	0.2 mg/l	0.2 mg/l	–	0.2 mg/l
39.	Nitrate Nitrogen	10 mg/l	–	–	20 mg/l
[1]40.	* * *	*	*	*	*

9 APPENDIX- D

NOISE STANDARDS FOR AUTOMOBILES

:)Noise limits for vehicles at manufacturing stage applicable on and from 1st April, 2005

Serial Number	Type of vehicles	Noise limits dB(A)
1.0	**Two wheelers**	
1.1	Displacement upto 80 cc	75
1.2	Displacement more than 80 cc but upto 175 cc	77
1.3	Displacement more than 175 cc	80
2.0	**Three wheelers**	
2.1	Displacement upto 175 cc	77
2.2	Displacement more than 175 cc	80
3.0	**Vehicles used for the carriage of passengers and capable of having not more than nine seats, including the driver's seat**	74

4.0	**Vehicles used for the carriage of passengers having more than nine seats, including the driver's seat, and a maximum Gross Vehicle Weight (GVW) of more than 3.5 tonnes**	
4.1	With an engine power less than 150 KW	78
4.2	With an engine power of 150 KW or above.	80
5.0	**Vehicles used for the carriage of passengers having more than nine seats, including the driver's seat : vehicles used for the carriage of goods.**	
5.1	With a maximum GVW not exceeding 2 tonnes	76
5.2	With a maximum GVW greater than 3 tonnes but not exceeding 3.5 tonnes	77
6.0	**Vehicles used for the transport of goods with a maximum GVW exceeding 3.5 tonnes.**	
6.1	With an engine power less than 75 KW	77
6.2	With an engine power of 75 KW or above but less than 150 KW.	78
6.3	With an engine power of 150 KW or above.	80]

[1][Provided that for vehicles mentioned at serial numbers 3.0 to 6.3, the noise limits for the following States shall be applicable on and from the date specified against that State,-

(i) Himachal Pradesh with effect from 1st October, 2005
(ii) Jammu and Kashmir with effect from 1st October, 2005
(iii) Madhya Pradesh with effect from 1st September, 2005
(iv) Punjab with effect from 1st October, 2005
(v) Rajasthan with effect from 1st June, 2005
(vi) Uttar Pradesh (Mathura, Kannauj, Muzaffarnagar, Aligarh, Farukkabad, Saharanpur, Badaun, Barreily, Moradabad, Hathras, Rampur, Bijnor, Agra, Pilibhit, J.P. Nagar, Mainpuri, Lalitpur, Hardio, Ferozabad, Jhansi, Shahjahanpur, Etawah, Jalon, Lakhimpur, Kheri, Etah, Mahoba, and Sitapur) with effect from 1st June, 2005.
(vii) Uttranchal with effect from 1st July, 2005.]

Noise standards for automobiles,domestic appliances and construction equipments notified in Part 'E',Schedule-VI of Environment(Protection)Rules,1986, ,as given in the Tables below.

Category of Vehicle	Noise limit in dB(A)
(a)Motorcycle,scooters and three wheelers.	80
(b)Passenger Cars	82
(c)Passenger or commercial vehicles upto 4 MT	85
(d)Passenger or commercial vehicles above 4 MT and upto 12 MT	89
(e)Passenger or commercial vehicles exceeding 12 MT	91

Category of Domestic Appliances/ Construction Equipments	Noise limits in dB(A)
(a)Window air conditioners of 1 tonne to 1.5 tonne	68
(b)Air Coolers	60
(c)Refrigerators	46
(d)Diesel Generator for domestic purposes	85 – 90
(e)Compactors(rollers),Front loaders, Concrete mixers,Cranes(movable), Vibrators and Saws	75

10 APPENDIX- E

NOISE LEVELS FOR DIESEL GENERATORS UNDER ENVIRONMENTAL PROTECTION RULES

Noise limit for diesel generator sets (up to 1,000 KVA) manufactured on or after the 21st January, 2005 has been set by Environmental Protection Rules and are provided below. The maximum permissible sound pressure level for new diesel generator (DG) sets with rated capacity up to 1,000 KVA manufactured on or after the 21st January, 2005 shall be 75 dB(A) at 1 meter from the enclosure surface. Emission limits for new diesel engines up to 800 kW for gen-sets applications shall be as given in the Table below:

Capacity of diesel engines	**Date of imple-mentation**	**Emission Limits (g/kw-hr) for**				**Smoke Limit (light absorption coefficient, m^{-1}) (at full load)**	**Test Cycle**	
		NO_X	**HC**	**CO**	**PM**		**Torque %**	**Weighting Factor**
Upto 19 kW	1.7.2005	9.2	1.3	3.5	0.3	0.7	100	0.05
							75	0.25
>19 kW upto 176 kW	1.1.2004	9.2	1.3	5.0	0.5	0.7	50	0.30
	1.7.2004	9.2	1.3	3.5	0.3	0.7	25	0.30
>176 kW upto 800 kW	1.11.2004	9.2	1.3	3.5	0.3	0.7	10	0.10

11 APPENDIX- F

TYPICAL REPORTING SYSTEM FOR EMP IN GEF-ESCBS

A) EMP Reporting System

Format 1: Target Sheet for Pollution Monitoring

Construction Stage: Report - Date_____ Month_____ Year_____

(Locations at which monitoring to be conducted as per EMP)

Sl. No	Depot Name	Details of Location	Duration of Monitoring	Instruments Used	Completion Target		Reason for Delay if any
					Target Date	Date of Completion if task completed	
Air Monitoring							
1							
2							
3							
4							
5							
Water Monitoring							
1							
2							
3							
4							
5							
Noise Monitoring							
1							
2							
3							
4							
5							

Certified that the Pollution Monitoring has been conducted at all the locations specified in the EMP and as per the directions of the CSC

Contractor

Project Engineer

(Supervision Consultant)

Format 2: Tree Plantation and Landscaping

Post Construction Stage: Report –Date____ Month_____ Year_____

Depot
Site:---

Sl. No	Activity	Physical Target						Financial Target			Completion Target		
		Target (tree/shrubs to be planted in Package) for this Quarter			Target Achieved		% of task completed	Total (lakhs)	Budget Spent	% used	Target Date	Date of Completion/% completed	Reason for Delay if any
		unit			No. of Trees	Survival Rate (%)							
1	Tree Plantation along periphery of Depot site	m-m											

Certified that the above information is correct

PIU / Implementing Agency

Source: Based on Draft ESMF for the Global Environment Facility 5 Project on Efficient and Sustainable City Bus Services (ESCBS) PCIB

12 APPENDIX- G

ENVIRONMENT AND SOCIAL SCREENING CHECKLIST

Environmental Social Management Framework for GEF -5

City	Component	Sub-Project Category	Environmental impacts								Resettlement impacts				
			No impacts	Construction impacts					Cultural resources[3]	Sensitive areas	No impacts	LA Impacts	Structures / Assets	CPR[4]	Non-titleholder impacts
				Air	Noise	Water	Soil	Ecology							

Legend:

Type – 1	Projects with Land acquisition and/or significant impacts on environmental and social aspects
Type –2	Projects with environmental impacts and impact on non-titleholders but does not involve land acquisition
Type – 3	Projects with only generic construction impacts and no R&R impacts

Note: There are no Type – 1 candidate sub projects that exist in the GEF-ESCBS that need to be excluded. However, in future identification of any additional candidate sites if undertaken, would need to be screened for the exclusion criteria

[3] No cultural properties are identified in the project sites proposed for development. Likelihood of chance finds though exists, needs to be addressed through the OP / BP 4.11, Physical Cultural Resourcesand provisions of the ESMF on chance find cultural properties will be applied.

[4] Common Property Resources refers to community assets as place of congregation, community halls, social facilities etc.,