Environmental Assessment (EA) of Jessore Software Technology (IT) Park (JSTP)

Support to Development of Kaliakoir Hi-Tech Park/ITParks Project

Bangladesh Hi-Tech Park Authority (BHTPA)
Private Sector Development Support Project (PSDSP)
Ministry of Information & Communication Technology

Government of the People’s Republic of Bangladesh
BCC Bhaban, Shere-E- Bangla Nagar, Agargaon, Dhaka-1207

June, 2014
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# Abbreviations

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<tr>
<td>BMD</td>
<td>Bangladesh Meteorological Department</td>
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<td>BHTPA</td>
<td>Bangladesh Hi-Tech Park Authority</td>
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<td>DoE</td>
<td>Department of Environment</td>
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<tr>
<td>EA</td>
<td>Environmental Assessment</td>
</tr>
<tr>
<td>ECA</td>
<td>Environmental Conservation Act</td>
</tr>
<tr>
<td>ECC</td>
<td>Environmental Clearance Certificates</td>
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<tr>
<td>ECNEC</td>
<td>Executive Committee of National Economic Council</td>
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<tr>
<td>ECR</td>
<td>Environmental Conservation Rules</td>
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<tr>
<td>EMP</td>
<td>Environmental Management Plan</td>
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<td>EMF</td>
<td>Environmental Management framework</td>
</tr>
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<td>GoB</td>
<td>Government of Bangladesh</td>
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<td>IEE</td>
<td>Initial Environmental Examination</td>
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<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>ITES</td>
<td>Information Technology Enabled Services</td>
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<td>JSTP</td>
<td>Jessore Software Technology Park</td>
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<tr>
<td>MTB</td>
<td>Multi-Tenant Building</td>
</tr>
<tr>
<td>JSTPA</td>
<td>Jessore Software Technology Park Authority</td>
</tr>
<tr>
<td>MoEF</td>
<td>Ministry of Environment and Forest</td>
</tr>
<tr>
<td>MoICT</td>
<td>Ministry of Information and Communication Technology</td>
</tr>
<tr>
<td>NEMAP</td>
<td>National Environment Management Action Plan</td>
</tr>
<tr>
<td>NOC</td>
<td>No-objection-certificate</td>
</tr>
<tr>
<td>NWMP</td>
<td>National Water Management Plan</td>
</tr>
<tr>
<td>PAP</td>
<td>Project Affected People</td>
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<td>PWD</td>
<td>Public Works Department</td>
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<td>PSDSP</td>
<td>Private Sector Development Support Project</td>
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<tr>
<td>RAP</td>
<td>Resettlement Action Plan</td>
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<tr>
<td>RRA</td>
<td>Rapid Rural Appraisal</td>
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<tr>
<td>STP</td>
<td>Software Technology Park</td>
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<tr>
<td>TTC</td>
<td>Technical Training Centre</td>
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<td>WB</td>
<td>World Bank</td>
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Executive Summary

Government of Bangladesh is implementing, Support to Development of Kaliakoir Hi-Tech Park / IT Park Project under the Private Sector Development Support Project (PSDSP) with the financial assistance from The World Bank and DFID. The objective of the project is to increase the employment in the country through the facilitation of investment in selected emerging growth centers in the manufacturing and services sectors of the economy.

The Jessore Software Technology (IT) Park (JSTP) covers a total land area of 3.03 acres, all of which has been allocated by government. In the age of globalization it is necessary to have proper strategy for IT Park/STP for a country like Bangladesh. For the successful implementation of the vision and objectives of the National ICT policy 2009, establishment of HTP/STP/IT for innovative companies and increase foreign and local investment.

IT Park/STP is a place, suitable for investment for the Software and IT Enabled Services industries; where all the physical/logical infrastructure, like, Ready Office Accommodation, Transportation, Tele-communication, High Speed Broadband Internet Access, Uninterruptible Power supply, Water supply, Gas supply, Residential and Dormitory facilities, indoor/outdoor entertainment facilities, Cafeteria, Banking, Insurance, Health, Currier, Travel etc. service/facilities and Securities are to be ensured for the knowledge workers and investors.

An Environmental Assessment (EA) is required for the construction of project site as per World Bank and Government of Bangladesh requirements.

The proposed site is located at Jessore Sadar Upazilla about 156 km South-West of Dhaka. It is also about 2 km from the important eastern part of Jessore Sadar Upazilla to Barandi and Shonkorpur Mouza of the Sadar Upazila of Jessore district. A major portion of the project site is an undulating land with grass and bushes with existing Poursahava’s area. A part of the proposed site is also fall under pond, agricultural land. A few habitants and trees are visible along the existing site and in the proposed alignment. The proposed site will be passed adjacent to the two water bodies (pond). One pond is outside the project site and another pond is inside the project site. Outside pond exists in the North side, Housing, Teachers Training Centre (TTC), and Passport office existing besides the pond in the West side, Shops, Shishu Sadan and some residence existing in the South, and also Oil mill godown existing in the East side. There are two roads besides the two sides such as North side and West side at the project site. The wide of the North side road is 16 ft wide of the west side road is 25 ft wide. The surrounding area of the proposed site is a mix of residential, institutional and vacant in nature consisting of undulating land.

The site is mostly non-arable flat land with a shallow ditch in the middle. It is almost vacant and no permanent structures or settlements are identified on the site except two semi-pacca houses which are being used as residential purpose by the fourth class employees of PWD. The land was previously owned by Public Works Department (PWD) for developing a brick field. Ministry of Land provided their concurrence to handover the said three acres of land from Barandi Mouza and Shankarpur Mouza to the Ministry of Information and Communication Technology (MoICT)
by transferring ownership from Public Works Department (PWD). The Project Site is situated at about half kilometer from the Jessore-Khulna Highway and linked with an access road which is locally known as Nazirshankarpur Road.

There is no chemical process during the operation in the STP and hence will not generate any liquid effluent and there will no impact of effluent on the environment. Only domestic wastewater are generated from the STP, dormitory and staff quarter which need to be properly treated through septic tank connected with soak pit.

E-waste will generate from this project after certain period of operation and need to be recycled and disposed after proper management. The global E-waste production is assessed at 20-50 Mt/years\(^1\) equal to 1-3% of the estimated global urban waste production 1636 Mt/Year\(^2\). Generally “e-Waste” comprises: computers, printers, toner cartridges, monitors, TVs, mobile phones, calculators, faxes, photocopiers, scanners, digital/video camera, VCRs, DVD player, MP3, CDs Battery, cable, magnetics and disks, microwave oven, microscope are also e-Waste. Most of the people two or more ways of dealing with their e-Waste. The main combinations were: throw out/recycle; recycle/donate; throw out/recycle/reuse, followed by recycle/reuse/donate. More than 50% of businesses are still throwing out their e-Waste rather than recycling or reusing it. Solid waste mainly paper, cartoon etc. will be collected properly and sale to the small traders.

Water should be sprayed during construction period to suppress the dust pollution. Generator should be covered with sound and noise absorbing materials to absorb sound, noise and vibration. The possible negative impacts are not severe, and the adverse impacts if duly addressed could be minimized without much effort, though they would require attention and positive commitment from the Project Management.

Environmental Management Plan (EMP) includes a set of mitigation measures for minimizing or removing negative impacts, enhancement measures for further improvement of positive impacts, environmental monitoring arrangements for observing the changes induced by the project interventions and institutional arrangements for smooth implementation of environmental management plan.

It is suggested that one environmental specialist should be appointed as a full time for supervision and monitoring of environmental quality and smooth implementation of the project.

\(^1\) UNEP, Call for Global Action on E-waste, United Nations Environment Programme (2006).
The findings of this EA suggest that the only negative impacts during pre-construction stage will be vegetation clearing. During construction stage, land raising from its original level certainly disrupts the natural surface of the earth which will obstruct the natural drainage system of the area, if proper mitigation measures are not taken. The proposed project, changes the local landscape of the area to some extent by covering a green area into a built-up area. This will change the natural and visual equilibrium for the local people. Impact on soil is not expected to occur as the project does not use any toxic or any chemical for its process and operation. Intervention of flora and fauna and habitats is expected to be negligible due to setting up the facility and its operation. The effect of noise in the operation phase on ambient conditions is insignificant.

The overall finding of the EA is that the proposed project will not cause any significant adverse environmental impacts, provided that adequate mitigation measures are implemented. The proposed mitigation measures are prescribed conceptually in the EA, as an outline EMP. This will be implemented by the contractor in the construction phase. The Jessore STP will perform as green environment once it is an operational since the activities of this park is non-polluting and green.

There are no uncertainties in the analysis, and no additional work is required to comply with National Law. There is thus no need for further study or Environmental Assessment.
INTRODUCTION

1.1 Background
1. Government of Bangladesh is implementing, Support to Hi-Tech Park / IT Parks project under the Private Sector Development Support Project (PSDSP) with the financial assistance from The World Bank and DFID. The objective of the Hi-Tech Park project is to increase the employment in the country through the facilitation of investment in selected emerging growth centers in the manufacturing and services sectors of the economy.

2. The honorable Prime Minister, during her visit in Jessore (a district under Khulna Division) on 27 December 2010, declared to establish an IT park there as part of Government’s ‘Digital Bangladesh’ concept to make the country as a middle income country by 2021. Following her commitment, the project to ‘Establishment of Software Technology Park has been taken up by Bangladesh Hi-Tech Park Authority (BHTPA).

3. Government has declared “Vision 2021: Digital Bangladesh” with a target to make Bangladesh as a middle income country using ICT and development of favorable business environment for innovative companies. ICT has been considered as a thrust sector. Government has taken various initiatives to achieve the target. Among them conducive business environment for Hi-Tech Industries especially IT/ITES industries is very crucial. So, IT Village/STP in divisional level will be one of the important and priority projects which would be the milestone for the development of IT sector as well as industrialization in Bangladesh.

4. Enhance pro-poor economic growth by creating employment opportunities through establishment of knowledge-based hi-tech industries by improving the business environment.

5. Facilitate investment in Hi-Tech Industries particular in IT/ITES. To create a conducive environment to attract local & foreign companies for establishing and operating Software and ITES industry in Jessore as well as in Bangladesh.

6. The objective of the ICT Village project is to establish knowledge based industries throughout the country, particularly related to Software and IT Enabled Services, and thus contribute to the national economy and achieve the goals of Vision 2021: Digital Bangladesh. The Government of Bangladesh intends to create basic infrastructure for establishing an ICT Village in 3.03 acres land allocated at Barandi Mouza, Jessore. This land will be used to develop a world-class business environment, conducive for IT/ITES industry. This ICT village will attract investments from both foreign and local entrepreneurs. The specific objectives of the project are: (1) To promote balanced development of ICT Industries in Southern region of the country (2) To create basic infrastructure for the establishment of ICT Village/STP in Jessore (3) To construct a Multi-Tenant Building (MTB) and other utilities services at the allocated land for ICT Village in Jessore for creating ready infrastructure for the local and foreign investor (4) To create a conducive environment
to attract foreign companies for establishing and operating Software and ITES industry in
Bangladesh (5) To create employment opportunities for the ICT professionals (6) To
promote knowledge based industry to realize the Vision 2021: Digital Bangladesh. The
proposed ICT village will ensure the following facilities: (a) Single window service (b)
Strong customer base (c) 24/7 technical supports (d) Competitive pricing (e) Tie up with
major telecom partners (f) Service of International standards viii. Inclusion of service for
new entrepreneurs including the freelance workers (g) Strong and low cost internet connectivity
(h) Office space for Software developer, call centers, Training centers, hardware suppliers
along with all recreational facilities for the user of the ICT Center (i) Low rent office space
and (j) Other physical facilities like nonstop/ stable power supply, water, gas, telephone,
road/rail/Air linkage etc.

7. An important component of this project is development of Jessore Software Technology
Park (JSTP) by Bangladesh Hi Tech Park Authority (BHTPA) that houses Information and
Communications Technology (ICT) enterprises catering to Bangladesh’s economy. The
proposed site is located at Jessore Sadar Upazilla about 156 km South-Western of Dhaka. It is
approximately 8 km away from Jessore Airport and about 3 km from the railway station. It is
also about 2 km from the important eastern part of Jessore Sadar Upazilla to Barandi and
Shonkorpur Mouza of the Sadar Upazila of Jessore district. Substantial preparatory activities
such as allocation of land, construction of boundary wall, preliminary expenditure on roads
and administrative buildings have been carried out for the development of JSTP and the same
is ready for park development.

8. The site is a non-arable flat land with a shallow ditch in the middle. It is almost vacant
and no structures or settlements are identified on the site except two semi-pacca houses which
are being used as residential purpose by the fourth class employees of PWD. The land was
previously owned by Public Works Department (PWD) for developing a brick field in that
place. Ministry of Land gave their concurrence to handover these three acres of land from
Barandi Mouza and Shankarpur Mouza to the Ministry of Information and Communication
Technology (MoICT) by transferring ownership from Public Works Department (PWD). The
Project Site is situated at about half kilometer from the Jessore-Khulna Highway and linked
with an access road which is locally known as Nazirshankarpur Road.

9. The project site is under the PWD and it was expected that this would not require any
land acquisition of private lands. Given the difficulties and the delays associated with the
acquisition process and the social impacts resulting from the displacement and resettlement of
people, the project authority has tried to resettlement in another place, on its outskirts, thus
avoiding any land acquisition or displacement of people. An Environmental Assessment (EA)
is required for the construction of project site for villagers as per World Bank and
Government of Bangladesh requirements.

10. Some housing under PWD inside proposed park, which will be lost due to the
development of JSTP. In order to ensure easy access to the villages and the main highway,
BHTPA proposes to develop the project site around the boundary of the JSTP. In order to assess the environmental impacts of the proposed site, BHTPA intends to carry out an Environmental Assessment (EA) of the project site in compliance with the Environmental Management Framework (EMF) of PSDSP and the safeguard policies of the World Bank (WB).

1.2 Objectives of the EA

11. The objectives of the EA will be to

- Review the proposed site of Software Technology (IT) Park (STP) and identify potential environmental impacts to be considered in the planning and design and implementation stage of the park
- To identify and assess impacts resulting from the project's development or construction phase.
- To identify and assess environmental and social impacts resulting from the project during its operational phase.
- Recommend specific measures to avoid or mitigate adverse environmental impacts and to enhance positive impacts
- Prepare implementable Environmental Management Plan (EMP) integrating the measures the identified impacts and an appropriate monitoring and supervision mechanism to ensure EMP implementation.
- Recommend suitable institutional mechanisms to monitor and supervise effective implementation of EMP.

1.3 Categorization

12. The project is classified as category “Orange B” for Department of Environment (DoE). WB categorizes all projects according to the magnitude or scale of their anticipated environmental impact. Projects with limited potential adverse environmental impact require an Environmental Assessment, and are classified as Category B in accordance with WB's Safeguard requirement as no significant impacts are envisioned. In compliance to the above requirements, an environmental assessment and review procedures were prepared and included.

1.4 Detail of Environmental Features

13. The detail environmental features within 200m of the project are tabulated below Table 1.1:

Table 1.1: Detail of Environmental Feature
### Table: Environmental Features

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<thead>
<tr>
<th>Sl. No.</th>
<th>Location</th>
<th>Environmental Features</th>
</tr>
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</table>
| 1       | North side of the project and adjacent of the road West side of the project | 1. Pond  
          |                                   | 2. Pond |
| 2       | West side of the project and adjacent the pond | Residence |
| 3       | West side of the project | TTC |
| 4       | West side of the project | Passport Office |
| 5       | South-West corner of the project | Grocer’s Shop |
| 6       | Adjacent of the house and pond | Paddy field |
| 7       | South side of the project | Sishu Sadan |
| 8       | South side of the project | Residence |
| 9       | South-East side of the project | Godown |

### 1.5 Methodology

14. Environmental assessment (EA) is an integral part of development planning. It is essential that environmental issues are properly evaluated in terms of impacts and relevance, and are integrated into each stage of the project cycle. The proposed actions under the JSTP involve interventions in the implementation of various infrastructures in the project area. In conforming to the requirements of preparing an EA report, a methodology was developed in accordance with the WB’s environmental assessment guidelines. The period of preparing the EA was from 12th November 2013 to 25th December 2013, and field visits for data collection were done in 15th November 2013. The task of preparing the EA report consisted of the following sequential components:

- Familiarization with and review of various project actions of the PSDSP projects;
- Identification and screening of the environmental parameters relevant to the proposed project actions in the JSTP area through a scoping process;
- Avoidance/ mitigation measures to address the potential negative impacts, and preparation of a monitoring program during the period of project implementation;
- Outlining a set of recommendations/ suggestions for institutional strengthening of the JSTPA to develop its in-house capability in environmental assessment tasks, especially issues of climate change and disaster risks.
2 DESCRIPTION OF THE PROJECT

2.1 Description of the Project

15. The proposed Jessore Software Technology (IT) Park project site is located at a distance of 2 km from the Jessore Sadar Upazilla. The land area of the proposed site for the development of ICT Village is 3.03 acres from two different mouzas – 2.25 acres of land from the Barandi mouza of J.L no. 91 and 0.78 acre from Shankarpur mouza of J.L. no. 82. The site is a non-arable flat land with a shallow ditch in the middle. It is almost vacant and no structures or settlements are identified on the site except two semi-pacca houses which are being used as residential purpose by the fourth class employees of PWD. There are five families staying in these houses for more than 15 years. PWD will take necessary steps to relocate them as soon as the construction work starts. The local households are situated around the periphery of the proposed site.

16. The land was previously owned by Public Works Department (PWD) for developing a brick field in that place. The Ministry of Land allotted the site for establishing the proposed ICT Village by transferring ownership from PWD, Jessore to MoICT. Ministry of Land gave their concurrence to handover this 3.03 acres of land from Barandi Mouza and Shankarpur Mouza to the Ministry of Information and Communication Technology (MoICT). The transferring process was carried out under section 75 of “Acquisition of Immovable Property Manual 1997”. There is no dispute over the land and no legal impediments to use the land for developing the proposed STP on the site.

17. A major portion of the project site is an undulating land with grass and bushes with existing Poursahava’s area. A part of the proposed site is also fall under pond, agricultural land. A few habitants and trees are visible along the existing site and in the proposed site. The proposed site will be passed adjacent to the two water bodies (pond). One pond is outside the project site and another pond is inside the project site. Outside pond is existing in the North Side, Housing, Technical Training Centre (TTC), and passport office existing besides the pond in the West side, Shop, Sishu Sadan and some residence existing in the South, and also Oil mill godown existing in the east side. There are two roads besides the two sides such as North side and West side at the project site. The wide of the north side road is 16 ft and the wide of the west side road is 25 ft. There are several components of proposed project site. These are:

1. Multi-Tenant Building (MTB) (15th Storied)
2. Site development
3. Data centre at the eastern part of Multi-Tenant Building (MTB)
4. Garden & Green Zone at the Western part of Multi-Tenant Building (MTB)
5. Public Library
6. Dormitory Building
7. Play Ground
8. Sports & Recreation
9. Family Flat
10. R & D Centre
11. Green Zone at the middle point.
12. Internal road, approach road form nearest high-way
13. Arboriculture
14. Landscape
15. Electric Sub-station
16. Generator
17. Internet connectivity etc will be constructed under this Project.

18. The surrounding area of the proposed site is a mix of residential, institutional and vacant in nature consisting of undulating land. The master plan of the project site is following Figure 2.1

![Figure 2.1: Master Plan of the Project Site](image)

2.2 Rationale of the Project
19. Mission of the project is to promote knowledge based industry in the country. Bangladesh has a pool of ICT experts and professional and the global IT/ITES market is worth 500 billion dollars which has good potential for local exporters to harness the
opportunity from ICT sector. IT Park/STP at the regional level would be an appropriate initiative to achieve the goal of Digital Bangladesh through balanced development of the country. Plentiful availability of knowledgeable rich manpower is a Prerequisite for the potential industries like IT/ITES. The IT Park/STP at the regional level will host ICT related industries. To attract such industries infrastructure readiness such as telecom infrastructure, transportation infrastructure must be of high standards with good legal environment, like Cyber law and Intellectual Property Rights. Therefore the Government is committed to established IT Park and Software Technology Park throughout the country.

20. The Government is going to establish Hi-Tech Park in Kaliakoir, Gazipur and already established ICT Incubator in a hired building at Karwan Bazar. The IT Incubator is playing an important role in developing ICT sector. Based on the experience and success of ICT incubator the government wants to create a favorable business environment for ICT sector through establishment of STP/IT Park. This IT Village/STP will play an important role for employment, increase competitiveness of the local industry through technological enhancement.

2.3 Location of the Project
21. Jessore is the first district of undivided Bengal. It was established in 1786. Geographically, it is at the South-western zone of Bangladesh. The site is located at 23°09’ 21” N to 89°13’20” E and about 2 km from the Jessore city center. It is approximately 8 km away from Jessore Airport and about 3 km from the railway station. Its elevation is 8 meters above mean sea level and the area is nearly slope from north to south. The distance, by road, between Dhaka and Jessore is approximately 156 km. The approach road to the site from the main highway is of good quality but narrow (5 meter wide).

22. Suitable site has selected in the Central Place of Jessore town for the STP. Jessore town stands on the bank of the river Bhairab. The river Bhairab is 5 km away from the project site at the west. Jessore is the part of Mouribund Delta of the country. It’s North side district is Jhenaidah, East side Narail and Magura, South side Khulna and Satkhira district and West side is India. The location map of Jessore sadar Upazilla including the project site is shown in Figure. 2.2. It consists of 8 upazila, 8 Pourashava (Municipality), 1423 nos. Mouza/Mohalla and 1477 nos of villages. Area of the district is 6674 Sq.km. where is 4.5 % of the total area of the country. Jessore is famous for production of various types of flower, which covers more than 30% demand of the Country. Literacy rate of Jessore is 70%. There are some prominent rivers in this district namley Kopothakko, Bhairab, Chitra, Ichamoti, Harihor, Dadra, Betraboti & Kodla. Jessore Municipality/pourashava contain 9 words and 73 Mohalla. The proposed site is located at Barandi and Shonkorpur Mouza of the Sadar Upazila of Jessore district.

23. There is a public library in the north-west corner. Jessore Regional Passport Office and Technical Training Centre are situated in the western side of the project site. In the south-
west corner there is a six-storied building of Sishu Sadan under Department of Social Services (DSS) and few small shops. In the south-east side there are few residential housing and oil mill godown. In the east side there is also few residential housing. There is a pond in the middle of the project. The location map of the project JSTP is shown in Figure 2.3. The surrounding area of the proposed site is a mix of residential, institutional and vacant in nature consisting of undulating land.

Figure 2.2: Location Map of Jessore District Including the Project Site
2.4 NOC from Local Authority
24. No Objection Certificate (NOC) from local authority is a pre-requisite document for submitting of application to DoE for obtaining environmental clearance certificate of this project. JSTPA obtained NOC from Mayor, Jessore Pourashava as local authorities and submitted application to DoE for site clearance for implementation of the project.

2.5 Access Road of the Project Site
25. Jessore-Khulna Highway, also known as Jessore-Khulna National Highway (N7), is the main highway that connects Jessore with Dhaka. The Project Site is situated at about half kilometer from the Jessore-Khulna Highway and linked with an access road which is locally known as Nazirshankarpur Road. Nazirshankarpur is a single lane road with a width of 5 m, which is at present in poor condition. It ends up with a feeder road known as Rail Road. The road is bounded on either side by numerous settlements and widening of this access road is necessary. The following google image of the site shows the national highway and access road in Figure 2.4.
2.6 Raw Material

The followings will be used as the main raw materials of the project. Such as

- Cement
- Local and Sylhet sand
- Bricks
- Stone chips
- Mild steel rod/Bar
- Water
- Admixture
- G.I Pipe
- Wood
- Glass curtain
- Thai Aluminum
- Internal & external paints
- Varnishes
PVC pipe

E-Waste

Most of the people generally consider “e-Waste” comprises: computers, printers, toner cartridges, monitors, TVs, mobile phones, calculators, faxes, photocopiers, scanners, digital/video camera, VCRs, DVD, paluer MP3, CDs Battery, cable, magnetics and disks, microwave oven, microscope are also e-Waste.

Most people indicated that they had two or more ways of dealing with their e-Waste. The main combinations were: throw out/recycle; recycle/donate; throw out/recycle/reuse, followed by recycle/reuse/donate. However, more than 50% of businesses are still throwing out their e-Waste rather than recycling or reusing it.

2.7 List of Machinery and Equipment

27. The following Machinery and Equipment will be used during construction of the 15th Storied MTB, a composite steel structure building:
   1. Mixture machine
   2. Mechanical Hoist
   3. Play Loader
   4. Dumper
   5. Scraper
   6. Theodolite
   7. Leveling Instruments
   8. Batching plant with transportation system
   9. Water Pump
   10. Concrete vibrator
   11. Steel shuttering & adjustable G.I or steel props
   12. Steel scaffolding materials
   13. Generator
   14. Welding set
2.8 Commercial Facilities Created in the IT Park

28. The following facilities will be got after construction of the 15th Storied MTB-
   1. A MTB (Multi Tenant Building, primarily for Software development) with Conference / seminar / sales and food Courts etc. and an area of 110,000 sq. ft building
   2. Future Expansion of the Software development possibilities
   3. Future Data Centre
   4. A Dormitory / Hostel and a Gymnasium Building with about 120 -140 bedroom and related facilities etc.
   5. Ancillary Building with Substations, Generators, and miscellaneous storage space etc
   6. Recreational spaces
   7. Adequate parking (as per code) on site

29. The following commercial facilities in the IT/STP:
   1. Banks
   2. Cafeteria
   3. Data Center
   4. Conference Center

30. In addition to the commercial facilities, the following facilities will also be present in the IT/ STP:
   1. Administration office of IT /STP
   2. Research (R&D) area
   3. Gymnasium
   4. Prayer room
   5. Meeting rooms

31. Developer of the JSTP or BHTPA will also be responsible for maintenance of the Park including security. Operator will collect a monthly O&M charge from the tenants to this end in addition to the lease charges.

2.9 Outputs of the Project

32. The following outputs of the project:
   1. To promote the development and export of software and software services including Information Technology (IT) enabled services/Bio-IT.
   2. To provide promotional services to the exporters by implementing Software Technology Parks (STP)/ Electronics Schemes and other such schemes which will be formulated and entrusted by the Government from time to time.
   3. To provide date communication services including value added services to IT/ IT enabled Services (ITES) related industries.
4. To promote micro, small and medium entrepreneurs by creation conductive environment for entrepreneurship in the field of IT/ITES.
5. Development of IT sector as well as industrialization in Bangladesh.
6. Access to public business related processes available to firms within the STP
7. Knowledge of and competitively priced products available to firms in the park zone
8. Firm level compliance with social and environmental standards within the park zone

33. The importance of environmental consideration, occupational health & safety and land requisition related to STP construction projects has been recognized in a number of national documents. The major relevant policies, acts, rules and plans are:

- National Environment Management Plan, 1995
- Environmental Conservation Act (ECA), 1995
- Environmental Conservation Rules (ECR), 1997

3.1.1 Environmental Policy, 1992 and Environmental Action Plan, 1992

34. The concept of environmental protection through national efforts was first recognized and declared with the adoption of the Environment Policy, 1992 and the Environment Action Plan, 1992. The importance of policies in beefing up the environmental regime is recognized in a number of international instruments including the World Conservation Strategy in 1980 and the Brundtland Commission Report, 1987. Paragraph 14 of Chapter 8 of Agenda 21 underscored the necessity of formulation of national policies as well as laws for environmental protection and sustainable development. The major objectives of Environmental policy are to i) maintain ecological balance and overall development through protection and improvement of the environment; ii) protect the country against natural disaster; iii) identify and regulate activities, which pollute and degrade the environment; iv) ensure environmentally sound development in all sectors; v) ensure a sustainable, long term and environmentally sound base of natural resources; and vi) actively remain associate with all international environmental initiatives to the maximum possible extent.

3.1.2 National Environment Management Plan, 1995

35. The National Environment Management Action Plan (NEMAP, 1995), based on a nationwide consultation program identified the main national environmental issues, including those related to the water sector which EA practitioners should note. The main related national concerns included flood damage, riverbank erosion, environmental degradation of water bodies, increased water pollution, shortage of irrigation water and drainage congestion; various specific regional concerns were also identified.

3.1.3 Bangladesh Environmental Conservation Act (ECA), 1995

36. The Environmental Conservation Act (ECA) of 1995 is the main legislative framework document relating to environmental protection in Bangladesh. This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. This Act established the Department of Environment (DOE), and empowers its Director General to take measures as he considers necessary which includes conducting inquiries, preventing probable accidents, advising the
Government, coordinating with other authorities or agencies, and collecting & publishing information about environmental pollution.

37. According to this act (Section 12), no industrial unit or project shall be established or undertaken without obtaining, in a manner prescribed by the accompanying Rules, an Environmental Clearance Certificate (ECC) from the Director General of DoE.

38. In addition, through a gazette notification date September 1, 2009, the High Court declared the 4 rivers surrounding Dhaka, namely Buriganga, Turag, Balu and Shitolakhkhya, as Ecologically Critical Areas, citing the ECA 1995, Section 5. Subsequently pollution creating activities that are detrimental to the water and aquatic life in those rivers has been declared forbidden.

3.1.4 Bangladesh Environmental Conservation Rules (ECR), 1997

39. The Environment Conservation Rules, 1997 were issued by the Government of Bangladesh in exercise of the power conferred under the Environment Conservation Act (Section 20), 1995. Under these Rules, the following aspects, among others, are covered:

   (i) Declaration of ecologically critical areas
   (ii) Classification of industries and projects into 4 categories
   (iii) Procedures for issuing the Environmental Clearance Certificate
   (iv) Determination of environmental standards

40. These Rules were amended three times (17 February 2002, 26 August 2002 and 01 April 2003) to specify different sections like inclusion of Certificate of Fitness, Pollution Under Control Certificate, Fees for Environmental Clearance Certificate and other services etc.

41. ECR’97 (Rule 7) classifies industrial units and projects into four categories depending on environmental impact and location for the purpose of issuance of ECC. These categories are:

   - Green
   - Orange A
   - Orange B, and
   - Red

42. All existing industrial units and projects and proposed industrial units and projects, that are considered to be low polluting are categorized under "Green" and shall be granted Environmental Clearance. For proposed industrial units and projects falling in the Orange-A, Orange- B and Red Categories, firstly a site clearance certificate and thereafter an environmental clearance certificate will be issued. A detailed description of those four categories of industries has been given in Schedule-1 of ECR’97. Apart from the general requirements, for every OrangeB and Red category proposed industrial unit or project, the
application must be accompanied with feasibility report on Initial Environmental Examination (IEE), Environmental Impact Assessment (EIA) based on approved TOR by DOE, Environmental Management Plan (EMP) etc.

43. The HTPA will follow all the national and international related policy and regulation of Bangladesh.

3.1.5 Implications of Policies and Environmental Clearance Procedure

44. Legislative bases for EIA in Bangladesh are the Environmental Conservation Act 1995 (ECA’95) and the Environmental Conservation Rules 1997 (ECR’97). Department of Environment (DOE), under the Ministry of Environment and Forest (MOEF), is the regulatory body responsible for enforcing the ECA’95 and ECR’97. The ECR 97 includes lists of projects, but this type of ICT/STP project is not categorized under the legislative documents of DOE. However, STP at Jessore may be categorized as Red due to its nature of environmental hazard during project construction phase. This will require initial environmental examination with EMP and DOE clearance.

45. It is the responsibility of the proponent to conduct an IEE and EIA of the development proposal. The responsibility to review EIAs for the purpose of issuing Environmental Clearance Certificate (ECC) rests on DOE. The procedures for “Red” Category include submission of:

- An Initial Environmental Examination (IEE)
- Environmental Impact assessment (EIA)
- An Environmental Management Plan (EMP)

46. Environment clearance has to be obtained by the respective implementing agency or project proponent (private sector) from Department of Environment (DOE). The environmental clearance procedure for “Red” Category projects can be summarized as follows:

Application to DOE → Obtaining Site Clearance → Submission of EIA study report with EMP → Applying for Environmental Clearance → Obtaining Environmental Clearance → Clearance Subject to annual renewal

Detailed steps for getting an Environmental Clearance Certificate:

47. The following are the steps need to be followed in getting an environmental clearance certificate from the Department of Environment (DOE).

(a) Feasibility Study Report of the Project (applicable only for proposed industries or projects);
(b) Initial Environmental Examination (IEE) Report, layout plan (indicating the site), design and time-schedule to construct the STP and the process-flow diagram;
(c) Environment Management Plan (EMP)
(d) No-objection-certificate (NOC) from the local authority;
(e) Mitigation measure with respect of adverse environmental impacts together with a plan to reduce pollution load;
(f) Outlines of relocation, rehabilitation plan (where applicable); and
(g) Other relevant information.

3.2 World Bank Safeguard Policies

48. The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process. Safeguard policies provide a platform for the participation of stakeholders in project design, and act as an important instrument for building ownership among local populations. The effectiveness and development impact of projects and programs supported by the Bank has substantially increased as a result of attention to these policies. The World Bank has ten environmental, social, and legal safeguard policies which are listed in the following:

**Environmental policies:**
- OP/BP 4.01 Environmental Assessment
- OP/BP 4.04 Natural Habitats
- OP/BP 4.09 Pest Management
- OP/BP 4.11 Physical Cultural Resources
- OP/BP 4.36 Forests
- OP/BP 4.37 Safety of Dams

**Social Policies**
- OP/BP 4.10 Indigenous Peoples
- OP/BP 4.12 Involuntary Resettlement

**Legal Policies**
- OP/BP 7.50 International Waterways
- OP/BP 7.60 Disputed Areas

49. In addition to the 10 safeguard policies, BP 17.5 exists as the Bank Disclosure Policy, which also relates to safeguards. Bank disclosure Policy supports decision making by the Borrower and Bank by allowing the public access to information on environmental and social aspects of projects. The policy requires disclosure in both English and Local language before project appraisal and must meet the World Bank standards.

3.2.1 Environmental Policy OP/BP 4.01 Environmental Assessment

50. The Bank requires environmental assessment (EA) of projects proposed for Bank support to ensure that they are environmentally sound and sustainable, and thus to improve decision making. EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation.
EA takes into account the natural environment (air, water and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples and physical cultural resources); and transboundary and global environmental aspects. The borrower is responsible for carrying out the EA and the Bank advises the borrower on the Bank’s EA requirements.

51. The Bank classifies the proposed project into three major categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

52. **Category A**: The proposed project is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works.

53. **Category B**: The proposed project’s potential adverse environmental impacts on human population or environmentally important areas—including wetlands, forests, grasslands, or other natural habitats—are less adverse than those of Category A projects. These impacts are site specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than Category A projects.

54. **Category C**: The proposed project is likely to have minimal or no adverse environmental impacts.

3.2.2 **Applicability of DoE and WB Policy 4.01**

55. The DoE has issued EIA Guidelines for Industries (this document was released in December 1997) and addresses the IEE and EIA for several industrial sectors, project and activities. Each Project Proponent shall conduct an EIA and is expected to consult and follow the DoE guidelines.

56. According to WB Operational Policy (OP 4.01), the nature of environmental assessment to be carried out for a particular sub-project would largely depend on the category of the project.

57. As mentioned earlier, The World Bank Operational Policy (OP) 4.01 classifies projects into three major categories (category A, B and C), depending on the type, location, sensitivity and scale of the project, and nature and magnitude of potential impacts. The proposed project under HTPA project will be a category B project according to World Bank classification, since no large-scale infrastructure investment or major expansion will be implemented under the proposed project. The environmental impacts of the project are expected to be mostly construction related and limited within the project boundaries.

58. All relevant acts, policies and regulations with this project will be followed by the project authority.
4. ENVIRONMENTAL BASELINE

4.1 General

59. Jessore district (coordinate 88° 40’ to 89°50’ E and 22° 47’ to 23° 47’ N) with an area of 6674sq. km, is bounded by Jhenaidah districts on the north, Khulna and Satkhira district on the south, Narail and Magura on the east, India on the west there are some prominent rivers in this district namley Kopothakko, Bhairab, Chitra, Ichamoti, Harihor, Dadra, Betraboti & Kodla. This chapter provides the detailed baseline and analysis for the proposed project area.

4.2 Physical Environment

4.2.1 Topography

60. Natural environment has a profound impact on a town in shaping its physical setting and its pattern of growth. Jessore town is located in the southwest region of the country, which has been developed and influenced by the process of siltation from a network of rivers. Because of its location in a moribund delta and tidal environment, the town has specific characteristics on land, soil, climate, hydrology and rainfall.

61. Topography of the project area is undulating, with pond, social forest and high land. Its elevation is 8 meters above mean sea level and the area is nearly slope from north to south (Banglapedia, 2006). The land of Jessore region can be broadly characterized by the Ganges-tidal floodplain having lower relief and being crass-crossed by innumerable tidal rivers and channels. It is nearly flat and the surface is poorly drained.

62. The land surface of Jessore town area is not perfectly level and is characterized by six major geomorphic units. These are natural levees, floodplains, old meander complex, bar, tidal marsh and back swamps. Natural levees are well developed along the Bhairab-Kopodak banks and are occupied mainly by the present built-up area of the town. This part of the city is 8m above the mean sea level (MSL). The low-lying areas extend mainly towards fringe areas of the town characterized by swampy areas, currently used for agricultural purposes that are poorly drained and persistent water logging problems (Reiman, 1993).

63. Jessore district is formed entirely by the deltaic action of the Ganges which brought mud and lime stone from the Himalayas. The soil is to a great extent uniform in character and varies only greater or smaller admixture of sand, silt and clay. Naturally, the percentage of sand is greater along the river side and smaller in those areas where deltaic action has ceased. The town fringes particularly are the marsh areas (Hassan, 1984).

4.2.2 Surrounding land use

64. The site is located in Barandi and Shonkorpur Mouza of the Sadar Upazila of Jessore district. The proposed 3.03 acre area consists of existing concrete road, some paddy at the east side of the Project. West side is TTC and passport office is situated. There is a big pond at the North side of the Project. Like other parts of Bangladesh agricultural crops are not dominant within the area. So productions not hamper to construct the proposed park. These agricultural lands only used for seasonal cultivations. The nearest railway junction called Jessore Railway Junction on the south, which are about 3 km away from the proposed park.
4.2.3 Climate
65. Bangladesh is located at the central part within the Asiatic monsoon region where the climate is tropical. Relatively small size of the country and generally low-lying area cause moderate spatial variation of temperature, precipitation, relative humidity, wind speeds and other climatic variables. However, the climate of Bangladesh exhibits pronounced temporal variability. This is because of the moisture-laden monsoon winds flowing predominantly from the south-west during summer and the comparatively dry and colder north-western winds during winter.

66. Jessore has a humid sub-tropical climate with large variations between summer and winter temperatures. The cluster has a tropical monsoon climate. It has three main seasons.

<table>
<thead>
<tr>
<th>Season</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer/Pre-monsoon</td>
<td>March to May</td>
</tr>
<tr>
<td>Rainy Season/monsoon</td>
<td>June to October</td>
</tr>
<tr>
<td>Winter season</td>
<td>November to February</td>
</tr>
</tbody>
</table>

67. The rainy season is hot and humid having about 85 percent of the annual rainfall. The winter is predominately cool and dry. The summer is hot and dry interrupted by occasional heavy rainfall. The annual average temperature maximum 31.3°C and minimum temperature is about 16. Annual average rainfall is about 1402 mm.

68. Different meteorological data like rainfall, temperature, relative humidity and wind speeds monitored at the meteorological station in Jessore, Khulna are described in the following subsections and summarized in Table 4.1

### Table 4.1: Monthly Averages of Climatic Variables of the Project Site, 2008-2012

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Temp (°C)</td>
<td>17.3</td>
<td>20.9</td>
<td>26.6</td>
<td>29.6</td>
<td>30.2</td>
<td>30.1</td>
<td>29.3</td>
<td>29.03</td>
<td>28.95</td>
<td>27.43</td>
<td>23.45</td>
<td>18.38</td>
</tr>
<tr>
<td>Max Temp (°C)</td>
<td>19.1</td>
<td>21.7</td>
<td>28.0</td>
<td>31.1</td>
<td>31.3</td>
<td>30.9</td>
<td>29.8</td>
<td>29.7</td>
<td>29.3</td>
<td>28.1</td>
<td>24.4</td>
<td>19.7</td>
</tr>
<tr>
<td>Min Temp (°C)</td>
<td>16.0</td>
<td>19.5</td>
<td>25.9</td>
<td>28.2</td>
<td>29.8</td>
<td>29.0</td>
<td>28.7</td>
<td>28.5</td>
<td>28.7</td>
<td>26.7</td>
<td>22.9</td>
<td>17.9</td>
</tr>
<tr>
<td>Rainfall (mm)</td>
<td>20.2</td>
<td>10.8</td>
<td>24.0</td>
<td>38.2</td>
<td>162</td>
<td>255</td>
<td>323</td>
<td>226</td>
<td>253</td>
<td>83</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Humidity (%)</td>
<td>79</td>
<td>72</td>
<td>24</td>
<td>72</td>
<td>74</td>
<td>80</td>
<td>84</td>
<td>85</td>
<td>84</td>
<td>81</td>
<td>78</td>
<td>81</td>
</tr>
<tr>
<td>Avg. Wind Speed</td>
<td>5.48</td>
<td>5.38</td>
<td>7.9</td>
<td>8.24</td>
<td>8</td>
<td>8.4</td>
<td>6.9</td>
<td>6.34</td>
<td>6.66</td>
<td>6.92</td>
<td>5.28</td>
<td>5.18</td>
</tr>
<tr>
<td>Max. Wind Speed</td>
<td>6.5</td>
<td>5.7</td>
<td>11</td>
<td>10.4</td>
<td>9</td>
<td>9.6</td>
<td>7.6</td>
<td>6.8</td>
<td>7.4</td>
<td>11.1</td>
<td>6.3</td>
<td>6</td>
</tr>
</tbody>
</table>

4.2.3.1 Temperature
69. Remarkable changes in temperature can be found with the changes of seasons in Jessore town. May is the hottest month sowing a monthly average maximum temperature of up to 31.3°C. However, Jessore town shows a mild summer than of inland areas, particularly northwestern district, where summer temperature sometimes exceeds 34°C. In June, there is sharp fall in temperature due to the outbreaks of monsoon. During the monsoon, the monthly average temperature is about 28.9°C. The cool dry winter season begins in November and
January is the coldest month with an average minimum is about 16°C (Meteorological Dept. Jessore, 2008-2012).

**Figure 4.1: Average Monthly Temperature (2008-2012)**

### 4.2.3.2 Rainfall

70. The average rainfall of this town is about 117mm. The main source of rainfall is the southwestern monsoon. Nearly 85% of total rainfall occurs during May-September. During March-April some rainfall also occurs due to Northwester effect. Winter is the dry period with little or nearly no rainfall. However, during the months of December and February little rainfall is recorded (Meteorological Dept. Dhaka, 2009)

### 4.2.3.3 Humidity

71. As would be expected, humidity during the wet season is significantly higher, as shown in Table 4.1 and Figure 4.2 those occurring at other times of the year. Maximum average relative humidity for the project area is found as 85% in the month of August, whereas minimum relative humidity is 70% in the month of March.
Due to monsoonal variation of the climate, there are variations in wind direction in Jessore town. The southwesterly monsoon starts from about the middle of March and recedes about the end of September. The monsoon winds blow from the south with sustain force from March to October. The wind blows from the north and northeast in January. February is a clam month with foggy weather in the morning particularly (Meteorological Dept. Dhaka, 2008-2012). Monthly maximum wind speed direction rose plot shown in Figure 4.3(a) and distribution of monthly average wind speed shown in Figure 4.3(b) during 2008-2012.
4.2.4 Surface water quality

73. The project site crosses a number of rivers, ponds and ditches. The ponds are used for fishing. There is no remarkable source of water pollution in the project site. A surface water sample collected from the inside of the project pond on 16th November 2013 and analyzed in the laboratory. Physically we found that the pond water is turbid and brown in color. The detailed surface water quality test results of parameter like pH, TDS, EC, DO, TSS, BOD and COD is shown in Table 4.2.

**Table 4.2: Surface Water Chemical Parameters**

<table>
<thead>
<tr>
<th>SN</th>
<th>Parameter</th>
<th>Unit</th>
<th>Concentration of Surface Water</th>
<th>Bangladesh (DoE) Standard for Surface Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>pH</td>
<td></td>
<td>7.6</td>
<td>6.5 – 8.5</td>
</tr>
<tr>
<td>02</td>
<td>DO</td>
<td>mg/l</td>
<td>5.1</td>
<td>≥5</td>
</tr>
<tr>
<td>03</td>
<td>BOD₅</td>
<td>mg/l</td>
<td>15</td>
<td>≤10</td>
</tr>
<tr>
<td>04</td>
<td>COD</td>
<td>mg/l</td>
<td>32</td>
<td>NYS</td>
</tr>
</tbody>
</table>
4.2.5 Ground water quality

The project site is located in the high land area and water is available within 100-120 ft depth. The ground water table varies 4-6 meter in the year at the project area and is potable. The ground water samples were collected from the project site for analysis of chemical parameters in order to get the primary idea regarding the quality of ground water. Table 4.3 shows the groundwater chemical parameters. From the test result it is found that the Iron concentration is higher than standard.

Table 4.3: Groundwater Chemical Parameters

<table>
<thead>
<tr>
<th>SN</th>
<th>Parameter</th>
<th>Unit</th>
<th>Concentration of Ground Water</th>
<th>Bangladesh (DoE) Standard for Ground Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>pH</td>
<td></td>
<td>7.8</td>
<td>6.5 – 8.5</td>
</tr>
<tr>
<td>02</td>
<td>DO</td>
<td>mg/l</td>
<td>3.3</td>
<td>6</td>
</tr>
<tr>
<td>03</td>
<td>COD</td>
<td>mg/l</td>
<td>2.2</td>
<td>4</td>
</tr>
<tr>
<td>04</td>
<td>TDS</td>
<td>mg/l</td>
<td>120</td>
<td>1000</td>
</tr>
<tr>
<td>05</td>
<td>EC</td>
<td>µS/cm</td>
<td>324</td>
<td>NYS</td>
</tr>
<tr>
<td>06</td>
<td>Iron</td>
<td>mg/l</td>
<td>9.09</td>
<td>0.3-1.0</td>
</tr>
</tbody>
</table>

4.2.6 Air Quality

There are no remarkable industrial/commercial sources of air pollution around the project site that causes air pollution. The vehicular movement and emission from vehicle in the create dust and gaseous mission and impair the air quality. Around the project site there is no brick field and polluting industries hence the project area is found quite clean and rural in nature.

4.2.7 Noise Level

It is observed that during site visit that noise was generating in the study area during day. There is no remarkable noise source like industries located in the area. The noise level was measured at day time in the project area at 5 sec interval and shown in Table 4.4

Table 4.4 Noise Level Data

<table>
<thead>
<tr>
<th>SN</th>
<th>Location</th>
<th>Results in dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Near Corner of the road at Public Library</td>
<td>53.1</td>
</tr>
<tr>
<td>02</td>
<td>Near Sishu Sadan</td>
<td>56.9</td>
</tr>
<tr>
<td>03</td>
<td>Entry Point</td>
<td>52.6</td>
</tr>
<tr>
<td>04</td>
<td>Near existing pond</td>
<td>51.7</td>
</tr>
<tr>
<td>DoE (Bangladesh) Noise Standard for Residential area</td>
<td>Day Time (6 am-9 pm)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Methods/Instruments</td>
<td>Sound Level Meter (SL-4033SD)</td>
</tr>
</tbody>
</table>
4.2.8 Fisheries
77. Fresh water fish habitat such as pond and ditches exist in and around the project site, which provide shelter, feeding, and spawning ground for different types of fresh water fish species. Large-scale human intervention for catching fresh water fishes from their natural habitat has been observed. The reproduction, breeding and multiplication of aquatic fishes are very finely tuned and adjusted to the rhythm and amplitude of monsoon flooding in and around the proposed project. The existing pond will be affected due to construction of MTB by filling the pond. A small quantity of fish production will be hamper every year.

4.2.9 Heritage and Archaeology
78. The heritage site is known after the name of its village Bharat Bhayana which is in the thana of Kesabpur under Jessore district. The village and its surroundings are dotted with some and sparsely lying architectural pieces. Of them, only one, Bharat Rajar Deul, has yielded the substantial ruins of a brick-built curious structure. It was planned on a cruciform base and endowed with several bind cells above. It shows starkly plain wall surface save some receding offsets at the base level only. The present height of the roof-less structure is about 10m at its highest point that appears to have been much more in its original form. The site has also yielded some busts of princely male figures, potteries of early medieval origin etc. One can start his journey for Bharat Bhyana from either Khulna Bus Stoppage or Jessore Airport by any kind of motorized vehicle.

79. Archaeological heritage and relics: Remnants of the Chanchara Rajbari, Dargaha of Ghazi Kalu, Rajbari, Dighi and remnants of the palace of king Mukut Roy (12th century), residence of Nawab Mir Jumla (17th century), Imam Bari built by Haji Muhammad Muhsin at Murli.

4.2.10 Flooding
80. As Jessore lies in the South-Western region of Bangladesh and adjacent to Bhairab River, the project area has low risk of natural disasters like cyclone, flood and earthquake, as the area is in a geographically elevated area. The area is low flood risk zone as per the records of 1988 & 1998 flood level. The communication never disrupted or stopped during the high flood. The national highway is above the high flood level. The area faces no river flooding [Figure4.4].
4.2.11 Detail of last 20 years of flooding

81. Figure 4.5 shows the detail of last 30 year monthly average variation (1980-2010) of flood situation in Bangladesh. From the Figure 4.5 it is found that 1988 and 2008 July to October surface water level increases and maximum water level found in August to September.
4.2.12 Transportation Facilities

There are adequate bus services carrying passengers between Jessore and Dhaka. Transportation by railway is also available. In particular, Jessore is a junction on the expansive Eastern Railway. The Eastern Railway network extends into Indian Territory and links the capital of Bangladesh, Dhaka with the Indian city of Kolkata; Jessore falls midway in this route. In addition to road and railway, air transportation is also available. There are currently three airlines out of which Regent Airways and United Airways operates regular flights twice daily from Dhaka to Jessore and another airline, Novo Air operates daily a single flight. The International Land Port named Benapole is under Jessore district.

4.2.13 Seismicity

On the basis of distribution of earthquake epicentres and morphotectonic behaviour of different tectonic blocks Bangladesh has been divided into three generalised seismic zones. The south of Bangladesh is seismically severe zone and represented by zone II with Bask coefficient 0.05. Ground condition (firm or soft) has not been taken into consideration during the seismic zonation of Bangladesh. So, considering the seismic zonation of Bangladesh the project area is less vulnerable for earthquake. Characteristic features of seismic zonation of Bangladesh are presented in the Table.

<table>
<thead>
<tr>
<th>Zoning</th>
<th>Area Mercalli Scale</th>
<th>Modified</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>North and eastern regions of Bangladesh (Seismically most active)</td>
<td>IX</td>
</tr>
<tr>
<td>II</td>
<td>Lalmai, Barind, Madhupur Tracts, Dhaka, Comilla, Noakhali and western part of Chittagong Folded belt.</td>
<td>VIII</td>
</tr>
<tr>
<td>III</td>
<td>Khulna division S-E Bangladesh (Seismically relatively quiet)</td>
<td>VII</td>
</tr>
</tbody>
</table>

(Source: ASM Woobaidullah)
According to the map Bangladesh has been classified into three seismic zones, with Zone-I the most severe, Zone-II severe and Zone-III the least severe. The project area falls in Zone-III, which is the least severe zone and shown in Figure 4.6.
4.2.14 Cyclones

85. Cyclones occur in the Bay of Bengal mainly in two seasons – April to May and October to November. Due to the funnel shaped coast of the Bay of Bengal, Bangladesh very often becomes the landing ground of cyclones formed in the Bay of Bengal. Approximately 45 damaging cyclones were reported in the coastal area of Bangladesh from 1793 through May 1997. Thus cyclone frequency during this period averaged about once in every 4.5 years. These cyclones cause enormous damage to the nation's lands, crops, infrastructure and lives of coastal people. The intensity of cyclone around the project location is generally less than other part of the coastal belt. The alignment of cyclonic events is given in Figure 4.7.
5IDENTIFICATION AND EVALUATION OF POTENTIAL IMPACTS

5.1 General Overview of Environmental Impacts
86. Identification of potential impacts and mitigation measures both are very important criteria of the EIA study for any project. Since the project site is vacant hence the Important Environmental and Social Components (IESCs) will not affected by the proposed STP construction project and there is no scope of compensation of any damages.

Identification of Impacts
87. In reviewing impacts, this section addresses the following issues:

- Land Use
- Loss of Vegetation
- Earth Cutting
- Disruption of Traffic
- Sanitation and drinking water facilities
- Noise and Vibration
- Air Quality
- Surface Water Quality
- Groundwater Quality
- Biodiversity

5.2 Pre-Construction Phase

5.2.1 Impact on Physical Environment

5.2.1.1 Land Use
88. In the preconstruction phase, the potential impacts are considered that either occur during project planning or occur during subsequent phases but are the direct consequence of activities which are carried out during the pre-construction phase.

5.2.1.2 Land Acquisition and Requisition
89. The project site has been selected in vacant place and hence, there will be no land acquisition require due to the project.

5.2.2 Impact on Biological Environment

5.2.2.1 Loss of Biodiversity
90. About 16 trees and no vegetation and shrub will be required to remove for the construction of the project site. No soil covering plants will be destroyed during pre-construction activities. These activities will not lead to soil erosion in the project area.

5.2.2.2 Terrestrial ecosystem and loss of trees
91. No vegetation and shrub within the proposed project site would be lost due to the development of project area. Such activities would not hamper wildlife habitats. It would be
necessary to cut 16 trees. Though there are no big trees in the project area, no herbs and shrubs would be uprooted. However, the areas would be relatively less impacted due to the project. The tree species are common species characteristic of the project area and includes Babla, Shisu, Coconaut, Khajur, Mango, Baroi, Jam etc. To cut the trees in the project area shall require approval from the Upazilla committee. There are no regulations currently to regulate felling of private trees.

**5.2.2.3 Aquatic ecosystem**

92. Trench will be dig for laying foundation of the 15th storied MTB on the existing pond. Hence the pond will be permanently lost. Fish habitats will be lost due to the project activities.

**5.2.2.4 Planning and Design**

93. In the pre-construction phase potential impacts are considered that either occurs during project planning and design or which occur during subsequent phases but are the direct consequences of activities which are carried out during the pre-construction phase.

**5.3 Construction Phase**

**5.3.1 Impact on Physical Environment**

**5.3.1.1 Loss of Vegetation**

94. The project area is located in a plain area and there remain five households. Most of the land of the proposed area is vacant and covered with small vegetation, existing pacca, katcha, government’s residence where some government employees live and they are shifted another place as soon as possible. Land slide during construction of the foundation, leading to instability in soils may occur.

**5.3.1.2 Earth Cutting**

95. The earth will be cut during laying foundation for 15th storied MTB. This earth cutting will filled up the surrounding low land to develop the project area.

**5.3.1.3 Disruption of Traffic**

96. The construction of STP with 15th storied MTB in the proposed site which will face temporary traffic disruption and pedestrian movement for very short period.

**5.3.1.4 Sanitation and drinking water facilities**

97. The health of the project personnel, construction workers and laborers living at the base camp would be impacted if arrangements for sanitation and drinking water are not ensured adequately and properly.

**5.3.1.5 Housing facilities for workers**

98. Inadequate housing facilities will be affected the health of the workers. If the temporary shed is not provided for construction workers and laborers for living at the base camp this will impact surrounding area as well as hamper construction activity. If the construction
workers and laborers are engaged locally then housing and sanitation problem will be minimum.

5.3.1.6 Air Quality
99. The impact of the project is related with generation of dust during transportation and filling up the low land by earth for proposed site construction. The construction equipment, diesel generator, concrete mixing, dust emission, cutting of earth will be transported to the project site and hence the surrounding area will busy with traffic and may impact on the air pollution and congestion of traffic movement.

5.3.1.7 Noise and Vibration
100. The noise and vibration produced during construction phase from the movement of vehicles, Lorries and construction equipment will impact public health of both workers and local people. This impact will be minor and of short duration at any particular location along the road.

5.3.1.8 Blockage of waterways
101. No blockage of waterways will occur due to site construction, since there is no crossing of river or canal around the project site. Hence there will be no impact on canal or river water quality.

5.3.1.9 Workers and public safety during construction
102. During construction period lack of any safety, protective equipment, emergency medical attention, and elements by proper administrative control, engineering control, and Emergency Response team may cause loss of property, life and disaster.

5.3.2 Water Quality

5.3.2.1 Surface and Ground Water
103. The nature of the project will not hampered any negative impact on the surface and ground water quality near the project pond water quality.

5.3.2.2 Drainage System
104. Lack of adequate drainage facilities at the construction site often contribute to localized drainage congestion. During rainy season monsoon showers and pre-monsoon showers could lead to surface run-offs. Liquid waste will generate from cutting the earth during construction of site. Drainage congestion may occur if drainage system is not managed properly.

5.3.3 Impact on Biological Environment
5.3.3.1 Biodiversity (Floral and Faunal)
105. Since the project area there is no vegetation which will be destroyed for clearing the proposed project area. 16 trees need to be cut for construction of the project. These types of activities will not create any soil erosion in the project area. After implementation of the project vegetation will cover in the project area. The existing pond will be affected due to construction of MTB by filling the pond. A small quantity of fish production will be hamper every year.

5.3.3.2 Workers and public safety issues
106. All workers recruited should be experience and trained in site construction activities especially in safety issues. All precaution and safety measures like first aid box, protective equipment for personnel, emergency medical attention, and elements by proper administrative controls, engineering control and emergency response team should be ready to ensure workers and public safety issues.

5.3.3.3 Employment Opportunity
107. Local manpower may qualify as drivers, and unskilled labor, and more rarely as equipment operators. Local manpower can 100% of the total labor force employed in construction. This should more than offset any temporary loss of agricultural and fishing employment, and there will be a resulting positive impact on the local economy.

5.4 Operation Phase
108. Though information technology i.e., computer use at all walks of life brings enormous benefit to the economy its adverse impact at operation level cannot be ignored. Its environmental impacts are often not realized or considered. These impacts are expressed throughout the manufacturing, use and disposal of computers, and thus require monitoring and an understanding of each stage of a computer’s lifecycle. The impacts during operational phase can be briefed in the following paragraphs.

5.4.1 Impact on Physical Environment
109. In rainy season water logging may occur due to drainage problem of surrounding areas. Potential environmental impacts from the operation of the road are limited to the loss of utility of land along the road alignment due to the requirement for a right of way. There is no physical negative impact during operation phase of the project instead there are positive impact. After establishment of original land surface there may invasion of exotic plants plantation due to creation of ROW which may affect the environment like drawing more water from the ground.

5.4.2 Impact on Air Pollution
110. Generator exhaust dust and gases will be impacted surrounding the project area. The impact of the project is related with generation of dust during transportation and filling up the low land by earth for newly constructed road. The construction equipment, diesel generator and soil will be transported to the road site and hence the surrounding area
will busy with traffic and may impact on the air pollution and congestion of traffic movement.

5.4.3 Impact on Noise Pollution
111. Noise may be impacted when generator started due to load shedding and traffic congestion. The noise and vibration produced during construction phase from the movement of vehicles, lorries and construction equipment will impact on public health both workers and local people. This impact will be minor and of short duration at any particular location along the road.

5.4.4 Impact on Domestic Wastewater
112. Domestic wastewater is to be properly treated through septic tank connected with soak pit before disposal to avoid environmental pollution.

5.4.5 Impact on Effluent
113. There is no chemical process during the operation of IT Software Park and hence will not generate any liquid effluent and there will no impact on effluent or liquid waste on the environment.

5.4.6 Impact on Geology
114. Jessore district is formed entirely by the deltaic action of the Ganges which brought mud and lime stone from the Himalayas. The soil is to a great extent uniform in character and varies only greater or smaller admixture of sand, silt and clay. Naturally, the percentage of sand is greater along the riversides and smaller in those areas where deltaic action has ceased. The town fringes particularly are the marsh areas (Hassan, 1984). General fertility level of the soils is medium, but Nitrogen and Potassium are limiting. Organic matter content is low to moderate.

5.4.7 Impact on Surface and Ground Water
115. There is no surface and ground water level impact since the proposed project will not use process water. During construction period a small quantity of water will require for construction and domestic proposed only. During operation of the project Jessore Pourashava water supply will provide the domestic supply of water for the STP project operation. Hence ground water table will not affect due to this project.

5.4.7 Social Related Impacts
116. During the construction period, temporary employment will be created. In recruitment of workers and technicians for the project priority will be given to individuals who are lived near to the project, including women. After finalization of construction there will be new permanent jobs created, most of them related to operation and maintenance (O & M) of the project. It is envisaged that about two thousand ICT professionals would be employed in the ICT Village. Besides, a large number of supporting staff involving in ICT business will
contribute in the development of the economy. The most significant positive impact of the proposed facility would bring economic benefits to the local people through employment in construction and operation phase of the facility.

5.4.8 Effects on Disposal of IT Equipment

117. The disposal of computers is a unique issue due to the fact that most computers are often disposed of before they truly become useless. In fact, the main reason for purchasing a new computer is not to replace a nonfunctioning system, but to keep up with rapidly changing technologies (Williams and Sasaki, 2003). One key term which is important for industry, the government, and the public, with respect to computer disposal, is “upstream management”; the various methods employed to reduce the amount of ingoing computer wastes before they are disposed of for good (Williams and Sasaki, 2003). These methods embody the concept of Reduce, Reuse, Recycle, and have proven to yield many benefits, both environmental and socioeconomic.

118. The majority of waste is led to (sanitary) landfill sites. The implementation of the appropriate, in this case, TCLP (Toxicity Characteristic Leaching Procedure) test has showed that e-waste discarded at urban waste dumping sites do not produce leachates with heavy metals concentrations exceeding the environmental limits [22]. Nevertheless, this chemical cocktail generated as leachate following the TCLP test from several electronic items was toxic for aquatic organisms [23]. Burning before discarding at landfill sites increases heavy metals mobility contained in circuits covered with a plastic grid and, for that reason, while not being bioavailable following washout, they are released to the atmosphere during burning.

119. On the other hand, e-waste recycling includes disassembling and destroying the individual parts to retrieve several materials. Through recycling, 95% of a computer’s useful materials and 45% of a cathode ray tube’s materials can be retrieved. Recycling methods have minimum environmental impact when combined with the application of appropriate technology, such as in Japan [25], while, on the contrary, when using the practices followed in developing countries (e.g. child labour, e-waste burning and emission of several pollutants to the air, leachate seepage in underground and surface aquifers etc.), the final environmental benefit balance is not always positive. It must be also stressed that any environmental benefit from recycling vanishes when the waste is recycled or transported to great distances due to the adverse environmental impact of the energy consumed for its transportation [26], while, recycling, in any case, has a smaller ecological footprint than e-waste dumping and burning [9].

4. E-waste management – Current situation

120. E-waste will generate from this project after certain period of operation and need to be recycled and disposed after proper management. The global E-waste production is
assessed at 20-50 Mt/years equal to 1-3% of the estimated global urban waste production 1636 Mt/Year. Generally “e-Waste” comprises: computers, printers, toner cartridges, monitors, TVs, mobile phones, calculators, faxes, photocopiers, scanners, digital/video camera, VCRs, DVD player, MP3, CDs Battery, cable, magnets and disks, microwave oven, microscope are also e-Waste. Most of the people two or more ways of dealing with their e-Waste. The main combinations were: throw out/recycle; recycle/donate; throw out/recycle/reuse, followed by recycle/reuse/donate. More than 50% of businesses are still throwing out their e-Waste rather than recycling or reusing it. Solid waste mainly paper, cartoon etc. will be collected properly and sale to the small traders. 90% of e-waste for the same period had been mixed with other urban solid waste or had been recycled with other materials (e.g. metal waste), with no prior process (a management practice mentioned as “grey recycling”). In order to deal both with the developing problem of “grey recycling” and the increasing amount of e-waste, the operation of an authorized alternative e-waste management system started in 2004, having as main responsibilities the collection, transposition and processing in special facilities. The system collected approximately 0.1 kilotons (Kt) in 2005.

121.

Kt in 2007, 47 Kt in 2008 and 25 Kt in the first five months of 2009, overbalancing the national goal, as defined by the European and Greek legislation. These goals include the separate collection of at least 4 kg/resident/year of waste of domestic origin, that is 44 Kt/year for Greece in total. Nevertheless, even today the management of discarded electronic appliances is not taken place in a controlled way, resulting to uncontrolled collection by street vendors and to their promotion to metal and alloy recovery units.
6PUBLIC CONSULTATION

6.1 Introduction
122. JSTPA recognized the importance of social and environmental factors for successful implementation of the proposed project and followed a comprehensive process of public consultation and environmental investigation. Feedback from the consultation process will play an integral role in development of the social and environmental programs.

123. The purpose of consultation is to inform local inhabitants/primary stakeholders to make them aware of the project and to gather their opinion/suggestions about the proposed development program as well as to incorporate their suggestions during project planning and implementation stage.

6.2 Methodology
124. As part of the EA process, group discussions as well as individual stakeholder’s consultation were organized and conducted to record views and opinions of the stakeholders. Participants in these consultation meetings included elected representatives, local leaders, affected people, representatives of professional groups etc. Table 6.1 indicates the date and place of the group discussion meetings including the number of participants present at each.

Table 6.1: Public consultation regarding the proposed project

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Date</th>
<th>Consulted with Whom</th>
<th>Place</th>
<th>No. of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15th November, 2013</td>
<td>Public consultation meeting with all stake holder, affected people, local bodies, teachers and students of all technical institute, business man and elites</td>
<td>TTC conference room, Barandi, Jessore</td>
<td>50</td>
</tr>
</tbody>
</table>

Photo 6.1 Consultation meeting with stakeholder and JSTPA & Local Elites

Photo 6.2 Consultation meeting with stakeholders & Local Elites
Public Consultation and Disclosure Plan

125. Public disclosure is a continuous process JSTP has initiated the process through the study. Public consultation and disclosure will be conducted during the survey. The study team collected information from affected parties and also disclose the overall findings to the affected parties.

126. Local people, local government authorities, JSTP officials and all others having a stake in the project will be covered in the public consultation and disclosure. Focused Group Discussions (FGD), Rapid Rural Appraisals (RRA), and Key Informant Interviews (KII) techniques used for information collection and disclosure at the local level Table 6.1. Also, the summary findings of the study will be published on the JSTP website to disclose to the national and international levels. The signature of the participant are attached as Annex-1.

127. The feedback of all affected parties incorporated in the environmental management plan (EMP) of the IEE report. It is already mentioned that JSTP is a joint effort between
BHTPA and JSTP authority having reputation of complying environmental and relevant standards. They are aware about the potential environmental impacts of power plant project using. They are committed to comply DoE standards as well as best practices. The consultants have completed public consultation, focus group discussion and NGO feedback.

6.4 Findings from Public Consultations
128. The participants in general welcomed the project and expected that the project will contribute to the national economy in many ways. As reported, the following major issues among others were raised in the public consultation meetings.

- The construction of Software Technology Park will create satisfaction over the people living in the area
- After implementation of the project site the land value will increase
- The lifestyle, education facilities, increase man hour and income of the people of the area will increase
- Defuse entrepreneurial culture among young people
- Transfer of new technology
- Use of new scientific discoveries in practice
- During construction activities may need to cut trees.
- Noise pollution from vehicles and equipment at the project sites may cause disturbance to human being.
- Movement of vehicles and pedestrian may hamper the normal activities
- Air pollution due to dust and gaseous emission should be controlled.
- Environmental pollution through sanitation and waste materials as well as other social nuisance should be controlled.
- Local worker should be employed in different activities of the project on a priority basis.
- Female entrepreneur should be highly encouraged.
7 ENVIRONMENTAL MANAGEMENT AND MITIGATION PLAN

7.1 Mitigation Measures of Project Impacts on land use, Noise and vibration, surface and ground water, air quality, bio diversity, socio economic aspects.

129. The potential impacts of such of the proposed site construction are considered in turn, by phase of implementation. The potential environmental impact of project is assessed by phase of development activity, namely: preconstruction, construction and operation phase.

7.1.1 Pre-construction Phase
130. The construction of the 3.03 acres project area is located at Barandi and Shonkorpur Mouza of the Sadar Upazila of Jessore district will require no land acquisition for construction of project site.

7.1.2 Construction Phase
131. In the construction phase potential impacts are those which results directly from the construction activity like earth cutting, soil erosion, soil contamination, loss of vegetation, noise, dust and gaseous emission, sanitation, drinking water supply, drainage problem, oil spillage, solid waste disposal, bio-diversity. The mitigation measures are described below in detail of the above potential impact.

- Vegetation clearance will be minimized
- Tree cutting should be kept at a minimum stage, and planting 5 times.
- Re-vegetation the expose part as early as possible just after completion of the project
- Dust emission from generator should be minimized

7.2 Implementation of the Environmental Management and Recommended Mitigation Plan
132. Environmental Management Plan (EMP) includes a set of mitigation measures for minimizing or removing negative impacts, enhancement measures for further improvement of positive impacts, environmental monitoring arrangements for observing the changes induced by the project interventions and institutional arrangements for smooth implementation of environmental management plan. EMP for the site construction is presented in the following matrix Table 7.1.
Table 7.1 EMP for project site construction

<table>
<thead>
<tr>
<th>Impact</th>
<th>Mitigation measure</th>
<th>Monitoring arrangements</th>
<th>Institutional Arrangement</th>
<th>Budget in Tk.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Pre-construction Phase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disruption of earth surface</td>
<td>Cutting earth should be kept minimum at site. Adequate drainage system should be constructed for the easy natural drainage system of the area.</td>
<td></td>
<td>JSTPA&amp; Contractors</td>
<td></td>
</tr>
<tr>
<td>Loss of trees and private properties at site</td>
<td>About 16 trees will be cutted. And 50 trees will be planted</td>
<td>Physical enumeration of loss by type and owner</td>
<td>JSTPA&amp; Contractors</td>
<td>50,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes in landscape Quality</td>
<td>Plantation of trees should be done at all possible open space of the building premises.</td>
<td></td>
<td>JSTPA&amp; Contractors</td>
<td></td>
</tr>
<tr>
<td><strong>B. Construction Phase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust emission, Fume emission from generator exhaust</td>
<td>Water should be sprayed during construction Mixing with aggregate should be done carefully</td>
<td>Conduct air quality test to check with the specification. This test will be conducted during construction period</td>
<td>JSTPA</td>
<td>200,000</td>
</tr>
<tr>
<td>Noise and vibration pollution</td>
<td>Make working programme according to the local situation. Generator may be covered with sound or use silencer or noise absorbing materials to absorb sound, noise and vibration</td>
<td>Conduct noise quality test to check with the specification.</td>
<td>Included in the contract</td>
<td></td>
</tr>
<tr>
<td>Water logging</td>
<td>During construction period pump continuous and drain out the water</td>
<td>Regular check the water logged area.</td>
<td>JSTPA, and Contractor</td>
<td></td>
</tr>
<tr>
<td>Labor Shade /Accommodation</td>
<td>Provide proper labour accommodation with proper ventilation, water supply and sanitation facilities.</td>
<td>Daily checked</td>
<td>Included in the contract</td>
<td></td>
</tr>
<tr>
<td>Labor employment</td>
<td>To prioritize employment of local skilled and unskilled labor</td>
<td>Daily labor logbook checking</td>
<td>JSTPA, and Contractor</td>
<td></td>
</tr>
<tr>
<td>Health and Safety of workers and surrounding people</td>
<td>Ensure necessary protective equipment wear by all worker. The workers should be trained</td>
<td>Regular health check-up of workers</td>
<td>JSTPA&amp; Contractor</td>
<td></td>
</tr>
<tr>
<td>Impact</td>
<td>Mitigation measure</td>
<td>Monitoring arrangements</td>
<td>Institutional Arrangement</td>
<td>Budget in Tk.</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>in health and safety measures.</td>
<td>Create awareness of the people about project activities and probable hazards.</td>
<td>Monitoring of awareness raising activities such as poster, signboards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worker Accident</td>
<td>Set up warning signs, signals and provide helmet for workers in accordance with relevant accident prevention and work safety procedure. Restrict access to work site.</td>
<td>Regular monitoring</td>
<td>JSTPA &amp; Contractor</td>
<td></td>
</tr>
<tr>
<td>Traffic Congestion</td>
<td>Avoid carrying of construction materials in peak hour of road traffic.</td>
<td>Regular monitoring</td>
<td>JSTPA &amp; Contractor</td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>Employ local and landless / poor labour.</td>
<td></td>
<td>JSTPA</td>
<td></td>
</tr>
<tr>
<td>C. Post Construction Phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drainage of surrounding areas</td>
<td>Surface drain pipes are to be constructed where require.</td>
<td>Water level monitoring at peripheral pond and low lying ditches.</td>
<td>JSTPA</td>
<td>Included in the contract</td>
</tr>
<tr>
<td>Domestic wastewater</td>
<td>The grey waters are to be processed through septic tanks attached with soak pit</td>
<td></td>
<td>JSTPA</td>
<td></td>
</tr>
<tr>
<td>Solid Waste and E-waste</td>
<td>Organize proper collection, transportation and disposal system of all solid and E-wastes. Provide supplementary training ensures that all staff put the new “green” policies into practice.</td>
<td>Daily monitoring system</td>
<td>JSTPA</td>
<td></td>
</tr>
<tr>
<td>Occupational Health</td>
<td>Provide proper ventilation in the building. Provide proper acoustic system in the walls of the building for the protection from noise and thermal pollution.</td>
<td></td>
<td>JSTPA</td>
<td></td>
</tr>
<tr>
<td>Noise and vibration</td>
<td>Reduce noise pollution by Monitor noise</td>
<td></td>
<td>Contractor. A</td>
<td>Included</td>
</tr>
<tr>
<td>Impact</td>
<td>Mitigation measure</td>
<td>Monitoring arrangements</td>
<td>Institutional Arrangements</td>
<td>Budget in Tk.</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Fire fighting</td>
<td>Automatic fire extinguish system should be provided</td>
<td>Automatic continuous monitoring</td>
<td>JSTPA</td>
<td></td>
</tr>
<tr>
<td>Generator dust &amp; gaseous pollution</td>
<td>Use chimney height more than 30 m Use heat recovery from flue gas</td>
<td>Monitor periodically</td>
<td>JSTPA</td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>Employ local jobless people wherever possible.</td>
<td></td>
<td>JSTPA</td>
<td></td>
</tr>
</tbody>
</table>

### 7.3 Organizational Management Aspects

133. Executive responsibility for project management commonly involves a number of organizations, each with specific responsibilities for particular aspects during the preparatory works for site clearing, earth cutting on site execution and post-construction operation & maintenance phases.

134. An important aspect of environmental management is the accumulation of a database of environmental measurements. The management measures shall have to be taken with regard to controlling the potential impacts that could, in broader terms, occur during the pre-construction, construction and operation and maintenance phases of the project and indicates responsibilities for the various actions concerned. The environmental management team should, at an early stage of project planning, prepare a detail schedule of management actions required along with fixation of specific individual responsibilities for these actions.

- Policy and Leadership
- Continuous Improvement
- Safety and Health
- Incident reporting and investigation
- Emergency preparedness and response
- Environmental protection
- Training and orientation
- Community relation
- Regulatory requirement
8 ENVIRONMENTAL MONITORING PROGRAM FOR PERFORMANCE EVALUATION

8.1 Requirements for Management and Monitoring

135. Environmental monitoring is an essential tool in relation to environmental management as it provides the basic information for rational management decisions. The prime objectives of monitoring are:

- To check on whether mitigation and benefit enhancement measures are actually being adopted and are proving effective in practice.
- To provide a means whereby impacts which were subjects to uncertainty at the time of preparation of EA, or which were unforeseen, can be identified, and steps to be taken to adopt appropriate control measures.
- To provide information on the actual nature and extent of key impacts and the effectiveness of the mitigation measures which, through a feedback mechanism, can be taken into account in the planning and execution of similar projects in future.
- There are two basic forms of monitoring:
  - Visual observation or checking, coupled with inquiries
  - Physical measurement of selected parameters

136. In the case of site construction projects in general, monitoring is done by physical measurement of some selected parameters like air, drinking water, wastewater, noise, solid waste etc. It should be mentioned here that the monitoring program should be such so that it can ensure compliance with national environmental standards. The importance of this monitoring program is also for ensuring that the project does not create adverse environmental changes in the area and providing a database of operations and maintenance, which can be utilized if unwarranted complaints are made.

8.2 Monitoring Requirement

137. Monitoring of the performance of project site is very important and sometimes vital. Dust is generated during construction period and need to be monitor the environmental quality. For surveillance of the performance of the site and the quality of the environment, monitoring of the environment of the work-zone, not affected village and the general environment should not require on a regular basis.

138. It should be mentioned here that the monitoring program should be such so that it can ensure compliance with national environmental standards. The importance of this monitoring program is also for ensuring that the project site does not create adverse environmental changes in the area and providing a database of operations and maintenance that can be utilized if unwarranted complaints are made.
8.3 Monitoring Parameters and Schedule

8.3.1 Monitoring Indicators

139. Environmental monitoring requires a set of indicators that could be conveniently measured, assessed and evaluated periodically to establish trends of change in base line environment quality. A list of parameters to be tested, sample number and sampling frequency are given in Table 8.1. These indicators may be independent or may be functionally related. The physico-chemical, ecological, human interest and socio-economic indicators should be well defined and a mutual relationship among the indicators should be well understood. The monitoring program, in view of the possible impacts as assessed earlier, should consider the indicators for the impact assessment related to the following issues:

Table 8.1: Types, Parameters and Location and Frequency of Monitoring

<table>
<thead>
<tr>
<th>Environmental component/Types of monitoring</th>
<th>Parameters</th>
<th>Location</th>
<th>Frequency of Monitoring or Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Water</td>
<td>pH, DO, TDS, Salinity, As, Fe and total coliform</td>
<td>Nearby ground water (two locations)</td>
<td>During construction period (Quarterly)</td>
</tr>
<tr>
<td>Surface water</td>
<td>pH, DO, BOD, COD, TDS and SS.</td>
<td>Pond water from (one location)</td>
<td>During construction period(Quarterly)</td>
</tr>
<tr>
<td>Noise</td>
<td>dBA</td>
<td>Along the site construction (two locations)</td>
<td>During construction period (weekly)</td>
</tr>
<tr>
<td>Dust</td>
<td>Spraying of water</td>
<td>Construction site</td>
<td>Daily</td>
</tr>
<tr>
<td>Air quality</td>
<td>SPM, PM$<em>{2.5}$ and PM$</em>{10}$, SOx and NO$_2$</td>
<td>Along the site &amp; near busy area</td>
<td>During construction period (once)</td>
</tr>
<tr>
<td>Waste Management</td>
<td>Monitoring, collection, transportation, disposal of SW. Inspection of construction camp.</td>
<td>Construction site</td>
<td>Weekly</td>
</tr>
<tr>
<td>Health and safety</td>
<td>Monitoring health and safety of worker</td>
<td>Construction site</td>
<td>Daily</td>
</tr>
</tbody>
</table>

8.3.2 Noise Monitoring

140. Generator and vehicle movement there are no high noise making equipment are used. Power generator units should be place in the soundproof rooms and regulating the use of hydraulic horns should be monitored for compliance.

8.3.3 Water Quality Monitoring

141. Ground water quality monitoring shall be done during site construction period to check the change the parameters. Surface water quality at Pond site shall be performed. Routine monitoring on Environmental Performance of the project will be reported by the Project Division of JSTPA and copy of the report will be made available to DoE.
8.3.4 Air Quality Monitoring
142. It was identified earlier that the negative impact on air quality mainly dust and gaseous emissions generated from the movement of heavy vehicles during construction, operations and maintenance of the site. Dust load on the nearby homesteads and plants is an indicator of dust pollution in the air. Mitigation measures suggested earlier will successfully offset these negative impacts. Monitoring of suspended particles load in the atmosphere of the construction sites should be measured frequently to comply with the air quality standard.

8.4 Direct Construction Impacts Monitoring
143. Monitoring need to be done during direct construction work mainly on dust emission, noise generation. Three basic monitoring systems during construction stage will be followed and these are:

- Monitoring of air quality at selected point during construction at quarterly intervals
- Monitoring of noise close to working location at quarterly intervals
- Monitoring of restriction or obstruction to traffic movement at work places during construction period

144. The significant physical impact will be on air quality due to generation of dust during MTB construction period. One point in the site will be monitored monthly during construction period for SPM. As the other issues related to air quality is of no concern.

145. The work camps are to be monitored regularly on the monthly basis if work camps are mainly proper method of protecting soil from spill of oil.

146. Water quality of the adjacent pond may be monitored if there is any scope of dumping of debris into the pond. Thus water quality monitoring will be specific on identification of any scope of turbid water flowing from work sites.

147. Water supply and sanitation in the labour camps will be monitored to ensure that the contractor engaged actually follows the guidelines under contractual obligation.

148. Solid wastes are to be disposed at designated at places in bins. The grey waters are to be processed through septic tanks. Hazardous waste should be properly collected and dispose through registered DoE vendor and make an inventory.

8.5 Environmental Management and Monitoring Program
149. The environmental management of the JSTP project should be based on the framework of concerned project cell of JSTPA and the project cell should be fully involved in the development and implementation of the project Environmental Management Plan (EMP).
Detail baseline monitoring, pre-construction, construction and post construction should also be co-ordinated by concern project cell.

8.6 Environmental Management Budget

150. At this stage of the project there are a number of environmental management issues which have been provided detail in EMP Table 7.1 and included in the contractor’s responsibility.

- The precise nature and extent of works involved.
- Details of their nature and scope any institutional strengthening and environmental training which is required.

151. Environmental management and monitoring cost will be around Tk. 5.0 Lac for monitoring and testing of various environmental parameters. At this stage of the project there are a number of matters which have not yet been resolved which have a bearing on environmental monitoring cost includes as follows in Table 8.2:

Table 8.2: Estimated outsourcing cost for environmental monitoring during construction and operation phases.

<table>
<thead>
<tr>
<th>Items</th>
<th>Number</th>
<th>Per unit sample Cost in Tk.</th>
<th>Total cost in Tk.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction Phase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Ambient air</td>
<td>6 Parameters</td>
<td>15000</td>
<td>90000</td>
</tr>
<tr>
<td>1. Drinking water &amp; surface water</td>
<td>10 Parameters</td>
<td>2500</td>
<td>25000</td>
</tr>
<tr>
<td>3. Noise level</td>
<td>10</td>
<td>1000</td>
<td>10000</td>
</tr>
<tr>
<td>Cost for one time sample during construction phase</td>
<td></td>
<td></td>
<td>125000</td>
</tr>
<tr>
<td><strong>A. For Cost during construction phase</strong></td>
<td></td>
<td></td>
<td>250000</td>
</tr>
<tr>
<td><strong>Operation Phase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.Ambient air</td>
<td>6 Parameters</td>
<td>15000</td>
<td>90000</td>
</tr>
<tr>
<td>2. Drinking water &amp; surface water</td>
<td>10 Parameters</td>
<td>2500</td>
<td>25000</td>
</tr>
<tr>
<td>3. Noise level</td>
<td>10</td>
<td>1000</td>
<td>10000</td>
</tr>
<tr>
<td>4. Training</td>
<td></td>
<td></td>
<td>125000</td>
</tr>
<tr>
<td><strong>B. Total cost for one time sample during operation phase</strong></td>
<td></td>
<td></td>
<td>250000</td>
</tr>
<tr>
<td>Grand Total (A+B) in Tk. Five lac only</td>
<td></td>
<td></td>
<td>500,000</td>
</tr>
</tbody>
</table>
9 INSTITUTIONAL CAPACITY

9.1 Key Aspects of the Study Including the no. of Competency Staff

152. The key aspect of the study is to assess environmental impacts for implementation of the project and is identified in section 5.2-5.4 of Chapter 5. The mitigation measures of identified impacts are described in section 7.2 of Chapter 7 and will be implemented during site construction period. The respective implementing or responsible agencies are also identified in Table 8.1 of Chapter 8. The manpower require for successful implementation of the project is 3 officers and 5 staffs. The positions are Project Director-1, Assistant Engineer-1, and Assistant Director-1. The other 3 skilled and 3 unskilled staff will be engaged during the implementation of the project. It is suggested that one Environmental Specialist should be appointed as a full time for supervision and monitoring of environmental quality and smooth implementation of the project.

9.2 Availability of Appropriate Technology and Equipment

153. A monitoring program will be implemented for construction of site in the project. Scientific environmental monitoring is required for implementation of the proposed project and environmental management plan. Specific monitoring parameters will help to achieve the monitoring objective and ensure environmental quality. Waste management, drinking water quality around the project sites will be regularly checked, tree plantation, quality of ambient air, noise, and health & safety of officers & laborers involved in the project and employment of laborer etc. should be monitored periodically to ensure pollution free environment in the project site.

9.3 Monitoring Requirement

154. Monitoring of the performance of a project is important and sometimes vital. For surveillance of the performance of the site and the quality of the environment, monitoring of the environment of the work-zone, and the general environment should be performed on a regular basis.

155. It should be mentioned here that the monitoring program should be such that it can ensure compliance with national environmental standards. The importance of this monitoring program is also for ensuring that the project does not create adverse environmental changes in the area and providing a database of operations and maintenance that can be utilized if unwarranted complaints are made. The environmental specialist should be monitored the air, water and noise quality in the project area.

9.4 Monitoring Budget

156. A budget amounting Tk. 500,000 will be required for proper environmental monitoring and test analysis and training of the project implementation.
10 RESPONSIBILITY OF THE CONTRACTOR

157. The Contractor shall carry out the project related activities as specified in contract agreement. JSTPA shall ensure that contractors take due responsibility to mitigate those negative impacts. Environmental awareness creation, particularly about the direct construction impacts and for the health, pollution and safety issues will be Contractor’s responsibility. Consultants’ supervisory roles will be in conformity to relevant Clauses incorporated in MTB construction contracts and national legislation. Clauses that may be incorporated with tender documents are:

- The Contractor shall take all steps to protect environment and avoid causing damages of water bodies, and public nuisances of all types during implementation operations.
- Contractor shall comply with the existing statutes and regulations concerning the execution of works as per requirements of DoE and donor’s environmental guidelines.
- Contractor shall use hollow brick for construction work where applicable to mitigate the overall emission control. Contractor shall also procure bricks for construction work from modern auto brick field.
- Contractor shall use bulk cement container instead of 50 kg bags in order to reduce GHG emission.
- Contractor shall be responsible for familiarizing himself with the legislation relating to environmental protection that is relevant to his activities. Reference to rational environmental quality guidelines should be made.
- Contractor shall be responsible for bearing the costs of cleaning up any environmental pollution resulting from his activities if methods for doing that are available and effective.
- Precautionary signboards /danger signals/ propitiatory billboards shall be placed in appropriate places to notify people about the possible dangers.
- Contractor in case of surface water pollution from his activities, shall take adequate prevention measures not to pollute water and in case pollution of surface water occurred he shall be liable to revert the original quality of water particularly so where surface water has potential use. Cost both for tests and purification shall be borne by Contractor.
- Where water abstraction from boreholes dug by the Contractor results in adverse effects on groundwater that at the time of commencement of contract was being used by local people Contractor under the situation shall ensure supply of equivalent quantity of safe water to the users.
- Contractor shall at all times maintain the camp and construction sites under his control in clean and tidy conditions and shall provide appropriate and adequate facilities for temporary dumping all types of wastes before disposed properly.
- Remove equipment, surplus material, rubbish and temporary works and leave the site in a clean condition to the satisfaction of the company’s representatives after completion of construction activities.
Be responsible to pay compensation upon the appropriate monetary evaluation applicable to the local market if any damage is incurred to agricultural land or surrounding homesteads outside of the requisitioned land

Contractor shall be responsible for safe transportation and disposal of all types wastes generated out of his activities in a manner so that no environmental pollution or hazard to health is caused to the workers and local people. In case any third party is employed to dispose of wastes, Contractor shall even in such case be considered as if he has discharged the responsibilities himself under this Clause until the wastes leave the site under his control. He remains legally bound to exercise due diligence to ascertain that the proposed transport and disposal mechanism do not cause pollution or public health hazards.

Contractor shall not allow waste oil, lubricant or other petroleum derivatives to be used as dust suppressants and shall take all reasonable precautions to prevent accidental spillage of petroleum products, contact of such materials with soil or water course through discharge, run-off and seepage.

Contractor shall be responsible for provision of adequate sanitary facilities to the construction workers (including those employed under subcontract) at construction sites, office and camp sites. He shall not knowingly allow discharge of any untreated sanitary waste to the ground or surface water. Before mobilization of construction workforce, Contractor shall provide details of sanitary and drainage arrangements to the Engineering Representative (ER) for approval. The detail should include maintenance and operation plans and sufficient other information to allow the ER to assess whether or not the proposed facilities are adequate.

All vehicles and plant operated by the Contractor (including subcontractor) shall be maintained according to manufacturers’ specification and their original manual, particularly regarding control of noise and/or smoke emission. The ER shall reserve the right to ask the Contractor for replacement or rectification of any vehicle or plant within 48 hours that he believes emits excessive noise and/or smoke by serving a notice in writing.

Contractor shall make every reasonable effort to reduce noise pollution caused by construction activities including relocation of crusher and ancillary plant at new site where the distance between these plants and residential sites is safer for attenuation of noise in the existing residential areas.

Contractor shall take all reasonable measures to minimize dust-blowing from sites under his control by spraying water on stockpile, bare soil, haul road, un-surfaced traffic route and any other source of dust when conditions require dust suppression. If the ER considers dust suppression measures adopted by Contractor ineffective, Contractor shall in that case take further measure to minimize dust blowing at construction site as per his direction.

In case any traffic disruption is caused due to construction activities of the Contractor (or subcontractors), Contractor shall in that case be responsible to provide alternative access
to for operational use by vehicles. The facilities provided shall be such that neither of the parties are disturbed by the arrangement.

- In case of any damage by Contractor (or subcontractor), the Contractor shall notify the ER of it and shall repair the road to its original condition at his own cost.

- In case of any damage caused to agriculture or to the surrounding homesteads outside the boundary of the project either permanently or temporarily by the Contractor or Subcontractor’s activities, Contractor shall in such case remain responsible to pay monetary compensation for the damage appropriate to the local market value.

- The Contractor on completion of the Contract shall remove the equipment, surplus materials, rubbish and temporary structures of all types and shall leave sites in clean condition to the satisfaction of local people and the ER.
11 CONCLUSION

158. An Environment Assessment (EA) has been carried out for the project according to the requirement of WB safeguard policy and DoE for necessary environmental clearances as it is made mandatory in ECA’95, for any new project set up and the subsequent ECA ’97. An EA report has been prepared through identifying the potential impacts, assessing them and recommending possible mitigating and enhancing measure for negative and positive impacts, respectively. An outline of EMP has been given in the present report to mitigate/enhance the impacts, which are expected to occur during construction and operation phase of the project.

159. Establishment of Jessore Software Technology Park as a component of the Support to Development of Kaliakoir Hi-TechPark/IT Parks under auspices of the World Bank, there will be a landmark social positive impact to the journey for development of IT/ITES sectors of Bangladesh.

160. Electronic equipment and therefore e-waste are everywhere in our society. They are characterized by a complex chemical composition and difficulty in quantifying their flows at a local and international level. The pollution caused by their irregular management substantially degraded the environment mostly in poorer countries, receiving them for recycling and recovery of their valuable metals. As for the consequences on ecosystems, human health and environmental restoration of areas burdened by certain polluters generated by waste (e.g. Li and Sb). Motivated by the minimization of environmental effects caused by the generated e-waste, many technological changes have been effective.

161. It should regularly inform staff of their environmental obligations via email and signage in key areas (e.g. staff kitchens and lunch rooms), and supplementary training ensures that all staff put the new “green” policies into practice.

162. Summarizing the above, e-waste separation from the rest of solid waste and their recycling for the recovery of valuable raw materials and basic metals is essential. The management system has to be rationally designed so that the environmental benefits from the collection, transportation, management and the financial benefits from the recovery are not offset by the required resources and energy consumptions for the system operation.

163. The findings of this EA suggest that the project involves potential socio-economic benefit, connecting with the Jhenaidah, Narail and Magura, Khulna and Satkhira. The social-economic development of the area will increase. The life style of the area will also increase after the operation of the STP project.

164. The project is to establish knowledge-based industries in the Jessore Region, particularly related to Software and IT Enabled Services, in order to contribute to the national economy to achieve the goal of Vision 2021: Digital Bangladesh.
165. Private Developer or BHTPA will also be responsible for maintenance of the Software Technology Park including security. Operator will collect a monthly O&M charge from the tenants to this end in addition to the lease charges.

166. The limited environmental impacts to which further careful attention should be given during the construction and in the operation and maintenance of the project in order to minimize and offset the adverse effects. Dust emission should be mitigated through sprayed water during construction period. Since the STP construction and operation will follows an environmental sustainable manner, the possible negative impacts are very minor and only during construction will occur and the adverse impacts if duly addressed could be minimized without much effort, though they would require attention and positive commitment from the Project Management.

167. There is no chemical process during the operation of the STP and hence will not generate any liquid effluent and there will no impact on effluent or liquid waste on the environment. Only domestic wastewater are generated from the incubator and dormitory building which need to be properly treated through septic tank connected with soak pit. Particulate matter and gaseous emission will generate only when electricity will not available and power will be backup through diesel generator. The emission from the diesel generator will be discharged through proper chimney with adequate height so that ambient air quality will be within limit.

168. E-waste will generate after certain period of time and need recycle and disposed after proper management. Solid waste mainly paper and cartoon etc will be collected properly and sale to the small traders.

169. The overall finding of the EA is that the proposed project will not cause any significant adverse environmental impacts, provided that adequate mitigation measures are implemented. The proposed mitigation measures are prescribed conceptually in the EA, as an outline EMP. This will be developed by the contractor in the construction phase. Jessore Software Technology Park will perform as green environment once it is an operational since the activities of this Incubator is non-polluting and green.

170. There are no uncertainties in the analysis, and no additional work is required to comply with National Law. There is thus no need for further study or Environmental Assessment.