

# Draft Initial Environmental Examination (Appendixes – Part 1 of 2)

---

Project Number: 52362-001  
April 2019

## BAN: Spectra Solar Power Project

Prepared by ERM India Private Limited for Spectra Solar Park Limited and the Asian Development Bank.

This initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

## **APPENDIX A**

## **ENVIRONMENTAL CLEARANCE PERMIT FROM THE DEPARTMENT OF ENVIRONMENT, BANGLADESH**



TL No. 03-075541

# AL-ARAFAH COMMERCIAL & TRANSLATION CENTER

Shop No. 59 (1st floor) D.N.C.C Kacha Bazar, Gulshan-2, Dhaka-1212

Ref:.....

Date: .....

Translated True Copy  
Government of the Peoples Republic of Bangladesh  
Department of Environment  
Office of the Manikganj District  
42, (Old-284 4<sup>th</sup> floor  
Baitha Ghat, Manikganj  
[www.doe.gov.bd](http://www.doe.gov.bd)



## Permit Under Situation of Environment Permit No. 19-20144

Ensuring by the Management of Environment in support of the organization/ project is issued of Permit of Environmental situation through the following terms and conditions :

Name of Organization / Project	: Spectra Solar Park Ltd.
Name of Entrepreneur	: Khan Md. Aftabuddin
Identification No.	: 72642
Kind of Organization / Project	: Solar Power Plant
Category of Organization / Project	: Orange -B
Address of Organization / Project	: Darikandi, Nali, Shibalay, Manikganj
Date of Issuing	: 28 February, 2019
Date of Expiry	: 27 February, 2020



(All the terms and conditions attached directly to the clearance certificate should be properly comply with, otherwise any legal action will be taken with the cancellation of this clearance certificate with penalty)

N.B. This is the system of generated clearance certificates, so that there is no need of signature.

Please visit for verifications : [http://sce.doe.gov.bd/certificate\\_verification](http://sce.doe.gov.bd/certificate_verification)

Page 1/3

ATTESTED

*6.4.2019*  
Advocate Md. Monzur Kadir  
Notary Public  
Whole of Bangladesh  
Room # 221 (1st Floor), 30 Zahed Plaza  
Gulshan-2, Dhaka-1212, Bangladesh  
Hand Phone : +8801711600234



Translated by

*M. Aftabuddin*  
6/4/19  
AL-ARAFAH COMMERCIAL &  
TRANSLATION CENTER  
Shop No.59, D.N.C.C. (Kacha Bazar)  
Gulshan-2, Dhaka-1212, Bangladesh.

Mobile : 01727110924

E-mail: [alarafah17@gmail.com](mailto:alarafah17@gmail.com)



TL No. 03-075541

# AL-ARAFAH COMMERCIAL & TRANSLATION CENTER

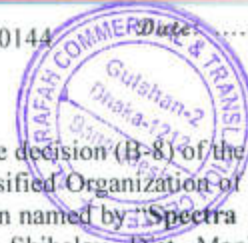
Shop No. 59 (1st floor) D.N.C.C Kacha Bazar, Gulshan-2, Dhaka-1212

Identification No. 72642 Ref: Spectra Solar Park

Permit No. 19-20-20144

Applicable terms and condition for the environment permit

1. After discussion your application of related documents & pursuant of the decision (B-8) of the 322nd meeting of the environment permit affairs committee of orange-B, Classified Organization of Dhaka Zone Office of the Environment Directorate, in favour of the organization named by **Spectra Solar Park Ltd.** Established at Village - Dharikandi, P.O. Nali, Upazila-Shibalay, Dist. Manikganj, environment permit has been issued under the following terms and conditions.
2. This clearance certificate will be applicable for the development of the land infrastructure & Conducting the installation of the instruments of the organization taking procedure to produce 35 MW Solar Power
3. With the procedure of the organization, sustain environment loose cannot be done.
4. There must the maintenance of drainage system to emit storm / water & other waste water.
5. Proper measure must be taken so that land delay cannot be occurred through the project procedure.
6. It is to collect personal protection equipment such as nose mash/ gloves for the working labours.
7. All rules & regulations are to be reared up to environment maintenance ruled 1997 (amended 2002 & Bangladesh environment maintenance Act 1995 (amendment 2010).
8. After rearing up all mitigation measures properly stated in the IEE report of other maters under Infra Structural development Permit
9. Except the taking environmental permit, cannot start commercial production
10. In the Suited site of the plant, is to implant & unnecessary Plant cannot be cut down With this permit, power connection can be made for construction work & installation of instruments but not applicable for gas connection.
11. In this organization, mercury less energy saving bulb such as, LED Bulb is to be used.
12. In this clearance certificate, electricity connection to be allowed for infrastructure development and equipment installation but gas connection is not be allowed.
13. In course of fire extinguishing apposite management is to be operate always in the factory
14. The creation of hard waste in the factory must be removed in the environmental way.
15. The degree of sound & the plant must be maintained respectively sound pollution (control) rules 2006 & environment maintenance rules 1997 stard degree.
16. In case of change / power increasing of the production/ processing of the organization, permission is to be taken from the environment directorate.
17. With any occurrence & production process of the factory, environment cannot be polluted in no way.
18. If any allegation is raised in future regarding environment pollution against the factory & directed control / amended management (site transfer / along with procedure closing) your organization is bound to take.
19. This permit does not determine the entitlement of land
20. The ownership of this permit is not transferrable.
21. This permit will remain enforce for next one year from the date of pronouncement of this permit & 30 days before the expiry of the period of the permit, it is to apply for renewal of the permit



ATTESTE

*Signature*  
6.9.2019

Advocate Md. Monzur Kadir  
Notary Public  
Whole of Bangladesh  
Room # 221 (1st Floor), 30 Zahed Plaza  
Gulshan-2, Dhaka-1212, Bangladesh  
Hand Phone : +8801711600234

Translated by

*Signature*

AL-ARAFAH COMMERCIAL &  
TRANSLATION CENTER  
Shop No.59, D.N.C.C. (Kacha Bazar)  
Gulshan-2, Dhaka-1212, Bangladesh.

Mobile : 01727110924

E-mail: alarafah17@gmail.com



TL No. 03-075541

# AL-ARAFAH COMMERCIAL & TRANSLATION CENTER

Shop No. 59 (1st floor) D.N.C.Kacha Bazar, Gulshan-2, Dhaka-1212

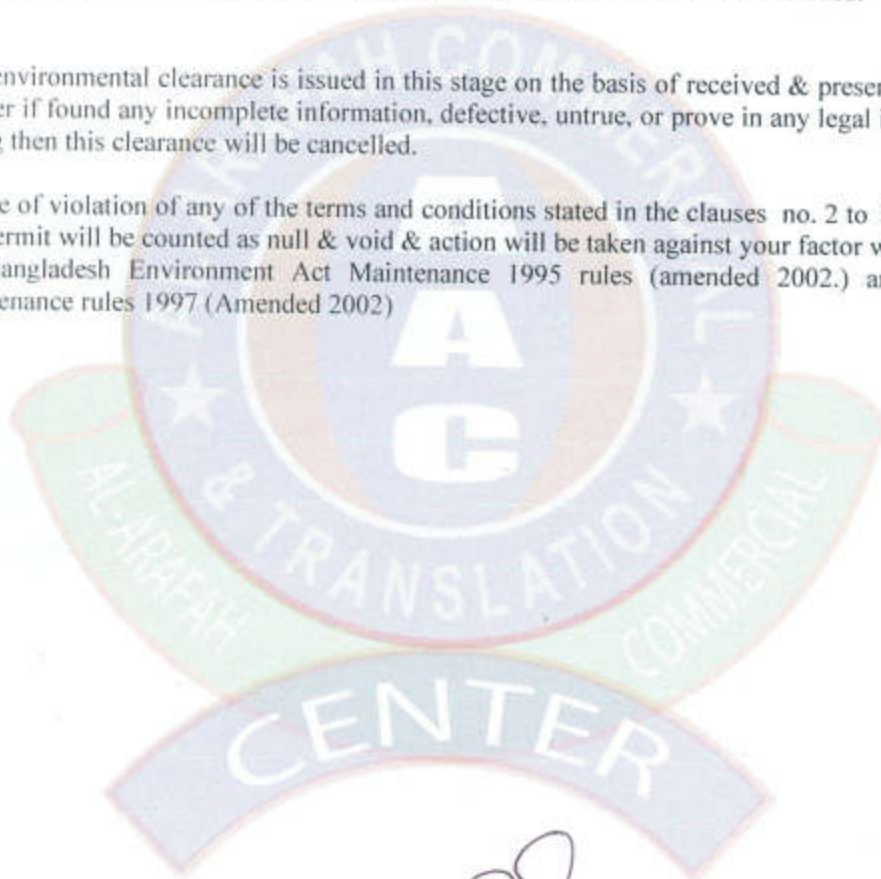
Refs:.....



Identification No. 72642 Spectra Solar Park

Permit No. 19-20-20144

22. Original copy of the permit must be maintained in the factory, In case of visiting factory by any officer or by the enforcement team of environment directorate, it is to show them the permit & all stern co-operation in showing the factory proceeding, otherwise, along with cancellation of permit, legal measures will be taken.
23. With the aforesaid power in the light of & environment Maintenance Act. 1995 & Environmental, Maintenance rules 1997, the above mentioned terms & Conditions will be enforced.
24. This environmental clearance is issued in this stage on the basis of received & presented information. Further if found any incomplete information, defective, untrue, or prove in any legal information have hiding then this clearance will be cancelled.
25. In case of violation of any of the terms and conditions stated in the clauses no. 2 to 24 of his permit, this permit will be counted as null & void & action will be taken against your factor which pursuant to the Bangladesh Environment Act Maintenance 1995 rules (amended 2002.) and Environment Maintenance rules 1997 (Amended 2002)



Translated by

Md. Monzur Kadir  
6/4/19

AL-ARAFAH COMMERCIAL &  
TRANSLATION CENTER  
Shop No.59, D.N.C.C. (Kacha Bazar)  
Gulshan-2, Dhaka-1212, Bangladesh.

ATTESTED

6.4.2019

Advocate Md. Monzur Kadir  
Notary Public  
Whole of Bangladesh  
Room # 221 (1st Floor), 30 Zahed Plaza  
Gulshan-2, Dhaka-1212, Bangladesh  
Hand Phone : +8801711600234



Mobile : 01727110924

E-mail: alarafah17@gmail.com



গণপ্রজাতন্ত্রী বাংলাদেশ সরকার  
পরিবেশ অধিদপ্তর  
মানিকগঞ্জ জেলা কার্যালয়  
৪২ (পুরাতন-২৮৪), ৪র্থ তলা,  
বেইথা ঘাট, মানিকগঞ্জ  
www.doe.gov.bd

## অবস্থানগত ছাড়পত্র

ছাড়পত্র নং: ১৯-২০১৪৪

পরিবেশগত ব্যবস্থাপনা নিশ্চিতকরণ সাপেক্ষে সংযুক্ত শর্তে নিম্নবর্ণিত প্রতিষ্ঠান/প্রকল্পের অনুকূলে অবস্থানগত ছাড়পত্র প্রদান করা হলো :

প্রতিষ্ঠান/প্রকল্পের নাম	: স্পেট্রা সোলার পার্ক লিঃ
উদ্যোক্তার নাম	: খান মোঃ আফতাবউদ্দিন
সনাক্তকরণ নং	: ৭২৬৪২
প্রতিষ্ঠান/প্রকল্পের কার্যক্রম	: সৌর বিদ্যুৎ উৎপাদন
প্রতিষ্ঠান/প্রকল্পের শ্রেণী	: Orange-B
প্রতিষ্ঠান/প্রকল্পের ঠিকানা	: দড়িকান্দি, নালী, শিবালয়, মানিকগঞ্জ।
প্রদানের তারিখ	: ২৮ ফেব্রুয়ারি ২০১৯
মেয়াদ উত্তীর্ণের তারিখ	: ২৭ ফেব্রুয়ারি ২০২০



এ ছাড়পত্র সনদের সাথে পৃথকভাবে সংযুক্ত প্রদত্ত শর্তাবলী যথাযথভাবে প্রতিপালন করতে হবে,  
অন্যথায় ছাড়পত্র বাতিল/ক্ষতিপূরণ আদায়সহ যে কোন আইনানুগ ব্যবস্থা গ্রহণ করা হবে।

বিঃদ্রঃ এটি একটি সিস্টেম জেনারেটেড ছাড়পত্র এবং এতে কোনোরূপ স্বাক্ষরের প্রয়োজন নেই।

## অবস্থানগত ছাড়পত্র জন্য প্রয়োজ্য শর্তাবলী:

১. আপনার আবেদনপত্র ও সংশ্লিষ্ট কাগজপত্র পর্যালোচনাস্তে এবং পরিবেশ অধিদপ্তর, ঢাকা অঞ্চল কার্যালয়ের কমলা-খ শ্রেণীভুক্ত প্রতিষ্ঠানের পরিবেশগত ছাড়পত্র বিষয়ক কমিটির ৩২২তম সভার সিদ্ধান্ত (খ-৮) মোতাবেক সাং-দড়িকান্দি, পোঃ নালী, উপজেলা-শিবালয়, জেলা- মানিকগঞ্জ ঠিকানায় স্থাপিত "স্পেস্ট্রা সোলার পার্ক লিঃ" নামক প্রতিষ্ঠানের অনুকূলে নিম্নবর্ণিত শর্তে অবস্থানগত ছাড়পত্র প্রদান করা হলো:
২. এ ছাড়পত্র ৩৫ মেগাওয়াট ক্ষমতাসম্পন্ন সৌর বিদ্যুৎ উৎপাদন কাঁচা উন্নয়ন, অবকাঠামো ও যন্ত্রপাতি স্থাপন কার্যক্রম পরিচালনা করার ক্ষেত্রে প্রযোজ্য হবে।
৩. প্রতিষ্ঠানটির কার্যক্রম দ্বারা পরিবেশগত ক্ষতিসাধন করা যাবে না।
৪. storm water এবং অন্যান্য বর্জ্য পানি নির্গমনের জন্য যথাযথ ড্রেনেজ ব্যবস্থা রাখতে হবে।
৫. প্রকল্পের কার্যক্রমের মাধ্যমে যাতে ভূমিক্ষয় না হয় সে বিষয়ে যথাযথ ব্যবস্থা গ্রহণ করতে হবে।
৬. কর্মরত শ্রমিকদের জন্য Personal Protection Equipment যেমন নোজ মাস্ক, গ্লাভস ইত্যাদি সংগ্রহ করতে হবে।
৭. বাংলাদেশ পরিবেশ সংরক্ষণ আইন, ১৯৯৫ (সংশোধিত ২০১০) এবং পরিবেশ সংরক্ষণ বিধিমালা, ১৯৯৭ (সংশোধিত ২০০২) এর সকল বিধিবিধান প্রতি পালন করতে হবে।
৮. অবকাঠামোগত উন্নয়নের আওতায় অন্যান্য বিষয়ের মধ্যে আইইইই প্রতিবেদনে বর্ণিত সকল মিটিগেশন মেজার্স যথাযথভাবে বাস্তবায়নপূর্বক পরিবেশগত ছাড়পত্রের জন্য আবেদন করতে হবে।
৯. পরিবেশগত ছাড়পত্র গ্রহণ ব্যতিরেকে বাণিজ্যিক উৎপাদনে যেতে পারবে না।
১০. কারখানাটির উপযুক্ত স্থানে বৃক্ষ রোপন করতে হবে এবং প্রয়োজন ব্যতিরেকে কোন গাছ কাটা যাবে না।
১১. প্রতিষ্ঠানটিতে পারদ বিহীন এনার্জি সেভিং বাথ যেমন LED Bulb ব্যবহার করতে হবে।
১২. এ ছাড়পত্র দ্বারা নির্মাণ কাজ ও যন্ত্রপাতি স্থাপনের জন্য বিদ্যুৎ সংযোগ পাওয়া যাবে কিন্তু গ্যাস সংযোগের ক্ষেত্রে প্রযোজ্য হবে না।
১৩. অগ্নি নির্বাপনকল্পে কারখানায় যথোপযুক্ত ব্যবস্থাাদি সার্বক্ষণিক কার্যকরী রাখতে হবে।
১৪. কারখানা স্ট্রাকচার বর্জ্য পরিবেশসম্মতভাবে অপসারণ করতে হবে।
১৫. কারখানার শব্দ এবং তরল/বায়বীয় বর্জ্য নিঃসরণ/নির্গমন মাত্রা যথাক্রমে শব্দ দূষণ (নিয়ন্ত্রণ) বিধিমালা-২০০৬ এবং পরিবেশ সংরক্ষণ বিধিমালা, ১৯৯৭-এ বর্ণিত মানমাত্রার মধ্যে হতে হবে।
১৬. প্রতিষ্ঠানটির উৎপাদন প্রক্রিয়ার পরিবর্তন/ক্ষমতা বৃদ্ধির ক্ষেত্রে পরিবেশ অধিদপ্তরের অনুমতি গ্রহণ করতে হবে।
১৭. কারখানাটির কোন কর্মকর্তা ও উৎপাদন প্রক্রিয়া দ্বারা কোনভাবেই পরিবেশ দূষণ করা যাবে না।
১৮. কারখানাটির বিরুদ্ধে ভবিষ্যতে পরিবেশ দূষণমূলক কোন অভিযোগ উপস্থাপিত হলে ও অত্র দপ্তর কর্তৃক তা প্রমানিত হলে অত্র দপ্তরের নির্দেশিত নিয়ন্ত্রণ/সংশোধনমূলক ব্যবস্থাাদি (স্থানান্তর/কার্যক্রম বন্ধসহ) গ্রহণ করতে আপনার প্রতিষ্ঠান বাধ্য থাকবে।
১৯. এই ছাড়পত্র ভূমির মালিকানা স্বত্ব নির্ধারণ করে না।
২০. এ ছাড়পত্রের মালিকানা হস্তান্তর যোগ্য নয়।
২১. এই ছাড়পত্র জারীর তারিখ হতে পরবর্তী ১ (এক) বছরের জন্য বহাল থাকবে এবং মেয়াদ শেষ হবার অন্ততঃ ৩০ (ত্রিশ) দিন পূর্বে নবায়নের জন্য আবেদন করতে হবে।



সনাক্তকরণ নং: ৭২৬৪২ স্পেস্ট্রা সোলার পার্ক লিঃ ছাড়পত্র নং: ১৯-২০১৪৪

২২. ছাড়পত্রের মূলকপি কারখানায় সংরক্ষণ করতে হবে। পরিবেশ অধিদপ্তরের এনফোর্সমেন্ট টিম বা কোন কর্মকর্তা প্রতিষ্ঠানটি পরিদর্শনে গেলে তাদেরকে ছাড়পত্র প্রদর্শনসহ কারখানার কার্যক্রম পরিদর্শনে সর্বাত্মক সহযোগিতা প্রদান করতে হবে। অন্যথায় ইস্যুকৃত ছাড়পত্র বাতিলসহ আইনগত ব্যবস্থা নেয়া হবে।

২৩. বাংলাদেশ পরিবেশ সংরক্ষণ আইন, ১৯৯৫ এবং পরিবেশ সংরক্ষণ বিধিমালা, ১৯৯৭-এ প্রদত্ত ক্ষমতাবলে উপরিলিখিত শর্তসমূহ Enforce করা হবে।

২৪. এ পর্যায়ে প্রাপ্ত ও পরিবেশিত তথ্যের ভিত্তিতে এ ছাড়পত্র প্রদান করা হলো। পরবর্তীতে কোন তথ্য অসম্পূর্ণ, ত্রুটিপূর্ণ, অসত্য কিংবা গোপন করা হয়েছে মর্মে প্রমাণিত হলে এ ছাড়পত্র বাতিল করা হবে।

২৫. এ ছাড়পত্রের ২নং অনুচ্ছেদ হতে ২৪ নং অনুচ্ছেদে বর্ণিত শর্তের কোনটি ভঙ্গ করলে এ ছাড়পত্র বাতিল বলে গণ্য হবে এবং আপনার কারখানার বিরুদ্ধে বাংলাদেশ পরিবেশ সংরক্ষণ আইন, ১৯৯৫ (সংশোধিত ২০১০) ও পরিবেশ সংরক্ষণ বিধিমালা, ১৯৯৭ (সংশোধিত ২০০২) অনুসারে আইনগত ব্যবস্থা গ্রহণ করা হবে।





## **APPENDIX B**

## **LAND VALUE ACCORING TO THE PROVISION STIPULATED IN THE ARIPA 2017**

২০১৫ সনের জন্য প্রযোজ্য বরংগাইল  
সাব-রেজিস্ট্রী অফিসের অধিক্ষেত্রের  
মৌজা ওয়ারী শ্রেণীভিত্তিক  
গড়মূল্য তালিকা ।

Land rate of 2015 for every Mouza at Boroigail Sub-Registry office.

শ্রেণী ভেদে শতাংশ প্রতি জমির গড় মূল্য						
ক্র.এল নং আর এস	মৌজার নাম	চান্দিনা	বারী	নাল	ডোবা	মন্তব্য
১৫১	দক্ষিণ কাশান্দ		১০,০০০/-*	১৩,০০০/-*	৩,০০০/-*	
১৫২	কোকাদি		১০,০০০/-*	৮,৩৩৩.৩৪/*	৩,০০০/-*	
১৫৩	রিশাদি		৪৫,০০০/-*	৪২,৩৫২/-	২,০০০/-*	
১৫৪	পূর্ব আরপাড়া		২৫,০০০/-*	২০,৯৭৫.৬১/*	৪,০০০/-*	
১৫৫	মাঝবদিয়া		২,০০০/-*	৯,৯৬৮/-	৭০০/-*	
১৫৬	পাইপাড়া		১২,০০০/-*	১৩,৪৩৪.৮৫/*	২,০০০/-*	
১৫৭	ইছাইল		২০,০০০/-*	২০,৫৪৩/-	১০,০০০/-*	
১৫৮	পশ্চিম আরপাড়া		৫,০০০/-*	৮,২৭৩/-	২,০০০/-*	
১৫৯	বোয়ালীপাড়া		৫৭,৫৬০.৯৭/*	১৫,৮২১/-*	৩,০০০/-*	
১৬০	বড় বোয়ালী		১৯,২০০/-*	২১,৬৯৬/-	৩,০০০/-*	
১৬১	শিবালয়	২,৬৬,৬৬৬.৬৬*	১,৮৮,৫৫১.৮৬/*	১,২৯,০২৩/-	২৫,০০০/*	
১৬২	আরিচা		৩,০০০/-*	২,৫০০/-*	১,৫০০/-*	
১৬৩	ছোট আনুলিয়া		১৭,৬৫২.২৬/-*	১৮,৫৯৬.২৯/*	২,০০০/-*	
১৬৪	ছোট বোয়ালী		৫২,৬৬৬.৬৭/*	৬০,৭১৩.১৭/*	৪,০০০/-*	
১৬৫	বড় আনুলিয়া		৭,১১১.১১/-*	২০,০৯৭/-	২,০০০/*	
১৬৬	ছোট কালীগঙ্গা		৮,০০০/-*	৫,০০০/-*	২,০০০/-*	
১৬৭	অগ্ন্যামপুর		৯,০২৩.২৬/-*	১৯,৪৩০/-	২,০০০/-*	
১৬৮	চরকান্দি		৯,০৯০.৯১/-*	৯,৩৯৭/-	২,০০০/-*	
১৬৯	মাসকান্দী		৫,০০০/-*	১০,৯৩৮/-	৩,০০০/-*	
১৭০	নরজনা					নদীগর্ভে
১৭১	ছোট নরজনা					নদীগর্ভে
১৭২	এলানবেশভৈল					নদীগর্ভে
১৭৩	ধুতরাবাড়ী		১৫,০০০/-*	৩৪,৪৭৩.৬৯/*	৭,০০০/-*	
১৭৪	পশ্চিম কাফুরা		৫,০০০/-*	১৫,০৫৫.৫৬/*	১,৫০০/-*	
১৭৫	বড় কালীগঙ্গা		৩৩,০৩৬/-	২২,২১৪/-	৩,০০০/-*	
১৭৬	পূর্ব কাফুরা		১৭,৬৬৬.৬৬/*	৭০,৬৫৯.৫৮/	২,০০০/-*	
১৭৭	ছোট ধুতরাবাড়ী		১৫,০০০/-*	১০,০০০/-*	৮,০০০/-*	
১৭৮	নালী	৭০,০০০/-*	৩৯,৮৫৪.১৫/*	১২,০৭৫.৫০/*	৮,০০০/-*	
১৭৯	ত্রিলোচনপট্ট		২০,০০০/-*	১০,৩৪৪.৮৩/*	৪,০০০/-*	
১৮০	তেঘরী		১৫,০০০/-*	৮,০০০/-*	৬,০০০/-*	
১৮১	বরুরিয়া		২৬,২৮০/-	১৫,৬৮০/-	৪,০০০/-*	
১৮২	গোবিন্দপুর					নদীগর্ভে
১৮৩	শালমাছ					নদীগর্ভে
১৮৪	গবিনাথপুর					নদীগর্ভে
১৮৫	মরিচাখোলা					নদীগর্ভে
১৮৬	কাচাদিয়া					নদীগর্ভে
১৮৭	বিল ঠেকরব					নদীগর্ভে
১৮৮	শিমুলিয়া					নদীগর্ভে

### LAND CLASSIFICATION AND LAND RATE

SL.NO	MOUZA	CHANDINA	BARI	NAL	DOBA	REMARKS
161	SHIVALAYA	26666666	188551.86	129023	25000	-
173	DHATURABARI		15000	34473.69	7000	
178	NALI	70000	39854.15	12075.50	8000	
179	TRILOCHANPATTY		20000	10344.83	4000	
180	TEGHARI		15000	8000	6000	
181	BORURIA		26280	15680	4000	

yoursub

২০১৭ এবং ২০১৮ ইং সনের জন্য  
বরংগাইল সাব-রেজিস্ট্রী অফিসের  
অধিক্ষেত্রের মৌজা ওয়ারী  
শ্রেণীভিত্তিক সর্বনিম্ন গড়মূল্য  
তালিকা।

Land rate of 2017 and 2018 for every Mouza at Boroigail Sub-Registry office

ক্র. নং	মৌজার নাম	চান্দিনা	বারী	নাল	ডোবা	মন্তব্য
১৭১	ছোট নরজানা					নদীগর্ভে
১৭২	এলান বৈলতৈল		৪৬,৯০২.৬৫/-	৩৪,৭৮৩.৪০/-	৭,০০০/-*	নদীগর্ভে
১৭৩	ধুতরাবাড়ী		৫,০০০/-*	১৫,০৫৫.৫৬/-*	১,৫০০/-*	
১৭৪	পাচিম কাফুরা		৩৫,২৭৭.৭৮/-	২৩,৫২১.৪৫/-	৩,০০০/-*	
১৭৫	বড় কালী গলা		১৭,৬৬৬.৬৬/-*	৭,৬৫৯.৫৮/-*	২,০০০/-*	সংশোধিত
১৭৬	পূর্ব কাফুরা		১৫,০০০/-*	১০,০০০/-*	৮,০০০/-*	
১৭৭	ছোট ধুতরাবাড়ী		২০,০০০/-*	২০,০২৬.১৪/-	৮,০০০/-*	
১৭৮	নালী	৭০,০০০/-*	৪৪,৯৪৬.৬৮/-	১০,৩৪৪.৮৩/-*	৪,০০০/-*	
১৭৯	ত্রিলোচনপট্টী		২০,০০০/-*	১০,৩৪৪.৮৩/-*	৪,০০০/-*	
১৮০	তেঘরী		২৩,৮০০.৮৯/-	৯,৮৬৮.৮৪/-	৬,০০০/-*	
১৮১	বরুরিয়া		২৭,৬৮৭.৫০/-	১৬,০৫৪.৮৩/-	৪,০০০/-*	নদীগর্ভে
১৮২	সোবিন্দপুর					নদীগর্ভে
১৮৩	শালনাহ					নদীগর্ভে
১৮৪	গবিনাথপুর					নদীগর্ভে
১৮৫	মরিচাখোলা					নদীগর্ভে
১৮৬	কাচাদিয়া					নদীগর্ভে
১৮৭	বিল ভৈরব					নদীগর্ভে
১৮৮	শিমুলিয়া					নদীগর্ভে
১৮৯	কুষ্টিয়া		৫,০০০/-*	৪,০০০/-*	৩,০০০/-*	
১৯০	দক্ষিণ শালজানা		১৫,৯০৫.২৬/-	১৪,৮১২.৬০/-	৬,০০০/-*	
১৯১	ধাঁসপুর		৩৩,২৪৯.৩২/-*	২৩,৭১৫/-*	৪,০০০/-*	
১৯২	ঘোনাপাড়া		৯,৩৩৩.৩৪/-*	১২,৮৮৩.২৩/-	৪,০০০/-*	
১৯৩	আফিয়া		১৬,৮৬৪.৮৭/-*	১৮,১৮৬.৫০/-	৫,০০০/-*	
১৯৪	জগৎদিয়া		৪,০০০/-*	৩,০০০/-*	২,০০০/-*	
১৯৫	ছোট কোকরদ		৫,১৮৫.১৯/-*	৫,০০০/-*	২,৭০০/-*	
১৯৬	বড় কোকরদ		৪,০০০/-*	৭,১৪২.৮৬/-*		নাই
১৯৭	বাউলী কান্দা	১৪,০০০/-*	২৫,৬১৮/-	১৫,৩৩৪/-*	৮,০০০/-*	
১৯৮	ছোট পাচুরিয়া					নদীগর্ভে
১৯৯	বামুটিয়া					নদীগর্ভে
২০০	চন্দ্রপ্রভাব					নদীগর্ভে
২০১	মহিন্দীপুর					নদীগর্ভে

### LAND CLASSIFICATION AND LAND RATE

SL.NO	MOUZA	CHANDINA	BARI	NAL	DOBA	REMARKS
173	DHATURABARI		46902.65	34743.40	7000	
178	NALI	70000	44946.68	20026.14	8000	
179	TRILOCHANPATTY		20000	10344.83	4000	
180	TEGHARI		23800.89	9868.84	6000	
181	BORURIA		27687.50	16054.83	4000	

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

সম্পত্তির বাজার মূল্য নির্ধারণ

- প্রকায়ন করা যাবে।
- ০১। অত্র বাজার মূল্য তালিকার ধারাবাহিক ভাবে (১-৭) = ৭ মোট পৃষ্ঠা রহিয়াছে।
- ০২। অত্র বাজার মূল্য তালিকা " সম্পত্তির সর্বমুদ্র বাজার মূল্য নির্ধারণ বিধিমালা এবং সংশ্লিষ্ট বিধিমালা ২০১৫ এর বিধি ৫ অনুসরণ ক্রমে প্রস্তুত করা হইয়াছে।
- ০৩। ২০১৫ ও ২০১৬ সনে যে সকল শ্রেণীর সম্পত্তির সাফ কবলা দলিল রেজিস্ট্রী হয় নাই বা অধ্যাতিক মূল্যে রেজিস্ট্রী হইয়াছে সে ক্ষেত্রে বিধি ৫ এর উপবিধি ৪ (গ) অনুসরণ ক্রমে পূর্ববর্তী বছরের অর্থাৎ ২০১৫ ও ২০১৬ সনের বাজার মূল্যই ২০১৭ ও ২০১৬ সনের জন্য কার্যকর করা হইয়াছে যা "/" চিহ্ন দ্বারা চিহ্নিত রহিয়াছে।
- দ্রষ্টব্য (১) ১ শা জানুয়ারী ২০১৫ হইতে ৩১ শে অক্টোবর ২০১৬ পর্যন্ত রেজিস্ট্রীকৃত সাফ কবলা দলিলের ভিত্তিতে সম্পত্তির বাজার মূল্য নির্ধারণ করা হইল।

বাজার মূল্য তালিকা প্রস্তুত করক  
হোসেন আরা আক্তার  
মোহরাম, সাব-রেজিস্ট্রারের কার্যালয়  
বরংগাইল, শিবালয়, মানিকগঞ্জ।  
২৫/১১/১৬

বাজার মূল্য তালিকা যাচাইকারক  
মোঃ আব্দুল হাই  
সহকারী  
সাব-রেজিস্ট্রারের কার্যালয়,  
বরংগাইল, শিবালয়, মানিকগঞ্জ।  
২৫/১১/১৬

সম্পত্তির " সর্ব মুদ্র বাজার মূল্য নির্ধারণ বিধিমালা ২০১৫ এবং এর, অত্র, ও নং- ৩২৫ আইন/২০১৫ অনুযায়ী বাজার মূল্য নির্ধারণ কমিটির নিকট বরংগাইল সাব-রেজিস্ট্রারী অফিসের অধিকারের আওতাভুক্ত ব্যক্তি মালিকানাধীন সম্পত্তির বাজার মূল্য তালিকা উপস্থাপন করা হইল।

Kalam  
(বিলকিস আরা)  
সাব-রেজিস্ট্রার, বরংগাইল  
শিবালয়, মানিকগঞ্জ  
ও সদস্য সচিব  
সম্পত্তির বাজার মূল্য নির্ধারণ কমিটি/২০১৬  
২৫/১১/১৬

(মাইকেল মহিউদ্দীন আশুগার)  
সাব-রেজিস্ট্রার, শিওর, মানিকগঞ্জ।  
ও সদস্য  
সম্পত্তির বাজার মূল্য  
নির্ধারণ কমিটি- ২০১৬ ইং।  
২৫/১১/১৬

Kalam  
(বিলকিস আরা)  
সাব-রেজিস্ট্রার, বরংগাইল, শিবালয় মানিকগঞ্জ।  
ও সদস্য সচিব  
সম্পত্তির বাজার মূল্য  
নির্ধারণ কমিটি- ২০১৬ ইং।  
২৫/১১/১৬

(মোঃ শাহাদাত হোসেন কুদ্দাস)  
জেলা রেজিস্ট্রার, মানিকগঞ্জ,  
ও সভাপতি  
সম্পত্তির বাজার মূল্য  
নির্ধারণ কমিটি- ২০১৬ইং।  
২৫/১১/১৬

সম্পত্তির বাজার মূল্য  
নির্ধারণ কমিটি

D/GF No. 9834006  
 This portion is held in trust by payee before presentation.  
 28 MAY 2018

SONALI BANK LTD.  
 Branch Date 5/1101/0020/1011  
 Mr. N. J. K. Sharma, Chairman, N. J. K. ...  
 Payment order for Tk 82,600/- on account of ...  
 Authorised Officer

জাতন্ত্রী বাংলাদেশ সরকার



৳২০

বিশ টাকা

৩৬০০০x৬২=৪২১২০০/-  
 ৪২১২০০/-  
 ১০০০/-  
 ২৫০/-  
 ২৮,০০০/-  
 ২২,০০০/-  
 ২২,০০০/-  
 ২৬+৪  
 ৫-১৬০০০/-  
 ২-২০০/-  
 ৫৩-২৬০/-  
 ২৪,০০০/-  
 ২৪,০০০/-

৪২১২০০/-  
 ৪২১২০০/-  
 ১০০০/-  
 ২৫০/-  
 ২৮,০০০/-  
 ২২,০০০/-  
 ২২,০০০/-  
 ২৬+৪  
 ৫-১৬০০০/-  
 ২-২০০/-  
 ৫৩-২৬০/-  
 ২৪,০০০/-  
 ২৪,০০০/-

৳২০  
 ২৮০০০/-  
 ২২,০০০/-

ক্রমিক নং ২৬৪২ বহি নং ২ দলিল নং ২৬৪২

১। রেজিস্ট্রার অফিসের নাম :- সাব-রেজিস্ট্রারের কার্যালয়, বরংগাইল, শিবালয়, মানিকগঞ্জ।  
 ২। দলিলের সার সংক্ষেপ :-

দলিলের প্রকৃতি	মৌজার নাম ও জে এল নং	ইউনিয়ন	উপজেলা	জেলা
সাক কবলা	বরুরিয়া, আর-এস ১৮১ নং	আফিয়া	শিবালয়	মানিকগঞ্জ

হস্তান্তরিত সম্পত্তির পরিমাণ	শ্রেণী	মূল্য (অংকে ও কথায়)
৩১ শতাংশ।	মাল	মং ১৪,০০,০০০/= (চৌদ্দ লক্ষ) টাকা মাত্র।

"দেশপ্রেমের পূর্ণ লিঙ্গ কৃষিজীবী বিন্যাস দিন"



কস ৬০০১৯৪৪

৳৬(সি)+৪  
 ৳-২০০/-  
 ৳-২০০/-  
 ৳৯-২৬০/-

মেঃ আব্দুল হালেক

Kelam  
 সাক্ষ-রেজিস্ট্রার  
 ০৭/০৭/১৭

বিশেষ, সাধারণ বা অপ্রত্যাহারযোগ্য Power of Attorney বা আম-মোক্তারনামা  
 [(বিধি-৭(১), ৮(১) বা ৯(১) দ্রষ্টব্য)]

- ১। রেজিস্ট্রার অফিসের নামঃ সাব-রেজিস্ট্রারের কার্যালয়, বরংগাইল, শিবালয়, মানিকগঞ্জ।
- ২। দলিলের সার সংক্ষেপঃ

৳৬(সি)+৪  
 ৳-২০০/-  
 ৳-২০০/-  
 ৳৯-২৬০/-

দলিলের প্রকৃতি	মোক্তার নাম	জে এল নং	ইউনিয়ন	উপজেলা	জেলা
অপ্রত্যাহারযোগ্য আম-মোক্তারনামা	বক্রিয়্যা	আর এস ১৮১ নং	আরুয়া	শিবালয়	মানিকগঞ্জ।
হস্তান্তরিত সম্পত্তির পরিমান	শ্রেণী	মূল্য (অংকে ও কথায়)			
২২ শতাংশ মার।	নাল	পণ্যমূল্য ব্যতীত।			

৩। সম্পাদনের তারিখঃ ইংরেজী দিবস...০৫... মাস...০৭....., সন ২০১৭।

বাংলা দিবস .২২... মাস...০৬... .., সন ১৪২৪।

“দেশপ্রেমের শপথ নিন, দুর্নীতিকে বিদায় দিন”



## **APPENDIX C      NOC FROM DC FOR NON-AGRICULTURAL LAND**

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার  
জেলা প্রশাসকের কার্যালয়, মানিকগঞ্জ  
(রাজস্ব শাখা)

স্মারক নং-০৫,৩০,৫৬০০,৩০২,০১৮,০০৪,২০১৬-৪৩২

তারিখ : ০৩-০৪-২০১৬ খ্রিঃ

বিষয় : ৩৫ মেঃওঃ সোলার পাওয়ার প্রাক্ট নির্মাণের লক্ষ্যে মানিকগঞ্জ জেলার শিবালয়া উপজেলার আওতাভুক্ত বরুরিয়া মৌজায় ১৪১.৭৪০ একর জমি অকৃষি জমি হিসেবে ছাড়পত্র প্রদান।

সূত্র : ০১। অফিসের স্মারক নং-০৫,৩০,৫৬০০,৩০২,১৮,০১৭,১৩-৩৮৩(সং) তারিখ : ২২-০৩-২০১৬ খ্রিঃ  
০২। সহকারী কমিশনার(ভূমি), শিবালয়া এর ০৩-০৪-২০১৬ খ্রিঃ তারিখের ৩৩৫(সং) নং স্মারক।

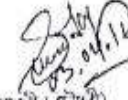
উপর্যুক্ত বিষয়ে সূত্রের পরিবেশকিতে জানানো যাচ্ছে যে, ব্যবস্থাপনা পরিচালক, স্পেক্ট্রা ইঞ্জিনিয়ার্স লিমিটেড ৩৫ মেঃওঃ সোলার পাওয়ার প্রাক্ট নির্মাণের লক্ষ্যে আবেদনিত শিবালয়া উপজেলাধীন বরুরিয়া মৌজায় ১৪১.৭৪০ একর জমি অকৃষি জমি হিসেবে ছাড়পত্র পাওয়ার আবেদন করেন। এপ্রেক্ষিতে ১নং সূত্র স্মারকে সহকারী কমিশনার(ভূমি), শিবালয়া এর নিকট প্রতিবেদন চাওয়া হয়। সহকারী কমিশনার(ভূমি), শিবালয়া ২নং সূত্র স্মারকে প্রতিবেদন দাখিল করেছেন। প্রতিবেদন পর্যালোচনায় দেখা যায় ১৪১.৭৪০ একর জমি এস,এ এন্ড টি এ্যার্ট এর ১৯৫০ সনের ১০৭ ও ১০৮ ধারা মোতাবেক অকৃষি হিসেবে ব্যবহার ডিক্লার জমি উন্নয়ন কর আদায় করা হয়েছে যা জেলা প্রশাসক মহোদয় অনুমোদন প্রদান করেছেন।

০২। বর্নিত অবস্থায়, আবেদিত ১৪১.৭৪০ একর জমি অকৃষি হিসেবে নির্দেশক্রমে ছাড়পত্র প্রদান করা হলো।

জনাব খান মোঃ আফতাবউদ্দিন  
ব্যবস্থাপনা পরিচালক  
স্পেক্ট্রা ইঞ্জিনিয়ার্স লিমিটেড

অনুলিপি : সদয় অবগতির জন্য।

০১। সহকারী কমিশনার(ভূমি)  
শিবালয়া, মানিকগঞ্জ।

  
(সাবরীন জৌহুরী)  
রেভিনিউ ডেপুটি কালেক্টর  
মানিকগঞ্জ  
ফোন নং-০৩২৪৩

Clearance of 141.740 acre land as non-agricultural land at Boruria Mouza, Shivalaya Upazilla for construction of proposed 35 MW Solar Park by Spectra Solar Power Limited.

Revenue Deputy Collector, Manikganj  
Dt: 03/04/2016

100  
L

৭৫২  
০৭/০৬/১৯

৩৩২  
০৭/০৬/১৯

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার  
উপজেলা ভূমি অফিস  
শিবালয়, মানিকগঞ্জ।

পত্র নম্বর : উ : ভূ : অ : শিবা/২০১৬- ৬০৬

তারিখ : ০৮/০৬/২০১৬ খ্রিঃ।

বিষয় : ৩৫ মেঃ ওঃ সোলার পাওয়ার প্রস্ট নির্মানের লক্ষ্যে মানিকগঞ্জ জেলার শিবালয় উপজেলার বরুরিয়া মৌজার অকৃষি জমি হিসেবে খাজনা প্রদানের জমি সমূহের তালিকা প্রেরণ প্রসঙ্গে।

সূত্র : জেলা প্রশাসক মানিকগঞ্জ মহোদয়ের কার্যালয়ের মৌখিক নির্দেশ।

১৯

উপর্যুক্ত বিষয় ও সূত্র স্বাক্ষরের প্রেক্ষিতে জানানো যাচ্ছে যে, অত্র উপজেলাবীন ইউনিয়ন ভূমি সহকারী কর্মকর্তা আকশ্যা হতে দেয় প্রতিবেদন এ দেখা যায় যে, চৈত্রী ইঞ্জিনিয়ার্স লিঃ কর্তৃক বরুরিয়া মৌজার ১৪১.৭৪ একর ভূমির ভূমি উন্নয়ন কর অকৃষি জমি হিসেবে আদায় করা হয়েছে। আদায়কৃত দাগ সমূহের তালিকা "তুক" আকারে প্রস্তুত করে মহোদয়ের সদয় অবগতি ও পরবর্তী প্রয়োজনীয় ব্যবস্থা গ্রহণের জন্য প্রেরণ করা হ'ল।

ক্রমিক নং	মৌজার নাম	খতিয়ান নং	দাগ নং	শ্রেণী	পরিমাণ (একরে)	মন্তব্য
১	বরুরিয়া	২৪	১০৪৮	মাগ	০.১০	
২		"	১০৬৫	"	০.১০	
৩		"	১০১৬	"	০.০৭	
৪		"	১০২০	"	০.০৮	
৫		"	১০০৪	"	০.২৫	
৬		"	২১৮৪	"	০.২৪	
৭		৩১৭	২৭২৩	"	০.১২	
৮		"	২৭৭২	"	০.১৭	
৯		১৮১	৭১১	"	০.১৬	
১০		"	২২৭০	"	০.৬১	
১১		৯২	২২১১	"	০.০৬	
১২		"	৪০৬	"	০.০৮	
১৩		"	৪৫২	"	০.০৮	
১৪		"	৪৪০	"	০.২২	

০৭/০৬/১৯

160

10		800	"	0.09
11	320	2208	"	0.08
12	"	2230	"	0.10
13	"	2219	"	0.04
14	"	2000	"	0.38
15	302	2300	"	0.22
16	"	2000	"	0.20
17	"	2000	"	0.20
18	"	2922	"	0.05
19	"	3209	"	0.10
20	"	2330	"	0.10
21	"	900	"	0.10
22	"	3000	"	0.10
23	"	2380	"	0.08
24	"	2380	"	0.08
25	"	2229	"	0.08
26	"	2200	"	0.20
27	"	2090	"	0.10
28	"	2298	"	0.22
29	"	2402	"	0.01
30	"	2900	"	0.12
31	"	2222	"	0.20
32	88	2900	"	0.20
33	"	2920	"	0.20
34	"	939	"	0.12
35	"	000	"	0.00
36	"	930	"	0.12
37	"	2223	"	0.18
38	"	2920	"	0.80
39	308	2212	"	0.00
40	300	2220	"	0.29
41	300	2220	"	0.10
42	"	2220	"	0.28
43	300	00	"	0.11
44	"	00	"	0.08
45	"	000	"	0.28
46	99	000	"	0.88
47	"	000	"	0.20
48	"	302	"	0.82
49	"	000	"	0.80
50	"	000	"	0.82
51	"	000	"	0.00

Handwritten signature and the number 161.

85		"	828	"	0.20	
84		"	838	"	0.30	
83		"	848	"	0.38	
82		"	858	"	0.29	
81		"	868	"	0.80	
80		"	878	"	0.30	
79		"	888	"	0.30	
78		"	898	"	0.42	
77		"	908	"	0.22	
76		"	918	"	0.40	
75		"	928	"	0.80	
74		"	938	"	0.88	
73		"	948	"	0.00	
72		"	958	"	0.07	
71		"	968	"	0.33	
70		"	978	"	0.33	
69		"	988	"	0.00	
68		"	998	"	0.80	
67		"	1008	"	0.30	
66		"	1018	"	0.20	
65		"	1028	"	0.20	
64		"	1038	"	0.80	
63		"	1048	"	0.80	
62		"	1058	"	0.30	
61		"	1068	"	0.30	
60		"	1078	"	0.80	
59		"	1088	"	0.29	
58		"	1098	"	0.20	
57		"	1108	"	0.30	
56		"	1118	"	0.30	
55		"	1128	"	0.80	
54		"	1138	"	0.29	
53		"	1148	"	0.20	
52		"	1158	"	0.30	
51		"	1168	"	0.30	
50		"	1178	"	0.80	
49		"	1188	"	0.29	
48		"	1198	"	0.20	
47		"	1208	"	0.20	
46		"	1218	"	0.80	
45		"	1228	"	0.80	
44		"	1238	"	0.30	
43		"	1248	"	0.30	
42		"	1258	"	0.80	
41		"	1268	"	0.30	
40		"	1278	"	0.30	
39		"	1288	"	0.80	
38		"	1298	"	0.30	
37		"	1308	"	0.80	
36		"	1318	"	0.30	
35		"	1328	"	0.30	
34		"	1338	"	0.80	
33		"	1348	"	0.30	
32		"	1358	"	0.30	
31		"	1368	"	0.80	
30		"	1378	"	0.30	
29		"	1388	"	0.30	
28		"	1398	"	0.80	
27		"	1408	"	0.30	
26		"	1418	"	0.30	
25		"	1428	"	0.80	
24		"	1438	"	0.30	
23		"	1448	"	0.30	
22		"	1458	"	0.80	
21		"	1468	"	0.30	
20		"	1478	"	0.30	
19		"	1488	"	0.80	
18		"	1498	"	0.30	
17		"	1508	"	0.30	
16		"	1518	"	0.80	
15		"	1528	"	0.30	
14		"	1538	"	0.30	
13		"	1548	"	0.80	
12		"	1558	"	0.30	
11		"	1568	"	0.30	
10		"	1578	"	0.80	
9		"	1588	"	0.30	
8		"	1598	"	0.30	
7		"	1608	"	0.80	
6		"	1618	"	0.30	
5		"	1628	"	0.30	
4		"	1638	"	0.80	
3		"	1648	"	0.30	
2		"	1658	"	0.30	
1		"	1668	"	0.80	


  
 162

## **APPENDIX D      SOIL QUALITY MONITORING RESULT**

# Mitra S. K. Bangladesh (Pvt.) Ltd.

House # 02, 5th Floor, Road # 32,  
Dhanmondi, Dhaka - 1209  
Bangladesh.

T : +88 02 5815 3196, +88 01973 167 777  
E : mskdhaka@mitrask.com  
W : www.mitrask.com



## TEST REPORT

Name & Address of the Customer :  
Environmental Resources Management (ERM)

ERM India Private Limited  
Building 10; 4th Floor, Tower A; DLF Cyber City;  
Gurgaon – 122 002;INDIA.

Report No.: MSK80/ERM/ED/003.2019  
Dated : 27.02.2019

Sample Description: Soil Quality.  
Sample Location: Shibalay, Manikganj, Bangladesh.

### Report of Soil Quality

S.N.	Parameters	Unit	SQ-1 (Inside Plant)
	<b>Dates</b>		<b>14.02.2019</b>
	<b>Classification</b>		
	<b>If Agriculture what crop is sown</b>		
1	pH value	None	8.17(1.2.5) at 25 deg C
2	Boron (as B)	mg/kg	12
3	Calcium (as Ca)	mg/kg	698
4	Chloride (as Cl )	mg/kg	39
5	Copper (as Cu)	mg/kg	6
6	Iron (as Fe)	mg/kg	38
7	Magnesium (as Mg)	mg/kg	140
8	Manganese (as Mn)	mg/kg	171
9	Sulphate ( as SO4 )	mg/kg	50
10	Alkalinity (as CaCO3 )	mg/kg	70
11	Bulk Density	gm/cc	1.38
12	Cadmium (as Cd)	mg/kg	<2.0
13	Lead (as Pb )	mg/kg	<2.0
14	Mercury (as Hg )	mg/kg	<0.1
15	Nickel (as Ni )	mg/kg	13
16	Polynuclear Aromatic Hydrocarbons ( as PAH )	mg/kg	<0.2
17	Arsenic( as As)	mg/kg	0.3
18	Available Nitrogen (as N)	mg/kg	22
19	Sodium (as Na)	mg/kg	3
20	Specific gravity	None	2.68
21	Texture	None	sand
22	Electrical conductivity	us/cm	36.6 (1.2) at 25 deg C
23	Total Potassium (as K)	mg/kg	653
24	Available Potassium (as K)	mg/kg	29
25	Sodium Adsorption Ratio (as SAR)	None	0.01
26	Available Phosphorus (as P)	mg/kg	<3.0
27	Zinc (as Zn)	mg/kg	30
28	Permeability	Cm/hr	4.8
29	Water Holding capacity	%	28
30	Cation Exchange Capacity	meq/100 gm	5.4
31	Cobalt (as Co)	mg/kg	<2.0
32	Hexavalent Chromium (as Cr+6)	mg/kg	<2.0
33	Total Petroleum Hydrocarbon (as TPH)	mg/kg	<10.0
34	Phosphorus (as P)	mg/kg	<3.0
35	Lithium	mg/kg	<2.0
36	Porosity	%	48.5
37	Moisture	%	3.9
38	Particle Size Distribution	%	sand 94.9% silt 2.1% clay 3.0%
39	Total Nitrogen (as N)	mg/kg	106
40	Acidity	mg/kg	nil
41	Carbonate as CO3	mg/kg	nil
42	Infiltration Capacity	None	27 mm/hrs

MITRA S.K. BANGLADESH (PVT.) LTD.

  
MD. REZAUL KAYUM  
Managing Director

Registered Office : 19 Green Road, Kalabagan, Dhaka-1205, Bangladesh.

## **APPENDIX E      CALIBRATION CERTIFICATES**



# Attachment 1: Calibration Certificate of Air Monitoring Equipment

*Certificate of Calibration*  
Certificate Number: EDCQP200-4.11.5

**Environmental Devices Corporation** certifies the Haz-Scanner model HIM-6000 is calibrated to published specifications and NIST traceable.

Calibration Dust Specifications are NIST traceable using Coulter Mutisizer II e. ISO12103 -1 A2 Fine Test Dust and is designed to agree with EPA Class I and Class III FRM and FEM particulate samplers and monitors and EN 12341 and EN 14907 standards.

Gas sensors are Calibrated against NIST/EPA traceable Calibration Gas using NIST primary Flow Standard: LFE774300 to ISO 17025 and EPA Instrumental Test Methods as defined by 40 CFR Part 60.

Quality system standard to meet the requirements of ANSI/ASQC standard Q9000-1994 (ISO 9001), MIL-STD 45662A, and customer's specification if required.

Temperature = 22°C  
Relative Humidity = 30%  
Atmospheric Pressure = 760 mmHg  
Measurement Uncertainty Estimated @ 95% Confidence Level (k=2) using ISO 17025 guidelines.

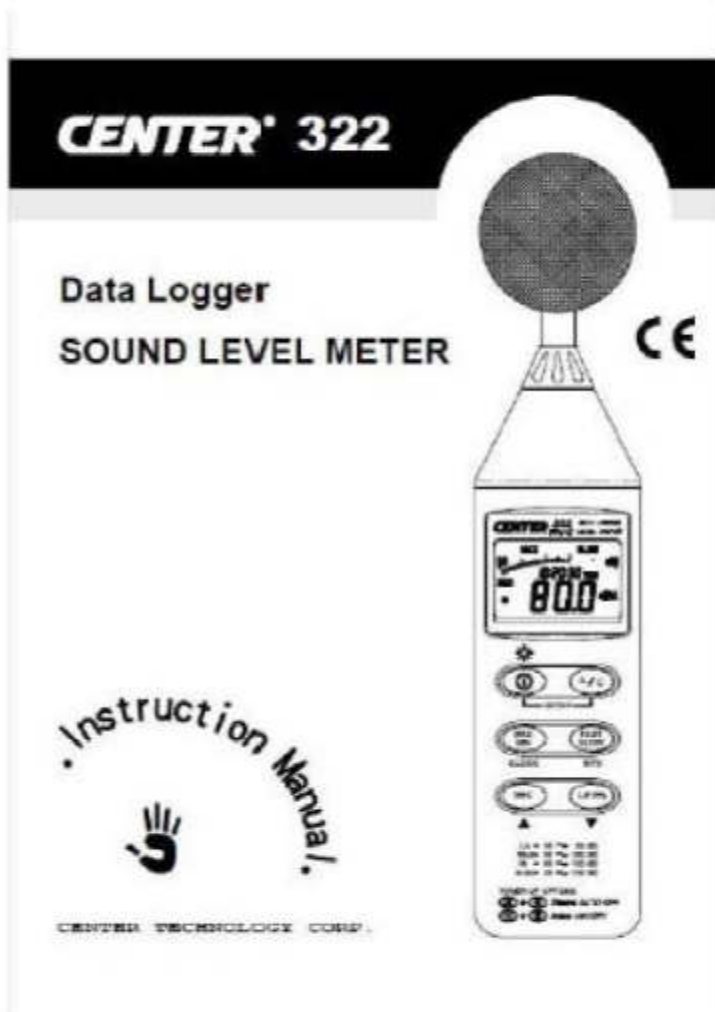
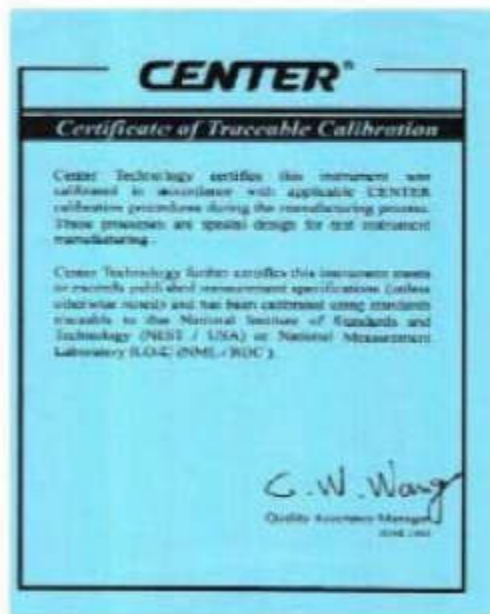
Model	Serial Number	Calibration Date	Next Calibration Due
HIM-6000	918157	May 23, 2018	May 2019

Calibration Span Accessory if purchased	Sensor A K=	Sensor B K=	Model :
	14000	14300	CS-105

Dan Okuniewicz <i>Dan Okuniewicz</i> Technician	Mark Sullivan <i>Mark Sullivan</i> Supervisor
---	---

Environmental Devices Corporation  
4 Wilder Drive Building #15  
Plaislow, NH 03865  
ISO-9001 Certified

## Attachment 2: Calibration Certificate of Noise Monitoring Equipment



# Noise Calibrator

# REED

## Model R8090

### Sound Level Calibrator

### Instruction Manual



[www.reedinstruments.com](http://www.reedinstruments.com)

## Features

- Generates a stable acoustic signal at a controlled frequency and amplitude to verify the accuracy of your sound level meter
- Complies with IEC 60942 Class 2
- Accommodates sound meters with 1/2" diameter microphones
- Simply place calibrator on microphone, turn on and adjust your sound level meter

## Specifications

Output Sound Pressure Levels:	94dB and 114dB
Accuracy:	$\pm 0.5$ dB
Output Frequency:	1000Hz $\pm 4\%$
Power Supply:	One 9V battery (included)
Dimensions:	120 x 51 x 43mm
Weight:	Approx. 120g

## Instrument Description

1. Microphone adaptor
2. Range switch
3. Battery compartment/cover



**REED** [www.reedinstruments.com](http://www.reedinstruments.com) 2

## Operating Instructions

Insert the microphone under testing into the calibrator's microphone cavity and ensure that it is fully inserted (sound level meters with 1/2" microphones can be calibrated with this device).

Slide the range switch to the 94dB position, or the 114dB position as desired. The calibrator generates a signal as soon as the switch is set.

Read the sound level meter's value. The sound level meter should read 94dB or 114dB, depending on the calibrator's signal level. If the sound level calibrator does not match the calibrator's signal (within specifications), adjust it as explained in the sound level meter's operating instructions.

Slide the range switch to the "OFF" position and remove the microphone.

## Battery replacement

Replace the battery when there is no sound pressure output from the sound level calibrator.

Open the battery cover to access the 9V battery. Remove the battery and replace with new 9V battery.

For service on this or any other REED product or information on other REED products, contact REED Instruments at [info@reedinstruments.com](mailto:info@reedinstruments.com)

**REED** [www.reedinstruments.com](http://www.reedinstruments.com) 3

## **APPENDIX F      SURFACE WATER QUALITY MONITORING RESULTS**

# Mitra S. K. Bangladesh (Pvt.) Ltd.

House # 02, 5th Floor, Road # 32,  
Dhanmondi, Dhaka - 1209  
Bangladesh.

T : +88 02 5815 3195, +88 01973 167 777  
E : mskdhaka@mitrask.com  
W : www.mitrask.com



## TEST REPORT

Name & Address of the Customer :  
Environmental Resources Management (ERM)  
ERM India Private Limited  
Building 10, 4th Floor, Tower A; DLF Cyber City; Gurgaon - 122  
002,INDIA.

Report No.: MSKBD/ERM/ED/002.2019  
Dated : 27.02.2019  
Sample Description: Surface Water  
Sample Location: Shitalay, Manikganj, Bangladesh.

Report of Surface Water Quality -RIL					
S.N.	Parameters	Unit	SW-1 (PLANT SIDE)	SW-2 (UP STREAM, DORIKANDI, MANIKGANJ)	SW-3 (DOWN STREAM, LOKKHIPUR, MANIKGANJ )
	Dates		14.02.2019	14.02.2019	14.02.2019
	Whether Tank/pond/lake/river		Pond water	River water	River water
(I)	Physico Chemical Parameters				
1	Colour	Hazen	<1.0	<1.0	<1.0
2	Odour	None	Unobjectionable	Unobjectionable	Unobjectionable
3	pH value	None	7.58 at 25 deg C	7.73 at 25 deg C	7.81 at 25 deg C
4	Turbidity	N.T.U.	36	9	22
5	Total Dissolved Solids (as TDS)	mg/l	178	318	368
6	Aluminium ( as Al )	mg/l	<0.01	<0.01	<0.01
7	Barium ( as Ba )	mg/l	<0.05	<0.05	<0.05
8	Chloride ( as Cl )	mg/l	9.8	49	70
9	Copper ( as Cu )	mg/l	<0.02	<0.02	<0.02
10	Fluoride ( as F )	mg/l	0.27	0.14	0.12
11	Iron ( as Fe )	mg/l	1.8	1.0	0.72
12	Manganese ( as Mn )	mg/l	<0.02	<0.02	<0.02
13	Nitrate ( as NO3 )	mg/l	<0.5	<0.5	1.13
14	Sulphate ( as SO4 )	mg/l	4.8	13	11
15	Total Hardness ( as CaCO3 )	mg/l	147	213	225
16	Cadmium ( as Cd )	mg/l	<0.001	<0.001	<0.001
17	Lead ( as Pb )	mg/l	<0.005	<0.005	<0.005
18	Mercury ( as Hg )	mg/l	<0.001	<0.001	<0.001
19	Nickel ( as Ni )	mg/l	<0.02	<0.02	<0.02
20	Arsenic ( as As )	mg/l	<0.005	<0.005	<0.005
21	Total Chromium ( as Cr )	mg/l	<0.01	<0.01	<0.01
22	Sodium ( as Na )	mg/l	7.2	36	42
23	Electrical conductivity	us/cm	288	522	624
24	Potassium ( as K )	mg/l	1.0	4.1	4.6
25	Total Nitrogen ( as N )	mg/l	0.6	<0.5	1.06
26	Zinc ( as Zn )	mg/l	<0.02	<0.02	<0.02
27	Hexavalent Chromium ( as Cr+6 )	mg/l	<0.01	<0.01	<0.01
28	Vanadium as V	mg/l	<0.2	<0.2	<0.2
29	Total Petroleum Hydrocarbon ( as TPH )	mg/l	<0.1	<0.1	<0.1
30	Total Suspended Solid ( as TSS )	mg/l	30	13	14
31	Temperature	Deg C	24.6	24.4	24.2
32	Dissolved Oxygen	mg/l	6.1	5.9	5.6
33	Biochemical Oxygen Demand ( as BOD )	mg/l	<2.0	<2.0	1.8
34	Chemical Oxygen Demand ( COD )	mg/l	<4.0	<4.0	20
35	Oil and Grease	mg/l	<1.4	<1.4	<1.4
36	Salinity	None	0.16 In respect to KCl equivalent salinity 35	0.30 In respect to KCl equivalent salinity 35	0.36 In respect to KCl equivalent salinity 35
37	Phenol	mg/l	<0.001	<0.001	<0.001
38	Total Alkalinity ( as CaCO3 )	mg/l	173	226	231
39	Chromium	mg/l	<0.01	<0.01	<0.01
40	Total Phosphorous	mg/l	<0.05	<0.05	<0.05
41	Faecal coliform	MPN/100ml	<1.8	<1.8	<1.8
42	Total coliform	MPN/100ml	<1.8	2	<1.8

MITRA S.K. BANGLADESH (PVT.) LTD.  
  
M.D. REZAUL KAYUM  
Managing Director

Registered Office : 19 Green Road, Kalabagan, Dhaka-1205, Bangladesh

## **APPENDIX G      GROUND WATER QUALITY MONITORING RESULTS**

# Mitra S. K. Bangladesh (Pvt.) Ltd.

House # 02, 5th Floor, Road # 32,  
Dhanmondi, Dhaka - 1209  
Bangladesh.

T : +88 02 5815 3195, +88 01973 167 777  
E : mskdhaka@mitrask.com  
W : www.mitrask.com



## TEST REPORT

Name & Address of the Customer :  
Environmental Resources Management (ERM)  
ERM India Private Limited  
Building 10; 4th Floor, Tower A; DLF Cyber City, Gurgaon - 122  
002/INDIA.

Report No.: MSK/BO/ERM/ED/001.2019  
Dated : 27.02.2019  
Sample Description: Ground Water.  
Sample Location: Shibalay, Maniaganj, Bangladesh.

Report of Groundwater Quality						
S.N.	Parameters	Unit	GW-1, INSIDE PLANT 14.02.2019	GW-2, INSIDE PLANT 14.02.2019	Desirable Limit	Permissible Limit
	Depth of Sample Collection					
	Whether Tubewell/Borewell/Slugwell		Borewell	Borewell		
<b>[I] Organoleptic Physical Parameters</b>						
1	Temperature	°C	24.0 deg C	24.2	-	-
2	Colour	Hazen	<1.0	<1.0	5	15
3	Odour	-	Unobjectionable	Unobjectionable	Agreeable	Agreeable
4	pH	-	7.53 at 25 deg C	7.21 at 25 deg C	6.5-8.5	6.5-8.5
5	Turbidity	NTU	154	56	1	5
6	Total Suspended Solid (TSS)	mg/l	46	23	-	-
7	Salinity	-	0.48 in respect to KCl equivalent salinity 33	0.57 in respect to KCl equivalent salinity 33	-	-
8	Electrical Conductivity	µS/cm	803 µS/cm	978 µS/cm	-	-
9	Dissolved Oxygen (DO)	mg/l	3.0	3.1	-	-
<b>[II] General Parameters</b>						
10	Aluminium (Al)	mg/l	<0.01	<0.01	0.03	0.2
11	Barium (Ba)	mg/l	<0.05	<0.05	0.7	-
12	Chloride	mg/l	34	17	250	2000
13	Copper (Cu)	mg/l	<0.02	<0.02	0.05	1.5
14	Fluoride as F	mg/l	0.38	0.31	1	1.5
15	Iron (Fe)	mg/l	22	5.2	-	0.3
16	Manganese (Mn)	mg/l	<0.02	<0.02	0.1	0.3
17	Nitrate	mg/l	5.9	<0.5	45	45
18	Phenol	-	<0.001	<0.001	0.001	0.002
19	Oil and Grease	mg/l	<1.4	<1.4	-	-
20	Sulphate	mg/l	<1.0	18	200	400
21	Total Hardness	mg/l	252	<11	200	600
22	Total Alkalinity	mg/l	<0.05	0.23	200	600
23	Total Phosphorous	mg/l	385	528	-	-
24	Sodium (as Na)	mg/l	30	22	-	-
25	Potassium (as K)	mg/l	1.9	4.2	-	-
26	Total Nitrogen (as N)	mg/l	9.9	<0.5	-	-
27	Total Petroleum Hydrocarbon (as TPH)	mg/l	<0.1	<0.1	-	-
28	Zinc (Zn)	mg/l	<0.02	<0.02	5	15
<b>[III] Toxic Substances</b>						
29	Cadmium (Cd)	mg/l	<0.001	<0.001	0.003	0.003
30	Lead (Pb)	mg/l	<0.005	<0.005	0.01	0.01
31	Mercury (Hg)	mg/l	<0.001	<0.001	0.001	0.001
32	Nickel (as Ni)	mg/l	<0.02	<0.02	0.02	0.02
33	Arsenic (As)	mg/l	<0.005	<0.005	0.01	0.05
34	Total Chromium (Cr)	mg/l	<0.01	<0.01	0.05	0.08
35	Hexavalent Chromium (as Cr+6)	mg/l	<0.01	<0.01	-	-
36	Vanadium as (V)	mg/l	<0.2	<0.2	-	400
<b>[IV] Biochemical and Bacteriological Parameters</b>						
37	Biochemical Oxygen Demand (as BOD)	mg/l	<2.0	<2.0	-	-
38	Chemical Oxygen Demand (COD)	mg/l	<4.0	9	-	-
39	Total Coliform	MPN/100ml	<2	<2	Not Detectable	Absent
40	E.coli	MPN/100ml	<2	4	Not Detectable	Absent

MITRA S.K. BANGLADESH (PVT.) LTD.  
  
 MD. NIZAUZ KAYUM  
 Managing Director

Registered Office : 19 Green Road, Kalabagan, Dhaka-1205, Bangladesh.



## **APPENDIX H      SEDIMENT QUALITY MONITORING RESULTS**

**TEST REPORT**

Name & Address of the Customer :  
Environmental Resources Management (ERM)

ERM India Private Limited  
Building 10, 4th Floor, Tower A; DLF Cyber City;  
Gurgaon – 122 002; INDIA.

Report No.: MSKBD/ERM/ED/004.2019

Dated : 27.02.2019

Sample Description: Sediment Quality.

Sample Location: Shibalay, Manikganj, Bangladesh.

Report of Sediment Quality					
S.N.	Parameters	Unit	SSQ-1 ( PLANT AREA SIDE DORIKANDI)	SSQ-2 ( DORIKANDI)	SSQ-3 (LOKKHIPURA)
Dates			14.02.2019	14.02.2019	14.02.2019
<i>Classification</i>					
<i>If Agriculture what crop is sown</i>					
1	pH value	None	7.78 (1:2.5) at 25 deg C	7.59 (1:2.5) at 25 deg C	7.67 (1:2.5) at 25 deg C
2	Copper (as Cu)	mg/kg	46	54	44
3	Manganese (as Mn)	mg/kg	439	609	679
4	Alkalinity (as CaCO <sub>3</sub> )	mg/kg	290	300	250
5	Cadmium (as Cd)	mg/kg	<2.0	<2.0	<2.0
6	Lead (as Pb)	mg/kg	9.6	13	11
7	Mercury (as Hg)	mg/kg	<0.1	<0.1	<0.1
8	Nickel (as Ni)	mg/kg	42	48	42
9	Texture	None	clay loam	clay loam	clay loam
10	Electrical conductivity	us/cm	257 (1:2) at 25 deg C	463 (1:2) at 25 deg C	400 (1:2) at 25 deg C
11	Total Organic Carbon	%	0.61	1.3	0.94
12	Zinc (as Zn)	mg/kg	72	100	90
13	Cation Exchange Capacity	meq/100 gm	11	14	13
14	Cobalt (as Co)	mg/kg	<2.0	<2.0	<2.0
15	Hexavalent Chromium (as Cr+6)	mg/kg	<2.0	<2.0	<2.0
16	Silica ( as SiO <sub>2</sub> )	%	44	40	42
17	Acidity	mg/kg	nil	nil	nil
18	Arsenic	mg/kg	0.48	0.68	0.88
19	Hg (inorganic)	mg/kg	<0.1	<0.1	<0.1
20	Hg (organic)	mg/kg	<0.1	<0.1	<0.1

MITRA S. K. BANGLADESH (PVT.) LTD.



MD. REZAUL KAYUM  
Managing Director

## **APPENDIX I**

## **CHECKLIST OF HOMESTEAD PLANTATION**

S. No.	Local Name	Common name	Scientific name	Family	Types	Uses	Local status	IUCN Global Status	Red data Book Bangladesh (National Herbarium Bangladesh 2001)
1.	Aam	Mango	Mangifera indica	Anacardiaceae	Tree	Fruit	VC	DD	Not Available
2.	Akasmoni	Acacia	Acacia auriculiformis	Fabaceae	Tree	Timber	C	LC	Not Available
3.	Bash	Bamboo	Bamboo spp.	Poaceae	Grass	Timber	VC	NL	Not Available
4.	Boroi	Indian Jujube	Zizyphus mauritiana	Rhamnaceae	Shrub	Fruit	VC	NL	Not Available
5.	Bot	Banyan tree	Ficus bengalensis	Moraceae	Tree	Aesthetic	C	NL	Not Available
6.	Chalta	Chalta	Dillenia indica	Dilleniaceae	Tree	Fruit	R	NL	Not Available
7.	Chambol	Silk tree	Albizia richardiana	Mimosaceae	Tree	Fuel	R	NL	Not Available
8.	Chapalish	Chapalish	Artocarpus chaplasha	Moraceae	Tree	Timber	R	NL	Not Available
9.	Debdaru	False ashoka	Polyalthia longifolia	Annonaceae	Tree	Aesthetic	C	NL	Not Available
10.	Eucalyptus	Eucalyptus	Eucalyptus camaldulensis	Myrtaceae	Tree	Timber	VC	NL	Not Available
11.	Gaab	Mabolo	Diospyros discolor	Ebenaceae	Tree	Fruit	R	NL	Not Available
12.	Jam	Java Plum	Syzygium cumini	Myrtaceae	Tree	Fruit	VC	NL	Not Available
13.	Jika	Indian ash tree	Lannea coromandelica	Anacardiaceae	Tree	Medicinal	C	NL	Not Available
14.	Kath Badam	Indian-almond	Terminalia catappa	Combretaceae	Tree	Fruit	R	NL	Not Available
15.	Kath Maloti	Eve's apple	Tabernaemontana Dichotoma	Apocynaceae	Shrub	Aesthetic	VC	NL	Not Available
16.	Kathal	Jackfruit	Artocarpus heterophyllus	Moraceae	Tree	Fruit	C	NL	Not Available
17.	Khezur	Date palm	Phoenix dactylifera	Arecaceae	Tree	Fruit	VC	LC	Not Available

S. No.	Local Name	Common name	Scientific name	Family	Types	Uses	Local status	IUCN Global Status	Red data Book Bangladesh (National Herbarium Bangladesh 2001)
18.	Kola	Banana	Musa sapientum	Musaceae	Herb	Fruit	VC	NL	Not Available
19.	Koroi	Rain tree	Samanea saman	Fabaceae	Tree	Timber	VC	NL	Not Available
20.	Koromcha	Bengal currant	Carissa carandas	Apocynaceae	Shrub	Fruit	R	NL	Not Available
21.	Krishnochura	Dwarf Poinciana	Caesalpinia pulcherrima	Fabaceae	Tree	Aesthetic	C	NL	Not Available
22.	Lebu	Lemon	Citrus spp.	Rutaceae	Shrub	Fruit	VC	NL	Not Available
23.	Lychu	Lychee	Litchi chinensis	Sapindaceae	Tree	Fruit	VC	NL	Not Available
24.	Mehegony	Mehegoni	Swietenia mahagoni	Meliaceae	Tree	Timber	VC	EN	Not Available
25.	Narikel	Coconut	Cocos nucifera	Arecaceae	Tree	Fruit	C	NL	Not Available
26.	Neem	Neem	Azadirachta indica	Meliaceae	Tree	Medicinal	C	LC	Not Available
27.	Pepe	Papaya	Carica papaya	Caricaceae	Shrub	Fruit	VC	DD	Not Available
28.	Peyara	Guava	Psidium guajava	Myrtaceae	Tree	Fruit	VC	NL	Not Available
29.	Royna	Pithraj tree	Aphanamixis polystachya	Meliaceae	Tree	Timber	C	LC	Not Available
30.	Sada koroi	White Siris	Albizia procera	Fabaceae	Tree	Timber	C	NL	Not Available
31.	Shegun	Teak tree	Tectona grandis	Verbenaceae	Tree	Timber	VC	NL	Not Available
32.	Shimul	Showy Silk Cotton Tree	Bombax insigne	Malvaceae	Tree	Aesthetic	R	NL	Data Deficient
33.	Shimul	Cotton tree	Bombax ceiba	Malvaceae	Tree	Fruit	R	NL	Not Available
34.	Sisu	Sisu	Dalbergia sissoo	Fabaceae	Tree	Timber	R	NL	Not Available

S. No.	Local Name	Common name	Scientific name	Family	Types	Uses	Local status	IUCN Global Status	Red data Book Bangladesh (National Herbarium Bangladesh 2001)
35.	Sonalu	Golden rain tree	Cassia fistula	Fabaceae	Tree	Aesthetic	C	NL	Not Available
36.	Supari	Areca palm	Areca catechu	Arecaceae	Tree	Fruit	C	NL	Not Available
37.	Taal	Palm	Borassus flabellifer	Arecaceae	Tree	Fruit	C	EN	Not Available
38.	Tetul	Tamarind tree	Tamarindus indica	Fabaceae	Tree	Fruit	VC	LC	Not Available
39.	Ulot Kombol	Devils Cotton	Abroma augusta	Sterculiaceae	Shrub	Medicinal	R	NL	Not Available
40.	Vati	Hill glory bower	Clerodendrum infortunatum	Lamiaceae	Herb	Fuel	R	NL	Not Available
41.	Zambura	Pomelo fruit	Citrus maxima	Rutaceae	Shrub	Fruit	R	NL	Not Available

## **APPENDIX J      WEEDS RECORDED IN THE AGRICULTURAL LAND**

SL No.	Local Name	Scientific Name	Family	IUCN Global Status
1.	Durba	<i>Cynodon dactylon</i>	Gramineae	NL
2.	Hatisur	<i>Dentella repens</i>	Boraginaceae	LC
3.	Kalkasunda	<i>Senna tora</i>	Caesalpiniaceae	NL
4.	Kalmi Shak	<i>Ipomoea aquatica</i>	Convolvulaceae	LC
5.	Kancha ghash	<i>Cotula hemispherica</i>	Compositae	NL
6.	Niratrabha	<i>Cyperus cephalotes</i>	Cyperaceae	LC
7.	Sachishak	<i>Alternanthera sessilis</i>	Amaranthaceae	LC
*** LC= Least Concern, NT= Near Threatened, EN= Endangered, DD= Data Deficient,				
Data Source: EQMS Field Survey, February, 2019				



## **APPENDIX K**

## **CHECKLIST OF FLORA RECORDED AT ROADSIDE VEGETATION**

SL#	Local Name	Common name	Scientific name	Family	Types	Uses	Local status	IUCN Global Status	Red data Book Bangladesh(National Herbarium Bangladesh 2001)
1.	Sisu	Sisu	Dalbergia sissoo	Fabaceae	Tree	Timber	C	NL	Not Available
2.	Koroi	Rain tree	Samanea saman	Fabaceae	Tree	Timber	VC	NL	Not Available
3.	Akasmoni	Acacia	Acacia auriculiformis	Fabaceae	Tree	Timber	C	LC	Not Available
4.	Neem	Neem	Azadirachta indica	Meliaceae	Tree	Medicinal	C	LC	Not Available
5.	Mehegony	Mehegoni	Swietenia mahagoni	Meliaceae	Tree	Timber	VC	EN	Not Available
6.	Kathal	Jackfruit	Artocarpus heterophyllus	Moraceae	Tree	Fruit	C	NL	Not Available
7.	Bot gach	Banyan tree	Ficus bengalensis	Moraceae	Tree	Asthetic	R	NL	Not Available
8.	Ashwath	Bodhi tree	Ficus religiosa	Moraceae	Tree	Asthetic	R	NL	Not Available
9.	Chapalish	Chapalish	Artocarpus chaplasha	Moraceae	Tree	Timber	VR	NL	Not Available
10.	Kathal	Jackfruit	Artocarpus heterophyllus	Moraceae	Tree	Fruit	C	NL	Not Available
11.	Shimul	Showy Silk Cotton Tree	Bombax insigne	Malvaceae	Tree	Asthetic	R	NL	Not Available
12.	Eucalyptus	Eucalyptus	Eucalyptus camaldulensis	Myrtaceae	Tree	Fuel	VC	NL	Not Available
13.	Kola Gach	Banana	Musa acuminata	Musaceae	Herb	Fruit	VC	LC	Not Available
14.	Aam	Mango	Mangifera indica	Anacardiaceae	Tree	Fruit	VC	DD	Not Available
15.	Bansh	Bamboo	Bambusa vulgaris	Poaceae	Grass	Timber	VC	NL	Not Available
16.	Kochu	Taro	Colocasia esculenta	Araceae	Herb		VC	LC	Not Available
17.	Sal	Shala tree	Shorea robusta	Dipterocarpaceae	Tree	Timber	VC	LC	Not Available
18.	Telshur		Hopea odorata	Dipterocarpaceae	Tree	Timber	R	VU	Not Available
19.	Shegun	Teak tree	Tectona grandis	Verbenaceae	Tree	Timber	C	NL	Not Available

20.	Lychu	Lychee	Litchi chinensis	Sapindaceae	Tree	Fruit	VC	NL	Not Available
<p>NB: LC= Least Concern, NT= Near Threatened, EN= Endangered, VU= Vulnerable, DD= Data Deficient,  NL= Not listed, VR= Very Rare, R= Rare, C= Common, VC= Very Common.</p>									

## **APPENDIX L      CHECKLIST OF MAMMALS IN THE STUDY AREA**

SN	Local Name	Common Name	Scientific Name	Family	IUCN Status*	Protection n status in the Wildlife Act 2012 Schedule
1.	Khet-indur	Lesser Bandicoot Rat	Bandicota bengalensis	Muridae	LC	III
2.	Dhari Indur	Large Bandicoot Rat	Bandicota indica	Muridae	LC	III
3.	Nengti Indur	House Mouse	Mus musculus	Muridae	LC	III
4.	Chamchika	Indian Pipistrelle	Pipistrellus coromandra	Vespertilionidae	LC	I
5.	Badur	The Indian flying fox	Pteropus giganteus	Pteropodidae	LC	I
6.	Boro Beji	Common Mongoose	Herpestes edwardsii	Herpestidae	LC	I
<b>Note: LC= Least Concern, NT= Near Threatened, DD= Data Deficient, VU=Vulnerable.</b>						

## **APPENDIX M      CHECKLIST OF AVI-FAUNA IN THE STUDY AREA**

Sl. No	Common Name	Local Name	Scientific Name	Family	IUCN Global Status	IUCN Local Status	Protection status in Wildlife Act-2012 Schedule
1.	Black kite	Bhubon chil	Milvus migrans govinda	Accipitridae	LC	LC	II
2.	Black Winged Kite	Kotua Chil	Elanus caeruleus	Accipitridae	LC	LC	I
3.	Brahminy Kite	Shonkho Chil	Haliastur Indus	Accipitridae	LC	LC	II
4.	Common King fisher	Chhoto Maachranga	Alcedo atthis	Alcedinidae	LC	LC	II
5.	White-throated kingfisher	Dhola gola Machranga	Halcyon smyrnensis	Alcedinidae	LC	LC	II
6.	Asian palm swift	Ashio Talbatashi	Cypsiurus balasiensis	Apodidea	LC	LC	I
7.	House Swift	Ghor Batashi	Apus affinis	Apodidea	LC	LC	I
8.	Cattle egret	Go Boga	Bubulcus ibis	Ardidae	LC	LC	II
9.	Indian pond heron	Kani Bok	Ardeola grayii	Ardidae	LC	LC	I
10.	Asian Openbill	Shamuk Khol	Anastomus oscitans	Ciconiidae	LC	LC	I
11.	Blue Rock pigeon	Gola Paira	Columba livia	Columbidae	LC	LC	I
12.	Spotted dove	Tila Ghughu	Streptopelia chinensis	Columbidae	LC	LC	I
13.	Indian Roller	Neelkontho	Coracias benghalensis	Coraciidae	LC	LC	I
14.	House Crow	Patikak	Corvus splendens	Corvidae	LC	LC	NL
15.	Large-billed crow/Jungle Crow	Dar kak	Corvus macrorhynchos	Corvidae	LC	LC	NL
16.	Rufous treepie	Harichacha, Khoira Harichacha	Dendrocitta vagabunda	Corvidae	LC	LC	II
17.	Asian Koel	Kokil, koel	Eudynamis scolopaceus	Cuculidae	LC	LC	II
18.	Black Drongo	Kala Fingey	Dicrurus macrocercus	Dicruridae	LC	LC	II
19.	Bronzed Drongo	Bronze fingey, chotabhujanga	Dicrurus aeneus	Dicruridae	LC	LC	I
20.	Black Headed Munia	Kalomatha Muni	Lonchura malacca	Estrildidae	LC	LC	I
21.	Pheasant-tailed Jacana	Jol Pipi	Hydrophasianus chirurgus	Jacaniidae	LC	LC	I
22.	Long-tailed Shrike	Lenja Latora	Lanius schach	Lanidae	LC	LC	II
23.	Brown Shrike	Badami Kosai	Lanius cristatus	Laniidae	LC	LC	II
24.	Brown Headed gull	Shada Buk Gangchill	Chroicocephalus brunnicephalus	Laridae	LC	LC	I

Sl. No	Common Name	Local Name	Scientific Name	Family	IUCN Global Status	IUCN Local Status	Protection status in Wildlife Act-2012 Schedule
25.	Green bee-eater	Suichora	Merops orientalis	Meropidae	LC	LC	I
26.	Indian Paradise Flycatcher	Shaheb Bulbuli	Terpsiphone paradisi	Monarchidae	LC	LC	I
27.	Oriental magpie robin	Doel	Copsychus saularis	Muscicapidae	LC	LC	I
28.	Black hooded oriole	Halde Pakhi	Oriolus xanthornus	Oriolidae	LC	LC	II
29.	House sparrow	Pati choro	Passer domesticus	Passeridae	LC	LC	II
30.	Black-rumped Flameback	Sonali kaththokra	Dinopium benghalense	Picidae	LC	LC	II
31.	Fulvous-breasted Woodpecker	kathkhutali	Dendrocopos macei	Picidae	LC	LC	II
32.	Streak Throated Woodpecker	Dagi gola Kathkurali	Picus xanthopygaeus	Picidae	LC	LC	I
33.	Rose-ringed Parakeet	Shobuj Tia	Psittacula krameri	Psittacidae	LC	LC	II
34.	Red-vented Bulbul	Bangla bulbul	Pycnonotus cafer	Pytconotidae	LC	LC	II
35.	Spotted owlet	Khurley pecha	Athene brama indica	Strigidae	LC	LC	I
36.	Brown Fish Owl	Bhootoom Pecha	Ketupa zeylonensis	Strigidae	LC	LC	I
37.	Asian Pied Starling	Gobrey shalik	Sturnus contra	Sturnidae	LC	LC	II
38.	Chestnut tailed starling	Kath Shalik	Sturnia malabaricus	Sturnidae	LC	LC	II
39.	Common myna	Salik/BhatSalik	Acridotheres tristis	Sturnidae	LC	LC	II
40.	Jungle Myna	Jhuti Shalik	Acridotheres fuscus	Sturnidae	LC	LC	II
41.	Chest Nut Pied Starling	Kath Shalik	Sturnus contra	Sturnidae	LC	LC	II
42.	Barn Owl	Lokkhi pecha	Tyto alba	Tytonidae	LC	LC	I

Note: LC= Least Concern, NT= Near Threatened, DD= Data Deficient.



## **APPENDIX N      CHECKLIST OF HERPETO FAUNA IN THE STUDY AREA**

S. No.	Local name	Common name	Scientific name	IUCN Local Status	Family	Protection n status in Wildlife Act 2012 Schedule
<b>A. Reptiles</b>						
1.	Dhora Shap	Checkered Keelback	Xenochrophis piscator	LC	Natricidae	I
2.	Baro Dumukha Shap	Diard's Blindsnake	Typhlops diardii	LC	Typhlopidae	II
3.	Laodoga Shap	Vine Snake	Ahaetulla nasuta	LC	Colubridae	I
4.	Darash Shap	Indian Rat Snake	Ptyas mucosa	LC	Colubridae	I
5.	Shonkhini	Banded Krait	Bungarus fasciatus	LC	Elapidae	II
6.	Jati Shap	Spectacled Cobra	Naja	NT	Elapidae	II
7.	Roktochosa	Common Garden Lizard	Calotes versicolor	LC	Agamidae	II
8.	Tiktiki	House Lizard	Hemidactylus flaviviridis	LC	Gekkonidae	II
9.	Kori Kaitta	Indian Roofed Turtle	Pangshura tecta	LC	Geoemydida	I
10.	Shundhi Kasim	Spotted Flapshell Turtle	Lissemys punctata	LC	Trionychidae	II
<b>B. Amphibians</b>						
1.	Sona Bang	Indian Bullfrog	Hoplobatrachus tigerinus	LC	Dicroglossidae	I
2.	Sobuj Dhani Bang	Two-striped Grass Frog	Hylarana taipehensis	LC	Ranidae	II
3.	Kuno Bang	Asian Common Toad	Duttaphrynus melanostictus	LC	Bufonidae	NL
4.	Kotkoti Bang	Skipper Frog	Euphlyctis cyanophlyctis	LC	Dicroglossidae	II
Note: LC= Least Concern, NT= Near Threatened, VU= Vulnerable, DD= Data Deficient.						

## **APPENDIX O      CHECKLIST OF FISHES IN THE STUDY AREA**

S. No.	Scientific Name	Local Name	Availability in Local	*IUCN Red List Status
1.	Sprata aor	Air	Rare	VU
2.	Eutropiichthys vacha	Bacha	Available	LC
3.	Bagarius	Bagha Air	Rare	CR
4.	Labeo bata	Bata	Available	EN
5.	Labeo boga	Bhangan	Available	CR
6.	Awaous guamensis	Baila	Available	LC
7.	Wallago attu	Boal	Available	VU
8.	Mystus cavasius	Cavasi Tengra	Available	NT
9.	Chaca	Chaca	Available	VU
10.	Chanda nama	Chanda	Available	LC
11.	Chela laubuca	Chela	Available	LC
12.	Channa orientals	Cheng Taki	Rare	LC
13.	Macrobrachium lamerrai	Chingri	Available	NL
14.	Notopteru chitala	Chital	Rare	EN
15.	Oxygaster bacaila	Chlea	Available	NT
16.	Rasbora daniconius	Darkina	Rare	NT
17.	Osteobrama cotio	Dhela	Available	NT
18.	Hilsa ilisha	Elish	Available	NT
19.	Clupisoma garua	Garua	Rare	EN
20.	Macrobrachium rosenbergii	Golda Chingri	Available	NL
21.	Labeo gonius	Gonia	Available	EN
22.	Aspidoparia jaya	Jaya	Rare	NT
23.	Corica soborna	Kachki	Available	NT
24.	Labeo culbasu	Kalbaosh	Available	EN
25.	Xenentodon cancila	Kankila	Available	LC
26.	Catla	Katol	Available	LC
27.	Gagata youssoufi	Kea Kata	Available	NT
28.	Ailia coila	Kajuli	Available	LC
29.	Anabas testudineus	Koi	Available	LC
30.	Colisa latius	Kolisha	Available	NL
31.	Ompok pabda	Madhu pabda	Rare	EN
32.	Clarias batrachus	Magur	Available	LC
33.	Amblypharyngodon microlepis	Mohula	Available	NT
34.	Amblypharyngodon mola	Mola	Available	NT
35.	Clupisoma murius	Murius	Rare	NL
36.	Pangasius	Pangas	Rare	EN
37.	Setipinna phasa	Phasa	Available	NT
38.	Notopterus	Pholi	Rare	VU
39.	Oxygaster phulo	Phulo Chela	Available	NT

S. No.	Scientific Name	Local Name	Availability in Local	*IUCN Red List Status
40.	Puntius sarana	Punti	Available	CR
41.	Puntius ticto	Punti	Available	VU
42.	Puntius phutunio	Punti	Available	NT
43.	Puntius sophore	Punti	Available	NT
44.	Cirrhinus reba	Raikhor	Rare	VU
45.	Rita	Rita	Rare	EN
46.	Labeo rohita	Rui	Available	LC
47.	Mastacembelus pancalus	Shal Baim	Available	LC
48.	Heteropneustes fossilis	Sing	Available	LC
49.	Channa punctatus	Taki	Available	LC
50.	Channa striatus	Taki	Available	LC
51.	Mustacembelus armatus	Tara Baim	Rare	EN
52.	Mystus tengra	Tengra	Available	LC
53.	Mystus vittatus	Tengra	Available	LC
54.	Gagata cenia	Tengra	Available	LC
55.	Nandus	Veda	Rare	NT

**Note: LC= Least Concern, NT= Near Threatened, VU= Vulnerable, DD= Data Deficient.**

## **APPENDIX P      LIST OF LAND OWNERS AT SOLAR PARK**

Sl	Date	Deed No	Mowja	Giver	Total Land in Decimal
1	20-Feb-18	608	Boruria	Md. Alal Pramanik G	38.00
2	26-Feb-18	615	Boruria	Md. Jahangir Hossain G	12.00
3	26-Feb-18	621	Boruria	Paheluddin Pramanik G	64.50
4	26-Feb-18	651	Boruria	Gopal Chandro Shil G	108.500
5	28-Feb-18	701	Boruria	Mohammad Khorshed Alam G	116.500
6	28-Feb-18	704	Boruria	Md. Aktaruzzaman Khan	8.000
7	28-Feb-18	709	Boruria	Abdul Jabber	12.500
8	5-Mar-18	716	Boruria	Musamat Somana Khatun	32.000
9	5-Mar-18	729	Boruria	Shakh Tahaj Uddin	48.000
10	7-Mar-18	776	Boruria	Nasir Uddin Molla	62.000
11	7-Mar-18	779	Boruria	Shakh Dhokl G	42.000
12	7-Mar-18	781	Boruria	Md. Aktaruzzaman Khan	153.000
13	7-Mar-18	783	Boruria	Musamat Morgina Khatun	15.000
14	14-Mar-18	862	Boruria	Md. Abul Kashem	23.000
15	14-Mar-18	875	Boruria	Shabaj Uddin G	107.000
16	14-Mar-18	876	Boruria	Fulboro Begum G	226.000
17	14-Mar-18	878	Boruria	Md. Lalo Munshi	95.500
18	14-Mar-18	881	Boruria	Boddonath Chaki G	183.660
19	14-Mar-18	882	Boruria	Mohamad Soboruddin G	362.500
20	18-Mar-18	887	Boruria	Khan Md. Aftab Uddin G	116.000
21	14-Mar-18	888	Boruria	Khan Md. Aftab Uddin G	156.000
22	20-Mar-18	929	Boruria	Md. Sobahan Pramanik G	106.000
23	21-Mar-18	965	Boruria	Shree Poresch Chanro Shaha	14.000
24	21-Mar-18	971	Boruria	Md. Lalan Sordar G	159.500
25	21-Mar-18	972	Boruria	Subor Jan G	205.500
26	21-Mar-18	973	Boruria	Ambia Begum G	316.430
27	21-Mar-18	974	Boruria	Md. Shofe Uddin	328.000
28	21-Mar-18	975	Boruria	Sunil Kumar Sarker G	199.000
29	21-Mar-18	976	Boruria	Musamat Hazara Begum G	278.500
30	21-Mar-18	977	Boruria	Shakh Kayamuddin G	207.540
31	21-Mar-18	978	Boruria	Musamat Mofajan Nesa G	112.500
32	28-Mar-18	1054	Boruria	Mohamad Jalal Uddin G	225.250
33	28-Mar-18	1055	Boruria	Md. Sher Ali G	172.250
34	28-Mar-18	1056	Boruria	Md. Shoriful Islam G	195.250
35	28-Mar-18	1057	Boruria	Topon Kumer Behera G	182.050
36	28-Mar-18	1058	Boruria	Showdorshon Ray Chowdury G	314.700
37	2-Apr-18	1060	Boruria	Md. Aowlad Hossain G:	232.500
38	28-Mar-18	1061	Boruria	Md. Layakot G	18.000
39	2-Apr-18	1084	Boruria	Md. Moksed Ali	66.500
40	2-Apr-18	1086	Boruria	Mohammad All G	97.000

Sl	Date	Deed No	Mowja	Giver	Total Land in Decimal
41	3-Apr-18	1101	Boruria	Musamath Jobada Khatun	8.000
42	3-Apr-18	1102	Boruria	Musamath Jobada Katun	13.000
43	4-Apr-18	1122	Boruria	Ms. Asia Khatun (Taherjan)	13.000
44	4-Apr-18	1129	Boruria	Md. Ainul Abidin	15.000
45	4-Apr-18	1133	Boruria	Shakh Shahz Uddin	38.500
46	4-Apr-18	1134	Boruria	Shakh Shahz Uddin	153.000
47	10-Apr-18	1165	Boruria	Md. Abdul Mannan Shakh	24.000
48	11-Apr-18	1216	Boruria	Dalema G	23.660
49	11-Apr-18	1221	Boruria	Md. Nokumoddin	18.000
50	11-Apr-18	1222	Boruria	Md. Molfat Kha	9.500
51	11-Apr-18	1224	Boruria	Md. Ancher Munshi G	106.750
52	12-Apr-18	1226	Boruria	Md. Sumon Hossain	466.150
53	18-Apr-18	1278	Boruria	Shakh Johir Uddin G	58.000
54	18-Apr-18	1280	Boruria	Md. Aktaruzzaman Khan	43.000
55	18-Apr-18	1283	Boruria	Md. Mozibor Rohaman	60.000
56	23-Apr-18	1296	Boruria	Md. Kobbat Ali	32.000
57	23-Apr-18	1299	Boruria	Md. Abue Said Munshi	57.875
58	23-Apr-18	1301	Boruria	Nourur Nahar Begum G	16.000
59	25-Feb-18	1351	Boruria	Md .Rohizuddin	16.000
60	25-Apr-18	1352	Boruria	Md. Afsar Munshi G	35.000
61	15-Apr-18	1356	Boruria	Md. Amjad Ali	13.000
62	7-May-18	1407	Boruria	Md. Gais Ulldin G	27.000
63	7-May-18	1409	Boruria	Md. Abul Kashem	10.000
64	7-May-18	1410	Boruria	Md. Shoid Paramanik	23.000
65	7-May-18	1412	Boruria	Rabia Khatun G	7.720
66	7-May-18	1413	Boruria	Md. Ainuddin Mollah G	31.000
67	7-May-18	1414	Boruria	Md. Khorshed Munshi G	42.500
68	8-May-18	1439	Boruria	Fale Bebi G	62.000
69	16-May-18	1542	Boruria	Md. Showkot Ali	23.000
70	16-May-18	1553	Boruria	Md. Julmoth Ali G	20.000
71	22-May-18	1586	Boruria	Abdur Razzak Mollah	10.000
72	22-May-18	1589	Boruria	Shajada Khatun	6.000
73	22-May-18	1591	Boruria	Md. Abdul Hasem Ga	60.000
74	22-May-18	1592	Boruria	Md. Shohid	21.000
75	30-May-18	1621	Boruria	Khan Mohamad Aftab Uddin	1,330.300
76	22-May-18	1635	Boruria	Md. Halim Mollah	8.000
77	29-May-18	1649	Boruria	Md. Abdul Mojid G	31.000
78	29-Apr-18	1655	Boruria	Md. Abdur Rahaman Munshi G	90.250
79	30-May-18	1665	Boruria	Md. Athaur Rahaman G	60.000
80	30-May-18	1674	Boruria	Md. Jalaluddin Thaqur G	8.000
81	30-May-18	1675	Boruria	Md. Abdur Rohim G	19.000
82	6-Apr-18	1690	Boruria	Md. Akther Hossln	62.000
83	6-Apr-18	1695	Boruria	Shakh Yousuf G	81.500



Sl	Date	Deed No	Mowja	Giver	Total Land in Decimal
84	4-Jun-18	1696	Boruria	Abdur Roshld Mollah	49.500
85	4-Jun-18	1697	Boruria	Shakh Dhoki	13.000
86	5-Jun-18	1701	Boruria	Topon Qumer Sarker	67.500
87	6-Jun-18	1738	Boruria	SK. Abue Bokker Siddik G	148.500
88	11-Jun-18	1745	Boruria	Md. Akter Hossain (Pakhon)	17.800
89	12-Jun-18	1765	Boruria	Topon Qumer Chaki	44.000
90	20-May-18	1797	Boruria	Md. Chamcul Munshi	53.500
91	20-Jun-18	1808	Boruria	Nurul Islam	39.200
92	20-Jun-18	1809	Boruria	Abdul Halim G	61.280
93	20-Jun-18	1810	Boruria	Md. Ansar Ali Munshl	26.000
94	27-Jun-18	1867	Boruria	Md. Rohiz Uddin (Nobin uddin)	32.700
95	9-Jul-18	1959	Boruria	Md. Lutfor Rahman	41.000
96	11-Jul-18	1966	Boruria	Md. Azmot Ali Kha G	242.000
97	11-Jul-18	2011	Boruria	Nazma Akter Shilpi	27.000
98	16-Jul-18	2031	Boruria	Md. Azaharul Islam	33.000
99	16-Jul-18	2036	Boruria	Md. Kaimuddin Sarder	84.000
100	28-Jul-18	2077	Boruria	Shofe Tagore G	41.500
101	22-Jul-18	2078	Boruria	Nurjahan Begum G	529.000
102	23-Jul-18	2092	Boruria	Md. Ansar Munshi	14.000
103	23-Jul-18	2114	Boruria	Jomeron Neca	20.000
104	31-Jul-18	2194	Boruria	Habeja Khatun	5.000
105	31-Jul-18	2213	Boruria	Md. Atoar Rahman	7.000
106	1-Aug-18	2243	Boruria	Adur Rahman Munshi	58.000
107	1-Aug-18	2257	Boruria	Sha kh Siddik G	72.500
108	8-Aug-18	2319	Boruria	Azmot Ali G	100.000
109	8-Aug-18	2324	Boruria	Md. Qubbat Ali G	33.500
110	9-Aug-18	2341	Boruria	Nayeb Ali Sarder	44.000
111	9-Aug-18	2345	Boruria	Md. Hasmoth Ali Khan G	86.500
112	13-Aug-18	2376	Boruria	Md. Hokum Ali G	43.500
113	14-Aug-18	2403	Boruria	Mohammad Ali	50.000
114	27-Aug-18	2443	Boruria	Md. Abdul Chelam Uddin M G	30.750
115	27-Aug-18	2448	Boruria	Md. Abdur Rahman Munshi	113.500
116	27-Aug-18	2458	Boruria	Adur RazzaK G	95.280
117	27-Aug-18	2459	Boruria	Halema Khatun G	51.000
118	27-Aug-18	2460	Boruria	Md. Arshad Ali Munshi	35.000
119	28-Aug-18	2480	Boruria	Md. Anowar Hossain	13.000
120	28-Aug-18	2496	Boruria	Md. Enus Ali G	23.000
121	29-Aug-18	2532	Boruria	Hazera Begum G	16.000
122	29-Aug-18	2533	Boruria	Khushi Begum G	147.500
123	29-Aug-18	2536	Boruria	Khan Md. Aftabuddin	27.000
124	4-Sep-18	2590	Boruria	Mosha. Mahera Khatun G	22.260
125	5-Sep-18	2618	Boruria	Abdul Hamid Khan	44.000
126	5-Sep-18	2627	Boruria	Gonesh Chanro Sutrodhor	18.000

Sl	Date	Deed No	Mowja	Giver	Total Land in Decimal
127	25-May-18	2825	Boruria	Md. Amjad Hossin Mollah G	72.000
128	9-Sep-18	2646	Boruria	Md. Ahmad Ali	20.000
129	9-Sep-18	2659	Boruria	Dalima Begum G	58.260
130	9-Sep-18	2666	Boruria	Shekh Montaz Uddin G	45.000
131	9-Sep-18	2667	Boruria	Mohammad Nayeb Ali	36.500
132	9-Sep-18	2675	Boruria	Md. Jalal Uddin Munshi G	274.000
133	9-Sep-18	2679	Boruria	Md. Chan Mia G	36.750
134	9-Sep-18	2680	Boruria	Md. Chan Mia G	13.000
135	9-Sep-18	2681	Boruria	Md. Chan Mia G	33.500
136	9-Sep-18	2685	Boruria	Md. Chunno Poddar G	223.500
137	23-Sep-18	2744	Boruria	Pankog Kumar Behara	5.500
138	24-Sep-18	2819	Boruria	Md. Abdur Rashid	15.000
139	24-Sep-18	2833	Boruria	Md. Nurul Islam	27.000
140	24-Sep-18	2834	Boruria	Md. Sabed Ali	46.320
141	24-Sep-18	2843	Boruria	Md. Bachchu Talukdar G	34.500
142	7-Oct-18	2967	Boruria	Gonesh Chandro Sutradhor G	12.000
143	7-Oct-18	2969	Boruria	Mohammad Ali	6.000
144	5-Nov-18	3313	Boruria	Noiman Begum	4.570
145	12-Nov-18	3413	Boruria	Md. Lal Mia G	75.500
146	19-Nov-18	3516	Boruria	Md. Jhangir Tangore G	8.500
147	20-Nov-18	3536	Boruria	Abdul Gofur Shekh	11.000
148	20-Nov-18	3538	Boruria	Md. Aziz Munshi	12.000
149	25-Nov-18	3575	Boruria	Jomna Orfe Jobina G	25.000
150	25-Nov-18	3581	Boruria	Munshi Golam Azmir G	106.000
151	26-Nov-18	3597	Boruria	Vanu Begum G	2.500
152	26-Nov-18	3607	Boruria	Abdul Gofur G	21.000
153	5-Dec-18	3700	Boruria	Salma Begum	45.000
154	5-Dec-18	3701	Boruria	Hasna Begum	7.000
155	19-Dec-18	3885	Boruria	Md. Alauddin	23.000
156	19-Dec-18	3887	Boruria	Md. Nowsher Ali Munshi	115.000
157	7-Jan-19	35	Boruria	Md. Muzibar Munshi	302.250
158	8-Jan-19	36	Boruria	Sudorsan Rai Chowdhury	306.780
159	9-Jan-19	39	Boruria	Md. Jalal Uddin	418.000
160	9-Jan-19	42	Boruria	Ainuddin Mollah	12.500
161	9-Jan-19	46	Boruria	Md. Lehaz Uddin Pramanik	38.000

**13,878.035**

## **APPENDIX Q      LAND OWNER LIST- TRANSMISSION LINE**



কব ৮৭৭৪৬৫৯

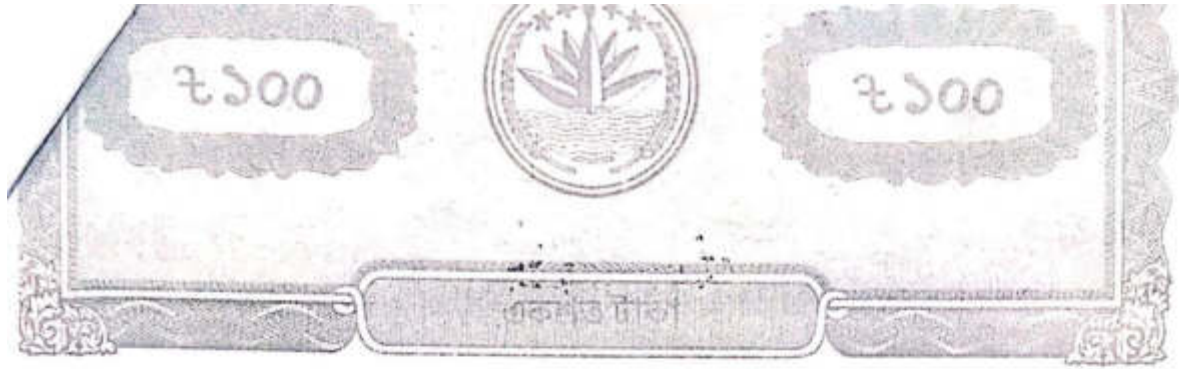
অঙ্গীকার নামা

অঙ্গীকারনামা

আমরা নিম্ন স্বাক্ষরকারীগণ এই মর্মে অঙ্গীকার করিতেছি যে, আমাদের জমির উপর দিয়ে স্পেক্ট্রা সোলার পার্ক লিমিটেড এর নির্মাণাধীন বিদ্যুৎ কেন্দ্র পর্যন্ত যে ৩৩কেভি ট্রান্সমিশন লাইন নির্মাণ করা হবে, তার জন্য প্রস্তাবিত শাইন বরাবর ২০ ফুট চওড়া জমির জন্য শতাংশ প্রতি ২৫,০০০/- টাকা হিসাবে সমস্ত ক্ষতিপূরণ পাইয়াছি। এছাড়াও প্রতিটি বিদ্যুতের খুঁটি স্থাপনের জন্য অকৃষি জমি হইলে খুঁটি প্রতি ৪০,০০০/- টাকা এবং কৃষি জমি হইলে খুঁটি প্রতি ২৫,০০০/- টাকা করে ক্ষতিপূরণ বুঝিয়া পাইয়াছি।

যেহেতু আমরা যথাযথ ক্ষতিপূরণ পাইয়াছি, সেহেতু আমাদের জমির উপর বিদ্যুতের খুঁটি স্থাপন এবং ৩৩ কেভি ট্রান্সমিশন লাইন নির্মাণ করা হইলে আমাদের কোন আপত্তি নাই মর্মে আমরা নিম্নস্বাক্ষরকারীগণ স্বাক্ষর করিতেছি :

ক্রমিক নং	নাম	ঠিকানা	দাগ নম্বর	মৌজা	স্বাক্ষর
১	মোঃ আক্তারুজ্জামান	ধুতুরাবাড়ী	১২৯৪	বরুরিয়া	আক্তারুজ্জামান নাম
২	মোঃ আক্তারুজ্জামান	ধুতুরাবাড়ী	১২৯৩	বরুরিয়া	আক্তারুজ্জামান নাম
৩	মোঃ রশিদ মোস্তা	কোদাদিয়া	১২৭০	বরুরিয়া	মোঃ রশিদ
৪	কোলিমুদ্দিন গায়েন	দরিকান্দি	১২৬০	বরুরিয়া	কোলিমুদ্দিন
৫	রনজিবুল	দরিকান্দি	১১৪২	বরুরিয়া	রনজিবুল
৬	মোঃ আনছার মুন্সি	দরিকান্দি	১১৩৮	বরুরিয়া	মোঃ আনছার মুন্সি
৭	মোঃ আনছার মুন্সি	দরিকান্দি	১১৩৮	বরুরিয়া	মোঃ আনছার মুন্সি
৮	মোঃ হযরত আলী	দরিকান্দি	১১৪৯	বরুরিয়া	মোঃ হযরত আলী
৯	মোঃ আনছার মুন্সি	দরিকান্দি	১১৫৯	বরুরিয়া	মোঃ আনছার মুন্সি



কব ৮৭৭৪৬৫৮

১০	কিয়ামুদ্দিন	দরিকান্দ	১১৬৬	বররিয়া	কিয়ামুদ্দিন কিয়ামুদ্দিন
১১	মোঃ আব্দুল লতিফ	দরিকান্দ	১১৬৭	বররিয়া	আব্দুল লতিফ
১২	মোঃ আব্দুল লতিফ	দরিকান্দ	১১৭৫	বররিয়া	আব্দুল লতিফ
১৩	মোঃ হযরত আলী	বররিয়া	১১৮৩	বররিয়া	হযরত আলী
১৪	মোঃ আরিফুল ইসলাম	দরিকান্দ	৮৮৭	বররিয়া	আরিফুল ইসলাম
১৫	মোঃ আরিফুল ইসলাম	দরিকান্দ	৮৮৭	বররিয়া	আরিফুল ইসলাম
১৬	বিরেন বেহারা	তিলোচানপট্ট	৮৮০	বররিয়া	বিরেন
১৭	দুলাল বেহারা	তিলোচানপট্ট	৮৭৮	বররিয়া	দুলাল বেহারা
১৮	দুলাল বেহারা	তিলোচানপট্ট	৮৭৬	বররিয়া	দুলাল বেহারা
১৯	মোঃ জালাল মুন্সি	তেঘরিয়া	১১২	বররিয়া	জালাল মুন্সি
২০	মোঃ জালাল মুন্সি	তেঘরিয়া	১১২	বররিয়া	জালাল মুন্সি
২১	মোঃ আক্তারুজ্জামান	ধুতুরাবাড়ী	১৯৫	বররিয়া	আক্তারুজ্জামান
২২	মোঃ আক্তারুজ্জামান	ধুতুরাবাড়ী	১৯৫	বররিয়া	আক্তারুজ্জামান
২৩	মোঃ আক্তারুজ্জামান	ধুতুরাবাড়ী	১৯৫	বররিয়া	আক্তারুজ্জামান
২৪	মোঃ ছবোরদ্দিন	বররিয়া	২০২	বররিয়া	ছবোরদ্দিন
২৫	মোঃ আইনাল হক	বররিয়া	২০৭	বররিয়া	আইনাল হক
২৬	মোঃ বাচ্চু ভাস্করদাস	তেঘরিয়া	২৩৭	বররিয়া	বাচ্চু ভাস্করদাস
২৭	মোঃ পিয়ার আলী	বররিয়া	২৩৯	বররিয়া	পিয়ার আলী
২৮	সায়েব আলী/চাঁদ	তিলোচানপট্ট	২৫৩	বররিয়া	সায়েব আলী
২৯	মোঃ হযরত আলী	বররিয়া	১৬২	বররিয়া	হযরত আলী
৩০	মোঃ ছাত্তার	বররিয়া	২৬৭	বররিয়া	ছাত্তার
৩১	মোঃ ছাত্তার	বররিয়া	২৬৭	বররিয়া	ছাত্তার
৩২	মোঃ মাইনুদ্দিন	বররিয়া	২৭২	বররিয়া	মাইনুদ্দিন



কব ৮৭৭৪৬৬০

৩৩	মোঃ মাইনুদ্দিন	বকরিয়া	২৭২	বকরিয়া	মাইনুদ্দিন
৩৪	মোঃ ইছাহক খান মো: সনজুল	বকরিয়া	১৩০৮	খুতরাবাড়ী	সবুল/সবুল
৩৫	মোঃ জলিল তালুকদার	ছোট খুতরাবাড়ী	১৩০৬	খুতরাবাড়ী	মি: সনজুল
৩৬	মোঃ সাহাজাহান	তেঘরিয়া	১০১৬	খুতরাবাড়ী	মি: সনজুল
৩৭	মোঃ শফি মোল্লা	তেঘরিয়া	৯৩৩	খুতরাবাড়ী	শফিউদ্দিন
৩৮	মোঃ শফি মোল্লা ১২	তেঘরিয়া	৯৩৩	খুতরাবাড়ী	শফিউদ্দিন
৩৯	মোঃ শফি মোল্লা ১৩	তেঘরিয়া	৯৩২	খুতরাবাড়ী	মো: মজিবুল মোল্লা
৪০	মোঃ শফি মোল্লা ১৪	তেঘরিয়া	৯৩২	খুতরাবাড়ী	মো: মজিবুল মোল্লা
৪১	মোঃ শফি মোল্লা ১৫	তেঘরিয়া	৯২২	খুতরাবাড়ী	মো: মজিবুল মোল্লা
৪২	মোঃ শফি মোল্লা ১৬	তেঘরিয়া	৯২০	খুতরাবাড়ী	
৪৩	মোঃ পেনা খান	তেঘরিয়া	৯১৭	খুতরাবাড়ী	মো: সৈয়দুল আলম
৪৪	মোঃ নইয়ুদ্দিন	তেঘরিয়া	৮৭১	খুতরাবাড়ী	
৪৫	গোপাল/স্বপ্ন	খুতরাবাড়ী	৮৮২	খুতরাবাড়ী	গো: সৈয়দুল আলম
৪৬	মোঃ রোকন কাজী	খুতরাবাড়ী	৮৬১	খুতরাবাড়ী	মো: সৈয়দুল আলম
৪৭	মো: সৈয়দুল আলম	বকরিয়া	২০৭	বকরিয়া	মো: সৈয়দুল আলম
৪৮	মো: সৈয়দুল আলম	বকরিয়া	২০৭	বকরিয়া	মো: সৈয়দুল আলম

আমার উপস্থিতিতে জমির মালিকগণ ক্ষতিপূরণ প্রাপ্ত হইয়া এই অঙ্গীকার নামায় স্বাক্ষর করিয়াছেন।

মোঃ আতিকুররহমান খান (মাসুম)

চেয়ারম্যান

৫নং আরুয়া ইউনিয়ন পরিষদ

শিবালয়, মানিকগঞ্জ।

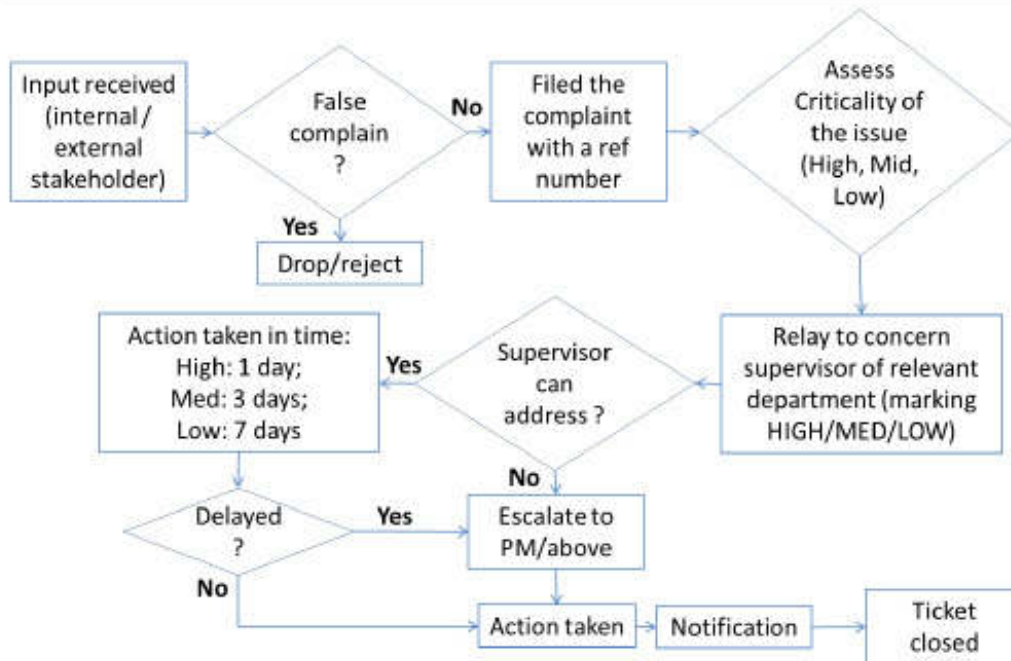
## **APPENDIX R      GRIEVANCE REDRESS MECHANISM**

## Grievance Redress Mechanism/Guideline

### Objective of this document

To provide a basic guideline to people/ any affected person (both internal & external) to be able to lodge/share any complain in connection to the site, work environment, surroundings etc.

### Basic flowchart



### Key points:

- Complain may be received over phone/email/letter/verbally at the complain desk. Full identity needs to be disclosed while placing the complain. For critical sophisticated issues, it can be addressed to company HR.
- Grievance Redress form is to be maintained/follow.

SSPL-QM/POLICY – 0053

Revision no: 00



- Site complain desk should be visible to people. At office for internal stakeholders separate book should be maintained.
- People awareness should be created on this methodology.
- Equality should be displayed during process irrespective of religion, cast, origin, gender, job grade, sub-contract workers.
- Category of Grievances
  - **Criticality LOW:** Minor, straightforward issues may only need screening before proceeding to the next step (resolution options and response). Review of minor issues, especially those related to a complainant's request for information, can generally be handled easily by providing information on the spot, or referring the person to the designated representative from the project team.
  - **Criticality MID:** Less clear, more problematic, or repetitive issues, or group complaints may need a more detailed review prior to action. Staff involved in handling grievances may need to seek advice internally, and in some cases turn to outside parties to help in the validation process, especially in cases of damage claims.
  - **Criticality HIGH:** Complex issues with multiple parties may need investigation can be organized internally, or the company may designate third-party experts to investigate when impartiality is important or when complex technical matters are involved. If an extensive investigation is found to be necessary, it shall be initiated swiftly before circumstances change or the conflict escalates further.

## **APPENDIX S**

## **ENVIRONMENTAL AND SOCIAL COMPLIANCE AUDIT REPORT**



**Spectra Solar Park Limited**

# **Environmental & Social Impact Assessment of 35 MW Solar Power Project in Manikganj District of Bangladesh**

**Environmental and Social Compliance  
Audit**

28 February 2019

Project No.: 0495823

Document details	
Document title	Environmental & Social Impact Assessment of 35 MW Solar Power Project in Manikganj District of Bangladesh
Document subtitle	Environmental and Social Compliance Audit
Project No.	0495823
Date	28 February 2019
Version	1.0
Author	Salil Das, Dwaipayan Dutta
Client Name	Spectra Solar Park Limited

#### Document history

Version	Revision	Author	Reviewed by	ERM approval to issue		Comments
				Name	Date	
1.0	00	Salil Das, Dwaipayan Dutta	Naval Chaudhary, Soumi Ghosh	Neena Singh	28.02.2019	Draft Report

---

## Signature Page

28 February 2019

# Environmental & Social Impact Assessment of 35 MW Solar Power Project in Manikganj District of Bangladesh

## Environmental and Social Compliance Audit

---

Neena Singh  
Managing Partner

---

Naval Chaudhary  
Principal Consultant

---

Soumi Ghosh  
Senior Consultant

### ERM India Private Limited

Building 10A  
4th Floor, DLF Cyber City  
Gurgaon, NCR – 122002  
INDIA

© Copyright 2019 by ERM Worldwide Group Ltd and / or its affiliates ("ERM").  
All rights reserved. No part of this work may be reproduced or transmitted in any form,  
or by any means, without the prior written permission of ERM

## CONTENTS

<b>1.</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Background to the Environmental & Social Compliance Audit .....	1
1.2	Primary Objective and Scope of the Study .....	1
1.3	Approach and Methodology .....	3
1.3.1	Kick Off Meeting and Corporate Overview .....	3
1.3.2	Site Visit .....	3
1.3.3	Documentation Review .....	4
1.3.4	Gap Assessment and CAP .....	4
1.3.5	Reporting .....	4
1.4	Limitations.....	4
1.4.1	Use of the Report.....	5
1.5	Layout of the Report .....	5
<b>2.</b>	<b>PROJECT OVERVIEW AND CONTEXT SETTINGS .....</b>	<b>6</b>
2.1	The Project .....	6
2.1.1	Project Location & Accessibility .....	6
2.1.2	Power Evacuation Transmission Line .....	6
2.2	Environmental Settings .....	9
2.3	Resource Requirement .....	12
2.4	Construction Activity .....	12
2.4.1	Approach Road .....	12
2.4.2	Site Development.....	12
2.4.3	EPC Works .....	13
2.5	Construction Material & Waste Storage Area .....	13
2.6	Diesel Storage .....	14
2.7	Workforce & Labour Camp .....	14
2.7.1	Site Development Activity .....	14
2.7.2	EPC Activity .....	15
2.8	Waste Generation, Treatment & Disposal .....	15
<b>3.</b>	<b>REGULATORY COMPLIANCE STATUS AND GAP ASSESSMENT.....</b>	<b>17</b>
3.1	Status of Legal Permits & Clearance as GoB Requirement.....	17
3.2	Compliance of ADB Safeguard and Social requirements .....	18
3.2.1	SR-1: Environmental Safeguards.....	18
3.2.2	SR-2: Involuntary Resettlement Safeguards .....	22
3.2.3	SR-3: Indigenous Peoples Safeguards .....	31
<b>4.</b>	<b>CORRECTIVE ACTION PLAN.....</b>	<b>33</b>

### List of Tables

Table 1.1	Schedule of activities undertaken during the site visit .....	3
Table 2.1	Environmental Settings of the Project.....	9
Table 2.2	Resource Requirement Details .....	12
Table 3.1	Legal Permits & Clearance .....	17
Table 3.2	Year wise Land Procurement Summary .....	24
Table 3.3	Consultation Details .....	27
Table 3.4	Socio-economic Profile .....	29
Table 3.5	Socio-economic Profile .....	30
Table 4.1	Corrective Action Plan .....	34

## List of Figures

Figure 1.1	Regional Setting Map of Project .....	2
Figure 1.2	Site and Consultation Photographs .....	4
Figure 2.1	Location map of 35 MW Solar Power Park, Manikganj .....	7
Figure 2.2	Proposed Transmission Line Corridor Map .....	8
Figure 2.3	Environmental Setting Map .....	11
Figure 3.1	Land Procurement Process .....	23
Figure 3.2	Procedure to use the Transmission Line ROW .....	24
Figure 3.3	Map of Arua Union .....	31
Figure 4.1	Risk Categorisation .....	33

## List of Boxes

Box 3.1	Summary DC Office clearance for non-agricultural land .....	25
Box 3.2	Briefing of Site selection .....	25
Box 3.3	Observations based on discussion with land Sellers .....	28
Box 3.4	Issues raised during Focus Group Discussion .....	28
Box 3.5	Focused group consultation with agriculture labour/share cropper .....	28

<b>APPENDIX A</b>	<b>LAND OWNERS LIST – SOLAR PARK</b>
<b>APPENDIX B</b>	<b>LAND OWNERS LIST – TRANSMISSION LINE ROW</b>
<b>APPENDIX C</b>	<b>LIST OF STRUCTURE (SHOPS) AT TRANSMISSION LINE ROW</b>
<b>APPENDIX D</b>	<b>HOUSEHOLD SURVEY QUESTIONNAIRE</b>
<b>APPENDIX E</b>	<b>UNION PARISAD PROFILE QUESTIONNAIRE</b>
<b>APPENDIX F</b>	<b>NOC LETTER FROM SHIVALAYA UPAZILA</b>
<b>APPENDIX G</b>	<b>NOC LETTER FROM ARUA UNION PARISHAD</b>
<b>APPENDIX H</b>	<b>DC OFFICE CLEARANCE FOR CONVERSION FROM AGRICULTURAL LAND TO NON-AGRICULTURAL LAND</b>
<b>APPENDIX I</b>	<b>DC OFFICE CLEARANCE LETTER FOR LAND FILLING</b>
<b>APPENDIX J</b>	<b>SALE DEED COPY</b>
<b>APPENDIX K</b>	<b>LAND RATE</b>
<b>APPENDIX L</b>	<b>LETTER OF INTENT (LOI) FROM BPDB</b>
<b>APPENDIX M</b>	<b>THE STATE ACQUISITION AND TENANCY ACT, 1950</b>
<b>APPENDIX N</b>	<b>GRIEVANCE REDRESS MECHANISM/ GUIDELINE OF SSPL</b>

## Acronyms and Abbreviations

Name	Description
ADB	Asian Development Bank
ARIPA	Acquisition and Requisition of Immovable Property Act
BBS	Bangladesh Bureau of Statistics
BDT	Bangladeshi Taka
BPDB	Bangladesh Power Development Board
CAP	Corrective action plans
DC	Deputy Commissioner
E&S	Environment and Social
EA	Executing Agency
EC	Environmental Clearance
EHS	Environmental, Health and Safety
EPC	Engineering, Procurement and Construction
ESAP	Environmental and Social Action Plan
ESHS	Environmental, Social, Health and Safety
FGD	Focused Group Discussion
GoB	Government of Bangladesh
GRM	Grievance Redressal Mechanism
HH	Household
HR	Human resources
IEE	Initial Environmental Examination
IPP	Indigenous Peoples Plan
JSA	Job Safety Analysis
KfW	KfW Development Bank
KII	Key Informants Interview
KM	Kilometer
M&R	Monitoring and Reporting
M&S	Monitoring and Supervision
NGO	Non-Government Organization
NOC	No Objection Certificate
P&HC	Population and Housing Census
PAP	Project Affected Person
PD	Project Director
PPE	Personal Protective Equipment
PTW	permit to work
R&R	Resettlement and Rehabilitation
RHD	Roads and Highways Department
ROU	Right of Use
ROW	Right of Way



Environmental and Social Compliance Audit

Name	Description
SEP	Stakeholder Engagement Plan
SOP	Standard operating procedure
SR	Safeguard Requirements
SSPL	Spectra Solar Park Limited
TL	Transmission Line
ToR	Terms of Reference

## 1. INTRODUCTION

ERM India Private Limited (hereafter referred to as 'ERM') has been commissioned by Spectra Solar Park Limited (hereafter referred to as "Spectra" or the "Client") to undertake an Environmental and Social Impact Assessment (hereafter referred to as the "assignment") for a proposed Greenfield 35 MW PV Solar Plant in Manikganj District, Bangladesh (hereafter referred to as the "Project"). As part of the assignment, ERM undertook an environmental and social (E&S) compliance audit and a flood likelihood assessment of the Project in the month of February 2019. This report presents the findings of the E&S compliance audit. This document presents the risks identified, against the applicable reference framework and the proposed way forward.

### 1.1 Background to the Environmental & Social Compliance Audit

The Project is located in-Shibalaya Upazilla of Manikganj District (refer Regional Setting Map **Figure 1.1**). It is an Independent Power Producer (IPP) project, where project sponsor is a Consortium Spectra Engineers Ltd. and Shunfeng Investment Ltd. (hereinafter referred to as "Sponsors"), who will construct, implement and operate this project for 20 years. The project will sell produced electricity to the Bangladesh Power Development Board (BPDB) at 0.139 USD/kwh for 20 years from the date of commercial operation.

It is understood that the Project is intended to get project financing from the Asian Development Bank (ADB) and the DEG (collectively referred to as "Lenders"). Lenders are in the process of sanctioning loan facility to the Project and therefore sought appointment of an Independent Consultant for undertaking an Environmental and Social Impact Assessment study along with E&S compliance audit of the Project.

ERM has carried out the E&S compliance audit in accordance with the ADB's safeguard Policy. This report highlights the outcome of this appraisal in the form of:

- a gap assessment with respect to the applicable ADB –Environment and Social Safeguard requirement and national/ local regulations describing areas of conformance and non-conformance; and
- a corrective action plan (CAP), which highlights key issues of non-conformance along with proposed corrective actions with tentative timelines.

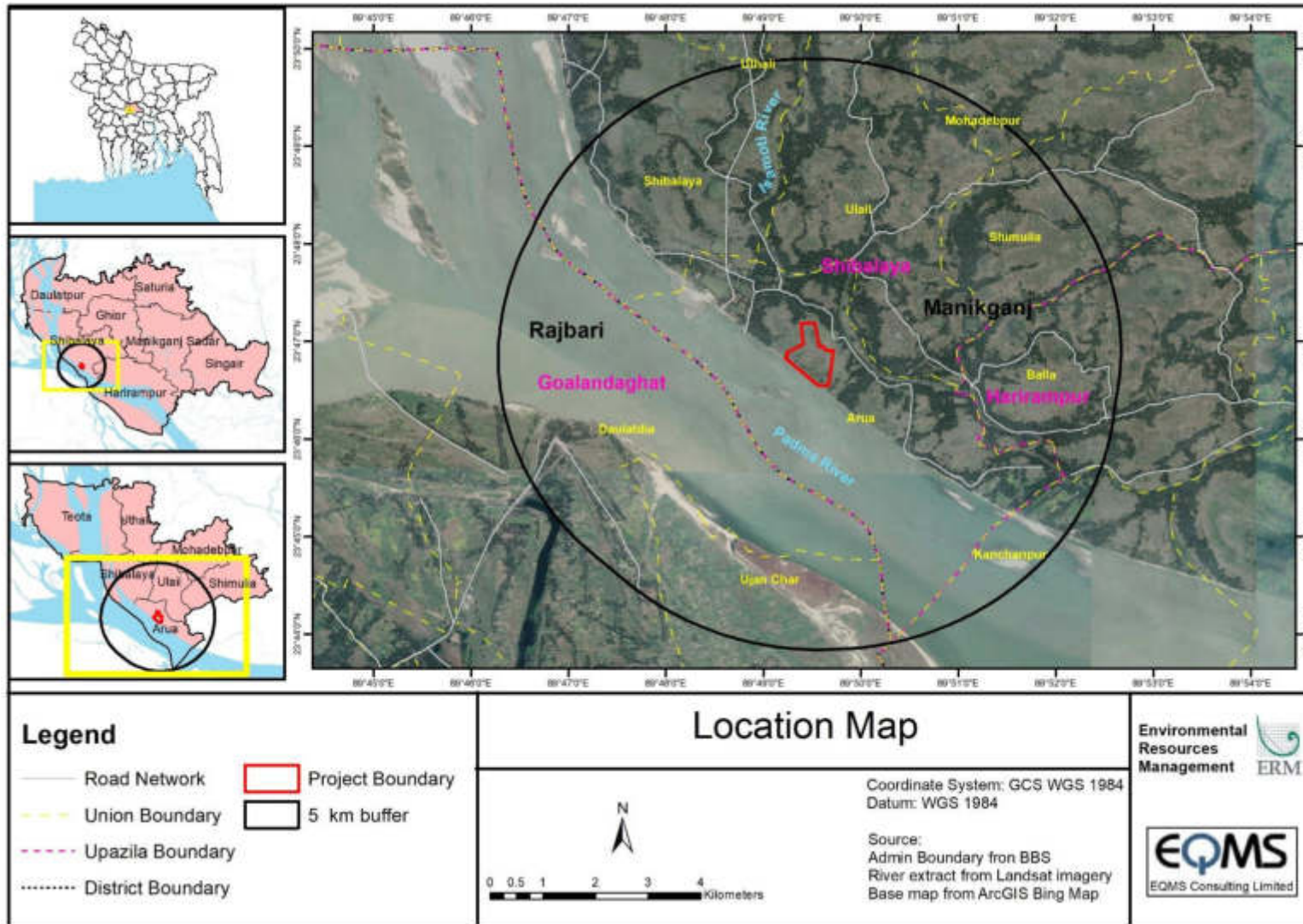
### 1.2 Primary Objective and Scope of the Study

The objective of the E&S compliance audit was to assess the environment and social risks associated with project development and undertake a gap assessment with respect to the applicable ADB safeguard requirements as well as National & local regulations, describing areas of conformance and non-conformance.

The specific scope of the study includes:

- Discussions with Spectra and their sub-contractors;
- Review of relevant onsite legal compliance;
- Visit to particular project areas (proposed solar power project site and transmission line)
- Identifying the various environmental and social non-compliances and gaps observed during the site visit; and
- Identify the necessary mitigation measures and/or recommend additional actions as necessary to be included in the CAP.

Figure 1.1 Regional Setting Map of Project



## 1.3 Approach and Methodology

The approach is based on its understanding of the assignment, and the past experience of the audit team of working on similar projects. The methodology adopted for the environmental and social audit (E&S Audit) is covered in the following key activities:

### 1.3.1 Kick Off Meeting and Corporate Overview

A kick-off meeting was undertaken with the Spectra team at their corporate office in Dhaka on 6 February 2019, to gain insight into the overview of the proposed solar power project. The Asian Development Bank, Green Delta Capital Limited and KFW-DEG representatives were also present in the kick-off meeting. The discussions were aimed at developing an understanding of the following components:

- **Organisation background:** including brief history, organisational structure.
- **Current Status:** Current status of the project and timeline for completion of the project.
- **Regulatory requirements:** Copies of various consents and approvals obtained by the Company to comply with the applicable national and local regulations were reviewed and the conditions checked. Other quality certifications or accreditations were also reviewed;
- **Environmental and Social Management systems:** measures undertaken by the Company to ensure environmentally sound and safe performance of the ongoing projects/ facilities was discussed.

### 1.3.2 Site Visit

A team of environmental and social professionals from ERM and EQMS Consulting Limited, Bangladesh (EQMS) undertook the site visit from 6 February to 8 February, 2019. The lenders have also visited the site during same period. Spectra team was represented by officials from the Project Development, Environment, Health & Safety and Land who were available for discussions and sharing of documents with the ERM- EQMS team in course of the site visit.

**Table 1.1 Schedule of activities undertaken during the site visit**

Day	Date	Location	Activity
Day 1	06.02.2019	Office of Spectra and project site	<ul style="list-style-type: none"> <li>• Opening meeting with the officials at corporate office</li> <li>• Discussions regarding the policies, systems and workforce details;</li> <li>• Visit to the site and meeting with construction manager</li> </ul>
Day 2	07.02.2019	Site visit and discussion with Spectra team & Sub-contractor	<ul style="list-style-type: none"> <li>• Transect walk for the whole site (Solar power project site)</li> <li>• Discussion with stakeholders- land sellers, general community; EPC contractors and staff, local/site based EHS team etc</li> <li>• Environmental, health &amp; safety and social audit;</li> <li>• Drainage and flood risk related information collection;</li> <li>• Environmental sensitivity assessment</li> </ul>
Day 3	08.02.2019	Site visit and discussion with Spectra team and Wrap up discussion	<ul style="list-style-type: none"> <li>• Route survey of proposed transmission line;</li> <li>• Discussion with project team at site</li> <li>• Social consultation at nearby villages</li> </ul>

## Figure 1.2 Site and Consultation Photographs



Discussion with Project Team



Site Visit



Consultation with Land Sellers



Discussion with Workforce

### 1.3.3 Documentation Review

The documentation review for the E&S Audit was carried out at two levels, i.e. at the site level and a desktop review, post-completion of the site visit.

### 1.3.4 Gap Assessment and CAP

In addition to the project level observations and key findings, the assignment also involved providing a corrective action plan (CAP) to close the identified gaps.

### 1.3.5 Reporting

This report compiles the findings and observations from the site assessment, review of documentation provided by Spectra, outcomes of stakeholder interactions held during the E&S Audit process. The report also provides a CAP in **Table 4.1** covering a summary of the key E&S issues observed as part of the assessment and respective corrective actions to address the same with a tentative timeline.

## 1.4 Limitations

The scope of work did not include any sampling, analysis of environmental media, collection of primary data, engineering design or development of technical specifications or cost estimates among others.

While this assessment has endeavoured to undertake a comprehensive review against the requirements of the applicable standards, however there remains certain limitations to the assessment, which should be considered:

- The E&S Audit is focussed on a review of the Spectra operation related to 35 MW Manikganj Solar Power Project and associated EHS related consents, licenses and permits only;

- The project description, and status of policies and procedures, presented in this report, is based on the information made available by the Spectra till 18 February 2019;
- The E&S Audit is a high-level assessment of environmental and social risks/issues and should not be construed as a detailed legal compliance review;
- Information provided in this report cannot be construed as legal advice;
- We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above;
- This report is confidential to the Client and their Lenders and ERM accepts no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk;
- ERM's findings are accurate and complete only to the extent that information provided to ERM was itself accurate and complete
- ERM's assessment is based on the current status of regulations in Bangladesh as well as our professional judgment on reasonably foreseeable regulations.

Professional judgements expressed herein are based on facts and information provided to ERM. Wherever ERM has not been able to make a judgement or assess any process, it has highlighted that as an information gap.

### 1.4.1 Use of the Report

ERM is not engaged in consulting or reporting for the purpose of advertising, sales promotion, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity purposes. Client acknowledges this report has been prepared for their and their clients' exclusive use and agrees that ERM reports or correspondence will not be used or reproduced in full or in part for such purposes, and may not be used or relied upon in any prospectus or offering circular. Client also agrees that none of its advertising, sales promotion, or other publicity matter containing information obtained from this assessment and report will mention or imply the name of ERM.

Nothing contained in this report shall be construed as a warranty or affirmation by ERM that the site and property described in the report are suitable collateral for any loan or that acquisition of such property by any lender through foreclosure proceedings or otherwise will not expose the lender to potential environmental or social liability.

## 1.5 Layout of the Report

The report is structured as under:

- Section 1: Introduction (including background to the E&S assessment, Scope, Approach and Methodology (this section))
- Section 2: Project Overview and Context Setting
- Section 3: Regulatory Compliance Status and Gap Assessment
- Section 4: Corrective Action Plan

## 2. PROJECT OVERVIEW AND CONTEXT SETTINGS

### 2.1 The Project

#### 2.1.1 Project Location & Accessibility

The proposed 35 MW Solar Project is located at Arua Union, Shibalaya Upazilla in Manikganj District. The proposed project site lies within Latitude 23°47'10.92" N to 23°46'33.07" N and Longitude 89°49'24.70" E to 89°49'40.21 E. This place is well connected with Manikganj District Headquarters to the North-West and Dhaka City to the East and South-East. The Project is well accessible by road from Dhaka at a distance of 65 km. The nearest town Manikganj is located approximately 18 km from the site. The plant location on satellite imagery and coordinates of the plant boundary delineated on the satellite imagery is represented in **Figure 2.1**.

#### 2.1.2 Power Evacuation Transmission Line

Power generated from the Project will be evacuated to proposed Barangail Grid Sub-Station. Before commissioning of Barangail, Manikganj 132/33 kV grid substation, power generated from Solar Power Plant will be evacuated through 33 kV double circuit line to bus-bar of Paturia 33/11 kV substation (by one circuit) and tapping another circuit with existing 33 kV line near Gheor 33/11 kV substation. Spectra Solar Park Limited (SSPL) will construct 7.2 km power transmission line from project site to existing Pauria Sub-station. The Paturia transmission corridor map is presented in **Figure 2.2**.

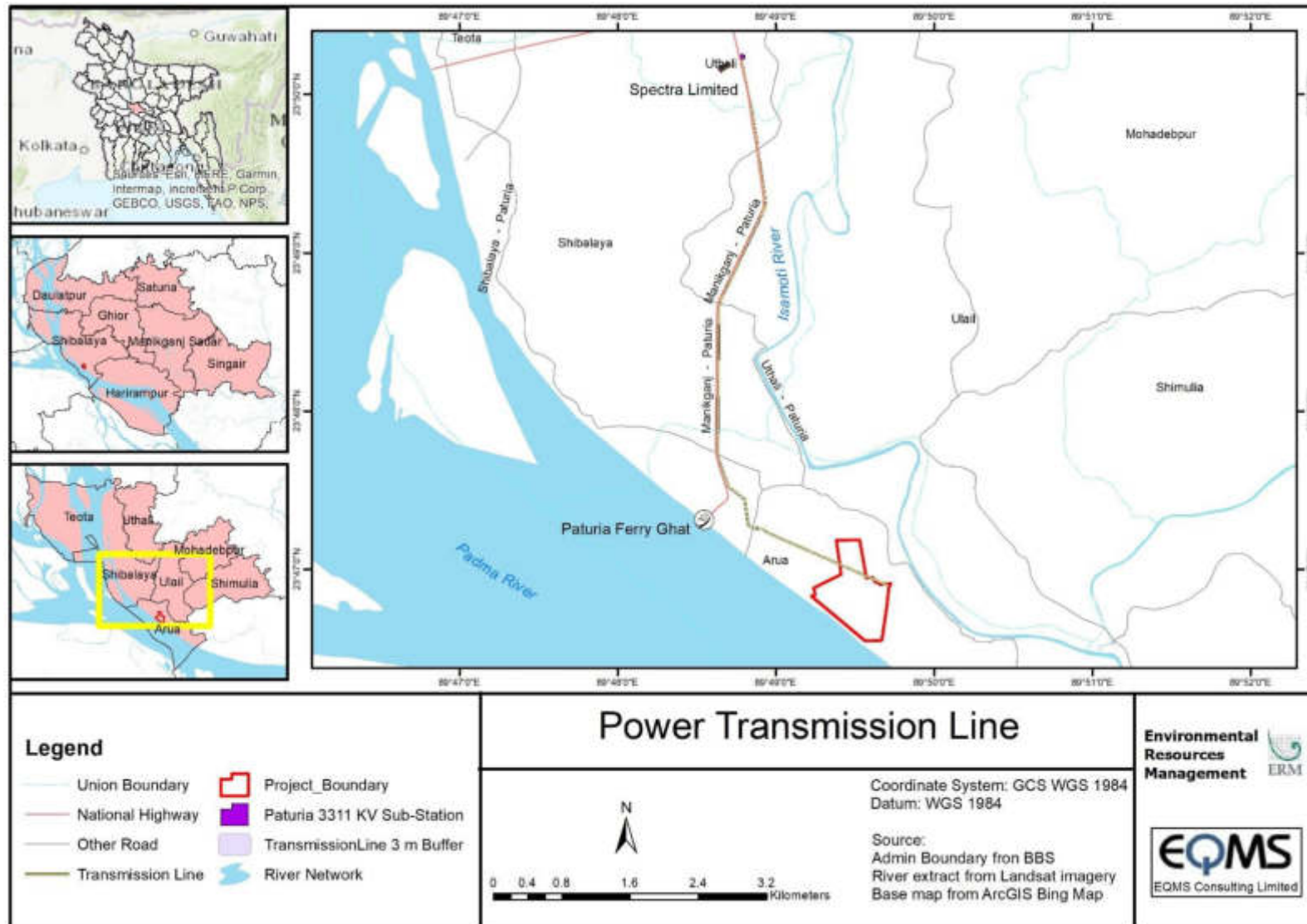
The width of Right of Use (RoU) of transmission line is 6 Meter (20 feet). Proposed transmission line route is falling 3.5 km in the Government Land and remaining 3.7 km in private land. The 3.5 km of the government land is the land of Roads and Highways Department (RHD) of Dhaka-Paturia Highway. The transmission line route is passing through Dhutrabari, Nobogram, Kashadoho, Aarpara, Rishadi, Bororia, Treghori villages of Arua and Shivalaya Union.

Figure 2.1 Location map of 35 MW Solar Power Park, Manikganj





Figure 2.2 Proposed Transmission Line Corridor Map



## 2.2 Environmental Settings

The total area of the Project site is approximately 138.78 acres. As per land records and Manikganj DC office clearance letter, it was a non-agricultural land. The project has also procured 1.0 acre land for site approach road and 0.3 acre land for residential unit. The environmental setting of the site is presented in **Table 2.1**.

**Table 2.1 Environmental Settings of the Project**

S. No.	Environmental Features	Details																														
1.	Site surroundings	<ul style="list-style-type: none"> <li>■ North – Tilochanpatti village (0.1 km from site boundary)</li> <li>■ South – Padma River 0.04 km from site boundary)</li> <li>■ East – Dariakandi village, Lakhipura village and Nayakandi village ((0.25 km, 0.35km, 0.25 km respectively from site boundary)</li> <li>■ West- Paturia village (0.3 km from site boundary)</li> </ul>																														
2.	Site Drainage	The drainage of the project site and its area is controlled through a small nala (streamlets) that is seasonal in nature. This nala is flowing towards east and joins Ichamati River. The Dhaleswari River is flowing from north to south, which is ultimately joins Padma River near Jhitka. During monsoon period water from Padma River backflow to Ichamati River and inundated that area. The consultation with the local villagers reveals that site is inundated about 4-5 months during monsoon period.																														
3.	Site Topography	The project site is locate in Ganges flood plan. Originally, the site was low laying land. Now the site is raised about 2 to 2.5 m. The Padma river is situated towards south and south west, approximately 50 m from site boundary. Villages are located towards, north, east and south. Ichamati River is located on the eastern side, approximately 450 m from site boundary.																														
4.	Site land use (pre-project)	<p>As per revenue record, the major part of the project site was Nal (low laying agricultural land) around 95%. The land area of the project site remains inundated for almost six months every year The other land use details are as follows:</p> <table border="1"> <thead> <tr> <th>Land category</th> <th>Area (acre)</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Nal (low agricultural land)</td> <td>134.95</td> <td>95.21</td> </tr> <tr> <td>Bari (homestead)</td> <td>5.39</td> <td>3.80</td> </tr> <tr> <td>Bashjhar (bamboo thicket)</td> <td>0.10</td> <td>0.07</td> </tr> <tr> <td>Bhiti (high land)</td> <td>0.30</td> <td>0.21</td> </tr> <tr> <td>Matiyal (low non-agricultural land)</td> <td>0.46</td> <td>0.32</td> </tr> <tr> <td>Palan (homestead garden area)</td> <td>0.14</td> <td>0.10</td> </tr> <tr> <td>Bagan (orchard)</td> <td>0.31</td> <td>0.22</td> </tr> <tr> <td>Doba (marshy land)</td> <td>0.09</td> <td>0.06</td> </tr> <tr> <td><b>Total</b></td> <td><b>141.74</b></td> <td><b>100.00</b></td> </tr> </tbody> </table>	Land category	Area (acre)	Percentage	Nal (low agricultural land)	134.95	95.21	Bari (homestead)	5.39	3.80	Bashjhar (bamboo thicket)	0.10	0.07	Bhiti (high land)	0.30	0.21	Matiyal (low non-agricultural land)	0.46	0.32	Palan (homestead garden area)	0.14	0.10	Bagan (orchard)	0.31	0.22	Doba (marshy land)	0.09	0.06	<b>Total</b>	<b>141.74</b>	<b>100.00</b>
Land category	Area (acre)	Percentage																														
Nal (low agricultural land)	134.95	95.21																														
Bari (homestead)	5.39	3.80																														
Bashjhar (bamboo thicket)	0.10	0.07																														
Bhiti (high land)	0.30	0.21																														
Matiyal (low non-agricultural land)	0.46	0.32																														
Palan (homestead garden area)	0.14	0.10																														
Bagan (orchard)	0.31	0.22																														
Doba (marshy land)	0.09	0.06																														
<b>Total</b>	<b>141.74</b>	<b>100.00</b>																														
5.	Ecological Sensitivity	There is no designated ecological sensitive area like National Park, Wildlife Sanctuary in 10 km radius area of the solar power project site. There is no natural forest in the 5.0 km radius area of the solar																														

S. No.	Environmental Features	Details
		power project site. Homestead plantation, block plantation and road side plantation was observed during site visit. Site is recently filled and free from any vegetation. Padma River is located on southern side (approximately 0.05 km from site boundary) of the project site, commercial fishing is being carried out by the local villagers including Hilsa fish.
6.	Environmental Sensitivity	<ul style="list-style-type: none"> <li>■ Schools               <ul style="list-style-type: none"> <li>• Nali Bararia Primary School, High School and Kindergarten School- approximately 0.75 km towards North. Located adjacent to existing site access road;</li> <li>• Nayakandi Primary School – approximately 0.65 km towards East.</li> </ul> </li> <li>■ Masjid               <ul style="list-style-type: none"> <li>• Dariakandi Jama Masjid- approximately 0.25 km towards east</li> <li>• Sahida Khanam Hafigia Madrasa and Masjid- approximately 1.4 km towards North-West</li> </ul> </li> <li>■ Market               <ul style="list-style-type: none"> <li>• Nali Bazar – approximately 0.75 km towards North- situated both side of the site access road.</li> <li>• Paturia Ferry Terminal and Paturia Bazar- approximately 0.85 km towards North West</li> </ul> </li> <li>■ Health Facility               <ul style="list-style-type: none"> <li>• Sawastha Paribar Kalyan Kendra at Nali- approximately 1.5 km from site</li> </ul> </li> </ul>

The environmental setting map is presented in **Figure 2.3**.

Figure 2.3 Environmental Setting Map



## 2.3 Resource Requirement

The details of the resource requirements for the project are presented in **Table 2.2**.

**Table 2.2 Resource Requirement Details**

S. No.	Resource	Details
1.	Land	<ul style="list-style-type: none"> <li>■ Solar Power Project site - 138.78 acres</li> <li>■ Site approach road (0.1 km) – 1.0 acre</li> <li>■ Residential Unit- 0.30 acre</li> <li>■ Power evacuation transmission line (7.2 km): 6.84 acre ROU (width 6.0 m)</li> </ul>
2.	Water	<ul style="list-style-type: none"> <li>■ Construction phase: 5 to 6 KLD and sourced from private bore well from the nearby village</li> <li>■ Operational Phase: not estimated the requirement of water; it was informed the two bore well will be constructed within the site and for that NOC from Union Parishad will be taken.</li> </ul>
3.	Manpower	<ul style="list-style-type: none"> <li>■ Land Development- activity already completed</li> <li>■ Civil construction (3-4 months duration) - 112</li> <li>■ Electrical work (1-2 months duration) – 62</li> <li>■ Operational phase 20 years</li> </ul>
4.	Power supply	<ul style="list-style-type: none"> <li>■ Construction phase: 3 DG sets (2 x 16 KVA, 8 KVA)</li> <li>■ Operational Phase: Back up DG sets for emergency operation</li> </ul>

## 2.4 Construction Activity

### 2.4.1 Approach Road

The Nali- Nayakandi Link Road (5.5 m width) is situated on the eastern side of the project site, which is connected with Dhaka-Paturia Highway (approximate road distance - 2.8 km). A 100 m site approach road has been constructed to connect the site with Nali- Nayakandi Link Road. It was observed that a 1ft dia Hume pipe has been provided as a cross drainage facility. The discussion with Site In-Charge reveals that a culvert will be constructed before monsoon.



Nali- Nayakandi Link Road



Site approach road

### 2.4.2 Site Development

The entire project site was on low land. The site has been filled up with white sand from river. The estimated volume of fill material required for the site is approximately 50.4 million cubic feet to raise the site level about 2 to 2.5 m from original level. The filling activity was started from September 2018 and it was reported during the site visit that 94% filling activity was completed.

The total periphery of the site is approximately, 3.846 km. Construction of retaining wall (box cutting, cut of wall casting, base casting and wall casting) along the periphery was started from January 2019 and currently approximately 50% of the work has been completed.



Site filled with Silver Sand



Construction of retaining wall (ongoing)



Construction of retaining wall (ongoing)



Construction machineries at site

### 2.4.3 EPC Works

Spectra will engage the Jiangsu Akcome Industrial Group Co., Ltd as the EPC contactor for this project. The scope of work of the EPC shall involve the following:

- Erection of Solar PV Panels
- Erection of Inverters and SCADA Facility
- Construction of underground and/or overhead electrical collection lines to connect PV modules to the pooling substation
- Erection of other associated facilities (control room, office, etc.)

Construction of related structures will involve civil and steel work for installation of pooling stations, transformers, substation, and electric cables and signal wires. After site development activity civil work will be initiated.

### 2.5 Construction Material & Waste Storage Area

The site has designated construction material storage facility and construction waste storage facility within the site. It was reported that during EPC works (installation of solar panel and associated facility) the project will provide a temporary laydown area (4.2 acres).



Construction material (cement) storage



Construction junk material storage area



Construction material storage area



Recyclable waste storage (cement bag) area

## 2.6 Diesel Storage

A temporary diesel storage facility (10,000 litre capacity) has been provided within the project site. The storage facility is on paved surface. The facility does not have any secondary containment and cover on top. It was reported that this storage facility will be shifted to Laydown area and will have necessary paved surface and secondary containment arrangements.



Diesel storage area with safety precaution



DG Set at construction site

## 2.7 Workforce & Labour Camp

### 2.7.1 Site Development Activity

There is one contractor (Khadija Enterprise) presently working for construction of retaining wall. The average workforce working under this contractor is 60 and maximum up to 150. A Labour Camp has been provided to accommodate 40 labourers within the project site. The Labour Camp has drinking water facility (water filter system), toilet facility and access to separate Kitchen.

There are 4 tube wells (15-20 ft depth) for sourcing of potable water for site office and labour camp. As per the Bangladesh Water Rules, 2018 permission is not required for sinking tube-wells, if it used for drinking and domestic use. The water is being treated with filter and then used for drinking purpose. It was reported that for bathing and washing, labourers go to Padma River.



Site office and labour camp



Labour accommodation at Camp



Drinking water facility at Labour Camp



Single pit toilet facility

## 2.7.2 EPC Activity

It was informed that after the completion of site development work, Akcome will start the civil construction work. It was also reported that during this construction phase, maximum 200 workforce will be working in the site. A 100 people capacity Labour Camp will be developed within the project site. A Temporary Laydown area will be developed on the eastern side of the solar power plant, which is adjacent to site approach road.

The water required for construction activity is being sourced from bore wells in the nearby villages. The water is being supplied through water tanker. Potable water for labour camp is being sourced from bore wells, constructed within the project site. The drinking water is being treated through water filter. It was reported that drinking water has not been tested for its quality.

## 2.8 Waste Generation, Treatment & Disposal

The sewage generated from the site office and labour camp is being disposed through single pit toilet facility. Grey water generated from site is being disposed in the pit. It was reported that, after the filled up single pit latrine, it will capped with sand and soil on top and another latrine will be constructed. The single pit latrine and disposal of grey water in pit have potential to contaminate the soil and ground water.

Separate municipal solid waste collection bins (food waste and other waste) has been provided. Presently food waste is being disposed in the pits within the site and recyclable waste is being sold to local vendor. Disposal of food wastes within the pits will helps to improve the soil quality. It was



reported that Aloe vera plantation will be carried out under the solar panels and vacant areas of the site after completion of construction activities.

No hazardous waste is being generated from the site at present and there is no facility for storage of hazardous waste at site. It was reported that during civil construction phase site will provide such facility.



Single Pit Latrine



Tube well and Grey water storage pit



Solid waste collection at labour camp



Municipal waste dumping pit within the project site

### 3. REGULATORY COMPLIANCE STATUS AND GAP ASSESSMENT

#### 3.1 Status of Legal Permits & Clearance as GoB Requirement

The current status of various regulatory approvals and permits for the project is summarised in **Table 3.1**:

**Table 3.1 Legal Permits & Clearance**

S. No.	Legal Requirement	Status	Compliance	Supplementary Action
1.	NOC from DC-Revenue for Non-agricultural land	The project has taken NOC from Office of DC as non-agricultural land development of power project NOC Dated 03.04.2016)	Complied	-
2.	NOC from Union Parishad for construction of Solar Power Plant	The project has taken NOC from Arua Union Parishad for construction of Solar Power Plant	Complied	-
3.	NOC from Upazila Parishad for construction of Solar Power Plant	The project has taken NOC from Shibalaya Upazila Parishad for construction of Solar Power Plant	Complied	-
4.	Site Clearance and Environmental Clearance (EC) as per Environmental Conservation Rules, 1997 and subsequent amendments	Project is categorised as <b>Orange 'B'</b> Category and requires site clearance based on IEE report and EC based on IEE report and Management plan.  It was reported that site clearance and environmental clearance process had not been initiated at the time of site visit.	Non-compliant	The project should immediately initiate the process of application to DOE for obtaining Site Clearance and Environmental Clearance.
5.	Land filling permission for DC office	The project has obtained permission from the Office of Deputy Commissioner for landfilling using Bulgate dredging sand (dated 30 April 2018).	Complied	-
6.	NOC for abstraction of ground water under The Bangladesh Water Rules, 2018	The required water for construction works is being supplied from bore wells in the nearby villages. It was reported that during operational phase 2 bore wells will be installed within the site. The project has not verified whether the water	Partially compliant	The project should source the ground water from supplier, who have the NOC for Bore well.  The project should take NOC before

S. No.	Legal Requirement	Status	Compliance	Supplementary Action
		supplier has the NOC for withdrawal of water from bore well.  It was also reported that project will obtain NOC from concerned authority for installation of two bore wells during operational phase.		installing bore-wells for operational phase.
7.	Factory License under The Factories Act, 1965 Bangladesh Labour Law, 2006 and amendment 2013	This Act pertains to the occupational rights and safety of factory workers and the provision of a comfortable work environment and reasonable working conditions.  As per this Act, the project need take factory license for operational phase	Not applicable for construction but will be required prior to commencing operations	The project should take factory License before operational phase
8.	LOI from Bangladesh Power Development Board for the development of Grid connected solar power plant	BPDB accords its approval to Sponsors and grants its permission to design, finance, insure, construct, own, commission, operate and maintain a 35 MW Grid Connected Solar PV based power generating facility at Paturia, Shibalaya, Manikganj, Bangladesh.	Complied	-

## 3.2 Compliance of ADB Safeguard and Social requirements

### 3.2.1 SR-1: Environmental Safeguards

SR1 on Environmental Safeguards aims to ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process. The SR1 covers environment management system, environmental impact & risk assessment, pollution prevention, control & practices, conservation of biodiversity, occupational health & safety, community health & safety and conservation physical cultural resources.

#### 3.2.1.1 EHS Polices & Environment Management System

Spectra Solar Park Limited (SSPL) has an EHS Policy and a HR Policy. However both polices have not been signed by the head of the organization. It was observed that the polies are not displayed at site. The polies are also not translated to local language (Bangla) for easy understanding of site workers.

SSPL has developed an Environmental, Health and Safety (EHS) manual for taking care of EHS issues and concerns. Certain procedures (hazard identification and its management, occupational heal and safety, pollution prevention, EHS audit and review) have been developed with

responsibilities of implementation allocated to different departments/divisions. In addition, SSPL has a procedure of carrying out periodic quality check and reviews. It was reported that regular and periodic (bi-weekly) has been carried out; however, records have not been maintained.

It was assessed during the site visit and consultations that though some elements of an E&S management system exist, a comprehensive EMS is not in place. Also all the risks have not been identified and thus procedures to address them have not been developed. Standard Operating Procedures (SOPs) have not been developed for construction as well for operational phases of the Project.

SSPL has a defined organisation structure and the role of responsibilities of all the personnel is well defined. This has ensured that the EHS implementation has been integrated with the workflow processes. Presently, there is no designated HSE personnel at construction site. The site engineer, is responsible for the HSE function as well. However concerted effort would be required to drive the EHS system through the organisation. The SSPL should deploy the EHS personnel at site; and he will be responsible for implementation environment, health and safety measures specified in the EHS manual.

The monitoring, auditing and reporting system has been specified in the EHS manual. However, EHS monitoring records and audit report were not available at site. The site in-charge also confirmed that it was not fully implemented.

### 3.2.1.2 Environmental Impact & Risk Assessment

The EIA study has not been conducted for proposed project (solar power plant and transmission line). The issue was discussed with Project team during the site visit. The project team agreed to engage local environment consultant for preparation of IEE report and management plan for site clearance and environmental clearance as per requirements under Environmental Conservation Rules. SSPL has already engaged ERM India Private Limited for conducting the ESIA study to meet the Lenders requirement.

The environmental, health and safety related issues and its control measures are broadly specified in the EHS manual. The area specific control & mitigation measures, capacity development and training measures, implementation schedule, cost estimates, and performance indicator have not been included in the manual.

### 3.2.1.3 Studies on Analysis of Alternative for location, design, technology, and components

SSPL has conducted the siting study for setting up of the solar plant. As per GoB requirement, any solar plant project should be constructed on non-agricultural land. The Project has procured approximately 138 acres land, which is categorised as non-agricultural land. The discussion with land sellers also reveals that major part of the site was low laying land and inundated during monsoon and post-monsoon season, approximately 5-6 month. The local people also confirmed that land was not suitable for agriculture purpose. There was no residential unit within the project site; therefore, R&R is not applicable for this project.

As stated above the project site has drainage and waterlogging problem. The site development work has been completed without carrying out any drainage & food risk study. SSPL has engaged ERM for conducting a flood likelihood assessment and the project team reported that recommendation of the study will be implemented at site.

### 3.2.1.4 Resource Efficiency & Pollution Prevention

SSPL has identified the following environmental elements and its control measures in the EHS manual:

- Endangered wildlife plant life or habitat;

- Protection of land resources;
- Water resources;
- Use of Pesticides;
- Dust Control;
- Noise Pollution;
- Traffic control;
- Air pollution

The environmental impact and risk assessment study was not conducted for this project prior to start of site development work. However, pollution prevention and emergency response plan have been broadly defined in the EHS manual. SSPL has not developed any SOPs or environmental management plan for implementation of above mentioned components. The manual also has not identified the potential impact related to storm water drainage, waste water management

SSPL has developed a waste management plan for the site. The waste management has been prepared for construction phase only. The management plan for operational phase was not incorporated in the waste management plan. The waste water management during construction and operation phase was also not included in the plan.

- Dust suppression measures: Silver sand has been used for development of site and construction of site approach road; which has a potential for generation of fugitive dust during strong wind and vehicle and machinery movement. After filling work, the site has been compacted and the same activity is presently continuing. The dust suppression measures through water sprinkling in site approach road is being implemented by the SSPL.
- Wastewater management: The waste water generated from the construction site is domestic waste water (black water and grey water). Black water is being treated through single pit latrine and grey water is being disposed in a pit for solar evaporation percolation in the soil. It was reported that same system will be provided for during civil construction phase.
- Solid waste management: Separate solid waste collection bins (food waste and other waste) has been provided. Presently food waste is being disposed in the pits within the site and recyclable waste is being sold to local vendor.
- Hazardous waste management: No hazardous waste is presently being generated from the site and there is no facility for storage of hazardous waste at site. It was reported that during civil construction phase, site will provide hazardous waste management facility.
- Monitoring & Auditing: Periodical monitoring (ambient environment) has not been carried out.

### 3.2.1.5 Identification of Risk & Emergency Response Plan

The risk assessment study has not been conducted for the solar power project. The site has also not conducted risk assessment study, associated with natural hazard like flood. However, SSPL has developed the procedure for identification of hazard; hazard communication process; permit to work (PTW) Systems; on site job safety analysis (JSA); toolbox meeting and training related hazard. SSPL has developed an onsite emergency response plan for construction activity, without carrying risk assessment study. The operational phase risk have not been identified and an emergency response plan has also not been prepared. SSPL has conducted the periodical training program for all the workers including sub-contractor workers, mock drill. SSPL maintained the incidence reports; however, training record, mock drill record were not maintained. Major incidence was not reported in the incidence report. the Site Engineer (SSPL) and Head of the Contractor (Khadija Enterprise) also confirmed that there was no major accident at construction site. During field visit, it was observed that most of the workers were using PPE, However few workers were not using full PPE like (safety shoe). The workers of the site reported that periodical training on job safety and PPE has been provided.



Emergency Number & PPE signage Displayed in the Board



Workers with PPE at construction site



Fire extinguisher at Site office



Safety precaution signage at DG set

### 3.2.1.6 Labour and Working Conditions

SSPL has developed a Human Resource (HR) Policy, where it specifically states about appointment, attendance, overtime/incentives, holiday, leave, payment system etc. However, there is no mention about Non-discrimination and equal opportunity, Sexual Harassment; Bonded, child and forced labour policy.

SSPL has developed a service rules for their workforce. The service rules describe the terms of employment and also the rights of the labour. The discussion with SSPL reveals that company does not discriminate among migrant and non-migrants and not involve any child and forced labourer.

SSPL is presently dealing with one contractor –Khadija Enterprise. The sub-contractor has not registered under Contractor Registration under Section 3A, Bangladesh Labour Act, 2006. The sub-contractor has no policy. The discussion with the Sub Contractor reveals that company does not discriminate among migrant and non-migrants and not involve any child and forced labourer.

SSPL as well as Khadija Enterprise has provided the accommodation facility in the site. The labour accommodation facility have the power, drinking water, separate kitchen, drinking water, sanitation facility.

Single pit latrine during long duration operation phase may contaminate the soil and ground water. Disposal of large volume of grey water during civil construction may contaminate the soil and ground water and spillage in nearby agricultural land cause conflict with local people.

### 3.2.1.7 Occupational Health & Safety

SSPL has maintained an Incident Register, no major incident / fatality was reported. Periodical safety talk is being carried out; however, register for the same is not being maintained. Mock drill for fire are also carried out. PPE has been provided for all the workers. During site visit, use of PPE was

observed. The Site Manager informed that, the safety audit has been carried out; however, record has not been maintained.

There is no initial and periodical health check-up has been carried out for the workers engaged in the site. A doctor is being visited weekly once for to treat and medical check-up is required for the workers. First Aid Box (2 numbers) has been provided in the site; two persons is responsible for First Aid; however, they have not received any formal training.

### 3.2.1.8 Community Health, Safety

The risk to community from proposed project is primarily during the transport of construction materials and machineries to site. The width of the site access road is approximately 5.5 m. There are two schools, two Masjids and one market is located besides the road. Movement of heavy vehicles along the road has a potential to cause accidents or hazards. SSPL has not prepared any transportation management plan.

### 3.2.1.9 Biodiversity Conservation

The pre-project land use was low laying non-agricultural land. Before site development site had no major vegetation. There are no ecological sensitive area and protected areas within 10.0 km radius of the project site. There will be no direct discharge from the project site to nearby Padma or Ichamati River.

## 3.2.2 SR-2: Involuntary Resettlement Safeguards

SR2 on Involuntary Resettlement aims to avoid involuntary resettlement wherever possible; to minimize involuntary resettlement by exploring project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups.

### 3.2.2.1 Land Procurement

The 35 MW solar power plant site is located at Boruria mouza in Shibalaya Upazila of Manikganj district. The project requires 140.740 acres (56.68 ha.) of land for the plant site. SSPL has procured land on the left bank of the mighty river Padma. Land development i.e. land filling has been completed and levelling of soil and construction of boundary wall at plant site is going on. Land required for the project is directly purchased by the Spectra Solar Power (developer) from 161 land owners (The list of the 161 affected land owners has given in **Appendix A**). Land has been purchased through willing seller - willing buyer approach. The Land procurement was done based on negotiated settlement with the land owners, but the land rate considered was not less than prevailing government mouza rate.

## Process of Land Procurement for Solar Park

**Negotiation with Land Owners:** Spectra Engineer Ltd. started negotiation with landowners since 2015 for procuring required land for the project. The company conducted a series of discussion, consultation and negotiations with the landowners. The project conducted several consultations with the land owners, key persons from the community and also community at large. The Acquisition and Requisition of Immovable Property Act (ARIPA)-2017 was not applicable for the project as land has been purchased and not acquired.

**Determination of Land Price:** Spectra procured the required land parcels through negotiation with the land owners as per the market rates of the land and ensured fair and just price of purchased land was received by the land owners. As on date the existing mouza rate is BDT 16400 per decimal (i.e. BDT 1,640,347 per acre) for low land in Baruria mouza. The company purchased and procured land at the rate of minimum BDT 35,000 per decimal (i.e. BDT 3,500,741 per acre) and maximum 45,000 (i.e. BDT 4,500,953 per acre) per decimal both are equivalent to the value according to the provision stipulated in the ARIPA-2017. (Refer to **Appendix K**). Consultation with the land sellers indicated that

most of the land parcels purchased by the Spectra Engineer Ltd. were low lying and had lower per decimal rates, than the rates provided by the Company to them.

**Consultation with Land Sellers:** Consultations and focused group discussions (FGDs) indicated that with the spread of word regarding procurement of less productive land at very high and lucrative price attracted the landowners and they satisfactorily sold their land to the company.

**Land for Land Policy:** The Company also followed land for land policy for the procurement process. 29% (47 out of 161) of the affected land owners got land for land in the adjoining villages. 9% of which (15 out of 161) got compensation in terms of land.

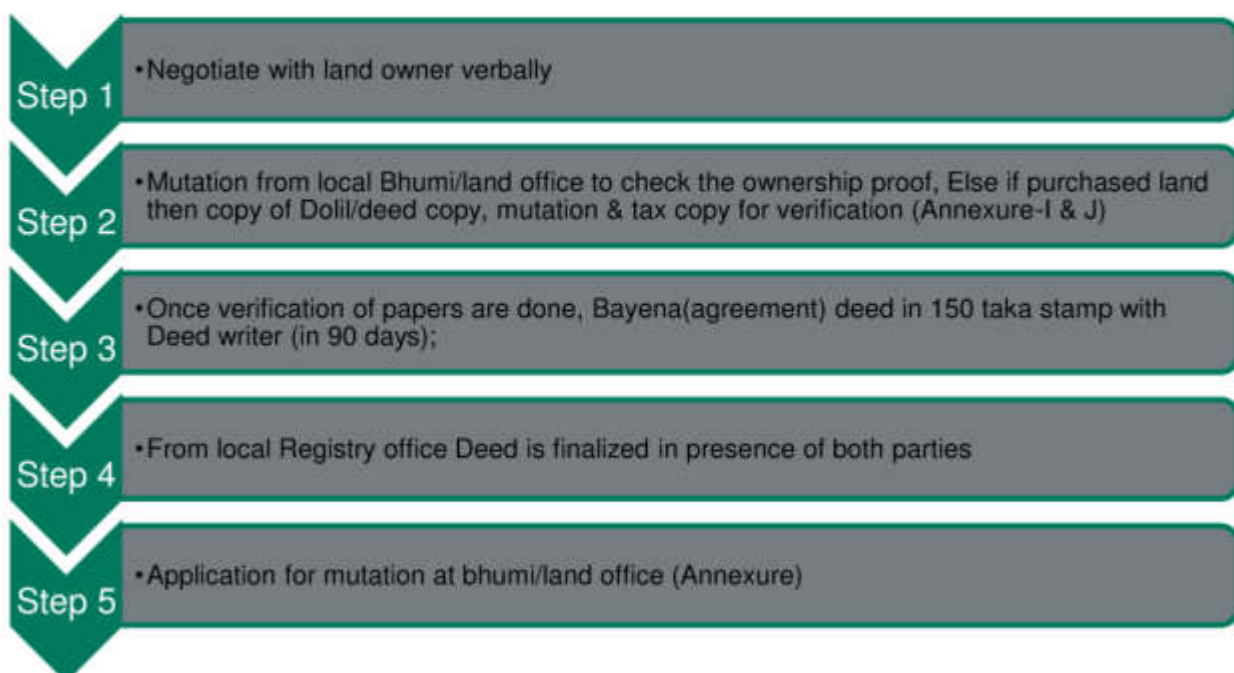
However, it is to be noted that some of the affected land owners reported that most of the plots selected for the solar park were low lying sandy nature which had lower per decimal rates. The company purchased equal quantity of double cropped land at their convenience and exchanged the land with them.

**Preventing Land Owners from becoming Landless:** Out of 161 land owners, 2 land owners were on the virtue of becoming landless due to selling of land to Spectra Engineer Ltd. (both the land owners were reported to have small land holdings and did not have any additional land outside the project area). However, the company has purchased equal quantity of cultivable land for these 2 land sellers at the nearby village in exchange of their land, thus preventing them from becoming land less.

**Utilization of the Land Price Received:** 20% of land owners confirmed that they have purchased land with the compensation amount in the adjacent locations from the village. The rest mentioned that they have started new business, purchased homestead in urban areas, deposited in local commercial banks and post offices, sending capable person to abroad for employment, purchased motorized passenger vehicle etc.

**Preference in Employment:** The Company has a policy to provide employment preference to the affected landowners. Based on the consultation with Spectra and affected land owners, it is revealed that some people i.e. approximately 5% from affected landowners got job at the Project site. Mostly these people engaged into non-technical job like security, cleaning or office clerk. Furthermore, it was reported that eligible, capable and qualified person or landowners will get preference in employment in the project in both construction and operational phase.

**Figure 3.1 Land Procurement Process**





## Land for Right of Way for Transmission Line

In addition to the solar park, the transmission line is also passing through private land (and partially along government road RoW). Transmission line RoW compensations are given to affected land owners for crop damages and devaluation of land due to restriction on land use. Compensation of BDT 25,000 paid to all the 48 land owners whose land parcel comes under the 6 meter (20 ft) RoW of the 7.2 km transmission line. Excluding this compensation paid for non-agricultural land BDT 40,000 per pole for erecting and for agricultural land BDT 25,000 per pole for erecting. Compensation paid one time to the affected land owners. Sample copy of sale deed attached in 0.

**Figure 3.2 Procedure to use the Transmission Line ROW**

**ROW Use Procedure  
for Transmission  
Line**

- Preliminary survey of Transmission line route (7.2 km) and Width for RoW is 6m (20')
- Land to be used to erect pole and draw transmission line across lands were identified and
- Approach to the land owners for one to one settlement.
- Initially Spectra have taken NOC (**Ongikarnama**) from all of them seeking permission to use their lands. (**Appendix B**)

**Table 3.2 Year wise Land Procurement Summary**

S. No.	Year	No of Deed	Total Land (Acre)*
1	2016	20	6.40
2	2017	100	48.63
3	2018	59	19.06
4	2019	3	10.93
Sale deeds completed			85.02
Sale deeds under process			56.51
Sale deeds pending			28.51

\* Status as on 10<sup>th</sup> February 2019

Source: SSPL

### 3.2.2.2 Selection of Land

The site is located at a low lying area of river Padma. The land area of the project site remains inundated for almost six months every year. The surface of the land is hugely sandy and suitable for seasonal bean crops. Spectra Engineers Limited applied to Deputy Collector, Manikganj for clearance of 141.740 acre non- agricultural land as it needs with the regulation to comply that no solar project will be installed on agricultural land. Deputy Commissioner, Manikganj issued a clearance letter of 141.740 acre land as non-agricultural land on 03.04.2016. (**Appendix H**).

### Box 3.1 Summary DC Office clearance for non-agricultural land

- Spectra Engineers Limited applied to Deputy Collector, Manikganj for clearance of 141.740 acre agricultural land to non- agricultural land to set up the 35 MW Solar power plan at Boruria Mouza.(Dated:13 January 2016). Based on which a report had been asked by DC, Manikganj to the Assistance Commissioner (Land), Shivalaya Upazila with reference to the letter number 05.30.5600.302.18.017.13-387 dated 22 March 2016.
- A report had been submitted by the Assistance Commissioner (Land), Shivalaya with reference to the letter number 335.
- As per the report review it has been found that 141.740 acre land has been used as non-agricultural land and tax has been submitted under State Acquisition and Tenancy Act, 1950, section 107 and 108 (**Appendix M**) for which permission granted by the DC Manikganj. Thereafter, 141.740 acre agricultural land has been declared as non-agricultural land.
- Another letter was issued by Upazila, Land Revenue Office, Shivalaya on 06 June 2016
- Based on the letter number 05.30.5600.302.18.017.13-387 dated 22 March 2016 and letter number 335 of 03 April 2016, it has been found from the report of Union Land Revenue Officer, Arua Union Parishad, that Spectra Engineers Limited submitted Land Development Tax as per Non Agricultural land of 141.740 acre..

As reported by the Project team, the site was chosen based on the following key factors:

- Non-cultivable land, site free of encumbrances, and no settlements
- The available land area was sufficient for the proposed project and no additional land requirement was envisaged in its immediate vicinity;
- The site and adjoining vicinity did not have any sensitivity with respect to cultural heritage, biodiversity, dense community settlements, common property resources or any sensitive receptors.

### Box 3.2 Briefing of Site selection

Construction of a large MW project significantly depends on land availability with strict adherence to regulation criteria. It is required that land will be of un-arable nature where any kind of agricultural work is not possible. In Bangladesh where almost all the land is highly fertile, sourcing of such kind of land was a bigger challenge. However, a very suitable land was sourced at Paturia, bank of the river Padma under Manikganj District. The project site lies on sandy terrain where traditionally no agricultural activities have been taken place.

Source: As per Feasibility Study, March 2018

#### 3.2.2.3 Utilization of Compensation

During FGD, the ERM-EQMS team asked affected landowners of the solar park, how have they invested and utilized the compensation amount that they received from the company.

- Mostly land sellers invest the compensation amount in different savings plan at Banks, Post offices.
- The affected land owners at the solar park location preferred to buy alternate parcels of land from the compensation amount. 30% of the affected land owners remarked that they have already purchased land parcels at adjacent locations with the compensation amount.
- Some money also kept for higher education and marriage purpose of the children, as informed by land sellers.

- Some land sellers invest the compensation amount for business like establishment of shop, purchase of pond for fishery, poultry business.
- Only 2 affected land owners informed that they have purchased two wheeler with the compensation money.

### 3.2.2.4 Involuntary Resettlement Impacts

The project has two component; i) Solar Park area and (ii) Transmission line. 140.740 acre land required for the solar project is directly purchased by the Spectra Solar Power (developer) from 161 land owners . Assessment of the land procurement process for the solar park shows that it has been undertaken through negotiated settlement based on will buyer-willing seller process. There are no IR impacts due to land procurement as land has been procured through negotiated settlement. Land sellers have received the land price as per the market rate and they are satisfied with the land price received as stated during the consultation.

The length of transmission line is about 7.2 km by which 3.5 km is the Government Land. The width of Right of Way (RoW) of transmission line is 6 Meter (20 feet). The 3.5 km of the government land is the land of Roads and Highways Department (RHD) of Dhaka-Paturia Highway. Spectra have to seek permission and NOC from RHD for using the land for ROW of RHD. In addition, 3.7 km of the transmission line is passing through private land. Transmission lines RoW compensations are given to 48 land owners for crop damages and devaluation of land due to restriction on land use. These affected land owners have received one-time compensation. .

In this segment of transmission line, some structures have been identified (12 Numbers) mostly used for commercial and business purposes. Most of the structures were identified as makeshift structures made of tin and bamboo and easily replaceable. (0). These structures will not be impacted or displaced permanently. Around 5-6 structures will be shifted and some will remain in-situ during construction. However, the project company agreed to provide support to the owners of these structures for shifting out to other location and further re-installation in the same location after the TL construction is completed.

Consultations with Spectra and site visit to transmission line and solar park indicated that none of the locations have any such place of sensitivity like any structures or any settlements. The TL will mostly traverse through agricultural land thus reducing any such potential impact.

### 3.2.2.5 Engagement with Stakeholders

Several consultation with affected land owners, Union Parishad Chairman and ward members was done by Spectra Solar regarding land compensation. Most of these consultation happened verbally and Spectra don't have any documentation or any minutes of these consultations. Spectra Power does not have a formal stakeholder engagement mechanism to undertake consultation with local communities. In general, the community agrees that the Spectra Solar plant has significance for them as infrastructure development in the local area. Also in the construction phase there will be temporary employment opportunities for local contractors and those who will be employed or supply services and provisions for workers and to contractors.

The community also acknowledges Spectra's assistance to specific initiatives that are undertaken by the company like development of road, schools. However, these activities are need-based and are not driven by any local development plan/framework.

Stakeholder consultation was carried out by ERM-EQMS team at three levels

- **Consultation at Union Level:** These consultations were held at Union level with representation of Union Chairman and Union Member to understand any outstanding/legacy issues associated with community conflict. The objective of such consultation were to inform them about the project, its features, expected impacts, project related land procurement and benefits such as compensation, information flow, grievance redress etc. (**Appendix E**)

- **Consultation with Land owners:** These consultations were held with different land owners whose land was purchased for the solar park and transmission line to understand their issues and concerns with regard to the project and their expectations in terms of benefits, compensation, entitlements and other advantages. The study team conducted 10 Focus Group Discussions and interacted with 71 landowners to know details on the land procurement process.
- **Focused Group Discussion:** Focused group discussions with the villagers, indirectly impacted groups such as sharecroppers (Bargadar) as identified within a 2 km radius of villages like Trilochonpatty, Nali, Nayakandi, Boruria. The key aspect of such discussions covered the present socio-economic condition after the implementation of the project and to understand issues and concerns with regard to the project and their expectations from the project. (**Appendix D**)

Apart from these consultations, few more consultations at local schools, health centers, banks, post-offices were conducted.

**Table 3.3 Consultation Details**

Date	Stakeholder Category	No. of Participants (Total/Male/Female)	Key Discussion Points
13 & 14 February 2019	Banks (Agrani Bank, Sonali Bank, Grameen Bank etc)  Post office at Shivalaya	6 4 Male, 2 Female	Most of the affected land owners invest their big amount of compensation money in post office, banks as stated during the consultation. Consultation done with the banks and post offices for verification only.
13 & 14 February 2019	Schools, Health centre,	8 6 Female, 2 Male	Attendance rate at the schools, Girls attendance rate, Major diseases, general medical facilities, medicine availability, availability of doctors
14 February 2019	Local Communities (Adjoining villages like Trilochonpatty, Nali, Nayakandi, Boruria)	80	Discussions with in the vicinity to understand their view of the project as well as identify any issues/conflicts including current and historical environmental and social concerns;
15 February 2019	Landowners	50 All Male	Assess the adequacy of the compensation accrued, the process followed and outcomes
15 February 2019	Representative/Chairman of local Unions (Arua and Ulail)	4 All Male	Any impact due to the proposed solar

The key issues raised during focused group consultation with selected land losers has been provided below:

### **Box 3.3 Observations based on discussion with land Sellers**

1. Land purchase- has been done based on willing buyer and willing seller method
2. The land rate was BDT 35,000 per decimal when they sold their land 3 years ago. Present the land rate is BDT 45,000 and Circle rate is BDT 16,100.
3. Previously the land which they sold was single crop land. Now the land they purchased with the compensation money or the land they receive as land for land compensation is multiple crop (2-3 times) land. Mostly they cultivate paddy, Mustard, vegetables.
4. Mostly land sellers invest the compensation amount in different savings plan at Banks, Post offices
5. Some land sellers invest the land selling money purchase of another land in the vicinity.
6. Some money also kept for higher education and marriage purpose of the children, as informed by land sellers.
7. Some land sellers invest the compensation amount for business like establishment of shop, purchase of pond for fishery, poultry business
8. Land sellers have received the land price as per the market rate and they are satisfied with the land price received.
9. The land owners who bought another land with the compensation amount the registration cost of the land was paid by Spectra.
10. The site is located at a low lying area. Land owners in the neighbouring agricultural land parcels reported water logging and poor drainage. Site was part of natural drainage of the area which is historically water logged for 4 – 6 months in a year. Development at the Site (backfilling) is likely to increase water inundation in the neighbouring agricultural land parcels.

The key issues raised during focused group consultation with Spectra Solar has been provided below:

### **Box 3.4 Issues raised during Focus Group Discussion**

1. Land purchase- has been done based on willing buyer and willing seller method
2. Negotiation of the compensation amount with land owner was happened verbally.
3. Mostly compensation distributed in two phases. 75% paid at the time of land deed agreement and 25% at the time of registration.
4. Status of mutation of land (transfer of land ownership to company) - 92 mutation done out of 161. Rest in process.
5. Some people from affected land owners family got job at Spectra. Mostly these people engage for non-technical job like security, cleaning or office Clark.

The key issues raised during focused group consultation with agriculture labour/share cropper has been provided below:

### **Box 3.5 Focused group consultation with agriculture labour/share cropper**

1. Six agriculture labours has been identified
2. They bought land (1-2 pakee) from land owner. (pakee is a land area unit use in Bangladesh)
3. They pay BDT 1500 to 2000 per year to their land owner
4. Mostly they cultivate Khesari grass (Lathyrus sativus or Indian pea) for cow fodder.



Consultation with Farmers at Trilochanpatty village



Consultation with Land owners



Consultation with Villagers at Nayakandi village



Consultation with Shopkeepers at Nali Bazar

### 3.2.2.6 Grievance Management and Redress

Spectra Solar Power Limited has established a grievance redressal mechanism to receive and address specific concerns on environmental & social issues. The grievance redressal mechanism (GRM) has been developed to record and resolve grievances of affected communities and employees. This GRM provide understandable and transparent process in culturally appropriate and readily accessible manner to all segments of the affected communities, and at no cost without retribution.

A Grievance register is maintained at project site. But the disclosure for GRM should be done with the community, employees and various stakeholders. The disclosure will be done through website and other potential opportunity of communication with display of relevant information at the entry gate of the site and other working areas at the site. It can also be done especially to the external stakeholder at the various stages of project screening and impact assessment studies at the project level and to be continued during the operations stage. GRM of Spectra Solar Power is attached as **Appendix N**.

### 3.2.2.7 Social Impact During operation

The site for the proposed solar power project located at Arua Union of Shibalaya Upazilla under Manikganj District. There are three villages in proximity to the project area, i.e. Nayakandi, Boruria and Tilochanpatty. There is no major industry in the immediate vicinity of the site. The Paturia Ferry Terminal and Paturia Bus Terminal is at the north-eastern site of the project.

There are 9 Wards in Arua Union. Out of these, 4 wards come within 1 km radius of the project site (Refer **Table 3.4**)

**Table 3.4 Socio-economic Profile**

S. No	Ward	Villages
1	Ward No 1	Dhukurabari, Chhota Dhukurabari
2	Ward No 2	Darikandi, Nali, Trilochan Patti

S. No	Ward	Villages
3	Ward No 3	Teghari, Baruria
4	Ward No 4	Nayakandi, Lakshimpur

\*Source: Secondary Information and Stakeholder Consultations

**Table 3.5** summarises key socio-economic information on the nearby residential areas based on discussions with local residents.

**Table 3.5 Socio-economic Profile**

S. No.	Indicator	Brief Description			
1	Population	Ward	Male	Female	Total
		Ward 1	940	862	1802
		Ward 2	1744	1593	3337
		Ward 3	1006	888	1894
		Ward 4	1012	945	1957
		<b>Total</b>	<b>4702</b>	<b>4288</b>	<b>8990</b>
2	Social Groups	Ward	Muslim	Hindu	
		Ward 1	79%	21%	
		Ward 2	58%	42%	
		Ward 3	93%	7%	
		Ward 4	90%	10%	
3	Crops	The major agricultural crops are paddy, jute, pulses, oil seeds (mustard), vegetables.			
4	Occupational Profile	Agriculture, Animal Husbandry, Business			
5	Health Centre	Satellite Clinic-1 at Ward No 1, provide health and family planning services			
6	Educational Institution	Ward 1	Ward 2	Ward 3	Ward 4
		Primary- 0	Primary- 4	Primary- 0	Primary- 1
		Secondary- 0	Secondary- 1	Secondary- 0	Secondary- 0
		Madrasa- 0	Madrasa- 0	Madrasa- 0	Madrasa- 1

\*Source: Secondary Information and Stakeholder Consultations at Arua Union

Figure 3.3 Map of Arua Union



Source: Collected from Arua Union office

### 3.2.3 SR-3: Indigenous Peoples Safeguards

SR3 on Indigenous Peoples Safeguards aims to design and implement projects in a way that fosters full respect for Indigenous Peoples' identity, dignity, human rights, livelihood systems, and cultural uniqueness as defined by the Indigenous Peoples themselves so that they (i) receive culturally appropriate social and economic benefits, (ii) do not suffer adverse impacts as a result of projects, and (iii) can participate actively in projects that affect them.

The Indigenous Peoples safeguards are triggered if a project directly or indirectly affects the dignity, human rights, livelihood systems, or culture of Indigenous Peoples or affects the territories or natural



or cultural resources that Indigenous Peoples own, use, occupy, or claim as an ancestral domain or asset.

The total ethnic households of Manikganj District as enumerated in Population and Housing Census 2011 are 116, which cover only 0.04% of the total household of the District with an average size of household 5.02 persons. In Shivalaya Upazila, there are total 32 ethnic households with total population of 126, as per P&HC 2011, whereas in Arua Union, there are 20 ethnic households with total population of 74 and majority of the population belongs to Monda ethnic group.

Based on consultations with the land sellers, it can be confirmed that no land was purchased from ethnic/ indigenous communities. Client representative also confirmed that the project would not lead to any adverse impacts on ethnic/ indigenous peoples. ERM-EQMS team also conducted FGDs at wards (Ward 1, 2, 3 and 4) within 1 km of project site in Arua Union to confirm presence of any ethnic group. The consultations revealed that no ethnic Therefore, the SR-3 is not applicable for the Spectra Manikganj Solar Power Project.

## 4. CORRECTIVE ACTION PLAN

This section summarizes the key issues and recommendations that have emerged from the gap assessment in the form of a Corrective Action Plan (CAP). Each corrective action has been organised as follows:

- Summary of Measures/Corrective Actions;
- Risk Categorization of the Recommendation;
- Responsibility and Resources;
- Measurable Outcome that can be submitted to ADB; and
- Suggested Timeline for Completion.

**Figure 4.1 Risk Categorisation**



**Table 4.1 Corrective Action Plan**

S. No.	Measures and/or Corrective Actions	Categorization of Action	Reference in the Report	Responsibility & Resources	Deliverable (Report/ Measurement)	Tentative Timelines*
<b>SR-1: Environmental Safeguards</b>						
1.	SSPL should take necessary regulatory clearance and permits like- <ul style="list-style-type: none"> <li>■ Site clearance,</li> <li>■ Environmental clearance,</li> <li>■ Ground water withdrawal permission,</li> <li>■ Factory license</li> </ul>	High	Section 3.1	SSPL	All the regulatory clearance and permits	<ul style="list-style-type: none"> <li>■ Site Clearance -1 month</li> <li>■ EC- 3 months</li> <li>■ Ground water NOC- before sinking of bore well</li> <li>■ Factory license before operation of solar plant</li> </ul>
2.	Approval of EHS & HR Policy and display of EHS policy in English and Bangla at site	Medium	Section 3.2.1.1	SSPL	Final EHS Policy	1 month
3.	Implementation of environment management system	Medium	Section 3.2.1.1	SSPL	On-site implementation	1 month
4.	Conducting Environment and social impact assessment	Medium	Section 3.2.1.2	SSPL	EIA/ESIA report	2 months
5.	Developing site and area specific EMP	Medium	Section 3.2.1.3	SSPL	ESMP	2 months
6.	Identification of risks during operational phase and development of an ERP	Medium	Section 3.2.1.5	SSPL	ERP for operational Phase	2 months
7.	Septic tank with soak pit latrine during EPC and operation phase and treatment and disposal system of domestic waste water during peak construction phase	Medium	3.2.1.6	SSPL and Sub-contractor	Treatment facility	Before start of particular activity
8.	<ul style="list-style-type: none"> <li>■ Maintenance of records like training, mock drill; field safety audit</li> </ul>	Medium	3.2.1.7	SSPL and Sub-contractor	Implementation occupational health &	Continuous

S. No.	Measures and/or Corrective Actions	Categorization of Action	Reference in the Report	Responsibility & Resources	Deliverable (Report/ Measurement)	Tentative Timelines*
	<ul style="list-style-type: none"> <li>■ Awareness generation to use appropriate PPE at construction site</li> <li>■ Provide training to First Aid site personnel</li> </ul>				safety measures as per ERP	
9.	Assessment of transport Risk and transport management during transport of construction material and machineries	High	3.2.1.8	SSPL and Sub-contractor	Transport management plan	1 month
<b>SR-2: Involuntary Resettlement Safeguards</b>						
10	Enhance awareness on the existing GRM among the internal and external stakeholders (neighbouring community, workers inclusive of contractual workers).	Low	3.2.2.6	HR and Admin Department of SSPL	Actual GRM Reporting and Tracking Mechanism	3 months from submission of Draft ESMS Framework
11	Develop and implement a stakeholder management plan	Low	3.2.2.5	HR and Admin Department of SSPL	Periodic meetings for which documentation should be maintained	3 months from submission of Draft ESMS Framework
12	Permission and NOC from government agency (RHD/ LGED) for using their land for Transmission Line	High	3.2.2.4	Spectra Solar Power	NOC copy of RHD/ LGED	Before construction work started at transmission line.

## APPENDIX A LAND OWNERS LIST – SOLAR PARK

Sl	Date	Deed No	Mowja	Giver	Total Land in Decimal
1	20-Feb-18	608	Boruria	Md. Alal Pramanik G	38.00
2	26-Feb-18	615	Boruria	Md. Jahangir Hossain G	12.00
3	26-Feb-18	621	Boruria	Paheluddin Pramanik G	64.50
4	26-Feb-18	651	Boruria	Gopal Chandro Shil G	108.500
5	28-Feb-18	701	Boruria	Mohammad Khorshed Alam G	116.500
6	28-Feb-18	704	Boruria	Md. Aktaruzzaman Khan	8.000
7	28-Feb-18	709	Boruria	Abdul Jabber	12.500
8	5-Mar-18	716	Boruria	Musamat Somana Khatun	32.000
9	5-Mar-18	729	Boruria	Shakh Tahaj Uddin	48.000
10	7-Mar-18	776	Boruria	Nasir Uddin Molla	62.000
11	7-Mar-18	779	Boruria	Shakh Dhokl G	42.000
12	7-Mar-18	781	Boruria	Md. Aktaruzzaman Khan	153.000
13	7-Mar-18	783	Boruria	Musamat Morgina Khatun	15.000
14	14-Mar-18	862	Boruria	Md. Abul Kashem	23.000
15	14-Mar-18	875	Boruria	Shabaj Uddin G	107.000
16	14-Mar-18	876	Boruria	Fulboro Begum G	226.000
17	14-Mar-18	878	Boruria	Md. Lalo Munshi	95.500
18	14-Mar-18	881	Boruria	Boddonath Chaki G	183.660
19	14-Mar-18	882	Boruria	Mohamad Soboruddin G	362.500
20	18-Mar-18	887	Boruria	Khan Md. Aftab Uddin G	116.000
21	14-Mar-18	888	Boruria	Khan Md. Aftab Uddin G	156.000
22	20-Mar-18	929	Boruria	Md. Sobahan Pramanik G	106.000
23	21-Mar-18	965	Boruria	Shree Poresch Chanro Shaha	14.000
24	21-Mar-18	971	Boruria	Md. Lalan Sordar G	159.500
25	21-Mar-18	972	Boruria	Subor Jan G	205.500
26	21-Mar-18	973	Boruria	Ambia Begum G	316.430
27	21-Mar-18	974	Boruria	Md. Shofe Uddin	328.000
28	21-Mar-18	975	Boruria	Sunil Kumar Sarker G	199.000
29	21-Mar-18	976	Boruria	Musamat Hazara Begum G	278.500
30	21-Mar-18	977	Boruria	Shakh Kayamuddin G	207.540
31	21-Mar-18	978	Boruria	Musamat Mofajan Nesa G	112.500
32	28-Mar-18	1054	Boruria	Mohamad Jalal Uddin G	225.250
33	28-Mar-18	1055	Boruria	Md. Sher Ali G	172.250
34	28-Mar-18	1056	Boruria	Md. Shoriful Islam G	195.250
35	28-Mar-18	1057	Boruria	Topon Kumer Behera G	182.050
36	28-Mar-18	1058	Boruria	Showdorshon Ray Chowdury G	314.700
37	2-Apr-18	1060	Boruria	Md. Aowlad Hossain G:	232.500
38	28-Mar-18	1061	Boruria	Md. Layakot G	18.000
39	2-Apr-18	1084	Boruria	Md. Moksed Ali	66.500
40	2-Apr-18	1086	Boruria	Mohammad All G	97.000

Sl	Date	Deed No	Mowja	Giver	Total Land in Decimal
41	3-Apr-18	1101	Boruria	Musamath Jobada Khatun	8.000
42	3-Apr-18	1102	Boruria	Musamath Jobada Katun	13.000
43	4-Apr-18	1122	Boruria	Ms. Asia Khatun (Taherjan)	13.000
44	4-Apr-18	1129	Boruria	Md. Ainul Abidin	15.000
45	4-Apr-18	1133	Boruria	Shakh Shahz Uddin	38.500
46	4-Apr-18	1134	Boruria	Shakh Shahz Uddin	153.000
47	10-Apr-18	1165	Boruria	Md. Abdul Mannan Shakh	24.000
48	11-Apr-18	1216	Boruria	Dalema G	23.660
49	11-Apr-18	1221	Boruria	Md. Nokumoddin	18.000
50	11-Apr-18	1222	Boruria	Md. Molfat Kha	9.500
51	11-Apr-18	1224	Boruria	Md. Ancher Munshi G	106.750
52	12-Apr-18	1226	Boruria	Md. Sumon Hossain	466.150
53	18-Apr-18	1278	Boruria	Shakh Johir Uddin G	58.000
54	18-Apr-18	1280	Boruria	Md. Aktaruzzaman Khan	43.000
55	18-Apr-18	1283	Boruria	Md. Mozibor Rohaman	60.000
56	23-Apr-18	1296	Boruria	Md. Kobbat Ali	32.000
57	23-Apr-18	1299	Boruria	Md. Abue Said Munshi	57.875
58	23-Apr-18	1301	Boruria	Nourur Nahar Begum G	16.000
59	25-Feb-18	1351	Boruria	Md .Rohizuddin	16.000
60	25-Apr-18	1352	Boruria	Md. Afsar Munshi G	35.000
61	15-Apr-18	1356	Boruria	Md. Amjad Ali	13.000
62	7-May-18	1407	Boruria	Md. Gais Ulldin G	27.000
63	7-May-18	1409	Boruria	Md. Abul Kashem	10.000
64	7-May-18	1410	Boruria	Md. Shoid Paramanik	23.000
65	7-May-18	1412	Boruria	Rabia Khatun G	7.720
66	7-May-18	1413	Boruria	Md. Ainuddin Mollah G	31.000
67	7-May-18	1414	Boruria	Md. Khorshed Munshi G	42.500
68	8-May-18	1439	Boruria	Fale Bebi G	62.000
69	16-May-18	1542	Boruria	Md. Showkot Ali	23.000
70	16-May-18	1553	Boruria	Md. Julmoth Ali G	20.000
71	22-May-18	1586	Boruria	Abdur Razzak Mollah	10.000
72	22-May-18	1589	Boruria	Shajada Khatun	6.000
73	22-May-18	1591	Boruria	Md. Abdul Hasem Ga	60.000
74	22-May-18	1592	Boruria	Md. Shohid	21.000
75	30-May-18	1621	Boruria	Khan Mohamad Aftab Uddin	1,330.300
76	22-May-18	1635	Boruria	Md. Halim Mollah	8.000
77	29-May-18	1649	Boruria	Md. Abdul Mojid G	31.000
78	29-Apr-18	1655	Boruria	Md. Abdur Rahaman Munshi G	90.250
79	30-May-18	1665	Boruria	Md. Athaur Rahaman G	60.000
80	30-May-18	1674	Boruria	Md. Jalaluddin Thaqur G	8.000
81	30-May-18	1675	Boruria	Md. Abdur Rohim G	19.000
82	6-Apr-18	1690	Boruria	Md. Akther Hossln	62.000
83	6-Apr-18	1695	Boruria	Shakh Yousuf G	81.500

Sl	Date	Deed No	Mowja	Giver	Total Land in Decimal
84	4-Jun-18	1696	Boruria	Abdur Roshid Mollah	49.500
85	4-Jun-18	1697	Boruria	Shakh Dhoki	13.000
86	5-Jun-18	1701	Boruria	Topon Qumer Sarker	67.500
87	6-Jun-18	1738	Boruria	SK. Abue Bokker Siddik G	148.500
88	11-Jun-18	1745	Boruria	Md. Akter Hossain (Pakhon)	17.800
89	12-Jun-18	1765	Boruria	Topon Qumer Chaki	44.000
90	20-May-18	1797	Boruria	Md. Chamcul Munshi	53.500
91	20-Jun-18	1808	Boruria	Nurul Islam	39.200
92	20-Jun-18	1809	Boruria	Abdul Halim G	61.280
93	20-Jun-18	1810	Boruria	Md. Ansar Ali Munshi	26.000
94	27-Jun-18	1867	Boruria	Md. Rohiz Uddin (Nobin uddin)	32.700
95	9-Jul-18	1959	Boruria	Md. Lutfur Rahman	41.000
96	11-Jul-18	1966	Boruria	Md. Azmot Ali Kha G	242.000
97	11-Jul-18	2011	Boruria	Nazma Akter Shilpi	27.000
98	16-Jul-18	2031	Boruria	Md. Azaharul Islam	33.000
99	16-Jul-18	2036	Boruria	Md. Kaimuddin Sarder	84.000
100	28-Jul-18	2077	Boruria	Shofe Tagore G	41.500
101	22-Jul-18	2078	Boruria	Nurjahan Begum G	529.000
102	23-Jul-18	2092	Boruria	Md. Ansar Munshi	14.000
103	23-Jul-18	2114	Boruria	Jomeron Neca	20.000
104	31-Jul-18	2194	Boruria	Habeja Khatun	5.000
105	31-Jul-18	2213	Boruria	Md. Atoar Rahman	7.000
106	1-Aug-18	2243	Boruria	Adur Rahman Munshi	58.000
107	1-Aug-18	2257	Boruria	Sha kh Siddik G	72.500
108	8-Aug-18	2319	Boruria	Azmot Ali G	100.000
109	8-Aug-18	2324	Boruria	Md. Qubbat Ali G	33.500
110	9-Aug-18	2341	Boruria	Nayeb Ali Sarder	44.000
111	9-Aug-18	2345	Boruria	Md. Hasmoth Ali Khan G	86.500
112	13-Aug-18	2376	Boruria	Md. Hokum Ali G	43.500
113	14-Aug-18	2403	Boruria	Mohammad Ali	50.000
114	27-Aug-18	2443	Boruria	Md. Abdul Chelam Uddin M G	30.750
115	27-Aug-18	2448	Boruria	Md. Abdur Rahman Munshi	113.500
116	27-Aug-18	2458	Boruria	Adur RazzaK G	95.280
117	27-Aug-18	2459	Boruria	Halema Khatun G	51.000
118	27-Aug-18	2460	Boruria	Md. Arshad Ali Munshi	35.000
119	28-Aug-18	2480	Boruria	Md. Anowar Hossain	13.000
120	28-Aug-18	2496	Boruria	Md. Enus Ali G	23.000
121	29-Aug-18	2532	Boruria	Hazera Begum G	16.000
122	29-Aug-18	2533	Boruria	Khushi Begum G	147.500
123	29-Aug-18	2536	Boruria	Khan Md. Aftabuddin	27.000
124	4-Sep-18	2590	Boruria	Mosha. Mahera Khatun G	22.260
125	5-Sep-18	2618	Boruria	Abdul Hamid Khan	44.000
126	5-Sep-18	2627	Boruria	Gonesh Chanro Sutrodhor	18.000



Sl	Date	Deed No	Mowja	Giver	Total Land in Decimal
127	25-May-18	2825	Boruria	Md. Amjad Hossin Mollah G	72.000
128	9-Sep-18	2646	Boruria	Md. Ahmad Ali	20.000
129	9-Sep-18	2659	Boruria	Dalima Begum G	58.260
130	9-Sep-18	2666	Boruria	Shekh Montaz Uddin G	45.000
131	9-Sep-18	2667	Boruria	Mohammad Nayeb Ali	36.500
132	9-Sep-18	2675	Boruria	Md. Jalal Uddin Munshi G	274.000
133	9-Sep-18	2679	Boruria	Md. Chan Mia G	36.750
134	9-Sep-18	2680	Boruria	Md. Chan Mia G	13.000
135	9-Sep-18	2681	Boruria	Md. Chan Mia G	33.500
136	9-Sep-18	2685	Boruria	Md. Chunno Poddar G	223.500
137	23-Sep-18	2744	Boruria	Pankog Kumar Behara	5.500
138	24-Sep-18	2819	Boruria	Md. Abdur Rashid	15.000
139	24-Sep-18	2833	Boruria	Md. Nurul Islam	27.000
140	24-Sep-18	2834	Boruria	Md. Sabed Ali	46.320
141	24-Sep-18	2843	Boruria	Md. Bachchu Talukdar G	34.500
142	7-Oct-18	2967	Boruria	Gonesh Chandro Sutradhor G	12.000
143	7-Oct-18	2969	Boruria	Mohammad Ali	6.000
144	5-Nov-18	3313	Boruria	Noiman Begum	4.570
145	12-Nov-18	3413	Boruria	Md. Lal Mia G	75.500
146	19-Nov-18	3516	Boruria	Md. Jhangir Tangore G	8.500
147	20-Nov-18	3536	Boruria	Abdul Gofur Shekh	11.000
148	20-Nov-18	3538	Boruria	Md. Aziz Munshi	12.000
149	25-Nov-18	3575	Boruria	Jomna Orfe Jobina G	25.000
150	25-Nov-18	3581	Boruria	Munshi Golam Azmir G	106.000
151	26-Nov-18	3597	Boruria	Vanu Begum G	2.500
152	26-Nov-18	3607	Boruria	Abdul Gofur G	21.000
153	5-Dec-18	3700	Boruria	Salma Begum	45.000
154	5-Dec-18	3701	Boruria	Hasna Begum	7.000
155	19-Dec-18	3885	Boruria	Md. Alauddin	23.000
156	19-Dec-18	3887	Boruria	Md. Nowsher Ali Munshi	115.000
157	7-Jan-19	35	Boruria	Md. Muzibar Munshi	302.250
158	8-Jan-19	36	Boruria	Sudorsan Rai Chowdhury	306.780
159	9-Jan-19	39	Boruria	Md. Jalal Uddin	418.000
160	9-Jan-19	42	Boruria	Ainuddin Mollah	12.500
161	9-Jan-19	46	Boruria	Md. Le haz Uddin Pramanik	38.000

13,878.035

## APPENDIX B LAND OWNERS LIST – TRANSMISSION LINE ROW



কব ৮৭৭৪৬৫৯

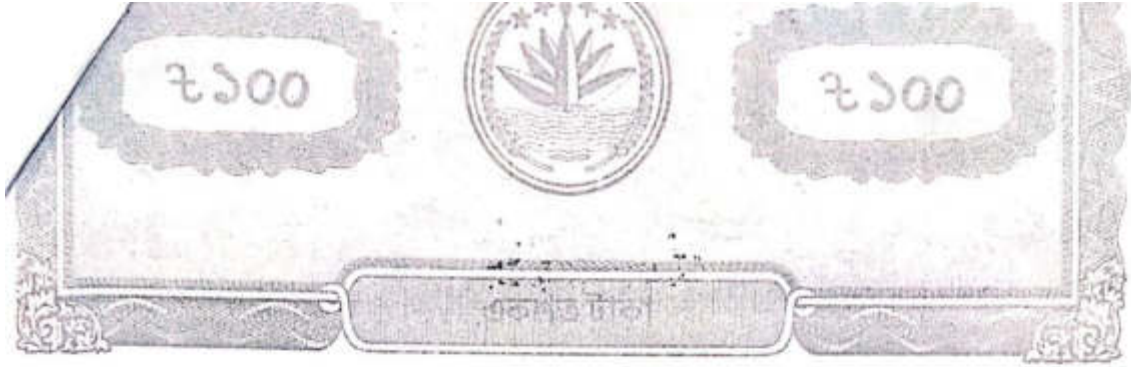
অঙ্গীকার নামা

অঙ্গীকারনামা

আমরা নিম্ন স্বাক্ষরকারীগণ এই মর্মে অঙ্গীকার করিতেছি যে, আমাদের জমির উপর দিয়ে স্পেন্ড্রা সোলার পার্ক লিমিটেড এর নির্মানাধীন বিদ্যুৎ কেন্দ্র পর্বত যে ৩৩কেভি ট্রান্সমিশন লাইন নির্মান করা হবে, তার জন্য প্রস্তাবিত লাইন বরাবর ২০ ফুট চওড়া জমির জন্য শতাংশ প্রতি ২৫,০০০/- টাকা হিসাবে সমস্ত ক্ষতিপূরণ পাইয়াছি। এছাড়াও প্রতিটি বিদ্যুতের খুঁটি স্থাপনের জন্য অকৃষি জমি হইলে খুঁটি প্রতি ৪০,০০০/- টাকা এবং কৃষি জমি হইলে খুঁটি প্রতি ২৫,০০০/- টাকা করে ক্ষতিপূরণ বুঝিয়া পাইয়াছি।

যেহেতু আমরা যথাযথ ক্ষতিপূরণ পাইয়াছি, সেহেতু আমাদের জমির উপর বিদ্যুতের খুঁটি স্থাপন এবং ৩৩ কেভি ট্রান্সমিশন লাইন নির্মান করা হইলে আমাদের কোন আপত্তি নাই মর্মে আমরা নিম্নস্বাক্ষরকারীগণ স্বাক্ষর করিতেছি :

ক্রমিক নং	নাম	ঠিকানা	দাগ নম্বর	মৌজা	স্বাক্ষর
১	মোঃ আক্তারুজ্জামান	ধুতুরাবাড়ী	১২৯৪	বরুরিয়া	মোঃ আক্তারুজ্জামান স্বাক্ষর
২	মোঃ আক্তারুজ্জামান	ধুতুরাবাড়ী	১২৯৩	বরুরিয়া	মোঃ আক্তারুজ্জামান স্বাক্ষর
৩	মোঃ রশিদ মোস্তা	কোদালিয়া	১২৭০	বরুরিয়া	মোঃ রশিদ স্বাক্ষর
৪	কোলিমুদ্দিন গায়েন	দরিকান্দি	১২৬০	বরুরিয়া	কোলিমুদ্দিন স্বাক্ষর
৫	রনজিতশীল	দরিকান্দি	১১৪২	বরুরিয়া	রনজিতশীল স্বাক্ষর
৬	মোঃ আনছার মুন্সি	দরিকান্দি	১১৩৮	বরুরিয়া	মোঃ আনছার মুন্সি স্বাক্ষর
৭	মোঃ আনছার মুন্সি	দরিকান্দি	১১৩৮	বরুরিয়া	মোঃ আনছার মুন্সি স্বাক্ষর
৮	মোঃ হযরত আলী	দরিকান্দি	১১৪৯	বরুরিয়া	মোঃ হযরত আলী স্বাক্ষর
৯	মোঃ আনছার মুন্সি	দরিকান্দি	১১৫৯	বরুরিয়া	মোঃ আনছার মুন্সি স্বাক্ষর



কম ৳১১১৪৬৫৮

১০	কিয়ামুদ্দিন	দরিকান্দ	১১৬৬	বররিয়া	কিয়ামুদ্দিন কিয়ামুদ্দিন
১১	মোঃ আব্দুল নতিফ	দরিকান্দ	১১৬৭	বররিয়া	আব্দুল নতিফ
১২	মোঃ আব্দুল নতিফ	দরিকান্দ	১১৭৫	বররিয়া	আব্দুল নতিফ
১৩	মোঃ হযরত আলী	বররিয়া	১১৮৩	বররিয়া	হযরত আলী
১৪	মোঃ আরিফুল ইসলাম	দরিকান্দ	৮৮৭	বররিয়া	আরিফুল ইসলাম
১৫	মোঃ আরিফুল ইসলাম	দরিকান্দ	৮৮৭	বররিয়া	আরিফুল ইসলাম
১৬	বিরেন বেহারা	তিলোচানপট্ট	৮৮০	বররিয়া	বিরেন
১৭	দুলাল বেহারা	তিলোচানপট্ট	৮৭৮	বররিয়া	দুলাল বেহারা
১৮	দুলাল বেহারা	তিলোচানপট্ট	৮৭৬	বররিয়া	দুলাল বেহারা
১৯	মোঃ জালাল মুন্সি	তেঘড়িয়া	১১২	বররিয়া	জালাল মুন্সি
২০	মোঃ জালাল মুন্সি	তেঘড়িয়া	১১২	বররিয়া	জালাল মুন্সি
২১	মোঃ আক্তারুজ্জামান	ধুতুরাবাড়ী	১৯৫	বররিয়া	আক্তারুজ্জামান
২২	মোঃ আক্তারুজ্জামান	ধুতুরাবাড়ী	১৯৫	বররিয়া	আক্তারুজ্জামান
২৩	মোঃ আক্তারুজ্জামান	ধুতুরাবাড়ী	১৯৫	বররিয়া	আক্তারুজ্জামান
২৪	মোঃ ছবোরদ্দিন	বররিয়া	২০২	বররিয়া	ছবোরদ্দিন
২৫	মোঃ আইনাল হক	বররিয়া	২০৭	বররিয়া	আইনাল হক
২৬	মোঃ বাচ্চু তালুকদার	তেঘড়িয়া	২৩৭	বররিয়া	বাচ্চু তালুকদার
২৭	মোঃ পিয়ার আলী	বররিয়া	২৩৯	বররিয়া	পিয়ার আলী
২৮	সাফেক আলী	তিলোচানপট্ট	২৫৩	বররিয়া	সাফেক আলী
২৯	মোঃ হযরত আলী	বররিয়া	১৬২	বররিয়া	হযরত আলী
৩০	মোঃ ছাত্তার	বররিয়া	২৬৭	বররিয়া	ছাত্তার
৩১	মোঃ ছাত্তার	বররিয়া	২৬৭	বররিয়া	ছাত্তার
৩২	মোঃ মাইনুদ্দিন	বররিয়া	২৭২	বররিয়া	মাইনুদ্দিন

## **APPENDIX C      LIST OF STRUCTURE (SHOPS) AT TRANSMISSION LINE ROW**

SL No.	Name	Father's Name	Village	Type of business	HH Member	Daily Approx. Income (BDT)	Shop Age
1	Sujit Sarkar	Nimai Sarkar	Nali	Hair Cut Saloon	4	400	10 years
2	Vasan Das	Rongolal Das	Nali	Tea Shop	2	350	16 years
3	Md. Sadek Molla	Md. Desal Molla	Goyelkhali	Restaurant	9	700	17years
4	Md. Topan Sarkar	L/Shopon Sarkar	Foridpur	Tea Shop	5	400	16 years
5	Md. Monir Hossain Khan	L/Abdul Hamid Khan	N. Kasadur	Tea Shop	4	400	16 years
6	Sanjoy Saha	L/Goyer Chandra Saha	Goyalbari	Restaurant	7	800	2 months
7	Md. Mizanur Rahman	Nuru Miah	Mohadebpur	Restaurant	5	580	4 months
8	Md. Razzak Khan	Razu Khan	Daskandi	Small Shop		400	2 years
9	Md. Salim Miah	L/Usman Miah	N. Kasadur	Tea Stall		400	8 months
10	Md. Hobi		Jobnabaz	Tea Stall		400	4 months
11	Md. Hafizur Rahman	Gias Khan	N. Kasadur	Small vendor		300	1 years
12	Md. Jonu	L/Abdul Hamid	Nobogram	Tea Stall (closed)			7 years

## APPENDIX D HOUSEHOLD SURVEY QUESTIONNAIRE

**Household Socio-Economic Survey – Spectra Solar Project**

1. Questioner No
2. Date
3. Name of Interviewee (only adult member)
4. Village Name
5. Mouza Name
6. Ward No.
7. Union Parishad
8. District

**Family Member Details (List Details of All Family Members)**

9. Name of Project Affected Person (PAP)

10. Relationship with (PAP)

**Codes:** **SIL**-Son-in-Law,  
**S**-Self, **DIL**-Daughter-in-Law,  
**M**-Mother, **GS**- Grandson,  
**F**-Father, **GD**-Grand-daughter,  
**W**- Wife, **HU** – Husband,  
**D**- Daughter, **BIL**- Brother-in-Law,  
**S**-Son, **SISL**-Sister-in-Law,  
**B**-Brother, **SIS**-Sister, **N**-Niece,  
**NP**-Nephew,  
**O** – Other specify

11. Age
12. Sex
13. Marital Status

**Code:** **M**-Male, **F**-Female  
**Codes:** **M**-Married, **UM**-Unmarried, **D**-Divorced/Separated, **W**-Widowed

14. Highest Level of Education

**Codes:** **IL**- Illiterate, **HS**-Higher Secondary,  
**P**-Primary, **G**- Graduation,  
**UP**-Upper Primary, **PG**-Post Graduation,  
**S**-Secondary, Graduation

15. Continuing Education (Yes/No)
16. Does the member suffer from any Disability?

**Y**-Yes, **N**-No

**Codes:** **ND**-No Disability, **M**-Mental, **V**-Visual, **S**-Speech, **L**-Locomotor, **H**-Hearing, **M**-Multiple



**Primary Occupation**

17. Primary Occupation
18. Approximate Income (Per Annum)
- Codes:**  
**F**-Farmer,  
**AL**- Agricultural Labour,  
**DL**- Daily Labour,  
**LO**- Land Owner (Working in own land), **RA**-Rural Artisan,  
**SG**-Service (Govt.),  
**SP** – Service (Private),  
**UE**-Unemployed Seeking Employment,  
**T** – Trading,  
**C** – Commercial business, shops etc.  
**CU** – Cultivator,  
**SC** – Sharecropper/ Lessee,  
**AH** – Animal Husbandry,  
**HW** – Small-scale Household Industry, **UFW** – Unpaid Family Work,  
**O**-Others Specify  
**U**-unable to work

**General Details**

19. Religion **Codes: H**-Hindu, **M**-Muslim, **O**-Other specify
20. Status of accommodation **Codes: O**-Owned, **R**-Rented, **O**-Other specify

**Quality of Life**

- 21 Electricity Yes  No  Any other light source, specify: Solar   
 Kerosene  Bio-gas  Others
- 22 Source of Drinking Water Pond  Tap Water  Tube Well/ Deep Well  Tube Well  Khal (Canal)  Other  Specify-
- 23 Source of Domestic use Pond  Tap Water  Tube Well/ Deep Well  Tube Well  Khal (Canal)  Other  Specify-
- 24 Sanitation Arrangement Open defecation  Non-sanitary/ Kutcha  Sanitary non-water sealed  Sanitary with water sealed
- 25 Fuel for cooking/heating Coal  Gul  Firewood  LPG  Kerosene  Other Specify   
 Bio-gas  Dried Cow dung with straw, leaves
- 26 Fuel Source (specifically for Firewood)

**27 Residence details**

- 28 Typology of Housing/ Accommodation Structure (Residing)
- |  |  |  |  |
|--|--|--|--|
| <b>Roof</b>  | <b>Wall</b>                                    | <b>Floor</b>                           | <b>Boundary</b>                        |
| RCC <input type="checkbox"/>                                       | Brick/ Cement <input type="checkbox"/>         | Mud/ cow dung <input type="checkbox"/> | Bricks/cement <input type="checkbox"/> |
| Straw/ bamboo/ polythene/plastic / canvas <input type="checkbox"/> | Tin (GI Sheet) <input type="checkbox"/>        | Wood /bamboo <input type="checkbox"/>  | Barbed Wire <input type="checkbox"/>   |
|  | Mud/ un--burnt Bricks <input type="checkbox"/> |  | Mud wall <input type="checkbox"/>      |

housing structure only)	Tin (GI Sheet) <input type="checkbox"/>	Straw/ bamboo/ polythene/plastic / canvas <input type="checkbox"/>	Brick /Cement <input type="checkbox"/>	Vegetation <input type="checkbox"/>	
	Tally <input type="checkbox"/>	Wood <input type="checkbox"/>	Floor Tiles <input type="checkbox"/>	Dry Wood <input type="checkbox"/>	
	Others, specify	Others, specify	Other, spec	No Boundary <input type="checkbox"/>	
24 What are the movable assets that you own? (tick all applicable)	Refrigerator <input type="checkbox"/>	Television <input type="checkbox"/>	Cable TV/ DTH connection <input type="checkbox"/>	Cycle <input type="checkbox"/>	Three-Wheeler <input type="checkbox"/>
	Bike/Two-wheeler <input type="checkbox"/>	Mobile/Telephone <input type="checkbox"/>	Computer <input type="checkbox"/>	Sewing Machine <input type="checkbox"/>	Ceiling Fan <input type="checkbox"/>
	Water Pump Set <input type="checkbox"/>	Mixer/Grinder <input type="checkbox"/>	Radio <input type="checkbox"/>	Others <input type="checkbox"/>	
				Specify-	

**A. Solar Project Site**

**Land Details**

30. What was the total land owned by the PAP (in acres) (other than residential)? (Before land taken by Spectra)      Own Land (in Decimal/ Satak):      Lease Land (in Decimal/ Satak):

31. What is the land size that has been procured by Spectra Solar? (Decimal/Satak)

32. What was the land use of procured land?      **Codes: A-Agriculture, O-Orchard, V-Vegetable Cultivation, M-Marshy Land, F-Fallow land, P-Pond**

33. Mode of Compensation      Y  N  (Decimal/Satak):

    (1. Land for land Compensation)      Place:

    (2. cash for land compensation)

    (3. Both Land and Cash Compensation)

34. If Yes, Cash compensation? (then was the value of land as per replacement value?      Y  N

35. Did the PAP buy any other land with the compensation money? If yes, how many Satak/decimal? Where?      Y  N  (Decimal/Satak):

    Place:

36. Usages of compensation money?      a. Purchase land

    b. Purchase House

    c. Investment in bank/post office

    d. Others (Specify)

**Agriculture**

37. What was the type of procured land? (Only for Agriculture land)      Single Crop       Double Crop       Multi Crop

38. What is the type of remaining Own land?      Single Crop       Double Crop       Multi Crop

39. What is the type of new land?      Single Crop       Double Crop       Multi Crop

(In case of Land Compensation or the person purchase new land with compensation money)

40. Was the cultivation done by you and your family members in the Procured land? Yes  No
41. Did you also hire agri. labours for cultivation on the Procured land? Yes  No
42. If Yes, how many labourer worked for minimum three consecutive seasons? Male: Female:
43. What was the average daily wage paid to the workers? (in Taka) Male: Female:
44. Where do the Agri. Labours come from? (within the Upazila or outside)
45. What is the approximate season wise income from your total Agriculture? (in taka) Summer Rainy Winter

#### Household Expenditure

46. What is the average monthly expenditure of the family (in Taka):

#### B. For Transmission Lines (TL)

##### Land Details

47. What is the land size that has been taken for the Tower footing? (Decimal/Satak)
48. Are you the only land owner or there are other landowners too for the tower footing land parcel? Only me  Other landowners also
49. Mention the number of other landowners persons
50. Is the tower footing land parcel given on lease? Yes  No
51. What is the landuse of land parcel taken for TL? **Codes: A-Agriculture, M-Marshy Land, O-Orchard, F-Fallow land, V-Vegetable Cultivation, P-Pond**
52. If agricultural land, what is the cropping pattern? Single Crop  Double Crop  Multi Crop

##### Compensation for TL Tower

53. Have you received compensation for crops/ cutting of trees/ structures? Yes  No  (it is to be noted that the landowner may reply in negative for two reasons: (1) he is yet to receive the compensation; or (2) the lease holder will receive the crop compensation and not him)
54. Did the lease holder receive crop compensation? Yes  No
55. Is the compensation paid for the crop damages are as per the schedule rates? (crop schedule from Agri. Yes  No

Dept./ tree schedule as per size from  
Forest Dept./ structure from PWD)

### C. Perception on project

56. Are you aware about the Spectra Solar Project? (Y/N)
57. If yes, then how did you know about it?  
(TV/Newspaper/Villagers/Govt. officials/Others)
58. Do you think the project will bring any benefits to the people?
59. Are there any other concern (s) besides above on land procurement that would be caused by the project? (Y/N) If Yes, Specify.
  - (a) Road Improvement
  - (b) Provision of drinking water
  - (c) Drainage system improvement
  - (d) Education facilities
  - (e) Development of CPR
  - (f) Skill Training

## APPENDIX E UNION PARISAD PROFILE QUESTIONNAIRE

1. **General**
  - a **Name of Village**
  - b **Union**
  - c **Up-zela**
  - d **District**
  - e **Number of Households**
2. **Population Profile**
  - a **Total Population**
  - b **Male**
  - c **Female**
  - d **Scheduled Caste/Tribes**
3.
  - a **Literacy Male**
  - b **Literacy Female**
4. **Overall Workers**
  - a **Main Workers**
  - b **Marginal Workers**
5. **BPL Families**
6. **Religion**
7. **Cropping Pattern:**
  - a **Major Crops**
  - b **Horticulture**
8. **Sources of Drinking water**
9. **Toilet Facilities**

	In-door Toilet	Out-door Toilet	Community Toilet
	Not Available		
10. **Electricity**

Power Line Available	Generator	Not
----------------------	-----------	-----
11. **Education Institution**

Primary School	Middle School	High School	
College	Vocational Training Centre		
12. **Health Facilities**

Dispensary	Govt. Hospital	Pvt Hospital
Not Available	Traditional	
13. **Veterinary Facilities**

Yes/ No		
---------	--	--
14. **Post Office**

Yes/ No		
---------	--	--
15. **Bank**

Yes/ No		
---------	--	--
16. **Police Station/Post**

Yes/ No		
---------	--	--
17. **Village Road**

Metal Road	RCC	Brick
Kachha		
18. **Irrigation Facilities**

Yes/ No		
---------	--	--

19.	<b>Co-operative Societies/ NGO</b>	Yes/ No			
20.	<b>Tourist Spot</b>	Religious	Historical	NA	
21.	<b>Income Pattern</b>	Farming	Fishing	Business	Salaried
22.	<b>Common Property Resources:</b>				
23.	<b>Tourist Spot</b>	Religious	Historical	NA	
24.	<b>Mode of transport</b>	Bus/ Jeep/ Auto/Scooters/ Bicycles/ SUV/ others			
25.	<b>Marketing Facilities:</b>	Yes/No			
26.	<b>Non-conventional energy facilities</b>	Yes/No			
27.	<b>Solid Waste Disposal:</b>	Unused Land	Road Side	Community Dustbin	
		Composting	Others		
28.	<b>Wastewater disposal:</b>	Drainage	Sewer	Soak pit	No System
29.	<b>Social Gathering Facilities:</b>	Community Centre/ Church Hall/ Mosque/Other			
30.	<b>Government Offices (if any):</b>				

## **APPENDIX F    NOC LETTER FROM SHIVALAYA UPAZILA**





# উপজেলা পরিষদ কার্যালয়

## শিবালয়, মানিকগঞ্জ।

উন্নয়নের পথতন্ত্র  
শেখ হাসিনার মূলমন্ত্র

ফোন: ৭৭১৬০৫৪, ই-মেইল: uzpshibalaya@hotmail.com

স্মারকনং- উচেকা/শিবা/১৯-

তারিখ : ০৪/০২/২০১৯ খ্রিঃ

### প্রত্যয়নপত্র

এই মর্মে প্রত্যয়ন করা যাইতেছে যে, মাননীয় প্রধানমন্ত্রী জননেত্রী শেখ হাসিনার অগ্রাধিকার ভিত্তিক ঘরে ঘরে বিদ্যুৎ প্রকল্পের আওতায় স্পেক্ট্রা সোলার পার্ক লিঃ শিবালয় উপজেলাধীন ০৫ নং আকুয়া ইউনিয়নের অন্তর্গত বড়রিয়া মৌজায় একটি ৩৫ মেগা ওয়াট সোলার পাওয়ার প্লান্ট স্থাপনের ইচ্ছা প্রকাশ করিয়াছেন। আমার জানামতে উক্ত মৌজায় সোলার প্লান্টটি স্থাপন করিলে পরিবেশগত কোন ক্ষতি হইবেনা এবং মাননীয় প্রধানমন্ত্রীর অগ্রাধিকার ভিত্তিক প্রকল্প হওয়ায় অত্র পরিষদের ইহাতে কোন আপত্তি নাই।

আমি স্পেক্ট্রা সোলার পার্ক লিঃ এর সাফল্য কামনা করিতেছি।

  
(মোহাম্মদ আলী আকবর)  
মোহাম্মদ আলী আকবর  
চেয়ারম্যান  
উপজেলা পরিষদ শিবালয়  
শিবালয়, মানিকগঞ্জ।

### NOC

As per Government of Bangladesh "Electricity for every household project" Spectra Solar Park Limited has shown their willingness to set up a 35 MW Solar Power Plant at Baruria Mouza of Arua Union, Shivalaya Upozlla. There will be no adverse impact on Environment for this project.

Chairman of Shivalaya Upazila  
Dt: 04/02/2019

## **APPENDIX G    NOC LETTER FROM ARUA UNION PARISHAD**

# নেং আকুয়া ইউনিয়ন পরিষদ

চেয়ারম্যান এর কার্যালয়

ডাকঘর : মালুচী, উপজেলা : শিবালয়, জেলা : মানিকগঞ্জ।



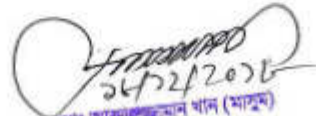
বারুয়া ইউপি/২০১-১

তারিখঃ ১৮/১২/২০১৮

## প্রত্যয়ন পত্র

এই বর্মে প্রত্যয়ন করা যাইতেছে যে, স্পেক্ট্রা সোলার পার্ক লিঃ নেং আকুয়া ইউনিয়নের অন্তর্গত বড়ুরিয়া মৌজায় একটি ৩৫.০০ মেগাওয়াট সোলার প্লান্ট স্থাপনের ইচ্ছা প্রকাশ করিয়াছে। উক্ত মৌজায় সোলার প্লান্ট স্থাপন করিলে পরিবেশগত কোন ক্ষতি হবে না এবং অত্র পরিষদের কোন আপত্তি নাই।

আমি স্পেক্ট্রা সোলার পার্ক লিঃ এর সাফল্য কামনা করছি।

  
১৮/১২/২০১৮  
মোঃ আব্দুল করিম খান (মাসুম)  
চেয়ারম্যান  
নেং আকুয়া ইউনিয়ন পরিষদ  
নিবাস: মানিকগঞ্জ।

### NOC

As per Government of Bangladesh "Electricity for every household project" Spectra Solar Park Limited has shown their willingness to set up a 35 MW Solar Power Plant at Baruria Mouza of Arua Union, Shivalaya Upazlla. There will be no adverse impact on Environment for this project.

Chairman of 5 No. Arua Union  
Dt: 18/12/2018