

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

PREPARED FOR

JAYANA BATTERY TECHNOLOGIES

UTTAR PANAPUKUR, OKRABARI, BOROBIL, GANGACHARA, RANGPUR



PREPARED BY

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ABBREVIATION

ATP	Air Treatment Plant
CZP	Coastal Zone Policy
DOE	Department of Environment
ECMP	Emission Control & Management plan
ECC	Environmental clearance certificate
EIA	Environmental Impact Assessment
EMP	Environment Management plan
ECR	Environmental Conservation Rules
ECA	Environmental Conservation Act
ETP	Effluent Treatment Plant
EQS	Environmental Quality Standard
HSEMP	Health, Safety & Emergency Management plan
IEE	Initial Environmental Evaluation
NMP	Noise Management Plan
NWP	National Water Policy
PPE	Personal Protective Equipment (PPE)
PPR	Public Procurement Rule
SWMP	Solid Waste Management Plan
TOR	Terms of Reference
WWMP	Waste water Management plan



GLOSSARY

Adverse Impact : An impact that is considered undesirable.

Ambient Air : Surrounding air.

Aquatic : An impact that is considered undesirable. Aquatic: Growing or living in or near water.

Accident: It is an unplanned event, which has a probability of causing personal injury or property damage or both.

Bangla : Bengali Language.

Baseline (or existing) condition : The 'baseline' essential comprises the factual understanding and interpretation of existing environmental, social and health condition of where the business activity is proposed. Understanding the baseline shall also include those trends present within it, and especially how changes could regardless of the presence of the project, i.e. the 'No development option'.

Bazar : Market.

Beel : A 'back swamp' or description. Can be either perennial or seasonal.

Beneficial impacts: Impacts, which are considered to be desirable and useful.

Biological Diversity: The variety of life forms, the different plants, animals and microorganisms, genes they contain and the ecosystems they form. It is usually considered at three levels; genetic diversity, species diversity and ecological diversity.

Disaster: It is defined as a catastrophic situation that causes damage, economic disruptions, loss of it human life and deterioration of health and health services on a scale sufficient to warrant an extraordinary response from outside the affected area or community. Disasters occasioned by man are factory fire explosions and release of toxic gases or chemical substances etc.

Ecosystem: A dynamic complex of plant, animal, fungal and microorganism communities and associated non living environment interacting as an ecological unit.

Emission: The total amount of solid, liquid or gaseous pollutant emitted into the atmosphere from a given source within a given time, as indicated, for e.g., in grams per cubic meter of gas or by a relative measure, upon discharge from the source.

Endangered species: Species in danger of extinction and whose survival is unlikely if the existing conditions continue to operate. Included among those are species whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to suffer from immediate danger of extinction.

Environmental effects: The measurable changes, in the natural system of productivity and environmental quality, resulting from a development activity.

Environmental impact assessment (EIA)/ Environmental assessment: The systematic, reproducible and interdisciplinary identification, prediction and evaluation, mitigation and management of impacts from a proposed development and its reasonable alternatives, sometimes known as environmental assessment.

Environmental Impact: An estimate or judgment of the significance and value of environmental effects for natural, socio-economic and human receptors.

Environmental Management plan (EMP): A plan to undertake an array of follow-up activities which provide for the sound environmental management of a project/intervention so that adverse environmental impacts are minimized and mitigated; beneficial environmental effects are maximized; and sustainable development is ensured.

Environmental Management: Managing the productivity use of natural resources without reducing their productivity and quality.

Emergency: It is defined as a situation where the resources out pass the demand. This highlights the typical nature of emergency. Situations of this kind are avoidable but it is not possible to avoid them always.

Emergency preparedness: It is one of the key activities in the overall management. Preparedness, though largely dependent upon the response capability of the persons engaged in direct action, will require support from others in the organization before, during and after an emergency.

Erosion : Process in which wind and water removes materials from their original place; for instance, soil washed away from an agricultural field.

Evaluation : The process of looking back at what has been really done or accomplished.

Fauna : A collective term denoting the animals occurring in a particular region or period.

Field Reconnaissance: A field activity that confirms the information gathered through secondary.

Sources: This field study is essentially a rapid appraisal.

Flora : All of the plants found in a given area.

Habitat : The natural home or environment for a plant or animal.

Household : A household is identified as a dwelling unit where one or more persons live and eat together with common cooking arrangement. Process living in the same dwelling unit having separated cooking arraignment constitute separate household.

Important Environmental Component (IEC): These are environmental components of biophysical or socio-economic importance to one or more interested parties. The use of important environmental components helps to focus the environmental assessment.

Initial Environmental Assessment (IEE) / Evaluation: Preliminary analysis undertaken to ascertain whether there are sufficient likely significant adverse impact to warrant a 'full' EIA. In some countries, use of initial assessment forms a meaning of "sourcing" proposed projects.

Khal: Small Channel, Cannel.

Land use: Types include agriculture, settlement, pisciculture and industries.

Mauza: A Bangla word for the smallest government administrative are corresponding to village revenue unit.

Mitigation: An action which may prevent or minimize adverse impacts and enhance beneficial impacts.

Negative Impact: Negative chance from the existing situation due to the project.

Public involvement/public consultation. A range of techniques that can be used to inform, consult or interact with stakeholders' affected/to be affected by a proposal.

Risk: It is defined as a likelihood of an undesired event (accident, injury or death) occurring within a specified period or under specified circumstances. This may be either a frequency or a probability depending on the circumstances.

Reversible impact: An environmental impact that recovers either through natural process or with human assistance (e.g. cutting off fish migration by an embankment might be reversible at a later stage if a proper regulator is built).

Stakeholders: Those who may be potentially affected by a proposal, e.g. local people, the proponent, government agencies, NGOs, donors and others, all parties who may be affected by the project or to take an interest in it.

Terrestrial: Living on land.

Taka: Unit of Bangladeshi currency.

Terrestrial: Living on land.

Thana: Sub-district level of government administration, compressing several unions under district.

Union: Smallest unit of local self-government comprising several villages.

Upazila: Sub-district name. Upazila introduced in 1982.

Zila: Bengali word of district.

Power: supply (a device) with mechanical or electrical energy

Battery: it's a device for storing charged



EXECUTIVE SUMMARY

Executive Summary

JAYANA BATTERY TECHNOLOGIES will use imported Sulfuric acid, Lead Oxide, PP Battery Container & Separator for the production of lead acid battery. Positive and negative grid casting, powder filling, sulfation and washing, drying, battery formation and charging will have steps in the production of lead acid battery at Vill: Uttar Panapukur, Borobil, P.S: Gangachara, Dist: Rangpur. Lead-acid batteries will be manufactured by above mentioned steps.

Water will be required for the manufacture of lead-acid batteries for the purpose of washing. Water will be withdrawn from the groundwater sources. While some of the water will be used in the manufacturing process, the greater portion will be used for domestic purposes of 250 workers.

The extraction of 3,500 cubic meters of water daily may be required for lead-acid battery production and domestic use. **Jayana Battery Technologies** will use lead plates and negative plates for the production of lead-acid batteries. Water used in the battery manufacturing process can turn into wastewater. For this reason, 'Jayana Battery Technologies' will install a 'Zero Discharge' Effluent Treatment Plant (ETP) with a daily capacity of 120 cubic meters; this means the treated water can be 100% reused for various purposes.

Lead contamination of the air during the battery manufacturing process is a severely adverse negative impact. Consequently, in accordance with environmental conservation laws (1995), any project involving the use of lead must install an Air Treatment Plant (ATP). **Jayana Battery Technologies** will be set up six set Air treatment plant (ATP) - that will be used for workplace treatment air from lead pollution.

During the production process of lead acid battery, noise level will be within the standard limit of noise pollution control rule 2025. No can be complaint about noise pollution around the project area. Contaminated water (acidic water) must not be discharged into the adjacent paddy field areas under any circumstances. Jayana Battery Technologies has committed to the local people about this aspect.

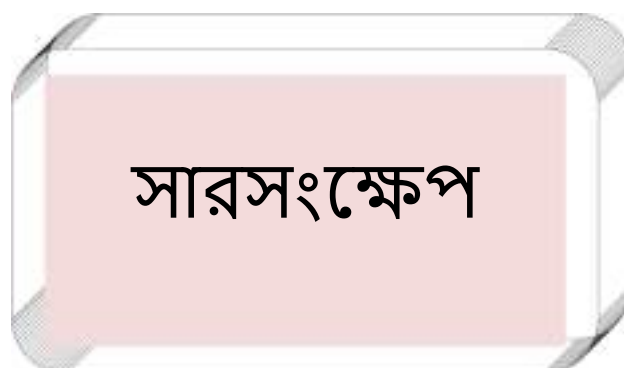
JAYANA BATTERY TECHNOLOGIES will have fire extinguisher at the workplace, will have contact phone number of Gangachara and Rangpur fire station. An any emergency situation JAYANA BATTERY TECHNOLOGIES will call ambulance for the emergency treatment of injured persons from the factory. JAYANA BATTERY TECHNOLOGIES will make toilets and septic tank in the factory promise. JAYANA BATTERY TECHNOLOGIES will supply drinking water for the 250 workers.

The solid waste will be collected and sold to the approve vendor. JAYANA BATTERY TECHNOLOGIES will follow the solid waste management rules 2021 for all respect of collection, separation, recycle, and re-use. JAYANA BATTERY TECHNOLOGIES will be appointed vendor in district and Upazila level for collecting of solid waste. The solid waste will be not form during acid production procure. As the project falls under red category according to the Bangladesh Environment Conservation Rules, 2023; it is mandatory to conduct an Environmental Impact Assessment (EIA) study and submission of EIA report to get Environmental Clearance Certificate from Department of Environment (DoE) Bangladesh. However, this is done at present as a requirement of the proponent. Impacts that are identified during the study reveal that fire hazards, environmental and occupational health and accidents, safety and emergency are only the major impacts of the project and the facility have already implemented all necessary action to reduce impacts to certain allowable limit.

This study also suggests general action and management plans necessary for such facilities. However, it could be concluded that the existing facility of JAYANA BATTERY TECHNOLOGIES is performing as an environment friendly organization and expect it will continue to do so. There are no particularly sensitive ecological, cultural, and archeological targets around the project area of JAYANA BATTERY TECHNOLOGIES. The plant did not have to relocate any human settlement, as it is established in an industrial and commercial setting. JAYANA BATTERY TECHNOLOGIES has acquired land for production building with no needed any resettlement for the local people. JAYANA BATTERY TECHNOLOGIES will make boundary wall for the purposes of security, mitigation of wild life impact. Trees will plant at the outside of boundary wall. JAYANA BATTERY TECHNOLOGIES will use both roads to mitigate the existing traffic impact at factory areas.

Given that JAYANA BATTERY TECHNOLOGIES is located environmentally acceptable area and suggested Environmental Management Plan would be followed meticulously, the plant is expected to perform within the required national environmental norms and standards.

The EIA report finds that though there are certain adverse environmental impacts associated with the industrial unit under consideration, those are however manageable. Given the location, proponent's commitments, measures already undertaken, and commitment for further measures to be adopted in due course of time if needed, JAYANA BATTERY TECHNOLOGIES is going to be a nationally important and environmentally compatible industrial unit for the production of lead acid battery.



EXECUTIVE SUMMARY

জায়ানা ব্যাটারি টেকনোলজিস লেড-অ্যাসিড ব্যাটারি উৎপাদনের জন্য আমদানিকৃত সালফিউরিক অ্যাসিড, লেড অক্সাইড, পিপি (PP) ব্যাটারি কন্টেইনার এবং সেপারেটর ব্যবহার করবে। রংপুরের গঙ্গাচড়া থানার অন্তর্গত বড়বিলের উত্তর পানাপুকুর গ্রামে স্থাপিত এই কারখানায় ব্যাটারি উৎপাদনের প্রক্রিয়ার মধ্যে রয়েছে বিভিন্ন ধাপ পজিটিভ ও নেগেটিভ গ্রিড কাস্টিং, পাউডার ফিলিং, সালফেশন ও ধৌতকরণ, শুকানো (ড্রাইং), ব্যাটারি ফরমেশন এবং চার্জিং। এই ধাপগুলি অনুসরণ করে লেড এসিড ব্যাটারী প্রস্তুত করা হবে।

লেড-অ্যাসিড ব্যাটারি তৈরির সময় ধোয়ামোছার কাজে পানির প্রয়োজন হবে। ভূগর্ভস্থ উৎস থেকে এই পানি সংগ্রহ করা হবে। যদিও পানির একটি অংশ উৎপাদন প্রক্রিয়ায় ব্যবহৃত হবে, তবে এর বড় অংশটি ২৫ জন শ্রমিকের দৈনন্দিন গৃহস্থালি কাজে ব্যবহৃত হবে। লেড-অ্যাসিড ব্যাটারি উৎপাদন ও গৃহস্থালি ব্যবহারের জন্য প্রতিদিন ১০৫.০ ঘন মিটার পানি উত্তোলনের প্রয়োজন হতে পারে। জায়ানা ব্যাটারি টেকনোলজিস লেড-অ্যাসিড ব্যাটারি উৎপাদনের ক্ষেত্রে লেড প্লেট ও নেগেটিভ প্লেট ব্যবহার করবে। ব্যাটারী প্রক্রিয়ায় ব্যবহৃত পানি বর্জ্য পানিতে পরিণত হতে পারে। এই কারণে, ‘জায়ানা ব্যাটারি টেকনোলজিস’ দৈনিক ১২০ ঘনমিটার ক্ষমতাসম্পন্ন একটি ‘জিরো ডিসচার্জ’ (zero discharge) ইটিপি (ETP) স্থাপন করবে; অর্থাৎ, পরিশোধিত পানি বিভিন্ন প্রয়োজনে শতভাগ পুনরায় ব্যবহার করা সম্ভব হবে।

ব্যাটারি উৎপাদন প্রক্রির সময় বাতাসে সিসার দূষণ একটি অত্যন্ত ক্ষতিকর প্রভাব ফেলে। তাই পরিবেশ সংরক্ষণ আইন (১৯৯৫) অনুযায়ী, সিসা ব্যবহারকারী যেকোনো প্রকল্পে অবশ্যই এয়ার ট্রিটমেন্ট প্ল্যান্ট (ATP) স্থাপন করতে হবে।

জায়ানা ব্যাটারি টেকনোলজিস ছয়টি এয়ার ট্রিটমেন্ট প্ল্যান্ট (এটিপি) স্থাপন করবে—যা কর্মক্ষেত্রে সিসা দূষণ থেকে বাতাস শোধনের কাজে ব্যবহৃত হবে। কোনো অবস্থাতেই দূষিত পানি (অম্লীয় পানি) পার্শ্ববর্তী ধানক্ষেতের এলাকায় ফেলা যাবে না। ‘জায়ানা ব্যাটারি টেকনোলজিস’ স্থানীয় জনগণের কাছে এ বিষয়ে প্রতিশ্রুতিবদ্ধ।

‘জায়ানা ব্যাটারি টেকনোলজিস’ তাদের কর্মস্থলে অগ্নিনির্বাপক যন্ত্রের ব্যবস্থা রাখবে এবং গঙ্গাচড়া ও রংপুর ফায়ার স্টেশনের যোগাযোগের ফোন নম্বর সংরক্ষণ করবে। যেকোনো জরুরি পরিস্থিতিতে, কারখানায় আহত ব্যক্তিদের জরুরি চিকিৎসার জন্য ‘জায়ানা ব্যাটারি টেকনোলজিস’ অ্যাম্বুলেন্স ডাকবে। ‘জায়ানা ব্যাটারি টেকনোলজিস’ কারখানার প্রাঙ্গণে শৌচাগার ও সেপটিক ট্যাংক নির্মাণ করবে এবং ২৫০ জন শ্রমিকের জন্য পানীয় জলের ব্যবস্থা করবে।

কঠিন বর্জ্য সংগ্রহ করে অনুমোদিত বিক্রেতার কাছে বিক্রি করা হবে। কঠিন বর্জ্য সংগ্রহ, পৃথকীকরণ, পুনর্ব্যবহার (recycle) এবং পুনঃব্যবহারের (re-use) ক্ষেত্রে ‘জায়ানা ব্যাটারি টেকনোলজিস’ ‘কঠিন বর্জ্য ব্যবস্থাপনা বিধিমালা ২০১১’ মেনে চলবে। কঠিন বর্জ্য সংগ্রহের জন্য জেলা ও উপজেলা পর্যায়ে ‘জায়ানা ব্যাটারি টেকনোলজিস’-কে বিক্রেতা হিসেবে নিযুক্ত করা হবে। এসিড উৎপাদনের প্রক্রিয়ায় কোনো কঠিন বর্জ্য উৎপন্ন হবে না। যেহেতু প্রকল্পটি ‘বাংলাদেশ পরিবেশ সংরক্ষণ বিধিমালা ২০২৩’ অনুযায়ী ‘লাল’ (Red) ক্যাটাগরির অন্তর্ভুক্ত, তাই পরিবেশ অধিদপ্তর (DoE) থেকে পরিবেশগত ছাড়পত্র পাওয়ার জন্য ‘পরিবেশগত প্রভাব নিরূপণ’ (EIA) সমীক্ষা পরিচালনা এবং EIA প্রতিবেদন জমা দেওয়া বাধ্যতামূলক। তবে, বর্তমানে প্রকল্প উদ্যোক্তার আবশ্যিক শর্ত হিসেবেই এই কাজটি করা হচ্ছে। গবেষণায় চিহ্নিত প্রভাবগুলো থেকে দেখা যায় যে, অগ্নিকাণ্ডের ঝুঁকি, পরিবেশগত ও পেশাগত স্বাস্থ্যঝুঁকি এবং দুর্ঘটনা ও জরুরি পরিস্থিতির মতো বিষয়গুলোই হলো এই প্রকল্প ও স্থাপনাটির প্রধান প্রভাব; আর এসব প্রভাবকে গ্রহণযোগ্য মাত্রায় নামিয়ে আনার জন্য প্রয়োজনীয় সব পদক্ষেপ ইতিমধ্যেই গ্রহণ করা হয়েছে। এই সমীক্ষায় এ ধরনের স্থাপনার জন্য প্রয়োজনীয় সাধারণ কর্মপরিকল্পনা ও ব্যবস্থাপনা বিষয়ক পরামর্শও প্রদান করা হয়েছে। সামগ্রিকভাবে বলা যায় যে, ‘জায়ানা ব্যাটারি টেকনোলজিস’ একটি পরিবেশ-বান্ধব প্রতিষ্ঠান হিসেবে কার্যক্রম পরিচালনা করছে এবং ভবিষ্যতেও তা অব্যাহত রাখবে বলে আশা করা যায়। প্রকল্প এলাকার আশেপাশে পরিবেশগত, সাংস্কৃতিক বা প্রত্নতাত্ত্বিক দিক থেকে অত্যন্ত সংবেদনশীল

কোনো স্থান বা স্থাপনা নেই। শিল্প ও বাণিজ্যিক এলাকায় স্থাপিত হওয়ায় এই কারখানাটির জন্য কোনো জনবসতি স্থানান্তরের প্রয়োজন হয়নি। স্থানীয় বাসিন্দাদের পুনর্বাসনের কোনো প্রয়োজন ছাড়াই ‘জায়ানা ব্যাটারি টেকনোলজিস’ উৎপাদন ভবন নির্মাণের জন্য প্রয়োজনীয় জমি অধিগ্রহণ করেছে। নিরাপত্তা নিশ্চিতকরণ এবং বন্যপ্রাণীর ওপর প্রভাব প্রশমনের লক্ষ্যে ‘জায়ানা ব্যাটারি টেকনোলজিস’ সীমানা প্রাচীর নির্মাণ করবে এবং এই প্রাচীরের বাইরের অংশে বৃক্ষরোপণ করা হবে। কারখানার এলাকায় বিদ্যমান যানজটের প্রভাব কমাতে ‘জায়ানা ব্যাটারি টেকনোলজিস’ উভয় সড়কই ব্যবহার করবে।

যেহেতু ‘জায়ানা ব্যাটারি টেকনোলজিস’ পরিবেশগতভাবে উপযুক্ত একটি এলাকায় অবস্থিত এবং প্রস্তাবিত পরিবেশ ব্যবস্থাপনা পরিকল্পনাটি যথাযথভাবে অনুসরণ করা হবে, তাই আশা করা যায় যে কারখানাটি জাতীয় পরিবেশগত বিধিমালা ও মানদণ্ড মেনেই তার কার্যক্রম পরিচালনা করবে।

পরিবেশগত প্রভাব নিরূপণ (EIA) প্রতিবেদনে দেখা গেছে যে, আলোচ্য শিল্প ইউনিটটির সাথে পরিবেশের ওপর কিছু বিরূপ প্রভাব জড়িত থাকলেও তা নিয়ন্ত্রণযোগ্য। কারখানার অবস্থান, উদ্যোক্তার প্রতিশ্রুতি, ইতিমধ্যে গৃহীত পদক্ষেপ এবং প্রয়োজনে ভবিষ্যতে আরও পদক্ষেপ গ্রহণের অঙ্গীকার বিবেচনায় নিলে বলা যায় যে, ‘জায়ানা ব্যাটারি টেকনোলজিস’ লেড-অ্যাসিড ব্যাটারি উৎপাদনের ক্ষেত্রে একটি জাতীয়ভাবে গুরুত্বপূর্ণ এবং পরিবেশ-বান্ধব শিল্প ইউনিট হিসেবে গড়ে উঠবে।

CHAPTER-1
INTRODUCTION

INTRODUCTION

1.1 Project Background

The Government of Bangladesh, with a view to providing for conservation and improvement of environmental quality, and controlling and mitigating pollution of the environment, enacted the Bangladesh Environment Conservation Act (BECA), 1995, which became effective from June 1, 1995. Section 12 of this Act stipulates that “No industrial unit or project shall be established or undertaken without obtaining environmental clearance from the Director General, Department of Environment in the manner prescribed by the rules”. Environmental Impact Assessment (EIA) Report, Preparation of Environmental Management Plan, Judging of Public Opinion, Public Access to Information, Structure and Function of the Environment Clearance Committee, Minimum Necessary Conditions for Clearance, Appeal, etc will be need for within the context of obtaining the Environmental Clearance Certificate for JAYANA BATTERY TECHNOLOGIES.

The Environmental Conservation Rules (ECR), 2023, the main subsidiary legislation of the BECA, provides specific rules and procedures for various categories of projects in relation to their approval prior to construction and operation. The EIA study is to be based on terms of reference that have the prior approval of the DoE. Department of environment has lardy given TOR for the JAYANA BATTERY TECHNOLOGIES for conducting an EIA study and preparation of an EIA report. JAYANA BATTERY TECHNOLOGIES will have all the responsibilities of a project proponent who may get this done either through in-house resources or through consultants. The TOR for EIA study is attached in an annexure 1.

1.2 Introduction to Environmental Impact Assessment (EIA)

An EIA for JAYANA BATTERY TECHNOLOGIES is conducted in response to a project proposal and therefore, the assessment procedure is project-centered. That is, the procedure is molded around the normal project planning process. This concept is called integrated project planning. Integrated project planning requires the project planner to assess and evaluate his planning decisions taking into account the technical, economic, social and environmental factors. It implies that EIA should be a continuous process throughout the course of project planning.

EIAs and environmental management tools effectively compliment other main planning tools such as economic analysis and feasibility studies of the lead acid battery production project area and its surroundings, as they assist decision makers to ensure their project plan is economically and environmentally and socially sound and sustainable. Since project planning and development involves various stages of different scale, it is important to understand the role of each stage in the project planning and development cycle.

1.3 Steps in EIA Process

The EIA process comprises of six key steps:

1.3.1 Screening

The first step in the process, screening helps to decide whether an EIA is required for the **JAYANA BATTERY TECHNOLOGIES** for the production of lead acid battery project at Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur. An appropriately designed screening system can, thus, prove to be an effective tool for preventing the squandering of time and money on assessing projects with insignificant environmental impacts. The screening data is carried from the field visit and secondary information from other sources.

1.3.2 Scoping

This step begins after screening has decided on the requirement for an EIA. Scoping is considered the backbone of the EIA process, and is ideally undertaken at the project planning stage. The main objective of the scoping process is to establish the environmental and social priorities and set the boundaries for the study and define the Terms of Reference (ToR) for the impact assessment. Systematic and well-planned scoping forms the basis for an effective and efficient EIA process. It also helps avoid unfocused and voluminous reports. The EIA report shall be prepared in accordance with guideline provide in the schedule 11 and rules 15 of the ECR, 2023.

1.3.3 Baseline data generation:

Baseline data provides a detailed description of the existing status of various environmental and social components in the study area. Both primary and secondary data is collected to describe this status. Baseline data is to be collected on land use, land cover, land environment, ambient air quality, water environment, biological environment, and socioeconomic factors. The baseline study involves gathering and evaluating information from existing sources and collecting field data at the project area of **JAYANA BATTERY TECHNOLOGIES**.

1.3.4 Impact assessment

An impact assessment is a planning and decision-making tool used to assess the potential positive and negative effects of proposed project of JAYANA BATTERY TECHNOLOGIES. Impact assessments consider a wide range of factors and propose measures to mitigate projects' adverse effects. In this step, the characteristics of potential impacts are identified, evaluated, and predicted using the baseline information on one hand and the features of the project on the other (cause-effect relationship). Impact predictions are normally done by using common methodologies and models. However, models can be used with care and prudence, as most of them are designed keeping in mind the requirements of the developed world; also, in most developing countries, the quality of data used to design these models is not always adequate.

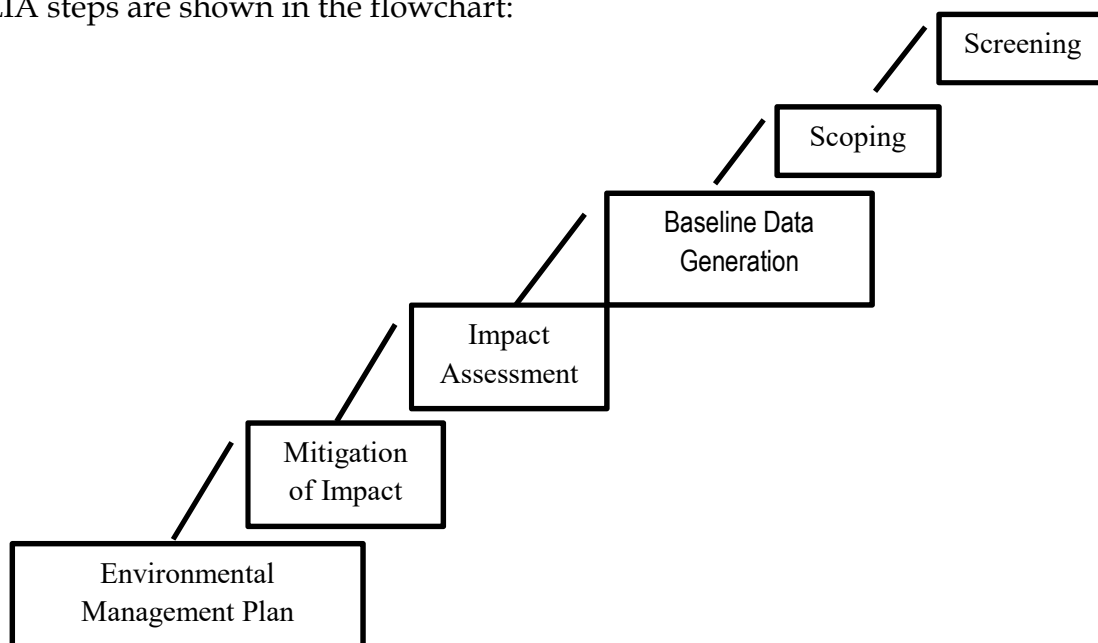
1.3.5 Mitigation of impacts

Mitigation refers to minimizing or avoiding the described impacts which will be needed to assess for JAYANA BATTERY TECHNOLOGIES. This step is the core part of an EIA. Impact assessment refers to the detailed evaluation of the environmental and social impacts of the planned project and identified alternatives, compared to the baseline conditions. At this stage, the possible preventive, remedial and compensatory measures for each adverse impact are determined and recommended. The application of mitigation hierarchy (avoidance, minimization, mitigation, compensation/ offset) is adopted.

1.3.6 Environmental Management Plan

An environment management plan (EMP), also referred to as an impact management plan, is prepared as part of the EIA reporting process. It translates recommended mitigation and monitoring measures into specific actions that have to be carried out by the proponent. Depending upon specific requirements, the plan may be included in the EIA report or can be prepared as a separate document.

EIA steps are shown in the flowchart:



1.4 Integrating EIA into the Project Cycle

The timing of submission of the EIA Report to the DOE for approval is vital. The proper timing of submission is essential so as not to cause any major disruption to the overall project planning cycle. The Project Proponent is mandated by of the Ministry of Environment, Forest and Climate Change through a regulatory order to submit the EIA Report as early as possible at the feasibility study stage to enable recommendations on environmental changes or modifications to the project plan to be incorporated (preferably at feasibility study stage). On the other hand, submission of an EIA Report towards the end of the project planning cycle will reduce the value of an EIA, and possibly increase environmental costs or delay implementation of the project.

An EIA carried out at the project identification stage will give an opportunity to Project Proponent to exhaust environmental issues and to find solutions to them, prior to project implementation. In instances where undesirable significant adverse environmental impacts are identified, alternatives which are environmentally acceptable can be found and designed for. This exercise can be repeated until acceptable solutions are found.

1.5 Purpose of the Project

JAYANA BATTERY TECHNOLOGIES will use lead oxide, sulfuric acid, PP battery container & cover and separator for the production of Lead -Acid Battery. The market outlook report provides an unbiased and detailed analysis of the ongoing market trends, opportunities/high growth areas, and market drivers which would help the stakeholders to devise and align their market strategies according to the current and future market dynamics.

Bangladesh has Lead -Acid Battery market witnessed steady growth, primarily influenced by the country's industrial sector. The rapid expansion of textiles, chemicals, and pharmaceutical industries proliferates the demand for lead acid battery as a crucial component in manufacturing processes.

According to research, the Bangladesh Lead -Acid Battery Market is anticipated to grow during the forecast period 2023-2029. Increasing industrial activities in export-oriented sectors, which demanded a consistent supply of sulphuric Acid and lead oxide for diverse applications is one of the key drivers of this market. Moreover, the government's emphasis on infrastructure development further stimulated the demand for construction materials, such as cement, which relied on sulphuric Acid and lead oxide in production processes. Apart from this, the adoption of sustainable practices is one of the key trends shaping the industry. Manufacturers and end-users alike showed a growing interest in environmentally friendly and efficient production processes.

Despite the growth trajectory of this market, the Bangladesh Lead -Acid Battery industry faced certain restraints such as price volatility of raw materials, particularly sulphuric Acid and lead oxide, which posed challenges for manufacturers and influenced pricing strategies. Additionally, stringent environmental regulations required companies to invest in responsible waste disposal and emissions management, which added to the production costs. JAYANA BATTERY TECHNOLOGIES will use this sulphuric Acid and lead oxide to make lead acid battery.

An Environmental Impact Assessment (EIA) in this regard is a right tool to identify impacts of a new or existing project and helps in preparing environmental management plan for JAYANA BATTERY TECHNOLOGIES.

1.6 Purpose of the Study

In Bangladesh, the future of Bangladesh's Lead -Acid Battery is likely to be positive as the country recovers from the impact of the COVID-19 pandemic. There may be a resurgence in industrial activities, leading to increased demand for Lead -Acid Battery in manufacturing processes. Additionally, as infrastructure projects and construction activities resume, there is a rise in the demand for construction materials, which further drives the demand for Lead -Acid Battery in the country. Furthermore, the market is witnessing a growing interest in sustainable practices and environmental-friendly production processes, as seen in the global market trends. However, uncertainties in the global economic landscape and potential fluctuations in raw material prices pose challenges for the market. As per demand and resist the import of this Lead -Acid Battery from foreign countries (China, India), JAYANA BATTERY TECHNOLOGIES will be attempted to make the above-mentioned Lead -Acid Battery % with the help of smart process from sulphuric Acid and lead oxide.

It is well recognized that each industrial development is unique many ways. Therefore, for the industry, the environmental aspects and consequent impact due to the development activities and plant operations must be examined on case-by-case basis. The first step in this process is an Environmental Impact Assessment (EIA) study to identify the potential impacts due to the industrial activities and evaluate the intensity of the impacts so that suitable effective measures can be taken to mitigate adverse impacts. An EIA study is an effective tool to delineate what needs to be done to operate an industrial unit in environment friendly way for producing this acid.

It is categorized in red category. For the project an EIA study in detailed design implementation period Managing Director of "JAYANA BATTERY TECHNOLOGIES" has requested ION WATER TECHNOLOGY (BD) for preparing an EIA report on this project as per DOE guideline. Accordingly, this EIA report has been prepared.

An Environmental Impact Assessment (EIA) in this regard is a right tool to identify impacts of a new project and helps in environmental impact Assessment.

1.7 Need of EIA

Environment is composed of Biotic & Abiotic components. There is a dynamic equilibrium between these components. When a project is undertaken it tends to disturb these components. To maintain the quality of environment it is essential that the perspective impacts of the project on natural environment are studied on time and remedial measure be taken so as to promote sustainable and holistic development of the project. This is done through EIA.

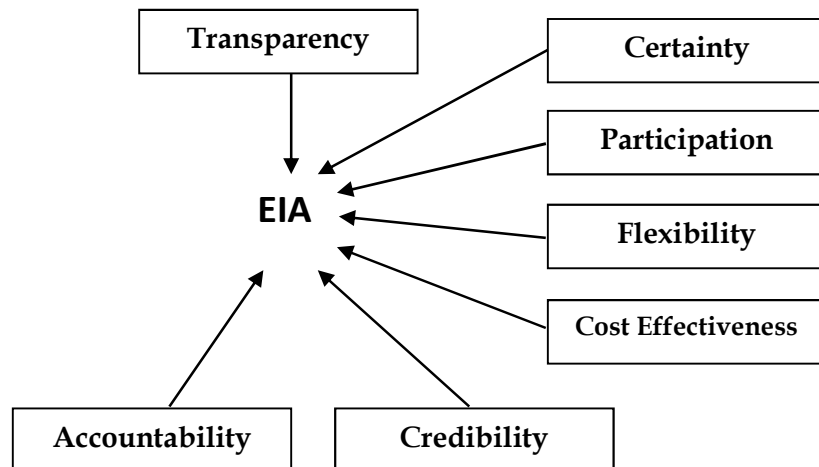
- For Example, a forest ecosystem is a complete ecosystem which provides food, shelter to a wide variety of species. It provides firewood, resins, timber, medicinal herbs, etc. to us.

Therefore, forests are our lifetime. Whenever a project is undertaken which demands clearing of the forest like construction of road or a dam, then EIA helps us to access the impact of that activity on this life line. It also suggests alternate project sites and alternate process technologies.

1.8 Ideal EIA System

An Ideal EIA system would be

- Apply to all projects that are expected to have a significant environment effect and address all impacts that are expected to occur due to that project.
- Compare alternatives to a proposed project, management techniques and mitigation measures.
- Result in a clear EIS (Environmental Impact Statement) which conveys the importance of the likely and their specific characteristics to non-experts in the field.



- Include broad public participation and stringent administrative review procedures.
- Be timed so as to provide information for decision making.
- Be enforceable.
- Include monitoring and feedback procedures.
- Therefore, the purpose of EIA is to help design projects which enhance of the quality environment by examining alternative and remedial measures throughout the entire course of planning and designing of the development projects.

1.9: Objectives of the EIA

The report presents the finding of an Environment Impact assessment (EIA) of the project namely “JAYANA BATTERY TECHNOLOGIES” at Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur. The objective of the study is to provide an examination and assessment of the principle-environmental impacts of this acid manufacturing industry. The outlet of an environmental management plan also suggested with an indication of the extent of work to be done to keep the development and environment compatible. In this context, it should be noted that the term “environment” and its derivatives have been used in a wide sense, which covers not only physical and chemical aspects, but also the human dimension.

The Specific objectives of this EIA are to: –

- Present a brief discussion on the EIA process and its role in the planning and implementation of development projects;
- Present a general description of the project and the process;
- Present a description of the pre-project environment;
- Delineate the significant environmental issues found and believed to be involved;
- Identify the environmental impacts of the project and quantify them to the extent possible;
- Suggest the plan for management of the environment, during the implementation and operation of the plant;

1.10 Literature Review

During the preparation of this preparation of this report, pertinent reference were consulted and reviewed. A list of these references has been presented in chapter-11.

1.11 Methodology

Environmental Conservation Act 1995 (ECA -95) is currently the main legislative document relating to environmental protection in Bangladesh. Under this act, No industrial unit or project shall be established or adopted Clearance, in the manner prescribed by the rules, from Director General. Compliance with the provision of this Act is the responsibility of Department of Environment (DOE). The Environment Conservation Rules, 2023 (schedule 11, rules 15) has been promulgated to implement the ECA' 95. The rules mainly consist of;

- 📁 Categorized list of the industrial Unit/ project (green, orange and red)
- 📁 Application form to take Environmental Clearance
- 📁 Ambient standards in relation to water, air noise as permitted discharge /emission levels of effluent and air pollution and noise by industries.

The rules incorporated “inclusion lists” of industrial units/projects requiring verifying degrees of environmental investigation e. g. all the proposed industrial units/projects in Red category will require two-steps assessment procedure, firstly an Initial Environmental Examination (IEE) for site clearance, and secondly, if warranted, a full Environmental Impact assessment (EIA)/Environmental Management Plan (EMP) for technical clearance. “JAYANA BATTERY TECHNOLOGIES” falls under **Red-category** of Environment Conservation Rules and hence will require an Environmental Impact assessment (EIA) for Environmental clearance.

This EIA report included the collection of information relating to the project by meeting with the project proponent undertaking a site visit to the location with a view to reconnaissance survey of the surrounding areas. This was followed by evaluation of the information to delineate the major environmental issue. Identification of significant environmental issues due to project was done using the Checklist method.

- EIA helps to identify the major areas of environmental damage due to developmental activities in a systematic and comprehensive manner and also suggests remedial measures to minimize these negative impacts.
- The EIA methodology consists of four phases, namely: -
- Organizing the job.
- Writing the Environment Impact Statement (EIS).
- Review of the EIS.

1.12 JAYANA BATTERY TECHNOLOGIES EIA Approach:

During the course of EIA the following steps have been followed:

- Field visit was undertaken to the project location with a view to reconnaissance and detailed physical survey of the surrounding areas. Questionnaire was used to collect data on the existing environment and socio-economic conditions;
- Monitoring of several environmental quality parameters was done in the project & adjoining areas;
- The existing operation & management process was studied;
- Identification of potential impacts and evaluation of their consequences, to the possible extent was done. Identification of impacts was done using checklists & matrices methods;
- The existing process was studied for the adequacy & efficiency of implemented mitigation measures;
- Recommendation for strengthening adopted mitigation measures.

1.13 EIA TEAM

2.	Subject	Description	Experience	Signature
	(Team Leader) Key person of Impact assessment for the production of Lead- acid Battery project	Mohd Nur E Alam Siddique B.Sc (Hons) M.Sc (SUST) in Analytical & Environmental Chemistry, M. Phil (DU), PhD Research Fellow (NU) Email: nasiddique75@gmail.com Environment Consultant of Ion Water Technology (BD) Mobile No: +88 01718815499 Area of Study : EIA, CESMP, ESIA & EMP/ESMP Approach An Expert on Environmental Issues ESMP, ESMF, CESMP, CESMMP, designer of WTP, ATP, ETP, STP, Industrial Wastewater Treatment, Environment monitoring, Solid waste management, Occupational Health & safety, Cleaner Production and Energy efficiency, Laboratory analysis for different environmental parameters, environmental education & awareness. Published 25 articles in national and international journals.	22 Years	
	Innovation team Environmental Impact Assessment (EIA) processes	Syed Nazmul Husain M. Sc. Environmental Science, Jahangirnagar University 2018 Post Graduate Diploma in Environmental Engineering Master in Disaster Management University of Dhaka. Environmental Safeguard Expert Consulting Services for Preparatory Facility to Improve Dhaka-Chattogram Freight Corridor for Technical Assistance for Green Railway Transport Project Preparation Facility Project, (Contract Reference No. 54.01.0000.706.07.010.25-145 (SD-2), Funded by World Bank (WB). Consulting Services Asian Development Bank (ADB) Contract No. 193334, Appointed by Asian Development Bank (ADB)-Headquarters (Manila).	10 Years	

	Team Member	Engr. Md. Mamunur Rashid B.sc Engineer, MIEB - 11688 Ion Water Technology (BD) + 88 01715861893 www.ionwaterbd.com Email: ionwaterbd@gmail.com An Expert on Environmental Issues (EIA, EMP) and also designer of WTP, ATP, ETP, STP, Industrial Wastewater Treatment,	17 Years	
	Team Member	Engr. Mohammad Abdul Mukit B.Sc in Chemical Engineer (BUET) IE: F- 13165 Ion Water Technology (BD)	9 Years	
	Team Member	Engr. Md. Moniruzzaman B.Sc in Civil Engineer (BUET) MBA, IBA - (DU) MIEB: 27225 Ion Water Technology (BD)	11 Years	
	Team Member	Engr. S. M. Sumon B. Sc. in Mechanical Engineer (KUET) Khulna University of Engineering & Technology	17 Years	
	Team Member	Mokbul Hossain B. Sc. Environmental Sciences University of South Asia	3 Years	
	Team Member	Md Imran Hossen Shagor Senior Environmental Engineer Ion Water Technology (BD)		
	Team Member	Md Mosharraf Hossain Technician & sample Collector Ion Water Technology (BD)		

1.14 Limitation of EIA

This report presents an Environmental Impact Assessment (EIA) of “JAYANA BATTERY TECHNOLOGIES” is located at Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur. Report is enriched by the inclusion environmental reconnaissance of the project area, identification of significant environmental issues and recommendation for further studies in order to address these issues. It provides a brief description of the project activities to be carried out and identifies major environmental impacts resulting from these activities during operation phase. Eventually the EIA suggests specific measures to mitigate adverse environmental impacts and to enhance beneficial impacts. Important environmental issues that need further studies have been identified.

Services performed by the consultant are conducted in a manner consistent with that level of care and skill generally exercised by members of the engineering and consulting profession. The report may not exhaustively cover an investigation of all possible circumstances that may exist. However, an effort is made to discover all meaningful areas under the stipulated time available.

In evaluating subject site, consultant relies in good faith on information provided by client’s management or employees. The Consultant assume that the information provided is factual, accurate and accepts no responsibility for any deficiency, misstatement or inaccuracies contained in this report as a result of omission or misrepresentation of any person interviewed or contacted. However, the consultant notifies the contradiction and errors in the data, where it seems appropriate. It should be recognized that the information given in the report is time specific and with the passage of time the relevancy of data and analysis may suffer. Specific circumstances and condition of site can change due to which conclusion and opinions may also change.

1.15 Acknowledgement

The EIA report of JAYANA BATTERY TECHNOLOGIES has been prepared basically with the support from “Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur”, authority and also from various government agencies including Bangladesh Meteorological Department (BMD), soil Resource Development Institute (SRDI), Bangladesh Bureau of Statistics (BBS), Bangladesh water Development Board (BWDB), Department of Environment (DOE) and Department of Agriculture Extension (DAE), Disaster Management Bureau (DMB), Bangladesh etc.

CHAPTER-2
ENVIRONMENTAL
POLICIES AND
LEGISLATION

ENVIRONMENT POLICIES AND LEGISLATION

2.1 Introduction

Development projects are governed by some legal and institutional requirements. So, considerations of relevant legal provisions, policies, strategies and institutional issues are very important for any project proponent or developer before they actually execute a program or plan, and obviously at the operational stages of projects the no project can deny these rules which set the boundary limits for each project. The proponent has to be well aware of these requirements and comply with the provisions as applicable and necessary. The following sections review the relevant national legislations and policies along with some international laws. JAYANA BATTERY TECHNOLOGIES factory will be developed at Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur. Since it 's fulfilled & performed its activities in compliance with local, national and international legislation. In other words, the project executed and operated in accordance with Bangladesh legislations and international agreements to which Bangladesh is a party.

Effective project planning requires not only good technical expertise but also proper understanding of government policies relevant to environmental protection and management for the acid production project from sulfur. An understanding of these policies is useful to ensure that development projects are undertaken in a manner that does not conflict with stated policies but ideally to complement them. Additionally, the legal and administrative requirements and procedures that affect a project are important considerations, especially during the stage of planning approval.

Various national policies and legislations that are prescribed in the country are of relevance to environmental protection and management for JAYANA BATTERY TECHNOLOGIES project. While there are those that are of direct relevance to environmental pollution control, many of the other policies and legislations relate to resource protection and conservation, and these include forest, fisheries, land, mineral resources, community and occupational safety & health, and others. Although these environment and social-related legislations fall within the responsibilities of other agencies and authorities, they nevertheless need to be understood as EIA requires a holistic approach be adopted in order that a comprehensive assessment is achieved.

It is good EIA practice to make it a point to review statutory and non-statutory requirements for lead oxide, sulfuric acid, PP battery container & cover and separator, as this will provide a clear understanding of how best an EIA can proceed. Clearing the legal and administrative requirements of authorities is as important in project planning as does clearing the technical and financial concerns.

A summary of the legal and administrative requirements for the project within an EIA report will assist the Project Proponent and the authorities keep into focus environmental objectives during the EIA review process.

This chapter-2 highlights some of the more important statutory and non-statutory requirements that may directly or indirectly affect the planning and development of a project in the industrial sector. It is, however, incumbent on the Project Proponent, and the environmental specialist engaged to undertake an EIA, to review these and other legislation and authority requirements each time a project is undertaken, as changes in the form of new legislation or amendments to older ones may be made from time to time.

2.2 National Environmental Policy and Legislation

The National Environment Policy of 1992 and the associated legislation on environmental protection and conservation represent the most important documents that relate to environmental protection and management for the project of **JAYANA BATTERY TECHNOLOGIES** in Bangladesh. The requirement of EIA for projects is described in these documents.

2.2.1 National Environment Policy

In 1992 the Bangladesh Government developed the National Environmental Policy (NEP) which defines the overall environmental framework and assigns responsibility for regulatory development, administration and enforcement. This responsibility has been given to the Department of Environment (DOE) which is under the Ministry of Environment, Forest and Climate Change. The National Environment Council, with the head of the government as chairperson, provides the overall policy direction. In 26 years since adoption of Environment Policy, 1992, the nature and level of environment and ecological degradation have been changed. In order to address all those changes and with a view to protect and conserve environment and ecosystem in a rigorous, pragmatic and sustainable manner as well as to bring the climate change to the mainstream of the environment and development, the government has revised the National Environment Policy, 1992 and adopted the revised National Environment Policy, 2018.

- Following are the key subject matters covered under the National Environment Policy, 2018:
- Ensuring sustainable development through reducing human pressure on nature and natural resources
- Considering environment protection as integral part of the development programs planned to meet the need of the present and future generation

- Making natural resources extraction, use, environmental conservation etc. to be based on science
- Considering environmental impacts and risks in extracting and using natural resources
- Evaluating economic contribution of ecosystem services simultaneously to that of natural resources
- Giving priority to poor and under privileged group of people in order to ensure their participation, equity, justice, accessibility to the use of natural resources and getting ecosystem services on which, they are dependent
- Taking initiatives to prevent misuse and ensure optimum of water, land, natural gas and other natural resources in the production process as well as day-to-day purposes
- Encouraging sustainable use of new and renewable resources
- Enhancing long term poverty alleviation and food security through conserving biological diversity
- Realizing compensation from persons and institutes those who are liable to environmental pollution through applying polluter pay principle
- Including environmental conservation and preservation in all national policies and ensuring implementation of the environment policy at both government and non-government level
- Giving priority to preventive measures over curative measures in environmental conservation
- Including adaptation and mitigation program in all development projects in order to address adverse impacts of climate change
- Ensure sustainable utilization of ecosystem goods and services
- Implementation of 3R principle in utilization of resources
- Strengthening institutional and legal capacity of institution (Government, local, private and technical) relevant to the enforcing and implementation of rules and regulation relating to environment policy and environment conservation
- Ensuring considerations of climate change and challenges of calamities in all kind of infrastructure projects
- Reducing of all SLCP (Short-Lived climate pollutants) which are harmful to health and environment
- Taking development programs considering sustainable production and consumption as integral part of environmental conservation to meet the need of present and future generation
- Allocating necessary funds to all areas of environmental conservation, preservation and control

- Taking up programs in favor of flourishing environment friendly economy
- Including environmental and ecological conservation particularly to introduce the environment and ecological concept in the environmental academic curriculum and textbooks of schools and colleges

The policy has provided sector wise policy coverage for different sectors along with their plan of implementation, identification of respective implementing agencies, legal and institutional framework, and directives on compliances for JAYANA BATTERY TECHNOLOGIES.

2.2.2 List of other National Plans, Policies Guidelines that confirm, compliment and support the National Environmental Policy:

- National Bio-safety Strategy & Action Plan 1995
- National Biodiversity Strategy & Action Plan of Bangladesh 2016-2021
- A Roadmap for Clean Fuels and Vehicles in Bangladesh, 2011
- National Action Programme on Desertification, Land Degradation and Drought (DLDD) 2016-2024
- Ecologically Critical Area Management Rules, 2016.
- Medical Waste (Management and Processing) Rules, 2008
- Hazardous Waste and Ship Breaking Waste Management Rules, 2011
- Bangladesh Biosafety Rules, 2012
- Bangladesh Biological Diversity Act 2017
- Natural Water Reservoir Conservation Act, 2000
- National Forestry Policy 2016
- National Conservation Strategy 1998 and Draft Update 2013
- National 3R (Reduce, Reuse & Recycle) Strategy 2010
- Bangladesh Climate Change Strategy & Action Plan (BCCSAP) 2009
- Bangladesh Delta Plan 2100
- National Disaster Management Plan 2010.
- Nationally Determined Contributions (NDCs)
- Five Year Plan
- Sustainable Development Goals (SDGs)
- National Adaptation Program of Action (NAPA) 2005 and Update 2009
- Other Sectoral Policies/Strategies like Industry, Agriculture, Energy, Water, Health, etc.
- National Bio-safety Framework and Guidelines
- Guidelines on Environmental Management, Waste Treatment and Workers' Occupational Health and Safety for Ship Breaking Yard in Bangladesh
- Establishing National Land use and Land Degradation Profile 2018 (proposed)

2.2.3 The Bangladesh Environment Conservation Act, 1995 (as amended in 2000, 2002 & 2010)

The Bangladesh Environmental Conservation Act (BECA), 1995 is the main legislation for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. The enabling powers of the BECA are wide ranging. Wide-ranging powers (Section 4) are given to the DG to take various actions or measures to enforce the BECA (**Table 2.1**)

Table 2.1: Provisions of the BECA, 1995

Section	Provision Under Section
Section 4	Powers of the DG to enforce various provisions of the Act including setting rules and regulations for environmental conservation and protection.
Section 4A	Powers given to the DG to seek the assistance of other enforcement authority (or authorities) in its enforcement. Done indirectly by way of disconnecting power, gas, or water supply to the user
Section 7	Allows the DG to seek compensation in cases of damage to the ecosystem or injury to person(s), whether directly or indirectly caused by a person or persons. He may also require that corrective or remedial action be taken to mitigate or ameliorate the situation.
Section 8	Allows any person affected or likely to be affected as a result of pollution or degradation of the environment to apply to the DG for remedy of the damage or apprehended damage.
Section 9	DG can require person responsible and the person in charge of the place of occurrence of an accidental pollution take measures to control or mitigate the environmental pollution.
Section 12	Requires that an Environmental Clearance Certificate be obtained before an industrial unit or project can be established or undertaken.
Section 13	Formulate and publish environmental guidelines relating to the control and mitigation of environmental pollution, conservation and improvement of the environment.
Section 14	Allows appeal against grievances to the Appellate Authority. [Note: The Appellate Authority was constituted by MoEFCC by a notification dated 03/11/1997].
Section 15	Allows the imposition of penalties for various offences.
Section 20	Power to make rules for various purposes including the setting of EIA procedures.

Section 12, requiring an Environmental Clearance Certificate, is effectively enforced by way of The Environmental Conservation Rules, 1997, which is made pursuant to the powers provided under Section 20 of the BECA.

2.2.4 The Environment Conservation Rules, 1997(as amended in 2002 & 2003)

The Environment Conservation Rules (ECR), 1997 is the main subsidiary legislation of the BECA which outlines various procedures or measures that need to be taken for compliance with the related provisions of the BECA (3.2). The ECR provides specific rules and procedures for various categories of projects in relation to their approval prior to construction and operation. For projects and activities listed within the red category, the ECR requires that an Initial Environmental Evaluation (IEE) be first submitted for approval and this can be accompanied with the terms of reference (TOR) for an EIA, which is to follow the IEE. However, this stage may be opted out by an application to directly submit an Environmental Impact Assessment (EIA) report to the DOE for its review and approval prior to the issuance of an Environmental Clearance Certificate (ECC). The EIA is to be based on a TOR that has the prior approval of the DOE.

Table 2.2: Principal Provisions of the ECR, 1997

Section	Provision Under Section
Rule 3	Outlines factors (such as human habitat, archaeological site, ancient monument, national park, mangrove, etc) that the Government will take into account to declare an area as Ecologically Critical Area (ECA) and specify the activities or processes that cannot be continued or initiated in an ECA
Rule 5	Outlines procedures for any person affected or likely to be affected as a result of pollution or degradation of the environment to apply to the DG for remedy of the damage or apprehended damage.
Rule 7	Outlines procedures for obtaining an Environmental Clearance Certificate (ECC).
Rule 7 (1)	Classification of industrial units and projects for purpose of issuance of into four categories: - (a) Green; (b) Orange - A; (c) Orange - B; and (d) Red.
Rule 7 (4)	For Orange-A, Orange-B, and Red categories, require a Site Clearance Certificate (SCC) and thereafter an ECC to be obtained.
Rule 7 (5)	Prescribed form for application of SCC or ECC.
Rule (6)	Outlines documents for various categories of industrial units and projects. Those within Orange-B and Red categories require submission of an Initial Environmental Evaluation (IEE), while an Environmental Impact Assessment (EIA) report is required for the latter category.
Rule 7 (9)	Specifies type of activities that may be undertaken with approval of SCC.
Rule 8	Indicates period of validity of ECC for Green projects (3 year), and for others (5 year). Renewal is to be made at least 30 days before expiry of certificate.
Rule 9	Sets procedures for appeal against any notice, order or directive to the Appellate Authority.

Rule 12 & 13	Prescribed emission and environmental standards to be complied with are outlined in various schedules.
Rule 14	Schedule 13 - prescribes fees for issuance or renewal of ECC.
Rule 16	Outline of procedures for payment of fees.
Rule 17	Require any accident that poses serious threat to the environment to be informed to the DG.

Also specified in the ECR are ambient environmental standards as well as standards for control of emissions or discharges that are required to be met. While these standards are intended to assist project planners in determining measures to be taken to comply with these requirements, it is the ultimate responsibility of the Project Proponent to ensure that the environmental impacts arising from their projects are minimal or within acceptable levels that will protect the environment. An EIA provides the means to determine if this will be so and it is recommended for adoption by Project Proponents for all major projects irrespective of whether or not it is a requirement of the DOE. Environmental stewardship demands that corporate governance includes taking responsibility for protection of the environment.

2.2.4.1 Environmental Conservation Rules (ECR), 2023

To reduce environmental pollution, the Bangladesh government has issued the Environmental Conservation Rules 2023 and repealed the prior ones that were enacted in 1997, with immediate effect. Lead acid battery production industry is fall on the Red-category as per ECR, of DOE (BD). As per rule of section -11 in ECR 2023, According to the provisions of Section 11 of the Act, if an officer authorized by the Director General wants to take samples of air, water, soil or other substances for the purpose of analysis, the owner, occupier or agent of the factory, premises or place concerned shall give a notice in accordingly. The project as per orange -Red category, the project authority will be developed their project with take appropriate mitigation measure for the environmental impacts. For the red-category project, project proponent will have to apply for locational clearance as per form -3 to the respective district or divisional office (DOE). The application method has been given in the schedule -6 and processing fees, related document, TOR to be submitted in the guideline of schedule -9 in ECR 2023. The draft terms of reference (TOR) for EIA will be formulated as per schedule -10. After receiving the above-mentioned documents (as per schedule 9), ECC (Environmental clearance committee) will be visited the project area for evaluation. After approved TOR as per schedule -10, Environmental Impacts assessment (EIA) will be submitted within 30 days for the approval of DG, DOE. Environmental consultant of the project proponent will be followed for the formulation of EIA with the guideline of Schedule -11 as per ECR 2023.

Before submission of EIA, public opinion for EIA in the present of local stakeholders concerned with the project and the officials of the relevant ECC (Environmental clearance committee). At the time of verification of public opinion, project proponent will be given information to the local public about basic information about the project activities, Environmental, and social impacts and their mitigation measures will be given information to the local public and stakeholders. As per sub-rule of rule 15, Public consultation report or minute of meeting (MOE) report will be submitted to the DOE for further approval. This minute of meeting (MOE) will be approved under sub- rule -8 and minute of meeting (MOE) report will be attached in EIA. In the EIA report will have management plan, environmental monitoring plan, possible alternative of the concerned project, accidental & occupational health safety plan, disaster & emergency plan, risk assessment etc will also be included in the EIA report. After getting environmental clearance certificate (ECC), the project authority will be renewed after two years from the date of issues of ECC. The renewal application will have done prior to 30 days from the date of expiry of ECC. The discharge waste or effluent, sludge from the project will have to discharge as per rule -12 of ECR 2023.

2.2.5 Noise Pollution (control) Rules, 2025

Major policy upgrade aimed at tackling the growing threat of noise pollution, the Ministry of Environment, Forest and Climate Change has issued the Noise Pollution (Control) Rules, 2025. It replaces the 2006 rules that had long been considered insufficient to meet current challenges. This rule has been promulgated under the provision of clause 20 and 15 (2) of BECA, 1995. The updated 2025 rules introduce several additional restrictions such as use of loudspeakers, microphones, amplifiers, and sound equipment in public areas now requires written permission. The updated 2025 rules introduce several additional restrictions such as use of loudspeakers, microphones, amplifiers, and sound equipment in public areas now requires written permission. The updated 2025 rules introduce several additional restrictions such as use of loudspeakers, microphones, amplifiers, and sound equipment in public areas now requires written permission. The rules banned forest picnics in natural forests and wildlife habitats. It also limits noise at social events capped at 90 decibels, which must conclude by 9 pm. Night-time construction work was also prohibited while new provisions added to regulate noise from factories and generators, with fines aligned with the “Road Transport Act, 2018”.

2.3 RESOURCES PROTECTION AND CONSERVATION POLICIES AND LEGISLATION

Besides the main environmental protection laws mentioned above, various other national policies and legislations need to be considered because of their relevance to environmental protection and conservation. These are mostly those that relate to natural resources protection and conservation, and include matters such as forest, fisheries, wild flora and fauna, water, and coastal zone protection and management.

2.3.1 Forestry Protection

The National Forestry Policy (NFP) provides the framework for the protection of the remaining forests in the country and the restoration of about 20% of the country's land under the afforestation programs by year 2015. The priority protection areas are the habitats which encompass representative flora and fauna in the core area of national parks, wildlife sanctuaries and game reserves. Multiple-use of forest, water and fish of the Sundarbans through sustained management will be ensured, keeping the bio-environment of the area intact.

The Forest Act (FA) of 1927, (amended in 1989) is the main legislation for forestry protection and management. The FA grants the government several basic powers, largely for conservation and protection of forests. Regulations have also been promulgated for specific categories of forests, such as the Prohibition and Rules affecting Protected Forests in Sundarbans Division (1959); Rules for the Preservation of Trees and Timbers belonging to the Government in the District of Chittagong; the Sylhet Forest (Protection from Fire) Rules, 1954; and Chittagong and Chittagong Hill Tracts Reserved Forests Fire Protection Rules, 1958.

2.3.2 Fisheries Protection and Conservation

The coastal wetlands and estuarine rivers of the Bay of Bengal southwest of Bangladesh are rich in biodiversity and highly productive ecosystems for many marine species, especially fish and shrimps. These resources have been identified as the principal source of animal protein for the people of Bangladesh and future dependency on this protein source requires strong action to protect these resources.

The National Fisheries Policy provides the framework for the conservation and management of fisheries resources to ensure supply and enhance production. All the water bodies suitable for fisheries production and their fisheries resources conservation, development and management are addressed under this policy. These include rivers and canals, *haor* and *baor*, floodplains, open and coastal water systems.

Matters related to marine fisheries are governed by the Marine Fisheries Ordinance (MFO), 1983, which was amended in 1992. The legislation provides for the Director responsible to take measures for the management, conservation, supervision and development of marine fisheries resources, and for implementation of actions to achieve the objectives of the legislation. Various powers for enforcement, mainly through licensing, are provided in the legislation.

2.3.3 Wildlife Conservation

Although there is no established wildlife conservation policy, the Bangladesh National Conservation Strategy has identified critical terrestrial and aquatic ecosystems for protection and conservation. These include mangroves, coral reefs, tidal wetlands sea grass beds, barrier islands, estuaries and closed water bodies.

The Bangladesh Wildlife (Conservation and Security) Act 2012, has been promulgated for the conservation and protection of wildlife. The legislation is within the purview of the Forestry Department.

2.3.4 Water Resources Protection and Conservation

The National Water Policy (NWP) provides the framework for the management of water resources of the country in a comprehensive, integrated and equitable manner. The NWP recognizes that water is essential for human survival, socio-economic development of the country and preservation of its natural environment. It is vital that the continued development and management of the nation's water resources should include the protection, restoration, and preservation of the environment and its bio-diversity.

The Bangladesh Water Act (BWA), 2008, gives effect to the National Water Policy. The overall purpose of the BWA is to consolidate and supplement existing laws for water resources in the country to regulate water resources in order to ensure integrated, equitable and sustainable management, development, and utilization of water resources and their conservation.

2.3.5 Coastal Zone Protection

The Coastal Zone Policy (CZP) 2005 aims to ensure that a participatory and integrated approach is taken in the management and development of the coastal zone to reduce conflicts in the utilization of coastal resources and to optimize exploitation of opportunities. This is in view of the complexity of the coastal zone which encompasses both the terrestrial and aquatic environment and transcends a wide variety of human activities.

2.3.6 Open Space Protection

The Urban Open-fields, Garden and Natural Water Bodies Protection Act (Jaladhar Ayne) 2000 is intended to preserve areas of open space from encroachment or conversion to other uses. With proper implementation of the law, the respective authorities can protect the open spaces natural water bodies including the flood plains of the urban areas from filing up for the sake of urbanization and development.

2.4 COMMUNITY AND OCCUPATIONAL SAFETY & HEALTH LEGISLATION

2.4.1 The Occupational Safety and Health (OSH) Legislation

Within Bangladesh OSH policy and regulatory frameworks, there are three broad areas of occupational safety and health related issue: (i) occupational accidents, hazards and diseases; (ii) safety equipment, tools and facilities, and (iii) workplace environment. The key provisions of each area include:

- Occupational Accidents, Hazards and Diseases
 - ✓ Accident prevention regulations
 - ✓ Prevention from workplace hazards
 - ✓ Disease prevention and safeguards
 - ✓ Record keeping and planning
 - ✓ Rehabilitation and awareness building
- Safety Equipment, Tools and Facilities
 - Fire-fighting apparatus and emergency fire exit
 - Personal Protective Equipment
 - Safety of buildings and machineries
- Workplace Environment
 - Health services and medical care
 - Workplace safety

Through the legal provisions on OSH related issues, Bangladesh established tripartite National Industrial Health and Safety Council in 2009. The Council has formulated a National Occupational Safety and Health Policy in 2013 and working towards implementation of the policy in every industrial sector.

The Labour Act 2006 (as amended in 2013)

The Labour Act is the most comprehensive labour and workplace related legislation of the country, consolidating the provisions of 25 separate acts into single labour code in 2006. Among others, it sets occupational safety and health standards, compensation for injury and accidents in the workplace, maternity benefits, factory inspectorate and restrictions in child labour. The responsibility of enforcing workplace safety such as fire safety, and welfare of workers has been given to the Department of Inspection for Factory and Establishments (DIFE), which is under the Ministry of Labour and Employment.

The law applies to all “establishments” which are defined widely to include, shops, hotels, restaurants, factories (though these must employ more than five laborers), plantations, docks, transport services, construction sites, and “any premises in which laborers are employed for the purposes of carrying on any industry.” It does not apply to the agricultural sector – though it does apply to tea plantations, and certain obligations apply to tea gardens.

The agencies mandated to implement the law include the Department of Labor/Labor Directorate (DOL) and the Department of Inspection for Factories and Establishments (DIFE) of the Ministry of Labor and Employment (MOLE) and the Labor Appeal Tribunal/Labor Court. The DoL is mainly responsible for facilitation of effective labour management relations, collective bargaining and negotiations and ensures prompt and efficient settlement of labour disputes in the industrial sectors of Bangladesh while the DIFE is responsible for ensuring workplace safety including fire safety, structural integrity of workplace buildings and welfare of workers. It conducts inspections of factories, shops, industries and commercial establishments, tea gardens, railway, internal water transport and road transport. The labor courts deal with both industrial disputes and individual grievances.

National Occupational Health and Safety Policy, 2013

The National Occupational Health and Safety Policy, 2013 addresses national commitment as per Constitution for continual improvement of occupational health and safety management system of the establishment to prevent or reduce workplace fatalities and work-related diseases. The policy specified the obligations of all relevant stakeholders and organizations. With the objectives, the various roles and responsibilities of relevant stakeholders including government, factory/business owners, trade union, employers and workers are clearly identified and established. The ministry of labor and employment (MoLE) is mainly responsible implementation and development of national action plan under the policy coordinating with all stakeholders. The key provisions include occupational accidents, hazards and diseases relate to accident prevention regulations, prevention from workplace hazards, disease prevention and safeguards, record keeping and planning, rehabilitation and awareness building. The National OSH Policy also ensures safety in transportation, maintenance and use of chemicals used in the production process.

Public Procurement Rule (PPR) 2008

This rule applies to the Procurement of Goods, Works or Services by any government, semi-government or any statutory body established under any law. The Public Procurement Rule 2008 requires contractors to take all reasonable steps to: (i) safeguard the health and safety of all workers working on site and other persons authorized to be in it; (ii) to keep the site in an orderly state; and (iii) to protect the environment on and off the site; to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of the Contractors methods of operation.

Table 2.3 Legislations and policy issuances related to safety in the workplace

Legislations and Issuances	Key Provisions
National Occupational Health and Safety Policy, 2013	Specifies the obligations of all relevant stakeholders and organizations in promoting and enforcing occupational health and safety
Labour Act 2006 as amended, 2013, Labour Rules (2015)	Imposes obligations on the part of the employer on the conditions of service and employment including wages and payment, employment of young people, maternity benefits, working hours and leave; trade unions and industrial relations; and, occupational health, safety, hygiene, and welfare of workers, and compensation for injury.
National Building Code 2006	Provides for standards for structural integrity; adequate, accessible and discernible means of exit/escape in Buildings; fire extinguishing system.
Public Procurement Rule (PPR) 2008	Requires contractors to provide for adequate measures regarding the “Safety, Security and Protection of the Environment’ in the construction works.
National Child Labour Elimination Policy 2010	Sets a policy to eliminate child labour exploitation through enactment of pragmatic laws, implementation of plans and programs, etc.
Fire Prevention and Extinction Act 2003 Fire Prevention and Extinction Rules 2014	Requires the owner of a building to apply for Occupancy Certificate to ensure compliance with the relevant provisions of the Building Code

2.4.2. Community Safety and Health (CSH) Legislations

There is no specific legislative framework for community health and safety aspect of industry or projects but under the government of Bangladesh there are specific laws and acts enacted by various ministries. The project proponent conducting the EIA may consult ongoing community-based programs and policies of the Ministry of Health to help improve assessment and mitigation planning on community health and safety impacts and risks. Table 2.4.2 below provides some of the relevant legislations and policy issuances that have relevant provisions on community health and safety of industry projects.

National Health Policy, 2011

The National Health Policy aims to ensure accessibility of primary health care and emergency care for all by, among others, providing quality and easily accessible care, irrespective of an urban and rural community, mainly focusing on the poor and disadvantaged population; and, ensuring coordination between different healthcare-related departments, ministry of GoB, and MOHFW, in addition to coordination between the Government of Bangladesh and NGOs. It also aims to ensure adequate epidemiological tracking of disease patterns and impacts of climate change on health

Table 2.4. Legislations and policy issuances related to community health and safety

Policy Issuances/Legislations	Relevant Provisions
National Health Policy, 2011	Promotes coordination of various agencies in pursuing a more accessible and equitable quality health care for the communities. Focuses programs on the poor and disadvantaged sector of the population. It also aims to ensure adequate epidemiological tracking of disease patterns and impacts of climate change on health.
National Policy for Safe Water Supply and Sanitation, 1998	Aims to improve the standard of public health and to ensure improved environment, particularly by facilitating access of all citizens to basic level of services in water supply and sanitation
Disaster Management Act, 2012	Provides the legal basis for coordinating activities for disaster management. Establishes the Department of Disaster Management under the Ministry Disaster Management and Relief

National Policy for Safe Water Supply & Sanitation (NPSWSS) 1998

This policy was promulgated to improve the standard of public health and to ensure improved environment, particularly by facilitating access of all citizens to basic level of services in water supply and sanitation, bringing about behavioral changes regarding use of water and sanitation; reducing incidence of water borne diseases; building capacity in local governments and communities to be effectively with problems relating to water supply and sanitation; promoting sustainable water and sanitation services; ensuring proper storage, management and use of surface water and preventing its contamination, among others. The Department of Public Health Engineering is the national lead agency responsible exclusively for water supply and sanitation facilities along with advisory service to GoB in framing policy and action plans. The Department has a Water Quality Monitoring and Surveillance Circle.

Disaster Management Act, 2012

This Act is the legal basis for coordinating activities about disaster management, setting policies and formulation of rules and to build up infrastructure of effective disaster management to fight all types of disaster. It also described the national disaster management principles and planning by reducing the overall vulnerability from different impacts of disaster through risk reduction activities; conduct of humanitarian assistance programs efficiently to enhance the capacity of poor and disadvantaged as well as strengthening and coordinating programs undertaken by various government and NGOs related to disaster risk reduction and emergency response. The Department of Disaster Management (DDM) is responsible for the Disaster Management Act and to mandate the implement of the objectives.

Road Transport Act, 2018

The Road Transport Act 2018 set-forth requirements for road/traffic safety and prevention of motor vehicle accidents. The Bangladesh Road Transport Authority (BRTA) is a regulatory body to control, manage and ensure discipline in the road transport sector, as well as to maintain road safety. It works under the Ministry of Communication to carry out the purposes set out for it under the Motor Vehicle Ordinance.

Other industry-specific laws and regulations

There are other industry-specific legislations which the proponent may also consult when relevant depending on the types and nature of the project, such as the Nuclear Safety and Radiation Control Act 1993, the Formalin Control Act, 2015, and, the Ship Breaking and Recycling Act, 2018.

2.5 LEGISLATION ON ENVIRONMENTAL APPROVAL PROCESSES AND PROCEDURES

Under Rule 7 of the ECR 1997, environmental clearance is required for all industries and projects listed in Schedule 1 of the ECR 1997. The process to obtain approval is conducted in tiers as follows:

1. Screening
2. Initial Environmental Examination (IEE), and
3. Environment Impact Assessment (EIA).

Each tier is defined with the level of details required to appraise a project for a decision to be made. Schedule 1 of the ECR 1997 lists the different types of industrial projects into four categories namely, Green, Orange A, Orange B, or Red, based on severity of its potential environmental impacts. Environmental clearance can be granted at various tiers depending on the category of project to which an industrial activity belongs. Industry activities posing “less” environmental impacts (such as those by Green category project), can be granted clearance at the Screening stage, while those for Orange A and/or Orange B categories at the IEE stage. Red category projects require both IEE and EIA to be carried out and Screening is not compulsory.

2.5.1 Screening

Screening is generally undertaken as the first stage of an environmental assessment for a project.

It is intended to provide the first level of information for a key decision to be made as to whether further assessment of the project is required. In general, the screening process can result in one of four outcomes, these being:

- No further level of assessment is required;
- Further study is necessary to determine the level of EIA required (often called an initial environmental evaluation or examination [IEE]);
- A more limited EIA is required (often called preliminary or initial EIA); or
- A full and comprehensive EIA is required.

However, in the context of the ECR 1997, screening would be in reference to determining the category in which the project or activity falls under (Schedule 1 of the Regulations). Upon determination as to which category the project or activity falls into, the process of environmental assessment and approval will follow that which is prescribed in the Regulations.

2.5.2 Initial Environmental Examination (IEE)

An IEE is typically a preliminary EIA study that is normally carried out at the early stage of project planning and is used to identify and estimate the potential environmental impacts from the project activities. IEE is normally done within a short time duration based on preliminary information that is readily available through environmental reconnaissance. In the context of the ECR 2023, an IEE is required to be submitted for obtaining location clearance from the DOE. The general objective of an IEE is to examine all environmental parameters that are likely to be affected by the identified project activities, and to determine the degree of the adverse impacts that are likely to affect them (the environmental parameters). IEE is intended to provide first-hand information about the environmental parameters likely to be influenced by the project activities and the magnitude of the adverse impact in order to allow decision makers to ascertain whether a detailed EIA is needed. IEE will not make detailed evaluation of the environmental parameters but instead provide a basis for need to undertake detailed evaluation.

The IEE report can be used as a scoping document when a proposal is referred to a full EIA. TOR for a detailed EIA study is normally required to be submitted with the IEE. The TOR outlines the basis for an EIA study that will be undertaken. An IEE is essentially an initial EIA study that:

- ✓ Describes the proposal and the environmental setting;
- ✓ Considers alternatives to improve the environmental benefits;
- ✓ Addresses the concerns of the local community;
- ✓ Identifies the potential environmental effects;
- ✓ Identifies possible measures to mitigate adverse impacts; and
- ✓ Describes (as necessary) the environmental monitoring and management plans.

2.5.3 Environmental Impact Assessment (EIA)

EIA is an extension of the IEE process in which it serves to provide a detailed assessment of likely adverse impacts that have been identified. As a planning tool, EIA is an integral component during development planning and feasibility study process to ensure that the planning is economically optimal and environmentally sound. The aims and objectives of EIA can be divided into two categories. The immediate aim of EIA is to inform the process of decision-making (both Project Proponents and authorities), by identifying the potentially significant environmental effects and risks of development proposals. In brief, the immediate objectives of EIA are to:

- Improve the environmental design of the proposal;
- Ensure that resources are used appropriately and efficiently;
- Identify appropriate measures for mitigating the potential impacts of the proposal; and
- Facilitate informed decision-making, including setting the environmental terms and conditions for implementing the proposal.

The ultimate (long term) aim of EIA is to promote sustainable development by ensuring that development proposals do not undermine critical resource and ecological functions or the wellbeing, lifestyle and livelihood of the communities and peoples who depend on them. In brief, the long term objectives of EIA are to:

- ✚ Protect human health and safety;
- ✚ Avoid irreversible changes and serious damage to the environment;
- ✚ Safeguard valued resources, natural areas and ecosystem components; and
- ✚ Enhance the social aspects of the proposal.

The findings of the EIA are important in providing guidance to the DOE as to acceptability of the environmental impacts due to the project. Where it is determined that the impacts are within acceptable levels, environmental clearance can be given to the Project Proponent to proceed with the project.

2.5.4 Application for Environmental Clearance

Section 12 of the BECA 1995 clearly states that no industrial unit or project shall be established or undertaken without obtaining, in the manner prescribed by rules, an Environmental Clearance Certificate (ECC) from the Director General of the DOE. Application for ECC is undertaken in stages which includes submission of IEE and EIA where;

- ✚ Approval of the IEE will grant the Project Proponent a location clearance for commencing preliminary land and site investigation.
- ✚ Upon receipt of the Location Clearance Certificate, the Project Proponent shall submit the EIA Report for approval of the DOE and proceed to apply for environmental clearance. Only after receipt of environmental clearance will physically site work be allowed to commence.

The procedure requires various actions and requirements to be undertaken for approval to be granted by the DOE in respect of the issuance of an SCC or an ECC. Review and processing time duration for each application stage depends on timely receipt and completeness of submission package. Under the ECR 2023, the SCC is to be granted within 30 working days for Red category projects, provided that information relevant for the application is complete and meets DOE's requirements. Failure to submit a complete submission package may cause rejection and/or resubmission in which will restart the review process from beginning. Hence, it is important that applicants should have full understanding of the requirements for the application before making the submission. It is advisable to have prior consultation with the authorities before submitting such applications.

Application for an ECC is to be submitted in the prescribed Form- 3 of the ECR 2023, and this is to be accompanied with appropriate processing fees (Schedule 13 and 14 of ECR 2023). The Environmental Clearance Certificate is valid for one (1) year from date of issuance. Each Environmental Clearance Certificate shall have to be renewed at least thirty (30) days before expiry of its validity period.

2.5.5 Appeal

An application to the DOE for site or environmental clearance may not necessarily be approved. Where the person is aggrieved by such a decision, an appeal, as provided under Section 14 of the BECA, may be made to the Appellate Authority which is constituted by the Government.

In making an appeal, the following matters will need to be followed:

- a. The appeal is to be made within 30 days from the date of issuance of the notice, order or direction;
- b. The grounds of the appeal is to be clearly stated and is to be accompanied with a certified copy of the notice, order or direction against which the appeal is filed;
- c. A copy of the environmental clearance certificate (if any);
- d. A Treasury Chalan showing proof of deposit of the appeal fee of Taka One Thousand; and
- e. Any other documents and papers that is relevant to the appeal.

It is to be noted that the decision of the Appellate Authority shall be final and shall not be called into question in any court.

2.6 Logistics & Environmental Quality Standard (EQS)

Bangladesh's Environmental Quality Standards (EQS) are legally binding standards set by the Department of Environment under the Environmental Conservation Rules, 2023 (and currently being amended at 2017) to regulate water, air pollution control rule 2022 for air quality, noise pollution control rule 2025 for noise level. These standards cover various aspects like surface water quality for irrigation and domestic use, noise level (day night) ambient air quality for battery manufacturing industry [Gas emission for industry or project, Schedule -5, rule -3 sub-rule (2) and rule -8 sub-rule (1,2)] and motor vehicle emissions. Compliance with these standards is necessary to control and mitigate environmental pollution, though many areas, particularly urban rivers, currently show water quality that is below the set standards.

The Government of Bangladesh has enacted Air Pollution (Control) Rules - 2022 with ambient air quality standards. This report establishes the Air Quality Index (AQI) followed by USEPA guideline to evaluate air pollution. Table 2.2 represents the current and approved air quality standards for Bangladesh.

Table 2.5: Ambient Air Quality Standards for Bangladesh as per air pollution control rule 2022

Pollutants	Standard level	Average time
SO ₂	80 µg/m ³	24 Hours
CO	5 mg/m ³	8 Hours
NO _x	80 µg/m ³	24 Hours
O ₃	100 µg/m ³	8 Hours
PM _{2.5}	65 µg/m ³	24 Hours
PM ₁₀	150 µg/m ³	24 Hours
Pb	0.5 µg/m ³	24 hours
Ammonia	400 µg/m ³	2 ours

Table 2.6: Stake emission Standards for Lead acid Battery industry as per air pollution control rule 2022

Sources	Pollutants	Unit	Maximum level
Grid coating	1) Lead (2) PM	mg/Nm ³	1) 10 (2) 25
Oxide Manufacturing	1) Lead (2) PM	mg/Nm ³	1) 10 (2) 25
Pest mixing	1) Lead (2) PM	mg/Nm ³	1) 10 (2) 25
Assembling point of lead acid battery	1) Lead (2) PM	mg/Nm ³	1) 10 (2) 25
PVC section	1) PM	mg/Nm ³	1) 150

Table 2.7: Stake emission Standards for lead smelter furnace as per air pollution control rule 2022

Pollutants	Unit	Maximum level
Lead (Pb)	mg/Nm ³	5
PM	mg/Nm ³	50
Minimum Stake height	Meter	30

Noise is known as unwanted sound. The difference between sound and noise depends upon the listener and the circumstances. Noise is one of the most common occupational health hazards. Noise at the workplace that exceeds the exposure standard and is not controlled is a major cause of hearing loss to workers.

A significant loss of hearing contributes to social isolation and reduced quality of life, career prospects, increased absenteeism, worker turnover and lowered work performance. It can also be a contributing factor to workplace injuries and accidents. In order to determine the existing work place sound level at before, during and after construction by measuring with a Sound Level Meter.

Table 2.8: Standards for Sound as per Noise pollution control rule 2025 [Schedule -1, Rule 4, and sub-rule (2)]

SN	Sound level depend on areas specific	Standards Level (dB (A) Leq)*	
		Day	Night
a.	Silent Zone (Sensitive areas such as parks, school, hospitals and mosques)	50	40
b.	Residential areas	55	50
c.	Mixed areas(mainly residential area, and also simultaneously used for commercial and industrial purposes)	60	50
d.	Commercial areas	70	60
e.	Industrial areas	75	70

Notes:

1. The time from 6 a.m. to 9 p.m. is counted as daytime.
2. The time from 9 p.m. to 6 a.m. is counted as night time.

* dB (A) leq means the average level of sound over a certain period of time relative to the human auditory system (Time weight average) which is indicated on a decibel scale.

Table 2.9: Standards for drinking water as per ECR 2023 (Schedule 2 Rule 31)

SN	Parameters	Unit	Standards (ECR 2023)
1	Fecal Coliform	CFU/100 ml	0
2	Total Coliform	CFU/100 ml	0
3	Free Residual Chlorine)	mg/L	0.2
4	Nitrate (NO ₃ ⁻)	mg/L	45
5	Arsenic (As)	mg/L	0.05
6	Turbidity	NTU	5.0
7	Aluminum (Al)	mg/L	0.20
8	Ammonia (NH ₃)	mg/L	1.50
9	Barium (Ba)	mg/L	0.70

10	Benzene (C ₆ H ₆)	mg/L	0.01
11	Boron (B)	mg/L	1.0
12	Cadmium (Cd)	mg/L	0.003
13	Calcium (Ca)	mg/L	75
14	Chloride (Cl)	mg/L	250*
15	Carbon Tetrachloride (CCl ₄)	mg/L	0.005
16	1,1- dichloroethane (1,1 C ₂ H ₄ Cl ₂)	mg/L	0.03
17	1,2 -dichloroethane (1,2 C ₂ H ₄ Cl ₂)	mg/L	0.03
18	Tetrachloroethane (C ₂ H ₂ Cl ₄)	mg/L	0.04
19	Tri-chloroethane (C ₂ H ₃ Cl ₃)	mg/L	0.02
20	Pentachlorophenol	mg/L	0.009
21	2,4,6-Trichlorophenol	mg/L	0.20
22	Chloroform (CHCl ₃)	mg/L	0.09
23	Total Chromium (Cr)	mg/L	0.05
24	Color	Hezen unit	15
25	Copper	mg/L	1.5
26	Cyanide (CN)	mg/L	0.05
27	Fluoride (F)	mg/L	1.0
28	Hardness as CaCO ₃	mg/L	500
29	Iron (Fe)	mg/L	0.3-1.0
30	Total Kjeldahl Nitrogen)	mg/L	1.0
31	Lead (Pb)	mg/L	0.01
32	Magnesium (Mg)	mg/L	30-35
33	Manganese (Mn)	mg/L	0.4
34	Mercury (Hg)	mg/L	0.001
35	Nickel (Ni)	mg/L	0.05
36	Nitrite (NO ₂)	mg/L	1.0
37	Odor	-	Odorless
38	Oil & Grease	mg/L	0.01
39	pH	-	6.5-8.5
40	Phenols	mg/L	0.002
41	Potassium (K)	mg/L	12
42	Radioactive materials alpha radiation	Bq/L	0.1
43	Radioactive materials beta radiation	Bq/L	1.0
44	Selenium (Se)	mg/L	0.01
45	Silver (Ag)	mg/L	0.02
46	Sodium (Na)	mg/L	200
47	Total suspended solid (SS)	mg/L	10
48	Sulfide as H ₂ S	mg/L	0.05
49	Sulfate (SO ₄ ⁻²)	mg/L	250
50	Total Dissolved Solid (TDS)	mg/L	1000

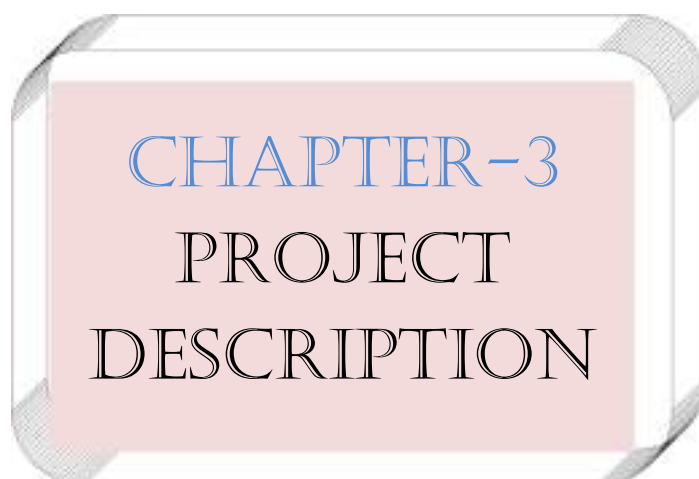
51	Temperature)	⁰ C	20-30
52	Tin (Sn)	mg/L	2.0
53	Zinc (Zn)	mg/L	5.0
54	Aldrin/ Dieldrin)	µg/L	0.03
55	(Anionic detergents)	mg/L	0.2

*Note: 1000 mg/l in coastal areas.

Table 2.10: Standards for Surface Water (ECR 2023, Schedule-4, Rule 32)

SN	Parameters	Unit	Inland surface water	Public sewage system Secondary treatment	Water for sea coastal areas
1	Ammoniacal Nitrogen (as elemental N)	mg/L	50	50	50
2	Ammonia (as free NH ₃)	mg/L	5	5	5
3	Arsenic (as As)	mg/L	0.2	0.2	0.2
4	BOD ₅ at 200 C	mg/L	30	250	100
5	Boron (B)	mg/L	2	2	4.0
6	Cadmium (as Cd)	mg/L	2	1	2
7	Chloride (Cl ⁻)	mg/L	600	600	-
8	Total Cr	mg/L	0.5	1.0	1.0
9	COD	mg/L	200	400	250
10	Hexavalent Cr	mg/L	0.1	2.0	1.0
11	Copper (as Cu)	mg/L	3.0	3.0	3
12	Fluoride (as F)	mg/L	2	15	15
13	Sulfide (as S)	mg/L	1	-	5
14	Iron (as Fe)	mg/L	3	3	3
15	Total Kjeldahl Nitrogen	mg/L	100	-	100
16	Lead (as Pb)	mg/L	0.1	1.0	2.0
17	Manganese (as Mn)	mg/L	2	2.0	2
18	Mercury (as Hg)	mg/L	0.01	0.01	0.01
19	Nickel (as Ni)	mg/L	1.0	2.0	5
20	Nitrate (as elemental N)	mg/L	10	-	20
21	Oil & grease	mg/L	10	20	20
22	Phenol compounds (as C ₆ H ₅ OH)	mg/L	1.0	5	5
23	Dissolved phosphorus	mg/L	5.0	-	-

	(as P)				
24	Radioactive substances (a) Alpha particle (b) Beta particle	microcurie(μ Ci)/L	To be determined by the Bangladesh Atomic Energy Commission	-	-
25	pH	-	6-9	6-9	6-9
26	Selenium (as Se)	mg/L	0.05	0.05	0.05
27	Zinc (as Zn)	mg/L	5	5	5
28	Temperature	$^{\circ}$ C (degree centigrade)	The temperature of the reservoir should not exceed 50 $^{\circ}$ C	-	The temperature of the reservoir should not exceed 50 $^{\circ}$ C
29	Suspended Solids (SS)	mg/L	100	500	100
30	Cyanide (as CN)	mg/L	0.1	2	0.2
31	Total Residual Chlorine	mg/L	1.0	-	1.2
32	Bio assay test (Applicable only to pesticide and pharmaceutical factories.)	-	90% of fish remain alive in treated wastewater after 96 hours.	90% of fish remain alive in treated wastewater after 96 hours.	90% of fish remain alive in treated wastewater after 96 hours.



PROJECT DESCRIPTION

3.1 Project Definition

JAYANA BATTERY TECHNOLOGIES is a private limited company and it will be made Sulfuric acid production at Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur. JAYANA BATTERY TECHNOLOGIES will be capable to produce 100 batteries from Sulfuric acid, Lead Oxide, PP Battery Container & Separator. Bangladesh's registered fleet exceeded 4 million battery-powered three-wheelers in 2025, and each unit requires a full set of five flooded batteries every 10-12 months because deep discharge cycles. The lead-acid battery market in Bangladesh is valued at approximately BDT 10,000 crore (USD 840-870 million) and is projected to grow at a Compound Annual Growth Rate (CAGR) of about 4.6% to 6.5% through 2031. The explosive surge in battery-run easy-bikes, mishuks, and e-rickshaws (estimated at 3 to 4 million vehicles nationwide) drives the vast majority of domestic demand. Starting, Lighting, and Ignition (SLI) applications for conventional vehicles, along with rising backup power needs for commercial spaces and telecom sectors, fuel steady demand. Off-grid solar power systems and rural installations heavily rely on cost-effective lead-acid storage technologies as alternative power. The project is well prepared keeping in view of growing local demand of lead acid battery. The project has been design based on foreign imported available raw materials; Sulfuric acid, Lead Oxide, PP Battery Container & Separator from approved vendors of different countries. JAYANA BATTERY TECHNOLOGIES will manufacture lead acid battery from Sulfuric acid, Lead Oxide, PP Battery Container & Separator by designing and assembling with the help of some machineries.

3.2 Location & Access to the project

The proposed project will be set-up on their land of area 100 Decimals at Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur. The project site is near to the road of Barabil - Uttam road which is come from the four-line Rangpur - Dinajpur highway. Geographically the project is located at 25°50'10.4"N 89°10'21.7"E. The location of the project has been shown in the following figures;

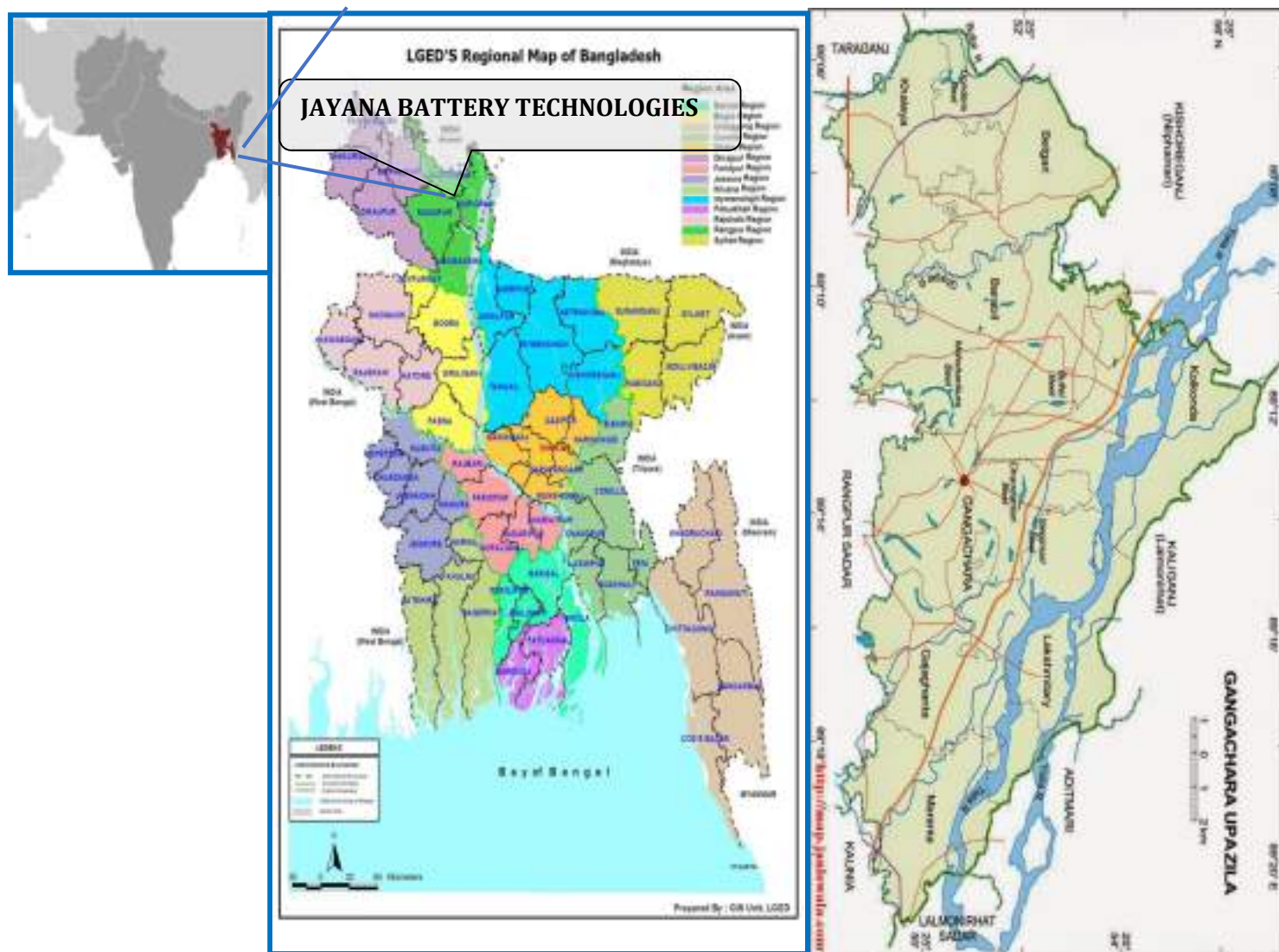


Figure – 3.1(a): Location Map of JAYANA BATTERY TECHNOLOGIES



Figure – 3.1(b): GPS Location Map of JAYANA BATTERY TECHNOLOGIES



Figure – 3.1(c): Adjacent area of JAYANA BATTERY TECHNOLOGIES

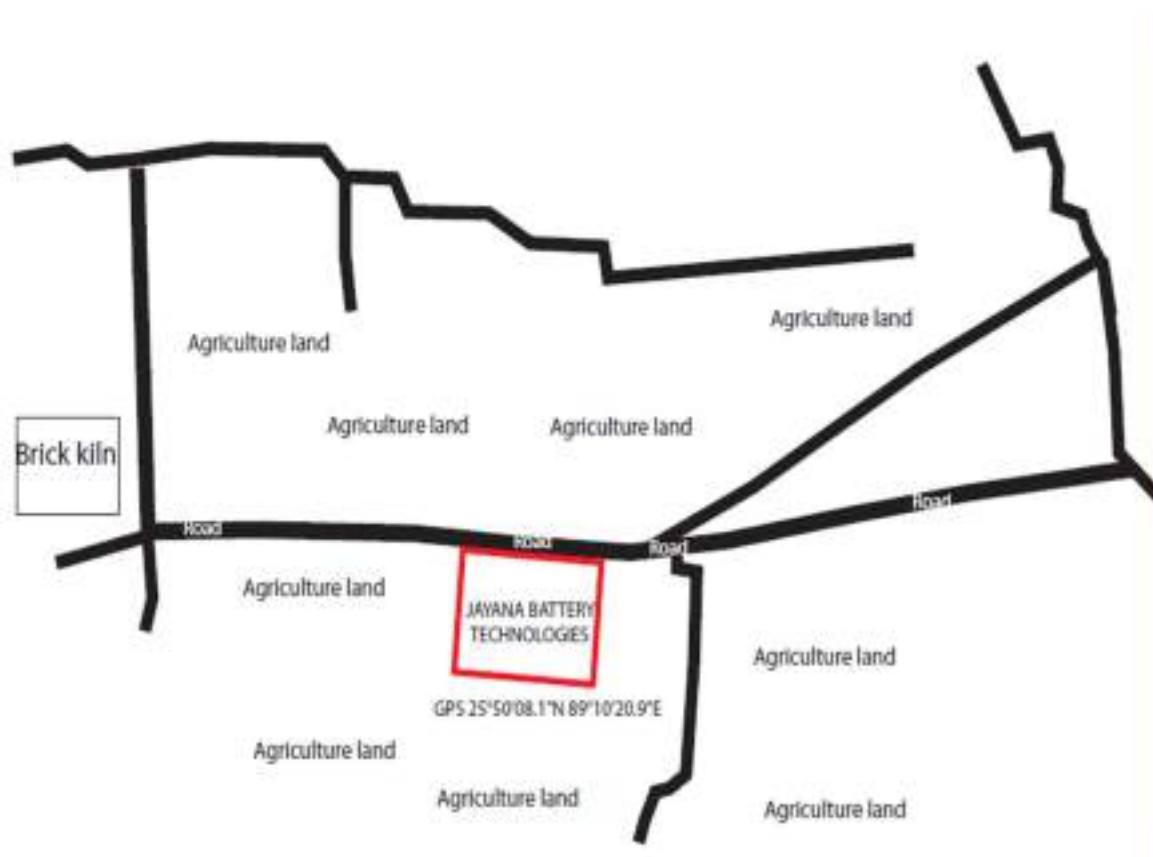
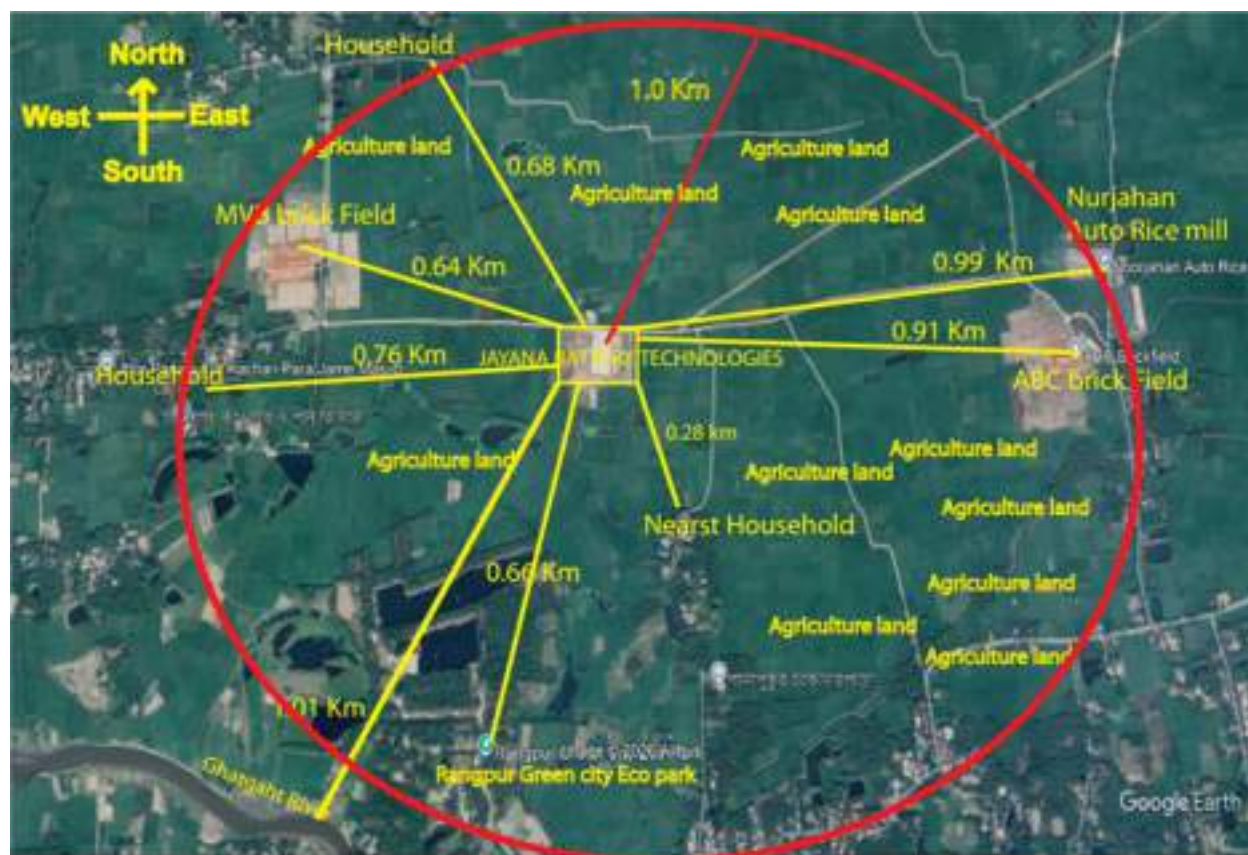


Figure – 3.1(d): Scratch diagram location Map of JAYANA BATTERY TECHNOLOGIES



Description of Existing Environment within 1.0 kilometer

Project Name: JAYANA BATTERY TECHNOLOGIES

Fig-3.1(e): Description of exiting environment within 1 kilometer perimeter

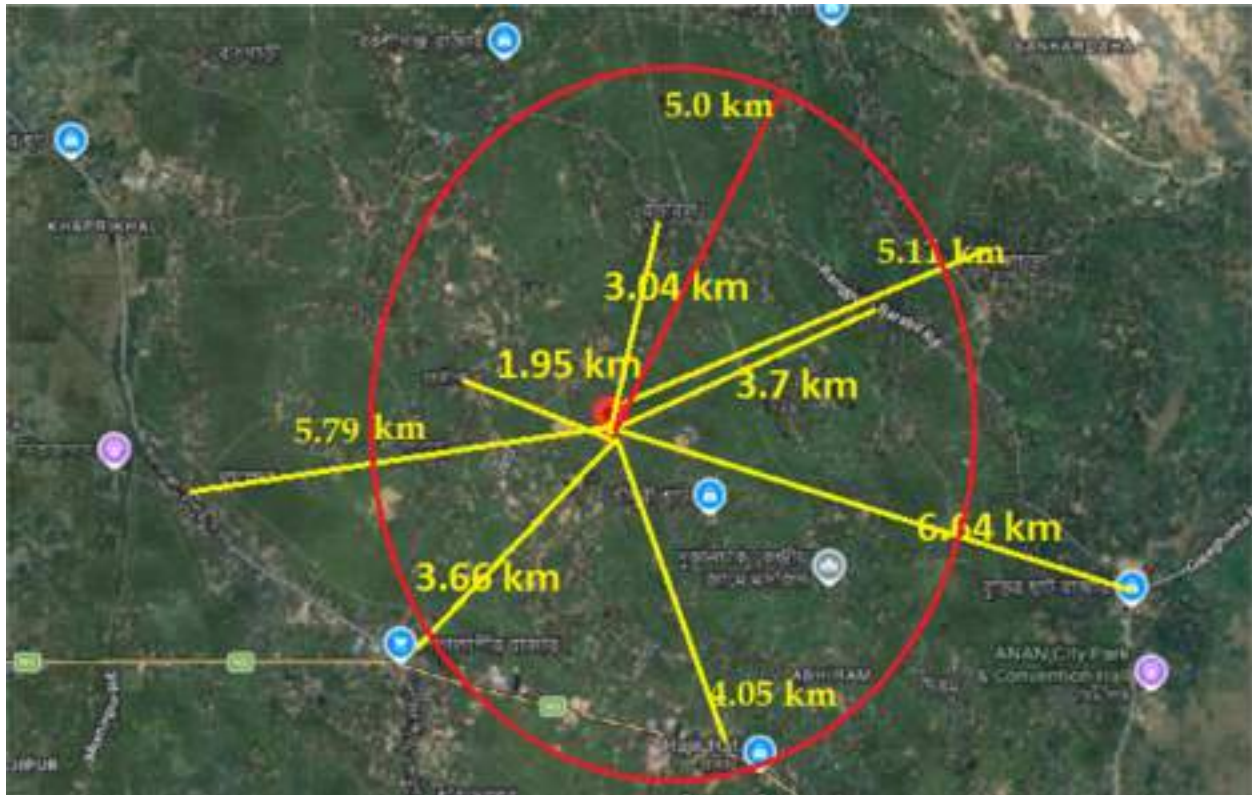


Fig-3.1(f): The Five kilometers radius for project study area

3.3 Project Components

JAYANA BATTERY TECHNOLOGIES has almost all the facilities for its effective operations of all machineries for the production of Lead acid battery. General plant layout attached as annexure-2 for manufacturing of Lead acid battery production industry till date it runs the following operational units.

- ✚ Curing and drying area
- ✚ Ball mill
- ✚ Casting machine
- ✚ Final assemble line
- ✚ Battery formation area
- ✚ Packing/Delivery
- ✚ ATP and ETP

Table -3.1: Basic Information of Sulfuric acid production industry

Sl no.	Subject	Description
1.	Name of the Project	JAYANA BATTERY TECHNOLOGIES
	Project Proponent	Md. KM. Reidwanul Bari Zion– Managing Director B. Sc, Engineer, EEE
	Type of Industry	Battery Manufacturing Industries.
	Project Location	Vill: Uttar Panapukur, Borobil, P.S: Gangachara, Dist: Rangpur GPS: 25.8355766N 89.1722099E (25°50'10.4"N 89°10'21.7"E)
	Head office address	House 44, Dhanmondi, Dhaka-1209, Bangladesh
	Project Value	BD Taka 18.5 million
	Final Product (Name & Qty/day)	Lead Acid Battery -100Pcs/day
	Raw Materials	Sulfuric acid, Lead Oxide, PP Battery Container & Separator.
	Number of employees	250
	Total Project Area/Covered Area	100 Decimals
	Type of Project	Battery Manufacturing
	Distance of the nearest road of the project site	20 Feet
	Highway distance of the project site	6KM
	Daily water requirement	105 Cubic Meter/Day
	Source	Ground Water.
	Power Requirement	2500 KW/Day, REB
	Gas requirement	2892 CFT
	Generator	2000KVA
	Treatment Capacity of the ETP plant	6.0 m ³ /Hour and 120.0 m ³ /day
	Amount of Land fixed for the ETP	1925 SFT
	Final output of the waste water	Underground water reservoir & pond. After overflow from pond goes to the Canal to Ghaghat river

3.4 Production Process

JAYANA BATTERY TECHNOLOGIES will be manufactured of a lead-acid battery begins with the creation of grids made from a lead alloy, which may include small amounts of other metals to enhance strength and conductivity. These grids serve as both the electrical conductors and the structural framework for the active material. The grids could be cast in a mold or punched from rolled lead strip. The following steps will be followed to make lead acid battery;

Positive grid casting: Positive grid casting is the structural framework positive plate material in lead-acid batteries. Liquid lead is poured into manually or semi-automatically operated metal molds. Liquid lead is applied to a water-cooled, rotating drum or belt carved with the grid pattern. The molten lead used for the positive grid requires specific alloys to balance mechanical strength, corrosion resistance, and electrical conductivity. These may be Lead-Antimony Alloys: Lead-Calcium Alloys: Tin and Silver Additive

Powder Filling: A mixture of lead oxide and metallic lead which will filled in the formation of positive plate of lead acid battery. A mixture of lead monoxide [PbO] and fine metallic lead. It serves as the base paste applied to battery grid.

Sulfation and Washing: Washing or chemically washing a lead-acid battery is an aggressive restoration method used to remove hardened lead sulfate crystals (sulfation) from the internal plates.

Drying: The lead-acid battery plate drying process removes moisture from newly pasted grids. The process involves of the Capillary Drying (water evaporation)

Negative grid casting: The negative plate of a lead-acid battery is composed of a lead-alloy grid filled with a porous, sponge-like lead (Pb) and specialized chemical expanders.

Pasting process on Negative grid:

The pasting process of a negative lead-acid battery plate involves creating a paste of lead oxide, sulfuric acid, water, and organic expanders (like barium sulfate and carbon black). This mixture is mechanically pressed into a cast or punched lead alloy grid.

Curing of Negative grid: The curing of the negative plate is a vital manufacturing step that hardens the lead paste and binds it securely to the grid. It involves two main phases: hydro-setting (controlled oxidation and crystal growth) and drying (moisture removal). Specialized expanders (e.g., barium sulfate, carbon, and lignin) are mixed into the negative paste to prevent shrinkage during this process.

Drying of negative plate: The drying of negative plates in lead-acid batteries involves a controlled two-phase curing and drying process. It is done to remove moisture while preserving the reactive sponge lead from oxidizing in the air.

Battery formation

The battery formation process usually begins with a soaking period where plates or cells rest in dilute sulfuric acid. This allows the electrolyte to penetrate the porous material and start preliminary reactions. After soaking, technicians apply the first charging phase at a controlled low rate to initiate material conversion without causing excessive heat or gas buildup.

Charging:

Next come multiple charge and discharge cycles. These steps gradually build the active layers while refining the plate structure. Constant current charging is common early on, followed by phases that limit voltage to prevent overcharging. Some setups include a gassing stage toward the end to complete the conversion. The entire sequence can span 20 to 70 hours or more, depending on plate thickness and battery design. Each stage must run smoothly to avoid incomplete formation or damage.

Washing and Drying: Finally, the formed plates or batteries go through rinsing, drying, or assembly checks before moving to capacity testing. This sequence ensures the battery formation process delivers consistent results every time. Teams monitor voltage, current, and temperature at every point to catch any deviations early

Assembling of lead acid battery: This method allows large batches to be processed together and gives precise control over each plate's development. The positive plates convert to lead dioxide while the negative plates become spongy lead, creating the exact materials needed for energy storage. These plates are finally assembling to make battery.

Charging of Battery: Connect the positive (Red) cable first, followed by the negative (Black) cable. Fully charge them at a slow rate (e.g., 2-10 amps) to maximize their lifespan.

Packing of Battery

For standard shipping and disposal, lead-acid batteries must be packaged to prevent short circuits, acid leaks, and physical damage. This involves placing the battery in a strong, rigid outer box (like corrugated fiberboard), protecting the terminals with non-conductive caps, and securing the battery so it cannot shift. Process flow diagram for each individual process has been attached in annexure 03.

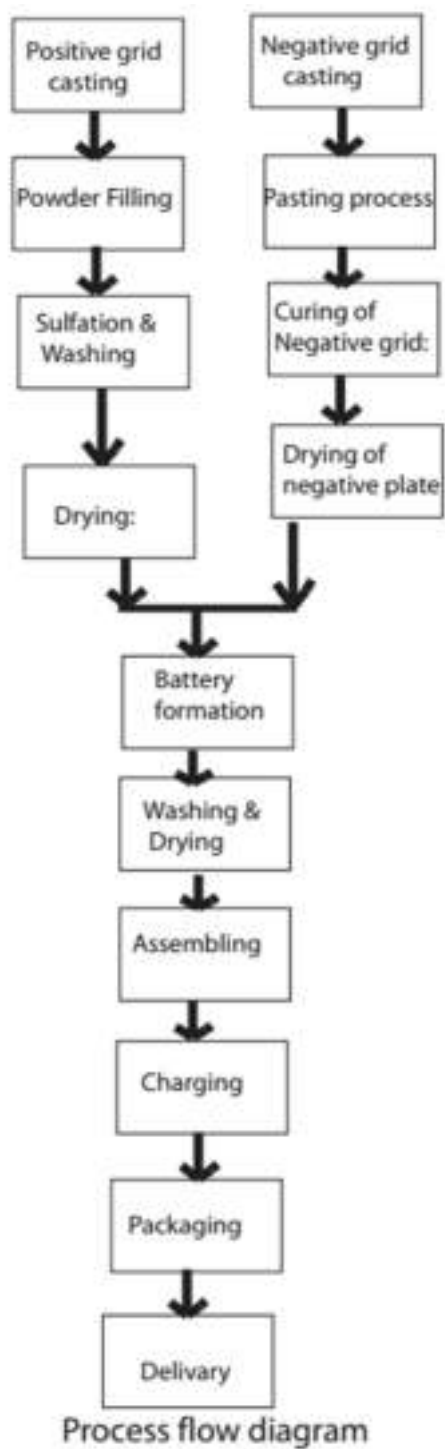


Fig 3.2; Production process of sulfuric acid

3.5 Machinery & Utilities

JAYANA BATTERY TECHNOLOGIES will be a full-fledged operational setup with sophisticated & world class machineries and utilities capable of 24 hours of nonstop operation for quality production of lead acid battery. These machineries are operated by the electricity. The factory has as well world class machinery setups in a tin shed big room. Machineries & utilities are maintained with proactive, scheduled and corrective maintenance as required. Machinery list and their function have been included.

-  Battery assemble system
-  Battery plate cleaning, lead bar, bottom sealing machine
-  Boiler
-  Battery drying and filling system
-  Battery lead -oxide and paste system
-  Battery curing and drying system machine
-  Battery lead parts machine
-  Battery charging machine
-  Packing/Delivery
-  ATP and ETP

List of machineries for sulfuric acid manufacturing process has been attached in annexure 04.

3.6 Other Support Facilities

JAYANA BATTERY TECHNOLOGIES is as always proactive to provide a risk free & safe workplace for all of its 250 employees. In this regard the whole campus is well maintained, all employees and workers have been made aware to work related risks and management options through awareness programs & trainings. The facility has a full capacity emergency firefighting system installed. JAYANA BATTERY TECHNOLOGIES will be also the license from Fire Service & Civil Defense with name of JAYANA BATTERY TECHNOLOGIES prides itself as a leader and trend setter when it comes to fulfilling social responsibility towards its workers and the community as a whole.

In an effort to ensure a living wage, especially at the lowest grade of workers (250), the shareholders and management felt the need to find innovative ways to supplement the income of the workers while staying within the industry norms with regards to minimum wage so as not to create any unnecessary friction. The efforts undertaken are as follows:

- 1) No child labors.
- 2) Free medical facilities.

- 3) Completely compliant with adequate fire extinguishing capabilities.
- 4) Uninterrupted water supply from in-house deep tube well.
- 5) Very strong principles of social responsibility.

3.7 Project Category

As per the criteria of DoE the project falls under Red Category and hence requires Environmental Impact Assessment (EIA). The EIA report will be prepared as per ECR 2023 (schedule 11 rules 15). However, though the project has some environmental impacts but is of lesser as will be revealed from the subsequent chapters.

3.8 Management Aspect

The overall management of the company has been vested with the Board of Director. The Board will formulate company's policies and provide guidelines for its day-to-day business operation. The Managing Director to look after the business affairs and other logistic support of the company. He will be assisted by the other Director as well as by the Managerial and Technical Staff at different levels. The sponsors have gathered sufficient experience in this line of Water Park, Resorts & International Standard Hotel Accommodation and they are well qualified. It is expected that the expertise of the sponsors already grown in successful operation of their present trade business and that will be the extra plus for managing the company.

3.9 Imported Machinery

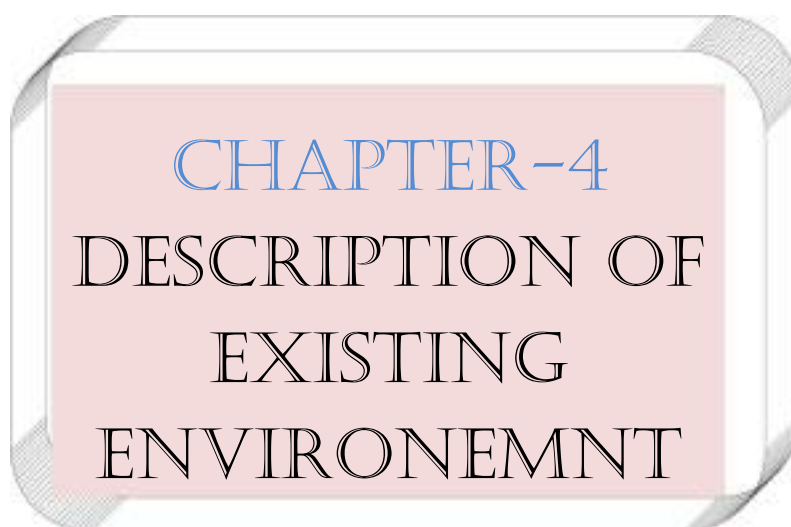
The project will be equipped with complete and balanced machinery together with all auxiliaries & equipment's. The main machinery for the project will be imported from the reputed manufacturer of China. Please see the details in annexure -04.

3.10 Employment Opportunities

The project after implementation will create job opportunities for 250 persons. Skilled and unskilled persons should be engaged in technical line & Administrative section. The above persons have to be recruited for 3 shifts operation of 8 hours each per day.

3.11 Tree plantation plan

JAYANA BATTERY TECHNOLOGIES will have used 100 Decimals for production floor of lead acid battery at Gangachara Thana under Rangpur district. **JAYANA BATTERY TECHNOLOGIES** will make a boundary wall around the project land. **JAYANA BATTERY TECHNOLOGIES** has taken plan to be plantation around the outside boundary wall.



DESCRIPTION OF EXISTING ENVIRONMENT

4.1 General Consideration

The baseline condition of environmental quality in the locality of sub-project site serves as the basis for identification, prediction and evaluation of impacts. The baseline environmental quality is assessed through field studies within the impact zone for various components of the environment, viz. air, noise, water, land and socio-economic, etc.

Information of baseline environmental status of the project area is useful for impact assessment process of assessing and predicting the environmental consequences of the significant actions. Based on the existing environmental scenario, potential impacts of subprojects associated will be identified and accordingly management plan will be proposed in forthcoming sections. The baseline environmental conditions will help in comparing and to monitor the predicted negative and positive impacts resulting from the project during pre-construction, construction and operation phases. Significant action depicts direct adverse changes caused by the action and its effect on the health of the biota including flora, fauna and human being, socio-economic conditions, current use of land and resources, climate change aspects, physical and cultural heritage properties and biophysical surroundings. Baseline data generation of the following environmental attributes is essential in EIA studies.

Data/information was collected from secondary sources for the macro-environmental setting like climate (temperature, rainfall, humidity, and wind speed), topography, geology, soils etc. Firsthand information has been collected to record the micro-environmental features within and adjacent to the project corridor. Collection of primary/field data/information includes extrapolating environmental features on proposed subprojects design, tree inventories, location and measurement of socio-cultural features adjoining proposed subprojects. Ambient air, noise quality, surface water and ground/drinking water quality have been assessed based on measurement/testing as well as visual inspection to prepare a baseline database. Consultation was another source of information and to explain local environmental conditions, impacts, and suggestions, etc.

4.2 Study Area: Rangpur Division

Rangpur Division shares borders with the Rajshahi and Mymensingh divisions. It is also bordered by the Indian states of West Bengal, Assam and Meghalaya and separated from Bhutan and Nepal by the Siliguri Corridor, and from China by the Indian state of Sikkim. Rangpur City is the administrative headquarter and the largest city. Rangpur Division includes the Teesta and Jamuna rivers.

Under the Rangpur Division (one of eight divisions) composed of eight districts of northern Bangladesh, the District of Rangpur is bordered on the north by Nilphamari District, on the south by Gaibandha District, on the east by Kurigram, and on the west by Dinajpur district. Rangpur town is the divisional headquarter. The soil composition is mainly alluvial soil (80%) of the Teesta River basin, and the remaining is barind soil.

According to the 2022 Census of Bangladesh, Rangpur District had 834,307 households and a population of 3,169,614, of whom 32.55% lived in urban areas. 17.54% of the population was under 10 years of age. The population density was 1,320 people per km². The literacy rate (age 7 and over) was 70.73%, compared to the national average of 74.80%, and the sex ratio was 98.04 females per 1000 males. The Rangpur district remains a population magnet, covers an area of 2,400.56 km² with a population in excess 3,169,614, growing at 1.2% rate since prior count, compared with national average of 1.22%. It is bounded by Rajshahi and Dhaka divisions on the east and north side.

In this study, study area covers both the immediate site, and an extended area of about 1 km radius. Immediate area here is the area that is enclosed by the project perimeter which falls mainly in Gangachara, Rangpur. In physico-chemical component, parameters included are land, water quality, air quality, climate, and noise. Primary and secondary data has been collected. In case of primary data collection emphasis has been given only to project boundary area. Secondary data has been collected from different government and non-government organizations. Secondary data covers environmental and socioeconomic information of Gazipur District area. JAYANA BATTERY TECHNOLOGIES is situated at 1.44 kilometers from the bank of river Ghaghat and 8.52 kilometers from the bank of river Tista. This area is not densely populated around the project side.

The following section describes the baseline environment in three broad categories:

- Physical Environment- factors such topography, geology, earthquake, climate and hydrology/drainage, environmental pollution,
- Biological Environment- factors related to life such as flora, fauna and ecosystem; and
- Socio-economic Environment- anthropological factors like demography, income, land use, land requirement and infrastructure.

As mentioned earlier in chapter 3, all the subprojects under the project JAYANA BATTERY TECHNOLOGIES are located at quite place of Vill: Uttar Panapukur, Borobil, P.S: Gangachara, Dist: Rangpur of Rangpur division in Bangladesh. The environmental baseline chapter is described according to the classification, nature and primary observation during field survey.

4.3 Physical Environment

4.3.1 Land

4.3.1.1 Existing Land Uses

The existing areas within JAYANA BATTERY TECHNOLOGIES will use for set up lead acid battery making industry. The project has been set up in area which generally has land usages with agriculture cultivation activities. Details shown in figure 4.1.

However, the nature of JAYANA BATTERY TECHNOLOGIES will project is such that its activities do not create any disturbance to other activities in areas outside its project perimeter. Hence during in-depth study for environmental impacts of the project upon surrounding environment, we can consider the project sites and immediate surrounding sites as areas of interest.



Fig- 4.0: The Land Use Pattern of the project Area

4.3.1.2 Land Form and Soil Classification

The general Physiography of Bangladesh is shown in Figure 4.2 & the location of the project has been marked on it. Most of the area of Bangladesh is a vast, low-lying alluvial plain, sloping gently to the south and southeast. A depression extends northeast from the Dhaka area following the Meghna floodplain and broadens out in the Sylhet depression. The land of the Gangachara Upazilla is composed of alluvium soil of the Pleistocene period.

Gangachara is the northernmost Upazila of Bangladesh's Rangpur District, located in the Rangpur Division. Gangachara Upazilla (Rangpur district) with an area of 269.67 sq km, is 4.90 kilometers miles away from Gangachara Upazilla. it is bounded by the upazilas of Taraganj, Rangpur Sadar and Kaunia to its southwest, south and southeast respectively. The location of Gangachara Upazilla is 25°51'03.3"N 89°13'07.4"E. Gangachara Upazilla (Town) is under Gangachara upazilla. It has a population of 286,730.

The project area has also been marked on the generalized soil map of Bangladesh. Gangachara soil series constitutes 40.4%, followed by Teesta silty alluvium (12.7%), Palasbari (10.4%), Teesta sandy alluvium (7.5%), and Pirgacha (4.6%). Soil stexure is Dominated by loam soils (70.5%), alongside sandy loam (4.5%), sand (3.7%), and clay loam (1.1%). Soils in the eastern section along the Teesta River valley consist of active and very young meander floodplain alluvium and grey sands, subject to seasonal flooding, char formations, and riverbank erosion. JAYANA BATTERY TECHNOLOGIES is situated at Vill: Uttar Panapukur, Borobil, P.S: Gangachara, Dist: Rangpur Bangladesh.

4.3.1.3 Climate

The Project area has a tropical monsoon climate with four seasons: dry or winter season (December–February); pre-monsoon or hot season (March–May); monsoon or rainy season (June–September); and post-monsoon or autumn season (October–November). Although less than half of Bangladesh lies within the tropics, the presence of the Himalaya Mountain range has created a tropical macroclimate across most of the east Bengal land mass. Bangladesh can be divided into seven climatic zones. According to the classification, the project areas are located in the south-central and south-eastern region climatic zones (Figure 4.2).

Like other parts of the country, the project areas are heavily influenced by the asiatic monsoon, and it has these three distinct seasons:

- Pre-monsoon hot season (from March to May),
- Rainy monsoon season (from June to October), and
- Cool dry winter season (from November to February).

The pre-monsoon hot season is characterized by high temperatures and thunderstorms. April is the hottest month in the country with mean temperatures ranging from 27°C in the east and south, to 31°C in the west-central part of the country. After April, increasing cloud-cover reduces the temperature. Wind direction is variable during this season, especially during the early part. Rainfall, mostly caused by thunderstorms, at this time can account for 10 to 25 percent of the annual total.

The rainy monsoon season is characterized by southerly or south-westerly winds, very high humidity, heavy rainfall and long periods of consecutive days of rainfall. The monsoon rain is caused by a tropical depression that enters the country from the Bay of Bengal. About 90% of the annual precipitation occurs during the five-month monsoon season from May to September.

The cool dry season is characterized by low temperatures, cool air blowing from the west or northwest, clear skies and meager rainfall. The average temperature in January varies from 17°C in the south west and south-eastern parts of the country to 20°C to 21°C in the coastal areas. Minimum temperatures in the extreme in late December and early January reach even in between 7°C to 8°C. To define meteorological conditions in and around the proposed construction area of the Project, temperature, rainfall, humidity and wind data were collected. Long-term average climatic data (1961-2016) collected from Dhaka and Narayaongonj Weather Stations of the Bangladesh

The project area has been marked in the average temperature map of Bangladesh in Figure 4.1.

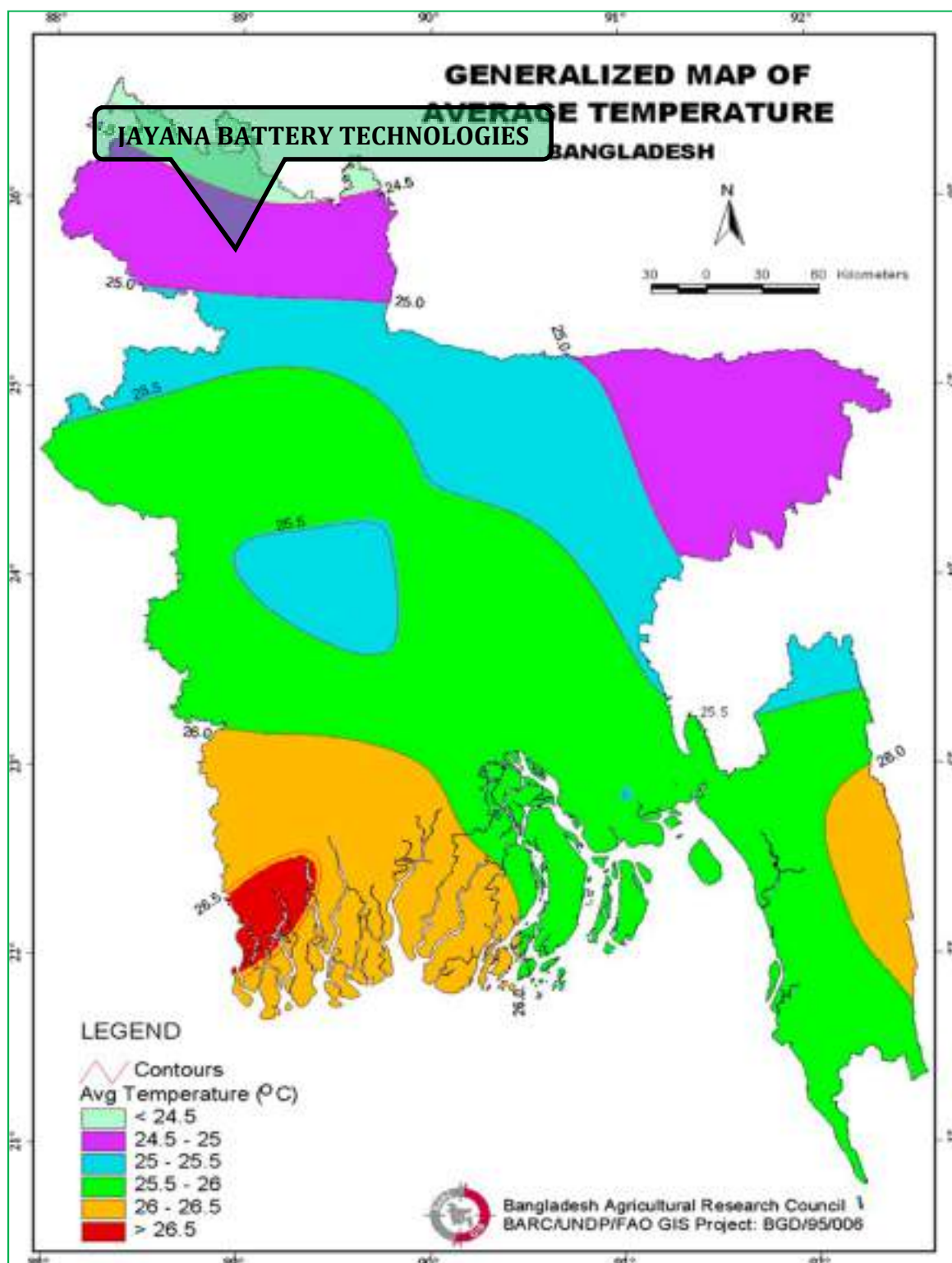


Figure – 4.1 Average Temperature Map of Bangladesh

4.3.1.4 Temperature and Humidity

The relative humidity rises to above 80% during the wet season. The mean annual evaporation is high, with the highest daily figures (Fig 4.1) occurring during March to May when the mean daily temperatures are at their highest. The mean monthly maximum temperature in Gazipur varies from 25.4°C in January, to 33.7°C in April. Humidity data of the Project Area in last 6 years has been shown in Table-4.5. While Table-4.6 and 4.7 presents the long-term temperature data of Dhaka, the nearest Meteorological station of the proposed project area.

Monthly Relative Humidity of the Project Area in Last 6 Years.

Monthly Mean Humidity in %													
Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
2009 ¹	72	55	53	66	72	74	80	82	81	73	66	69	70
2010 ¹	71	56	59	67	71	79	77	78	79	74	68	66	70
2011 ¹	69	54	57	64	76	80	79	82	77	73	67	73	70
2012 ²	72	51	59	68	68	78	80	79	79	61	66	73	70
2013 ²	61	60	52	62	79	79	78	82	80	79	65	70	70
2014 ²	66	56	48	55	67	77	-	-	-	-	-	-	-

Source: 1. Bangladesh Metrological Department &
2. <http://www.tutiempo.net/>

Long Term Temperature at Rangpur

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Norm. Max.	25.4	28.1	32.5	33.7	32.9	32.1	31.4	31.6	31.6	31.6	29.6	26.4
Norm. Min.	12.7	15.5	20.4	23.6	24.5	26.1	26.2	26.3	25.9	23.8	19.2	14.1

Source: Bangladesh Metrological Department

Monthly Temperatures at Gazipur for the Last 6 Years

Year		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	Max	25.9	29.7	33.3	35.6	34.6	34.5	32.3	32.5	32.5	32.2	30.2	26.0
	Min	14.8	17.3	21.4	25.9	25.2	26.7	26.7	26.7	26.3	24.2	20.2	15.4
2010	Max	23.8	28.9	34.1	35.5	34.3	33.1	33.0	33.1	32.5	32.4	30.1	26.1
	Min	12.8	16.2	23.3	26.4	25.9	26.7	27.4	27.1	26.6	25.1	20.9	15.5
2011	Max	23.4	28.7	32.1	33.5	33.4	32.6	32.3	31.1	32.4	32.7	29.7	25.0
	Min	12.2	16.9	21.5	23.2	24.6	26.3	26.7	26.5	26.4	24.7	19.2	15.0
2012	Max	23.4	28.7	32.1	33.5	33.4	32.6	32.3	31.1	32.4	32.7	29.7	25.0
	Min	12.2	16.9	21.5	23.2	24.6	26.3	26.7	26.5	26.4	24.7	19.2	15.0
2013	Max	25	28.2	33.8	33.8	31.6	32.9	32.4	32.1	32.7	31.7	30.2	25.8
	Min	13	18.4	22.3	24.3	25.1	27.4	27.3	26.4	26.7	24.2	19.2	15.5
2014	Max	24.2	26.2	32.4	36.2	35.4	32.8	-	-	-	-	-	-
	Min	13.8	16.5	20.6	24.8	26	25.8	-	-	-	-	-	-

Source: 1. Bangladesh Metrological Department &

2. <http://www.tutiempo.net/>

4.3.1.5 Rainfall

The project area receives about 2150 mm of rainfall annually. Lowest rainfall occurs in the winter, while more than 85 % of the total annual rain fall occurs during monsoon period. **Table- 4.8** represents normal average monthly rainfall in Dhaka station.

Average Normal Rainfall at Rangpur

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	7.7	28.9	65.8	156.3	339.4	340.4	373.1	316.5	300.4	172.3	34.4	12.8

Source: 1. Bangladesh Metrological Department

4.3.1.6 Wind

Generally, wind blows in south or south-east direction from April to September. However, this direction changes to north-west or north direction in October to November and north-west or west direction in December to March in year. Table 4.9 represents the average wind speeds in knots for the year 2017 to 2022 recorded at Dhaka station.

Monthly Average Wind Speed at Rangpur from 2017 to 2022

Year		Month											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	Speed	3.3	4.1	4.0	4.1	3.8	3.1	4.3	2.8	4.2	2.3	2.8	2.4
	Direction	W	W	W	S	S	S	SE	S	SE	E	N	NW
2010	Speed	2.9	3.3	3.8	4.1	3.7	3.0	2.4	2.2	2.6	2.0	2.9	2.4
	Direction	NW	W	S	S	S	S	S	S	SE	NE	N	N
2011	Speed	2.2	2.4	3.8	2.4	3.0	2.7	2.4	2.4	2.6	2.0	2.3	2.1
	Direction	W	W	S	S	S	SE	SE	SE	SE	NW	W	NW
2012	Speed	2.4	3.0	2.5	2.6	2.5	3.0	-	-	-	-	-	-
	Direction	W	W	S	S	S	S	-	-	-	-	-	-

4.3.1.7 Disasters

Bangladesh is most vulnerable to several natural disasters and every year natural calamities upset people's lives in some part of the country. The geographical setting of Bangladesh makes the country vulnerable to natural disasters. The mountains and hills bordering almost three-fourths of the country, along with the funnel shaped Bay of Bengal in the south, have made the country a meeting place of life-giving monsoon rains, but also make it subjected to the catastrophic ravages of natural disasters. Bangladesh is currently ranked as one of the world's most disaster-prone countries, with 97.1 per cent of its total area and 97.7 per cent of the total population at risk of multiple hazards, including cyclones (World Bank, 2005). Bangladesh very often becomes the landing ground of cyclones formed in the Bay of Bengal. Recent natural and environmental challenges in Rangpur include seasonal flash floods along the Teesta River, severe nor'wester storms (Kalboishakhi), and localized weather forecasting disruptions due to radar outages. Rising waters from upstream regions and heavy local rainfall frequently inundate low-lying char areas and riverbanks in Gangachara and surrounding upazilas, stranding thousands of residents and damaging crops. However, the project area as marked in the map of disaster-prone areas of Bangladesh in Figure – 4.2 is relatively free from disasters.

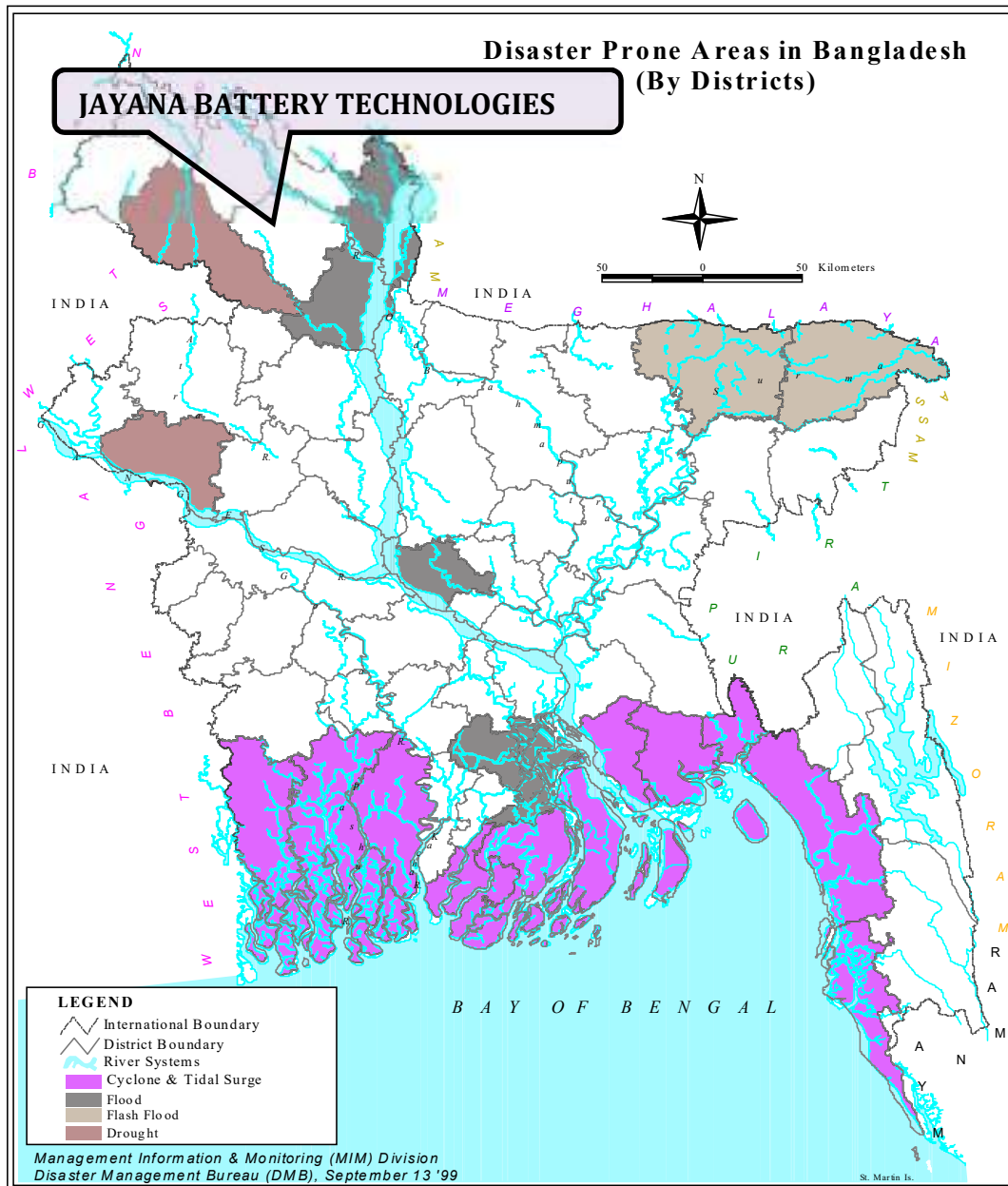


Figure – 4.2 Disaster Prone Areas of Bangladesh



Figure - 4.3 Earthquake Zones of Bangladesh.

Wind Speed and Wind Direction - Wind could be the biggest and most influential weather factor. So, it is extremely important to know the direction and velocity. The Wind Rose model is used to understand wind factors. Monthly prevailing wind data (wind speed and wind directions) were collected from Rangpur substations for the period of 1961-2012 and analyzed to determine the distribution of wind force within the study area. These data were then used to formulate the wind rose (Figure 4.4) which provides an overview of prevailing wind conditions within the survey area.

Historical wind data (wind speed, wind direction) shows that the wind speed is at a maximum in the early part of the monsoon, but drops substantially by the beginning of the dry season and is assumed to reflect the Project corridor conditions.

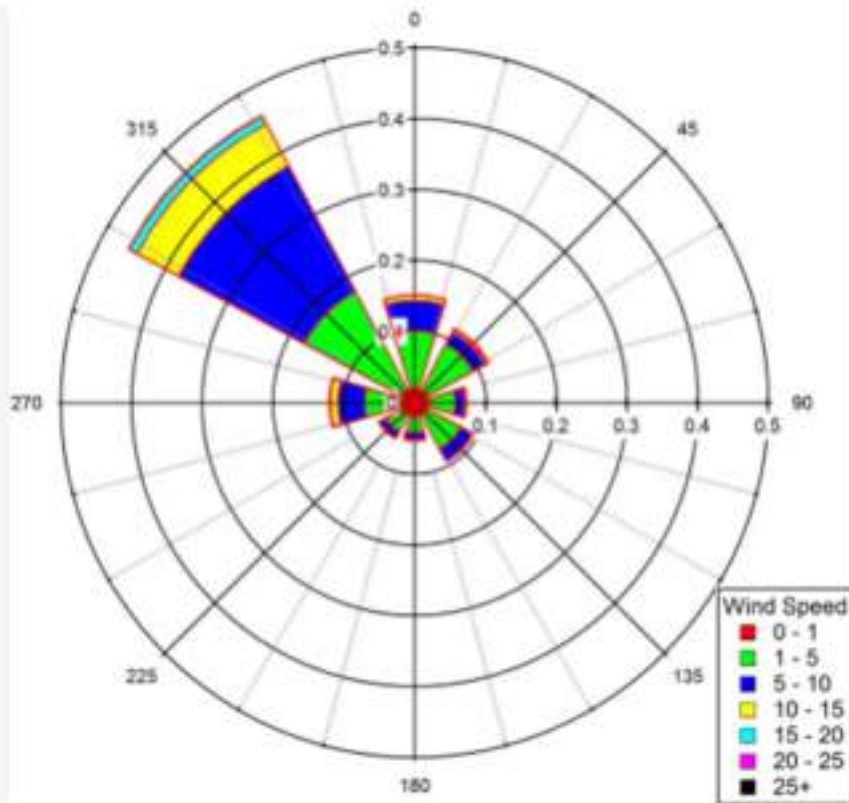


Figure 4.4: Rangpur Meteorological Substation

For Rangpur station, the long arrows or petal indicates that wind blows more frequently with a dominant speed 5 mph from the east from the west direction and which comprises nearly 54 percent wind of the data period (Figure 4.9). It is recorded that the wind speeds mostly remain in the range of 2-5 m/s. But in the winter months it remains in the range of 1.4-4.7 m/s occasionally rising up to 6.4 m/s. The highest speed is recorded as 9.8 m/s in the month of May, 1977 among the data period of 1977-2012 blowing towards south and southeast directions.

4.4 Water Sources

As other parts of the country, the project area also receives sufficient amount of rainfall and there is a good availability of ground water, which is being, used by hand pumps and deep tube well for drinking and domestic purposes. The river Gahgahat river are very near (1400 m) to the project area. Ground water level exists at moderate (Generally below 15.0 m) depths in the project, which is being recharged mainly by infiltration of rainwater. The groundwater will be used for the production process of **JAYANA BATTERY TECHNOLOGIES**. The project area has been marked on the Ground water zoning map shown in Figure 4.8. Ground water is a stable source of water for domestic use in this area. Usage of ground water for irrigation is not present here because the project and its surrounding area are mainly urban in nature and cultivation practice is mostly absent here. To determine quality of ground water, water sample was collected from the existing ground water source & the water quality analysis report has been tabulated in Table 4.1. Results show that all the parameters remain within allowable limit of drinking water value as per Environmental Quality' Standards for Bangladesh and also within limit of water quality parameters as per DOE.

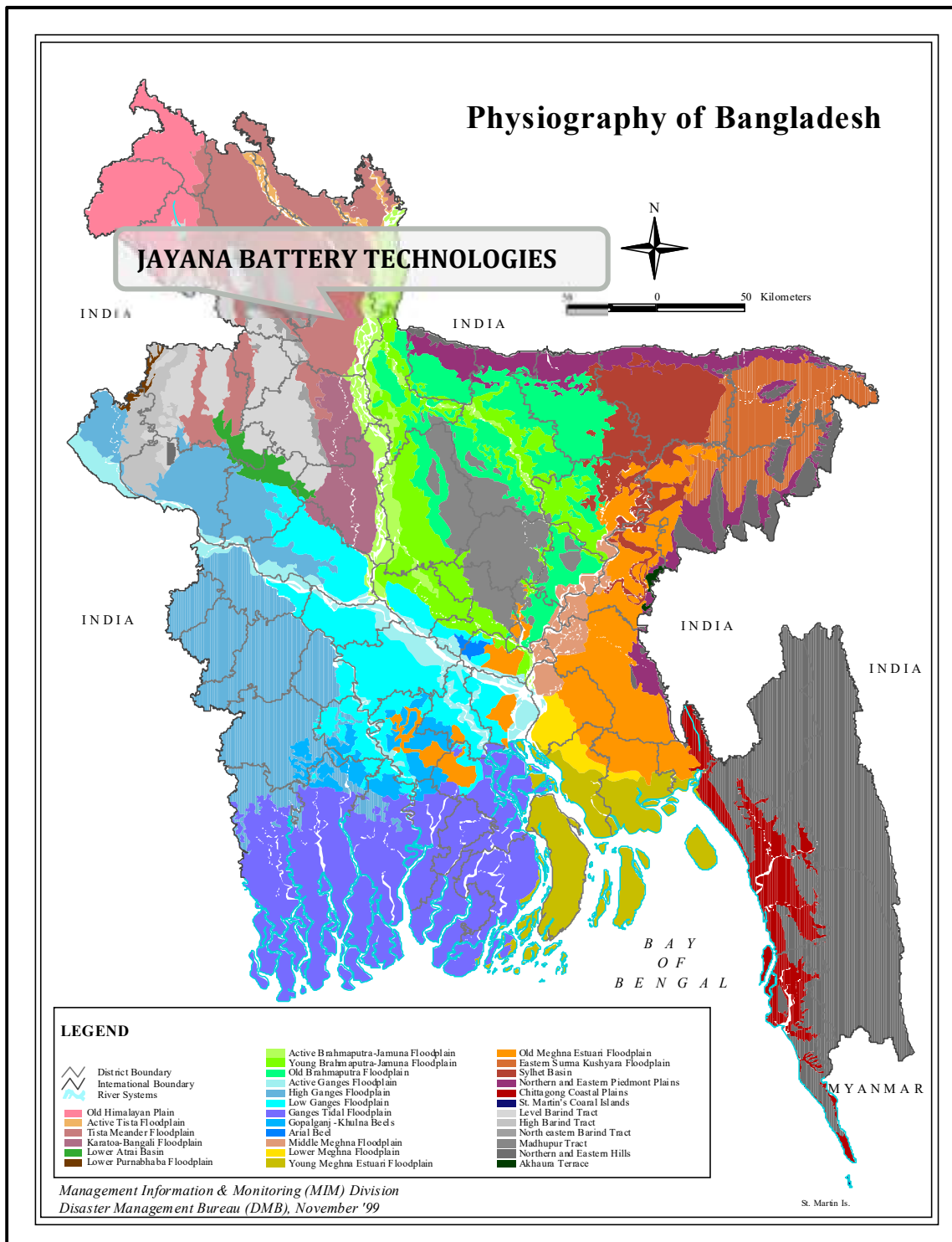


Figure – 4.5 Location Marked on Physiographic Map of Bangladesh

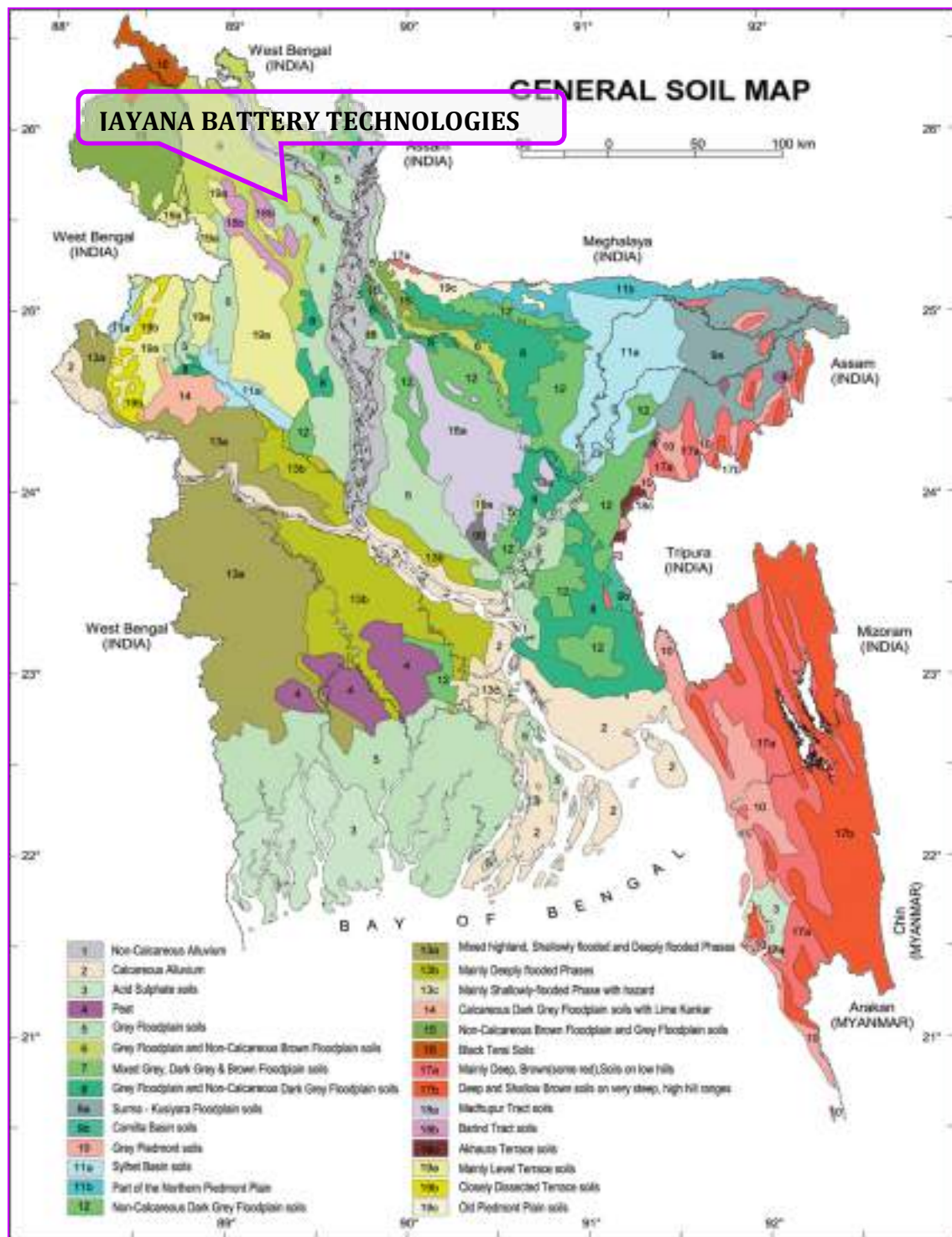


Figure - 4.6 General Soil Map of Bangladesh

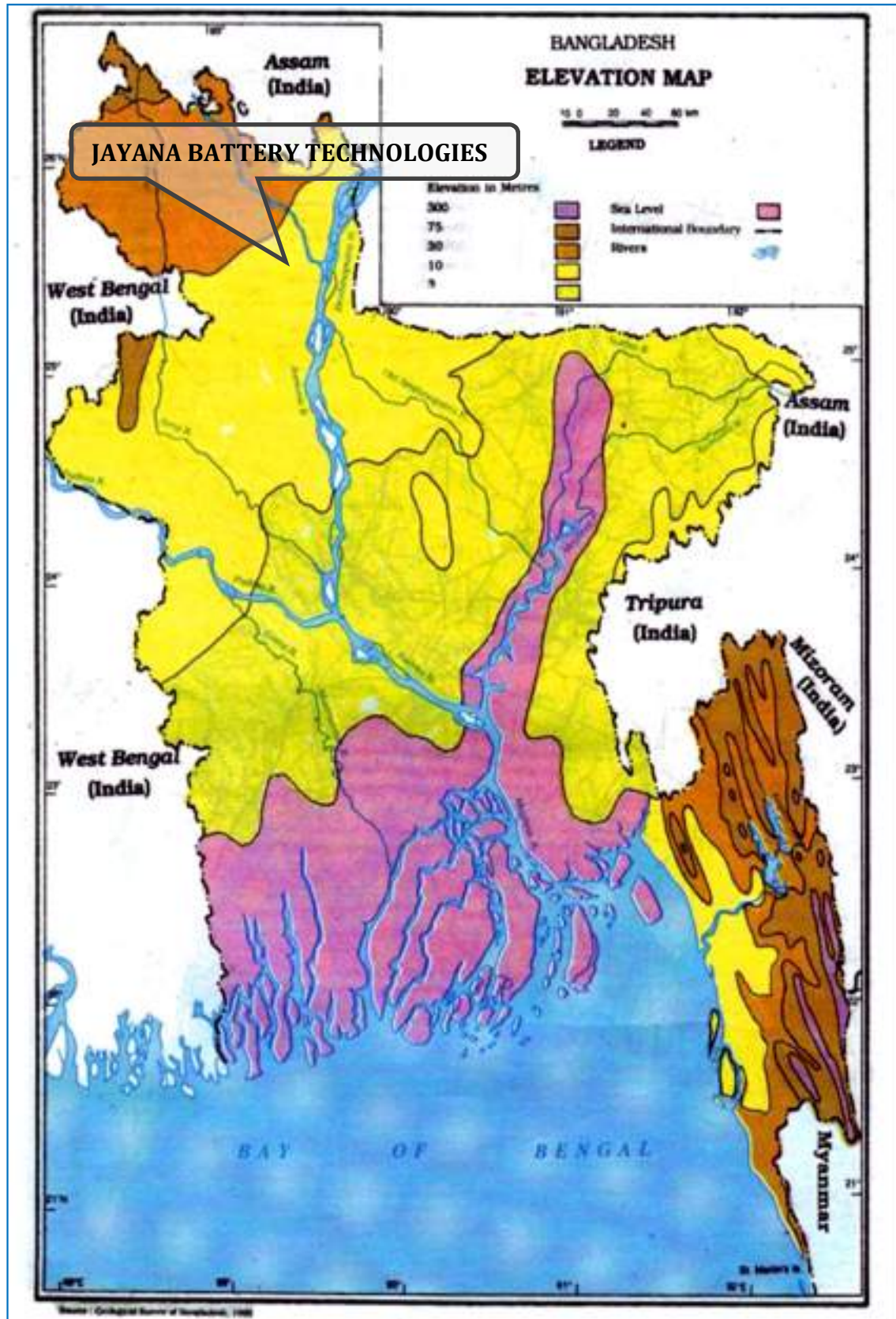


Figure – 4.7 Elevation Map of Bangladesh

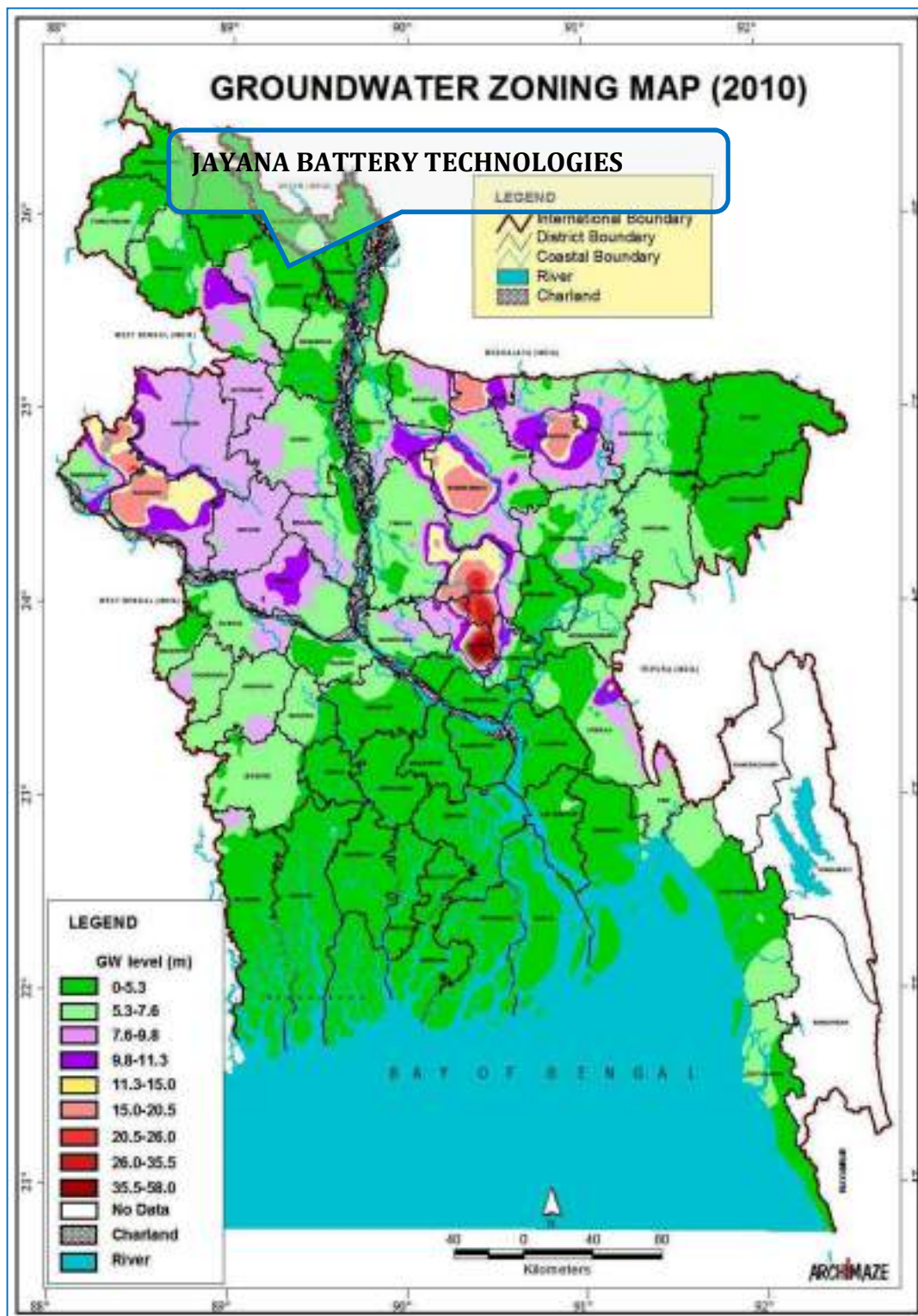


Figure – 4.8 Groundwater Zoning map

4.4.1 Surface Water Quality

Surface water is abundant in the wet season in Bangladesh. An estimated 795,000 million cubic meter (Mm^3) of surface water is discharged through the Ganges-Brahmaputra system, in the downstream of the confluence of the Ganges and the Brahmaputra. This is equivalent to 5.52 m deep water over a land area of 144,000 km^2 . There are other rivers discharging surface water into the Bay of Bengal. An average annual rainfall of 2.40 m within the country partly replenishes surface water sources. Each year about one-third of Bangladesh is submerged in a normal flood, and the area submerged may increase to about two-thirds during severe floods. In the dry season water scarcity persists in many areas. In this period surface water is only available in part of the 22,155 km of major rivers, 1,922 km^2 major standing water bodies and about 1,475 km^2 of ponds in the country. Surface water irrigation systems in the country compete for this available water in the dry season. The perennial water bodies are decreasing with the use of more and more surface water.



Figure – 4.9: Surface water collection point of up & down stream at Ghaghat River

Traditionally, before and during the early stages of tube wells installation, rural water supply was largely based on protected ponds. There are about 1,288,222 ponds in Bangladesh having an area of 0.114 ha per pond and 21.5 ponds per mauza (BBS, 1997). About 17% of these ponds are derelict and probably dry up in the dry season. The biological quality of water in these ponds is extremely poor due to unhygienic sanitary practices and absence of any sanitary protection. Many of these ponds are chemically and bio-chemically contaminated for fish culture. If one pond per mauza could be protected from contamination, it would provide a source of drinking water with minimal treatment and water for other domestic uses without treatment. The Government of Bangladesh has greatly emphasized the development of protected pond-based water supply systems. The protected ponds should not receive any surface discharge and should only be replenished by rain and groundwater infiltration.



Figure 4.10: Surface water Samples Collection Location Map

The overall quality of surface water around the project site and its surroundings varies throughout the year. Typically, water quality improves during the monsoon due to the influx of fresh rainwater, and worsens during the dry season as water evaporates and the concentration of contaminants increases.

During 14-15 September 2026, surface water samples were collected by the environmental survey team from different locations of the subproject areas & preserved in the ice box and tested in the laboratory. The result of the surface & river water (Ghaghat river) samples and the GoB standards for fishing water (ECR, 2023). The concentration levels of all the parameters for surface water were within the acceptable limit set by the DoE, GoB, according to the best practiced based classification. The details of the test results are given in the Annexure 06.





Fig 4.11: Collection of Surface Water Sample from the pond water and river near the project area

Table: Surface Water quality Sampling Location and GPS Coordinate.

SN	Name of samples	Code	GPS Coordinate
01	Ghaghat River Water (Upstream)	River water -1	25°50'24.9"N 89°09'25.8"E
02	Ghaghat River Water (Downstream)	River water -2	25°49'51.8"N 89°09'33.6"E
03	Surface Water sampling point-1	SWSP- 1	25°50'10.6"N 89°10'26.3"E
04	Surface Water sampling point-2	SWSP- 2	25°50'11.3"N 89°10'21.7"E
05	Surface Water sampling point-3	SWSP- 3	25°50'10.4"N 89°10'29.1"E
06	Surface Water sampling point-4	SWSP- 4	25°50'10.9"N 89°10'19.4"E

Table 4.1: Test Results of surface and River water quality parameters

Surface water quality Parameters	Unit	SWSP- 1 25°50'10.6"N 89°10'26.3"E	SWSP- 2 25°50'11.3"N 89°10'21.7"E	SWSP- 3 25°50'10.4"N 89°10'29.1"E	SWSP- 4 25°50'10.9"N 89°10'19.4"E	River water -1 (Upstream) 25°50'24.9"N 89°09'25.8"E	River water -2 (Downstream) 25°49'51.8"N 89°09'33.6"E	Surface water quality Standard as per ECR 2023
pH	-	7.22	7.12	7.20	6.98	7.13	7.10	6-9
Suspended Solid (SS)	mg/L	1.5	1.6	1.9	1.9	2.1	2.2	100
Dissolved Oxygen (DO)	mg/L	4.5	4.1	4.3	4.9	4.8	4.7	>6
Chemical Oxygen Demand (COD)	mg/L	38	39	33	24	29	28	200
Biological Oxygen Demand (BOD) ₅ days	mg/L	14	17	13	12	11	12	30
Temperature	⁰ C	23.6	23.5	23.4	23.8	22.8	22.7	>5 ⁰ C

4.4.2 Ground Water Quality

Groundwater quality at a project site is determined by testing physical (pH, TDS, EC), chemical (As, Mn), and biological parameters (BOD, COD) and comparing them with standard drinking or irrigation guidelines of national standard (ECR 2023). Tube well water in Rangpur is generally collected from subsurface confined aquifers at depths ranging from 25 meters to 200 meters. Groundwater in the Rangpur district of Bangladesh is generally fresh and suitable for domestic and irrigation uses.





Fig 4.12: Collection of tube-well (ground water) Water Sample from different tube-well and deep tube

During 14-15 September 2026, surface water samples were collected by the environmental survey team from different locations of the subproject areas & preserved in the ice box and tested in the laboratory.



Figure 4.13: Ground water Samples Collection Location Map from the project area

Table 4.2: Test Results of Groundwater quality parameters

SN	Name of samples	Code	GPS Coordinate
01	Deep tube well water (Groundwater)	GW-1	25°50'08.4"N 89°10'21.6"E
02	Deep tube well water (Groundwater)	GW-2	25°50'08.4"N 89°10'20.3"E
03	Deep tube well water (Groundwater)	GW-3	25°50'10.6"N 89°09'59.9"E
04	Deep tube well water (Groundwater)	GW-4	25°50'09.9"N 89°09'54.2"E
05	Deep tube well water (Groundwater)	GW-5	25°50'09.0"N 89°09'46.5"E
06	Deep tube well water (Groundwater)	GW-6	25°50'10.9"N 89°10'21.7"E

Groundwater (deep tube well) quality parameters

Ground water quality parameters	Unit	GW-1 25°50'08.4"N 89°10'21.6"E	GW-2 25°50'08.4"N 89°10'20.3"E	GW-3 25°50'10.6"N 89°09'59.9"E	GW-4 25°50'09.9"N 89°09'54.2"E	GW-5 25°50'09.0"N 89°09'46.5"E	GW-6 25°50'10.9"N 89°10'21.7"E	Drinking water quality Standard as per ECR 2023	WHO Standard 4th edition (Guidelines for Drinking Water 2011)
pH	-	7.21	7.14	7.26	7.17	7.12	7.2	6.5-8.5	6.5-8.5
Total Dissolved Solids (TDS)	mg/L	132	113	106	111	123	121	1000	1000
Arsenic	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01
Manganese	mg/L	0.013	0.014	0.017	0.017	0.012	0.017	0.04	0.08
Hardness as CaCO ₃	mg/L	125	134	83	104	107	106	500	-
Iron	mg/L	0.11	0.10	0.12	0.21	0.18	0.12	0.3-1.0	0.3
Fecal Coliform	CFU/100ml	0	0	0	0	0	0	0	-
Total Coliform	CFU/100ml	0	0	0	0	0	0	0	-

4.5 Ambient Air Quality

Within Bangladesh there are two major sources of air pollution: industrial emissions and vehicular emissions. Industrial sources include power generation, fertilizer factories, mills (sugar, paper, jute and textile), brick kilns, tanneries, chemical and pharmaceutical industries and the burning of solid waste. Emissions from these various sources contribute to the formation of the smog that regularly shrouds the major cities (Rahman et al, 2005).

Pollutants emitted from industrial sources include hydrogen sulfide, ammonia, and chlorine; all of which can result in health complaints such as skin irritation, headaches and nausea. Sustained exposure to these pollutants can result in other severe health effects such as severe respiratory health issues and birth defects (Rahman et al, 2005).

In Bangladesh – where some 89% of the population use solid fuel – air-quality related deaths were estimated to be over 56,000 in 2007 alone (WHO, 2007). With increasing rates of urbanization, it is anticipated that vehicular ownership and usage will also increase, leading to a continued decline in air quality. DoE has identified two-stroke engines as a major polluter, and now discourages their use within Dhaka (Rahman et al, 2005).

Within the rural areas of Bangladesh, the main sources of air pollution are brick kilns and domestic heating and cooking – with wood, coal, diesel and biofuel (often manure) used as sources of energy (UNEP, 2002). It is therefore likely in rural areas that the principal air contaminants are particulate matter and volatile organic compounds (VOCs). Rural areas often also experience problems, particularly in the dry season, with dust generation due to construction, transport and agricultural activities such as tilling, threshing and plowing.



Figure 4.14: Air pollution Sampling point Location Map





Fig: 4.15: Collection of ambient air sampling (day -night) at different location of Borobil, Gangachara,

Ambient air quality measurements are essential to provide a description of the existing conditions or the baseline against which changes can be measured and to assist in the determination of potential impacts of the proposed project. Two hours air quality measurement (except CO) has been conducted at the various locations of the subprojects by using ECOTECH (Combined P10/P2.5 Sampler) as an air pollution monitoring equipment (Figure 4.11) and an analysis of parameters was done by Global Environment Consultant Ltd.

The measurement results are given in the below Table 4.2. According to Bangladesh National Ambient Air Quality Standard (APCR 2022) from the Environmental Conservation Rules, 2023 which was amended on 25th July 2022 vide S.R.O. No. 255-Law/2022; any of the measure's parameter of the local ambient air does not exceed Bangladesh standard. The air quality measurements were (day-night) carried out at 4 different locations of Borobil, project area under Gangachara, Upazila under Rangpur district. All parameters were within DOE standards.

Table : Results of Ambient Air Quality Sampling Location & GPS Coordinate

Air sampling points	Address	GPS Coordinate
Air sampling point-1 (ASP-1)	Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur	25°50'11.1"N 89°10'21.4"E
Air sampling point-1 (ASP-2)	Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur	25°50'11.7"N 89°10'34.7"E
Air sampling point-1 (ASP-3)	Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur	25°50'11.4"N 89°10'09.9"E
Air sampling point-1 (ASP-4)	Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur	25°50'14.3"N 89°10'51.4"E

Table 4.3: Test Results of Ambient air quality parameters

Air quality Parameters	Unit	Air sampling point-1 (ASP-1) 25°50'11.1"N 89°10'21.4"E	Air sampling point-2 (ASP-2) 25°50'11.7"N 89°10'34.7"E	Air sampling point-3 (ASP-3) 25°50'11.4"N 89°10'09.9"E	Air sampling point-4 (ASP-4) 25°50'14.3"N 89°10'51.4"E	Air quality Standard as per APCR 2022
PM ₁₀	µg/m ³	61	58	57	62	150
PM _{2.5}		30	29	27	31	65
NO _x		18	15	13	14	80
SO ₂		9	10	11	12	80
CO		541	621	517	419	5000
Pb		0.01	0.01	0.01	0.01	0.5
O ₃		18	22	23	17	100
NH ₃		8	10	8	7	400
Abbreviation: Particulate Matter (PM10) with maximum size 10 µm, Particulate Matter (PM2.5) with maximum size 2.5 µm. APCR - Air Pollution Control						

4.6 Noise Quality

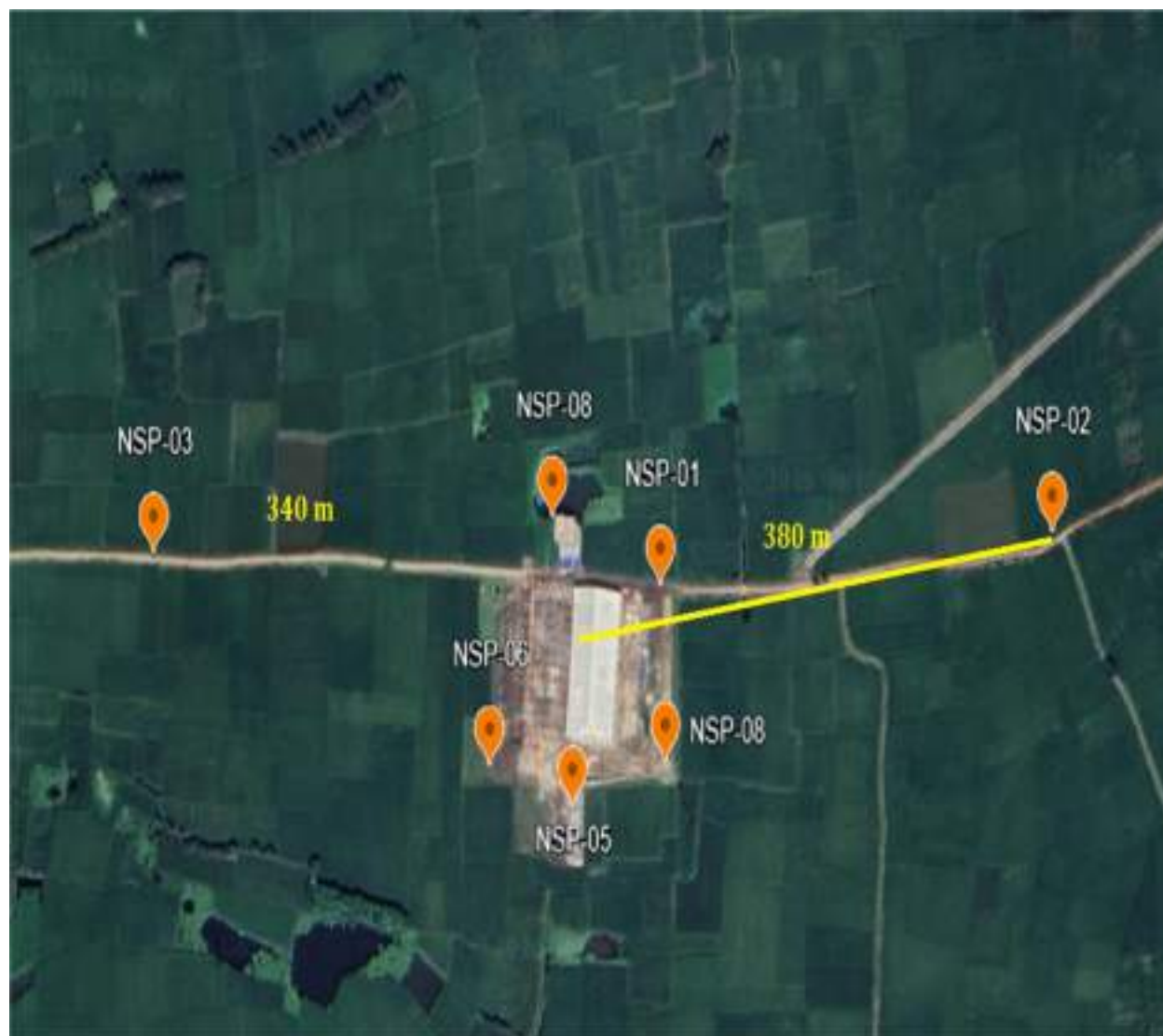
Excessive noise is a potential issue for both human and biological receivers and can potentially cause a range of negative issues, from mild annoyance and moderately elevated levels of aggression to significant disturbance of behavioral patterns and in severe cases temporary or permanent hearing loss. According to World Health Organization's Guidelines for Community Noise (1999), daily sound pressure levels of 50 decibels (dB) or above can create discomfort amongst humans, while ongoing exposure to sound pressure levels over 85 dB is usually considered the critical level for temporary hearing damage.

The noise level of the surroundings of the project area is insignificant. The proposed site is presently using for agriculture and the anthropogenic disturbance is less. However, there is sound pollution from the traffic movement on the nearby road. Noise level has been monitored for 15 minutes at the various locations of the subproject sites during day-night time. Results of the noise level monitored along with details of the measurement locations have been showed in Table 4.5.





Fig 4.16: Collection of noise level sampling at different location of Uttar Panapukur, Okrabari The noise level measurement at 8 different locations of Uttar Panapukur, Okrabari, Borobil, under Gangachara, Upazilla also included in Table 4.3. The results show that time weighted average value of the noise monitored at the project area exceeded the standard fixed for the respective areas. The level of noises was within the level of mixed and commercial area as per air pollution control rule 2025.



Name of the Project: JAYANA BATTERY TECHNOLOGIES

Fig 4.17: Noise level sampling point at different location of Uttar Panapukur, Okrabari

Table 4.4: Test Results of Ambient Noise levels

Address of noise level monitoring		Noise level point for sampling- Day -night								GPS -Coordinate	
Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur		Noise Sampling point (NSP-1)								25°50'11.1"N 89°10'21.4"E	
		Noise Sampling point (NSP-2)								25°50'11.7"N 89°10'34.7"E	
		Noise Sampling point (NSP-3)								25°50'11.4"N 89°10'09.9"E	
		Noise Sampling point (NSP-4)								25°50'14.3"N 89°10'51.4"E	
		Noise Sampling point (NSP-5)								25°50'08.1"N 89°10'24.1"E	
		Noise Sampling point (NSP-6)								25°50'07.4"N 89°10'21.5"E	
		Noise Sampling point (NSP-7)								25°50'08.0"N 89°10'19.2"E	
		Noise Sampling point (NSP-8)								25°50'11.9"N 89°10'20.9"E	
Parameters	Unit	Concentration Present								Noise Standard as per Noise pollution control rule 2025 (day-night time)	
		NSP -1	NSP -2	NSP -3	NSP -4	NSP -5	NSP -6	NSP -7	NSP -8		
Noise level	dB(A) at night	52.9	47.7	49.0	48.0	42.3	45.1	40.3	41.8		
	dB(A) at Day time	56.5	51.2	53.2	52.1	46.2	48.3	44.1	45.2		
Bangladesh (DoE) standard as per Noise pollution control rule 2025										Day	Night
Industrial area										75	70
Commercial Area										70	60
Mixed Area										60	50
Residential Area										55	45
Silent Area										50	40
										Day	Night
Industrial										70	
Residential; Institutional; Educational										55	

All units are in (LA_{eq}) dBA, Note: This noise data was usually accomplished by – Lutron Sound Level Meter (Model – 4012)

The standard level of ambient noise at the industrial area is 75 dB according to DOE and but for the standard of IFC/ World Bank, the ambient noise level at the industrial area is 70 decibels at day time. According to the Air Pollution (Control) Rule, 2025("SRO no 452-law/2025), the level of noise will have to keep within the above-mentioned standard limit. The levels of noise were varied from 55.5 dBA to 66.3 dBA around the **JAYANA BATTERY TECHNOLOGIES**. However, the level of noise is very satisfactory (noise of mixed area as per Air Pollution (Control) Rule, 2025) and within the limit of sound industrial for Air Pollution (Control) Rule, 2025 and IFC/World Bank.

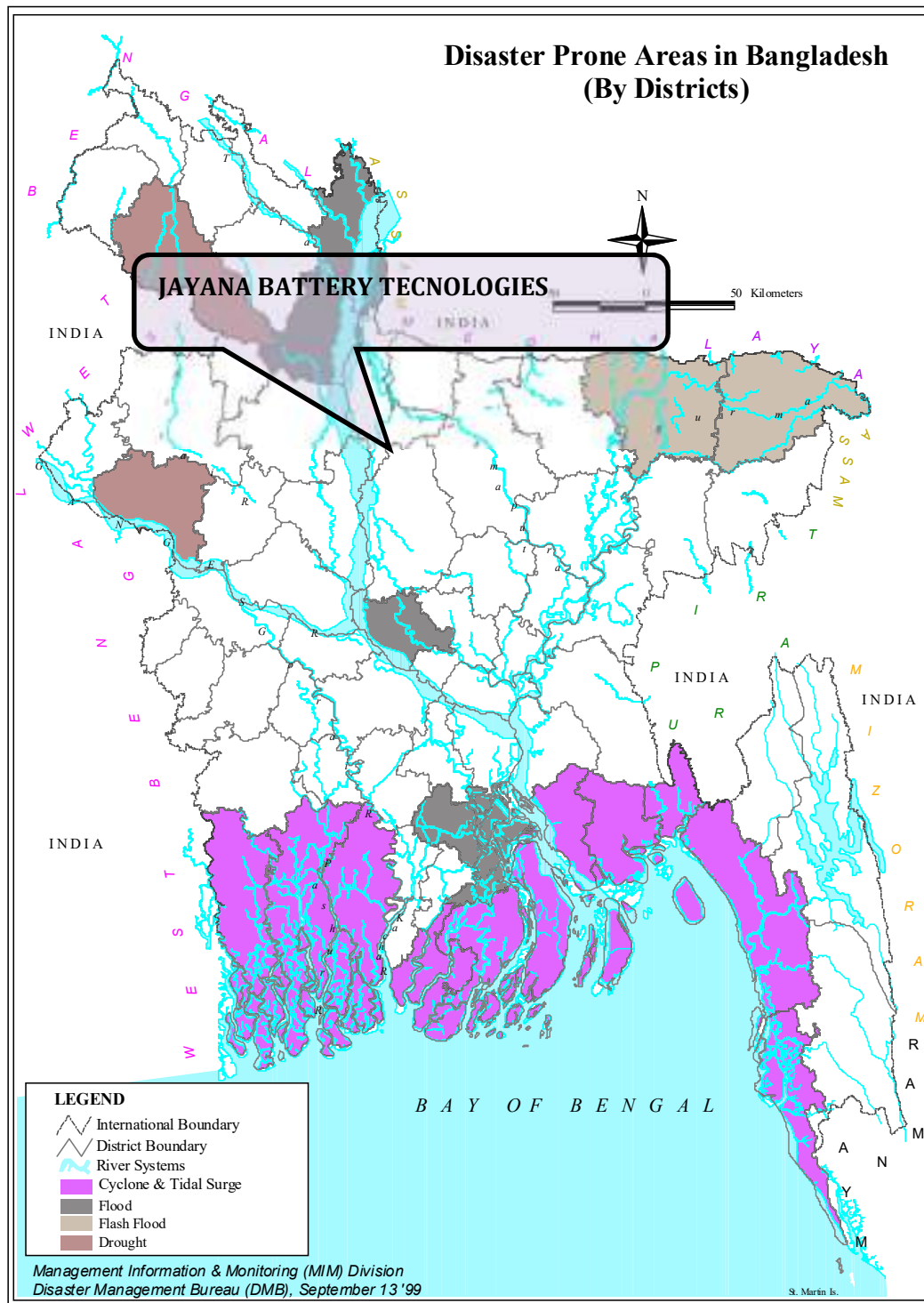


Figure – 4.18 Disaster Prone Areas of Bangladesh

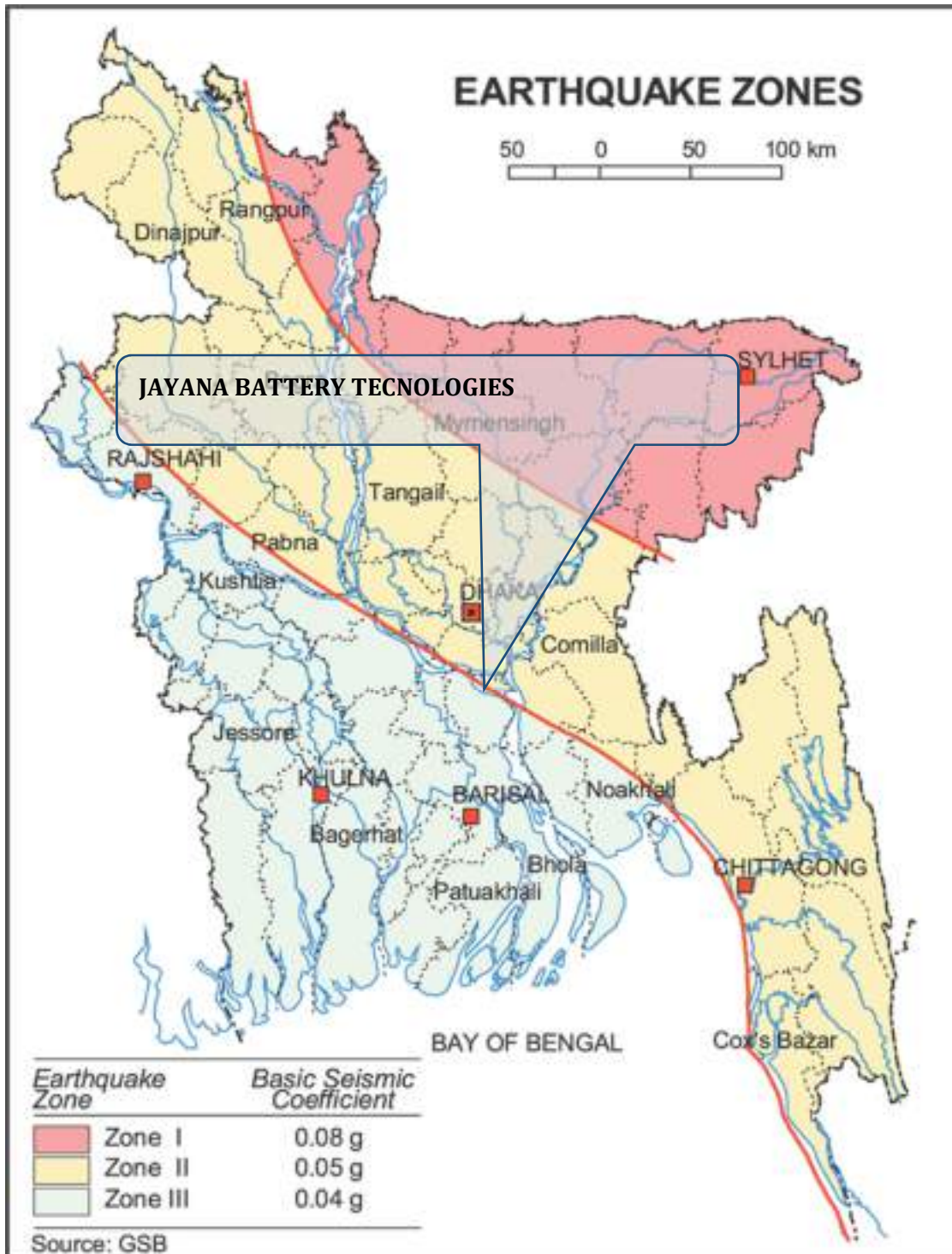


Figure – 4.19: Earthquake Zones of Bangladesh.

4.7 Seismicity

Bangladesh is possibly one of the country's most vulnerable to potential earthquake threat and damage. Earthquake vulnerability of any place largely depends on its geology and topography, population density, building density and quality and finally the coping strategy of its people and it shows clear spatial Variations. The seismic-tectonic map of Bangladesh shows the epicenter locations have conformity with the present knowledge of faulting and other structural behaviors of the region. Earthquake events in the Shelf-zone are random and follow the occurrence of the surface faults. Bangladesh has been divided into three generalized seismic zones. Zone-I, Zone-II and Zone-III on the basis of the distribution of earthquake Epicenters and morph tectonic behavior of the different tectonic blocks.

Zone-I comprising the northern and eastern region of Bangladesh is the most active zone with basic seismic co-efficient of 0.08. The project area under the zone-II represents the region of recent uplift Pleistocene & blocks of the Barind and the western extension of the folded belt with moderate seismic co-efficient 0.05, Zone -III is seismically quiet zone with estimated basic seismic co-efficient of 0.04. The project area has been marked on the seismic zoning map of Bangladesh.

4.8 Biological Environment

4.8.1 Introduction

Forests, pasture lands, rivers, surface water and other water bodies, etc. are the most important natural ecosystems. They are the foundation on which conservation of biological diversity depends. Biological diversity, which refers to genetic variation as well as to the diversity of human populations and ecosystems, is a resource that belongs not only to regions and to nations but also to all of humankind. Although it is a renewable resource, it can be irreversibly destroyed.

This section describes the floral and faunal diversity of the project area. Experts on flora and fauna have visited the project area to collect first hand data and information (both primary and secondary) to prepare the EIA report. Varieties of plant species and wild animals have been identified and recorded during the preliminary survey. Every species plays an important role in its natural community and ecosystem and removal of that species is likely to have adverse impact. Bio- habitat of the study area may be divided in two major types viz. terrestrial and wetland habitat.

Floral Diversity

The Rangpur division of Bangladesh, located in the northernmost region of the country, features a mostly agricultural landscape intersected by major rivers like the Teesta and Jamuna. Because it lacks large dense forests, the common wild animals found here are primarily those adapted to rural, suburban, and wetland habitats. The Rangpur division features a rich vascular floral diversity, comprising over 825 distinct plant species distributed across 537 genera and 139 families. The region's flora is predominantly characterized by an abundance of herbs (making up nearly 60%), followed by trees (21.7%), and shrubs (14.7%), alongside minor distributions of lianas, palms, and bamboos. In the forested zones and specialized habitats of the Rangpur Division (such as Mithapukur), Sal (*Shorea robusta*) serves as the dominant forest tree species. It thrives alongside other prominent trees, including: Koroï (*Albizia procera*), Shimul (*Bombax ceiba*), Neem (*Azadirachta indica*), Sonalu (*Cassia fistula*), Jarul (*Lagerstroemia speciosa*).

		
Mnago (<i>Mangifera indica</i>)		Banyan tree (<i>Ficus benghalensis</i>)
		
Guava (<i>Psidium guajava</i>)		Sisoo / Shishu (<i>Dalbergia sissoo</i>)
		
Rain Tree (<i>Samanea saman</i>)		Mahogany (<i>Swietenia mahagoni</i>)

Figure: 4.20: Local floras at the project area

Wildlife Diversity

The Rangpur division of Bangladesh, located in the northernmost region of the country, features a mostly agricultural landscape intersected by major rivers like the Teesta and Jamuna. Because it lacks large dense forests, the common wild animals found here are primarily those adapted to rural, suburban, and wetland habitats.

Wildlife diversity in the Rangpur Division—located in the far northern region of Bangladesh—is deeply shaped by its landscape of fertile floodplains, a humid subtropical climate, and networks of freshwater rivers and wetlands (beels). While the region has seen significant agricultural expansion, it continues to preserve a variety of native avian, aquatic, and terrestrial species within its protected parks and wetlands.

The division boasts a massive density of bird species, primarily thriving around its marshlands and agricultural fields.

Native & Wetland Birds: Common species include the Indian Pond Heron, Night Heron, Intermediate Egret, and the Purple Moorhen.

Birds of Prey: Major raptors include the Black Kite, Brahminy Kite, Lesser Spotted Eagle, and the Grey-headed Fish Eagle.

Migratory Visitors: During the cooler winter months, various migratory waterfowl travel from Siberia to inhabit regional water bodies like the Ramsagar National Park Lake.

Amphibians (Anurans): The region supports various toad and frog species adapted to seasonal wetlands, ponds, and crop fields, with nocturnal activity peaking after rains.

Reptiles (Snakes & Lizards): Common species include skinks (*Eutrophis dissimilis*), geckos (*Hemidactylus bowringii*), tree snakes (*Dendrelaphis proarchos*), and various elapids inhabiting rural groves.

	
little cormorant (<i>Microcarbo niger</i>)	Intermediate egret(<i>Ardea intermedia</i>)
	
Bar headed geese (<i>Anser indicus</i>)	Common Asian Toad (<i>Duttaphrynus melanostictus</i>)
	
Skink (<i>Eutrophis dissimilis</i>)	Betachra (<i>Dendrelaphis proarchos</i>)

Figure: 4.21: Local faunas at the project area

4.8.2 Terrestrial Habitat

a) **Terrestrial Flora:** Terrestrial flora is classified according to their habitats. In the project area, terrestrial floras are present mainly in the home stead regions, roadsides, village groves, playgrounds high cultivated lands. Human being as well as wildlife uses these flora species for different purposes. They play an important role in the socio-economic and ecological balance. From a rapid field survey covering different terrestrial habitats of the project area, a number of flora species have been identified as shown in Table. 4.10.

b) **Terrestrial Fauna:** Wildlife that fully depends on the terrestrial ecosystems for life, shelter, food and breeding is called terrestrial fauna. A number of terrestrial fauna species have been identified during the brief and rapid assessment in the project area shown in Table 4.11.

Terrestrial Planted Flora

Si. No.	Local Name	Status	Si. No.	Local Name	Status
1	Tezpata	Common	12	Narikel	Common
2	Amgas	Common	13	Jambura	F. Common
3	Kathal	Common	14	Tetul	F. Common
4	Supari	Common	15	Lukluki	F. Common
5	Lichu	Common	16	Jalpai	Rare
6	Khezur	Common	17	Tal	Rare
7	Satni	Common	18	Kamla	Rare
8	Kalagas	Common	19	Anarosh	Rare
9	Lebu	Common			
10	Bel	Common			
11	Peara	Common			

*Source: Field survey database

Terrestrial Fauna

Sl No	Species	Local Name	Status	Sl No	Species	Local Name	Status
1	Reptiles	Anjila	Common	16	Birds	Choroi	Common
2		DhuraShap	Common	17		Doyel	Common
3		MatiaShap	Common	18		Kak	Common
4		Tiktiki	Common	19		Bagari	Common
5		Kari Katta	Common	20		Ghughu	Common
6		DaraishShap	Common	21		Shalik	Common
7		Gokhra	F.Common	22		Kokil	Common
8		Kassap	F. Common	23		Bok	Common
9		GuiShap	Rare	24		Tuntuni	Common
10	Mammals	Babur	Common	25		Badur	Common
11		Idur	Common	26		Chil	Common
12		Shial	Common	27		Machranga	F.Common
13		Chika	Common	28		Tota	F.Common
14		Bagdash	Common	29		Haludakhi	F.Common
15		Khekshial .	F. Common	30		Katthokra	F.Common
				31		Pecha	Rare
				32		Shakun	Rare
				33		Tia	Rare

*Source: Field survey database; F=Fairly

4.8.3 Wetland Habitat

a) *Wetland flora*: Wetland flora plays a vital role in nature. It grows mainly in aquatic habitats viz. beel, ponds, canals, ditches or low-lying cultivated lands. From a rapid survey in different wetland and aquatic habitat, a number of species have been identified as shown in Table 4.12.

	
Mystus (Catfish)	Notopterus (Chitala chitala)
	
Puntius (<i>Puntius sophore</i>)	Asian snakehead (<i>channa</i>)

Table 4.12 Aquatic Flora of the Project Area

SI. No.	Local Name	Status	SI. No.	Local Name	Status
1	Dholkalmi	Common	9	Padmaphul	F. Common
2	Muthagas	Common	10	Kalmi	F. Common
3	Kachuripana	Common	11	Shalook	F. Common
4	Hoggal	Common	12	Jal Padma	F. Common
5	Sheola	Common	13	Bishkatali	Rare
6	Shapla	Common	14	Hizal	Rare
7	Ghagra	F. Common	15	Kharjar	Rare
8	KhudiKachuripana	F. Common	16	Keorali	Rare

*Source: Field survey database

b) Wetland Fauna: The wildlife that fully or partially depend on water reservoir such as river, canal and pond etc. for life, shelter, food, nesting, breeding and reproduction inside the water reservoir is known as wetland fauna. Important aquatic fauna comprises some species of amphibians, reptiles, birds and mammals. Aquatic fauna may act as sensitive bio indicators of the altered state of the ecosystem resulting from human influence. In the survey area there are two major type of wetlands namely permanent wetland (rivers, canals and ponds) and seasonal wetlands (agricultural lands during flood).

4.8.4 Endangered and Threatened Species:

According to the field survey report, five species were in endangered while six species were in threatened category which has been shown in table 4.13.

Endangered and Threatened Species

Category	Endangered	Threatened
Amphibian	JhiJhi Bang	Sona Bang
Reptiles	Gokhra	GuiShap, Udh
Mammals	Khekshial	Khatash
Birds	Machranga, HoludPakhi	Pecha, Kath Thokra

4.09 Socio-Economic Profile of the Project Area

This section is intended to highlight the socio-economic scenario of the project area and its vicinity. It covers demographic and socio-economic characteristics of the project inhabitants. It is prepared on the basis secondary sources of data. The district has 1 city corporation and 3 municipalities, namely, Rangpur City Corporation, Badarganj, Haragach, and Peerganj, and eight upazilas, namely: Badarganj, Mithapukur, Gangachara, Kaunia, Rangpur Sadar, Pirgacha, Pirganj and Taraganj.

4.9.1 Area, Population and Social Structure

Rangpur District is an administrative and important region of Rangpur Division in the northern part of Bangladesh. Rangpur, the second district of Bangladesh, was established in 1765 and the present Rangpur city was recognized as the divisional headquarters of Rangpur District on December 16, 1769. It is bounded by Nilphamari district and Lalmonirhat district to the north, Gaibandha district to the south, Kurigram district to the east, and Dinajpur district to the west.

The total area is 2,308 square kilometres (891 sq mi). Rangpur district consists of eight upazilas, 76 unions, 1,455 mouzas, 1 city corporation, and 3 municipalities. The Teesta River separates the northern and northeastern borders of Rangpur district from Lalmonirhat and Kurigram districts.

According to the 2022 Census of Bangladesh, Rangpur District has 834,307 households and a population of 3,169,614, of whom 32.55% lived in urban areas. 17.54% of the population was under 10 years of age. The population density was 1,320 people per km². Gangachara Thana was created in 1917; it is currently an upazila. It has 9 unions, 87 mouzas and 123 villages. Gangachara Upazila is an administrative area of Rangpur District, Bangladesh. It is located about 10.2 km north-northwest of Rangpur. This upazila extends from 25°48' to 25°57' north latitude and 89°05' to 89°21' east longitude. The area is 269.14 sq km. It is bounded by Kaliganj upazila of Lalmonirhat district and Jaldhaka upazila of Nilphamari district to the north, Rangpur Sadar upazila and Kaunia upazila to the south, Aditmari upazila and Lalmonirhat Sadar upazila of Lalmonirhat district to the east, Kishoreganj upazila and Taraganj upazila of Nilphamari district to the west. This upazila is made up of alluvial soil of the Teesta River. Dosha soil is found everywhere. However, the soil of some areas of the upazila including Gangachara, Khaleya Khaparikhal, Manthanar Hat, Bhutka, Changmari, Pirer Hat, Chandaner Hat, and Jamchaora is sandy. These lands are irrigated with water to produce some crops including tobacco, potatoes, corn, wheat, and cotton. This upazila is located at the foot of the Himalayan Mountains. The Himalayan Mountains are located about 100 km north of Gangachara. The beauty of various types of trees prevails everywhere in the upazila. The total area of the upazila is 269.67 sq km and population is 2,97,869.

4.9.2 Literacy and Educational Institutions

The literacy rate (age 7 and over) was 70.73%, compared to the national average of 74.80%, and the sex ratio was 98.04 females per 1000 males in Rangpur district. In terms of education system, Rangpur district has been one of the most important districts of Bangladesh since ancient times. Many famous educational institutions have been established here. There are 282 higher secondary schools, 722 government primary schools, 38 lower secondary schools, 193 schools controlled by private organizations and 320 madrasas in this district. Rangpur Division includes Rangpur Medical College & Hospital. It is a government hospital and medical college established in 1969. Other government institutions include Mother and Child Hospital, Chest Disease Hospital and Rangpur Sadar Hospital, also known as Cholera Hospital. Private institutions include Christian Missionary Hospital, Rangpur Dental College, Prime Medical College, Doctors Clinic and some private medical colleges.

Gangachara Upazila have Aldadpur Old Primary School was established in 1830, Soyra Bari Primary School was established in 1886, Alalhat Primary School was established in 1890, Dondara Primary School was established in 1895, Baraibari Primary School was established in 1898 and Ganjipur Primary School was established in 1900. All these institutions were run with government grants, student salaries and money from landlords. Aldadpur Primary School was run by the Rangpur District Board, so the villagers still call it a board school. There are government primary schools, one government college and one government high school in Gangachara Upazila. The rest are private educational institutions. There are 2-degree colleges, 1 college, B.M. There are 2 colleges, 3 schools and colleges, 29 secondary schools, 4 lower secondary schools, 167 government primary schools, 5 Fazil Madrasas, 5 Alim Madrasas, 14 Dakhil Madrasas, 4 Ebtedayi Madrasas, and numerous Qawmi-Hafizi Madrasas and kindergarten schools.

CHAPTER-5
IDENTIFICATION &
MITIGATION OF
POTENTIAL IMPACTS

IDENTIFICATION & MITIGATION OF POTENTIAL IMPACTS

5.0 General Considerations:

In the case of most park or development projects, potential negative impacts are far more numerous than beneficial impacts. A number of project activities during operation of the proposed project JAYANA BATTERY TECHNOLOGIES, project have been discussed in the previous chapters. This chapter identifies positive and negative impacts that may be generated due to operational activities of the project.

Though regional and national economic benefits associated with the project are considered to fall outside the scope of this EIA, they are also considered here. It is fully recognized that the long-term benefits have ultimately contributed to an improvement in the quality of life in the project area.

5.1 Impacts identification & Mitigation Measures

Identification of potential impacts due to the operation of JAYANA BATTERY TECHNOLOGIES, has been done are comprehensive lists of environmental effects and impacts indicator designed to stimulate the analysis & to think broadly about possible consequences of contemplated actions (Munn, 1979) The evaluation of the impacts has been done using following impact assessment matrix. The significance of environmental impact is the product of two factors, namely probability of occurrence and severity of effects Table -5. 1 represents the checklists/ Impact Summary Matrix developed for JAYANA BATTERY TECHNOLOGIES in order prepare the checklist and further to analyze associated Environmental impacts due to the project, multi-disciplinary team from the consultant's side. We visited the existing project site, closely identified activities of the project and significant environmental components that may be affected by the project. As an existing facility only impacts from Operational activities has been considered.

In this matrix Conventional, resort and water world operational activities which may create the Environmental impacts are shown. The terms none, minor, moderate, major, short termed and long termed are used in checklists to classify the magnitude and duration of impacts. Generalized mitigation and enhancement measures have also been presented in the table. It can be observed from the checklists that the major activities, which have the potential of creating moderate/major SEIs either negative or positive are, water, air and noise pollution and employment.

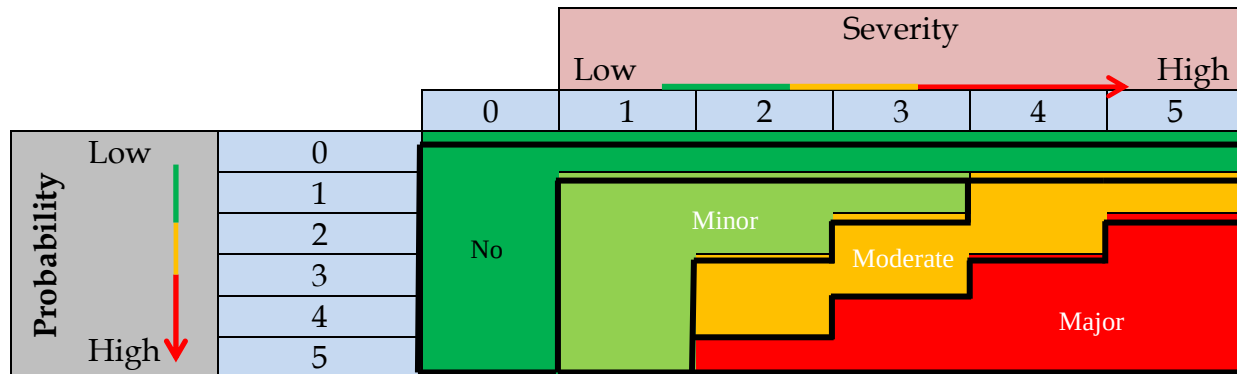


Figure: 5.1 Impact Assessment/Evaluation Matrixes

5.1.2 Environmental Aspects process Model:

As previously stated, there are many different processes and methods that you can use to identify and evaluate environmental aspects. They range from simple block flow diagrams coupled with subjective impact assessment to sophisticated risk analysis methodologies. A recommended, simple five step process model is presented below. This process model defines the primary steps in the aspects process, while leaving the details of which tools to use up to you. Each step is linked to a page which provides additional details on the mechanics of the step. Once you decide how to implement each step of the process for your organization, those details should be reflected in your aspect procedure.

As aspects exercise is included for each step to reinforce the methodologies described. The exercise starts at step 1 and builds on the result of the previous step, where appropriate. To use a subject with which most of us are familiar, automobile ownership has been selected as the subject of the exercise. A complete, rolled up version of the exercise can be accessed at auto exercise.

5.2 Evaluation of Predicated Adverse impacts & Mitigation Measures

5.2.1 Impact at Due to Operation of the Existing Facilities

Unjustified and unplanned Operation of any project can potentially affect quality of life, air, noise, water, (and, Fungi (Plant), Biota (Animal) and human by increase in water, noise and air pollution, increase in hazardous waste generation, pollution from spillage/surface runoff, disturbance to Fungi & Biota, by loss of trees resulting from increased access, increase in land values, threatening agriculture, etc.

This section will describe Environmental issues during the operational phase of the existing JAYANA BATTERY TECHNOLOGIES project & also describes the mitigation measures that have already by reduce impacts to allowable limit. It is highly believed the proponent has left no action that was necessary to reduce impacts at the pre-construction and construction stages of the project, hence impacts during construction phase and mitigation measures are not discussed here. The major environmental components that need to be evaluated for impacts are:

- ✓ Topography
- ✓ Climate
- ✓ Water use & Waste water discharge (Major)
- ✓ Solid waste generation (Moderate)
- ✓ Gaseous Emission (Moderate)
- ✓ Noise generation (Moderate)
- ✓ Occupational Hazard (Moderate)
- ✓ Natural and Accidental Hazard (Uncertain); etc.
- ✓ Employment generation (Significant Positive); etc.

5.2.1.1 Impacts on Topography

Impacts & Origin:

Installation of any facility requires more or less land development. During construction phase it may be required to excavate soil or fill up a low area which certainly modifies the natural topography. During operational phase it may be require modifying plant process and/or existing infrastructures, which further modify natural topography. Thus, may cause change in natural landscape and create visual intrusions.

Mitigation Options

If it is required alter the natural topography during plant setup care should be taken during planning & design stages to reasonably limit the natural topographical change. However, if it is not avoidable the plant layout should be planned in a way to reduce visual intrusions.

Existing Situation of JAYANA BATTERY TECHNOLOGIES

JAYANA BATTERY TECHNOLOGIES has been set up on a fairly level ground. The plant has a typical plant layout which does not create visual intrusion.

5.2.1.2 Impacts on Climate

Improper layout, design, Site development, modification may have adverse effect on climate mainly in Reform of macro climatic changes. In case of the current project the project activities are of very limited in nature. The land requirement of the project is also less and the project has a very typical layout with any level ground and good drainage facility. Hence impact of the project upon local climate can be neglected & no mitigation measure is needed to be adopted.

5.2.1.3 Impact of Water Use & Wastewater Discharge on Environment

Impacts and Origin

Water is a vital element for our daily activities. That is why water quality is a principal Environmental concern and therefore, understanding the consumption, sources and characteristics of the water & waste water and selection of adequate treatment options are crucial from the management viewpoint. JAYANA BATTERY TECHNOLOGIES will use 3500 m³/day water in their operation phase of the production of lead acid battery. 3000 m³/day water will use for the domestic purpose of 250 workers in lead acid battery production industry. This water is mainly used for the production purposes but there is no Liquid Effluent Coming out from this Plant and The Plant is a "ZERO EFFLUENT PLANT." However, there will be a provision for a 120 m³ per Day or 6 m³ per hour, as Stand by ETP Only for emergency use or in case of any accidental leakage the floor wash from the plant treatment purpose only.

Mitigation Measures

Most of the measures that are required to minimize impacts of water & wastewater include the Following:

- ✓ Limiting overall water consumption
- ✓ Regular monitoring of surface water quality
- ✓ Effective treatment of wastewater streams
- ✓ Installation of rainwater harvesting system at least for the office buildings.
- ✓ Resource of propose water if found viable
- ✓ Re-use of treated ETP water

Existing water usage and demand:

3500 m³/day water from groundwater source will be stored in tank. During the production of lead acid battery, Major portion of water is used for the purpose of production at JAYANA BATTERY TECHNOLOGIES.

Treated Discharge of Liquid Wastewater

About 105 m³/day per hour water will be used for lead acid battery production purpose. JAYANA BATTERY TECHNOLOGIES will have an ETP of capacity 120 m³/day for the treatment of wastewater which will generate from the production purposed.

5.2.1.4 Impact Due to Solid Waste Generation

Impact and Origin

Significant amount of solid waste will be generated from the different Section which including included waste paper, waste poly, cartoons, dirt, kitchen/canteen wastes, etc. The main solid waste will be generated from wastepaper which will collected from third party vender. Stapler pin, small paper, plastic/polythene, rope and glass, metal will be separated from the production process from the wastepaper.

- ✓ Poorly disposed waste paper & especially plastic waste can block drainage.
- ✓ Stapler pin and metal if not disposed properly can pollute soil & water of the receiving environment;
- ✓ Odor emitting from degradable waste especially kitchen waste can pollute local ambient air.
- ✓ Decomposing kitchen waste can pollute local ambient condition;
- ✓ Poorly managed electrical, mechanical wastes can pollute soil, water and air.

Mitigation Measures:

The following mitigation options are generally recommended for solid waste management as per Solid Waste Management Rules 2021 (Rule 9, for organizations-SRO 356/law/2021)

- ✓ Solid waste to be handled, managed and disposed according to the waste management regulations (Solid Waste Management Rules 2021);
- ✓ The responsible for production proponent –Solid waste (in-house and solid waste from users) will have collected in own responsibility from the field level. The collected wastage (used paper) will 100% recycle in the production process
- ✓ Authority of JAYANA BATTERY TECHNOLOGIES will be engaged solid waste collectors or vendors in the district, Upazila area. The vendor will collect the solid waste with appropriate price from the users. The vender will transport solid waste to JAYANA BATTERY TECHNOLOGIES
- ✓ JAYANA BATTERY TECHNOLOGIES will send to annual solid waste collection and recycling report to the DG, DOE in the month of March every year.
- ✓ The solid waste management and recycling process will be approved with own or with local government jointly.
- ✓ The solid waste collection from the users' level, JAYANA BATTERY TECHNOLOGIES will be engaged people at the districts and Upazila through awareness program Waste handling bins to be provided, each bin should have a lid which should always be covered;
- ✓ Along with advertisement of products, name and list of vendors appointed in each district and upazila for solid waste collection should be publicized.
- ✓ Plastic waste (kraft paper) should be collected and handled separately in closed waste receptacles and There should be no scattering of waste during transportation to disposal site.
- ✓ Daily disposal of food-based waste before decomposition and production of odor;

Existing Management Practices:

JAYANA BATTERY TECHNOLOGIES will have sufficient numbers of cleaners who regularly cleans and collects solid wastes generated in the production floors of lead acid battery. Sufficient numbers of dustbin has been put in place. In case of electro mechanical waste the amount is very negligible and collected and stored in a having re sale value is generally sold out to DoE approved small vendors as per solid waste management rule 2021.

5.2.1.5 Impact on Air Quality

Impact and Origin

As the operational phase of such project air pollution may occur mainly from breaking, crushing, and handling battery plates produces fine lead particles that become airborne, posing severe neurological and respiratory health risks to workers. Melting lead paste and scrap in recovery furnaces creates heavy metal fumes and toxic exhaust gases of lead or lead oxides. Air Treatment Plant (ATP) is mandatory in the lead-acid battery industry to capture toxic lead dust, sulfuric acid mist, and metal-laden furnace fumes. During the positive grid casting in a lead-acid battery is the manufacturing process of pouring or injecting a molten lead alloy into a mold to create the structural and conductive lattice framework for the positive plate. This is the way lead may escape in the air of workplace area. It is mandatory to set up air treatment plant in the lead acid battery industry.

In the operation phase of Lead acid Battery production, generators may emit flue gases in the open air. Stake point emission (like PM, carbon dioxide, carbon monoxide, and sulfur dioxide) from the generator may affect the ambient air quality due to combustion diesel oil. The high temperature of flue gases also impacts the air quality in terms of thermal pollution. This is a long-term adverse impact.

Mitigation Measures:

Mitigating lead exposure in a lead-acid battery workplace requires implementing the industrial hygiene hierarchy of controls to stop dust and fumes from entering the air or workers' bodies. It will be needed for Installing air treatment plant (ATP) at high-risk section of lead acid battery industry; grid casting, plate pasting, battery breaking, and smelting to capture lead dust and fumes from the source. Total six ATP will be used for this industry for mitigation measure of lead pollution impact at work place.

From stack emission point of View, since diesel & natural gas is used as fuel of generator so, the impact on air quality will not be significant. However, air pollution from diesel-based generators could be minimized by providing proper stack height for the well dispersion of exhaust gasses. For generators this could be determined applying the thumb rules that, the stack height is taken as height of the building where generator is installed plus 0.2 times of square root value of generator capacity in KVA. ($H=h+0.2\sqrt{\text{kVA}}$). It should be mentioned here that, generator emissions are best controlled through the air-fuel ratio. Adequate quantities of air, about 1.4 time's stoichiometric amounts, assure complete combustion of the fuel and consequent reduction in hydrocarbon and carbon monoxide emissions. This is done at the expense nitrogen oxide emissions, which are increased as a result of excess air. This occurs because of a greater oxidizing environment and higher temperatures in the combustion chamber. Both atmospheric nitrogens. And organic nitrogen in the fuel contributes to the overall emission level of oxidized nitrogen compounds. It is generally accepted that particulate hydrocarbons and carbon monoxide pose greater problems than do nitrogen compounds, due to the role of carbon compounds in the formation of smog.

Existing Situations at JAYANA BATTERY TECHNOLOGIES

JAYANA BATTERY TECHNOLOGIES will be set up 6 set ATP for air treatment from the workplace. The minimum stake height will be kept 30 m as per air pollution control rule 2022 [Gas emission for industry or project, Schedule -5, rule -3 sub-rule (2) and rule -8 sub-rule (1,2)]. JAYANA BATTERY TECHNOLOGIES will use a generator of 2000KVA. Diesel oil will be used for the operation of generator. The operation of this generator of results emission of exhaust gases. If it is not managed properly, it can create pollution of the surrounding air quality. The chimney height will be increased for the stake of generator.

However, it is evident from the ambient air & generator 's stack gas analysis report (as presented in chapter that the factory is not creating any significant pollution to ambient air. Hence no mitigation measure is suggested. However, to ensure proper and efficient operation of generator it is suggested to monitor the exhaust gases regularly and tune burners accordingly. JAYANA BATTERY TECHNOLOGIES has a plan to install PV solar plate on the rooftop of industry as alternative source of power.

5.2.1.6 Impact Acoustic Environment

The team 'noise' may be defined as an unwanted sound at a wrong time and a wrong place. Noise is soldered to be one of the dimensions of pollution, which leads to degradation of the environment and also creates psychological and physical effects on human health. The discomfort caused by noise is difficult to "assess; it includes auditory fatigue and temporary lessening of hearing ability. Perception of noise is often relative to the background sound level, so that new roads in quiet areas or noisy trucks at night are often perceived as worse than higher levels of noise in a busy area during working day. Noise levels depend on the two parameters sound pressures and sound intensity.

Potential Impact of Noise

Noise Pollution can potentially affect immediate neighbors, employees and visitors. The impacts are:

- ✓ Continuous exposure of neighbors to noise nuisance may result in noise induced hearing lose,
- ✓ Noise nuisance may reduce concentration of neighbors in their private matters.
- ✓ High noise level will force employees to shout laud when communicating to one another
- ✓ Exposure of employees to high noise level (above 85dB) continuous for 8hours per day may result in noise induced haring lose;
- ✓ Exposure of ear to peak sound level instantaneously may result to deafness.
- ✓ A significant loss of hearing contributes to social isolation and reduced quality of life, career prospects, increased absenteeism, worker turnover and lowered work performance.

Existing Situations at JAYANA BATTERY TECHNOLOGIES.

In order to assess the present sound quality sound quality monitoring was conducted at indoor workplace areas at different sections of JAYANA BATTERY TECHNOLOGIES results area shown in table 4.3. Which indicates that the sounds levels are a bit higher than DoE standard for industrial area, however it meets the World Bank standard for 8 hours of exposure except the generator section.

Mitigation Measure

Noise pollution is mostly related to occupational health impacts, to which due attention has to be provided the following mitigation measures are suggested to reduce impacts of noise resulted from the operation of JAYANA BATTERY TECHNOLOGIES.

- ✓ Noise Shielding by barriers or buildings mostly at the generators room / Regular noise quality monitoring at the site
- ✓ Mandatory use of PPEs inside noisy areas
- ✓ Replacing noisy machines with low noise/"noiseless machines
- ✓ Regular maintenance of machineries or Equipment's
- ✓ Green belt development surrounding the boundary of the project area.

5.2.1.7 Impact on Health and Safety, Natural & Accidental incidents

Impact and Origin

There might be hazards to plant workers, operators, employees and technical personnel from working at floor level, utility sections, and storerooms. Provisions need to be made by the project for protecting Occupational health, including protection of workers from hazards, fires etc. as well as protection of workers' health and assurance of safe drinking water supply and sanitation.

Based on the magnitude of the impact for fire and the area that can be potentially affected, the emergency management plan may either be an onsite management plan or an offsite management plan. There are also Possibilities of the above hazards to take place during natural causes like earthquake, Cyclone etc.

Mitigation Measures of Chemical Storage and Management

- ✓ In case of chemical storage, proper segregation scheme should be strictly followed,
- ✓ Designated storage area with spill collection system.
- ✓ Layout of the plant is important from environment and safety point of view; location of chemical storage sections should be proper & in line with the emergency management plan.
- ✓ Sulfuric acid Hazardous chemicals (such as potential effect to skin) should be stored in a closed loop,
- ✓ The quantification and addition of chemicals should be computerized.
- ✓ There should be restricted entry into the chemical storage area, proper signage for restricted entry should be put in place.
- ✓ Operators involved in the handling of Sulfuric acid should be trained.
- ✓ Roads should be wide enough to support free movement of vehicles.
- ✓ Containers should have good valves with tight stopping devices to avoid spilling or dripping of hazardous chemicals.
- ✓ Storage containers of Sulfuric acid and lead oxide should have legible signs indicating the contents of the container, health hazard warning), and spill clean - up procedures in case of emergencies.
- ✓ Secondary containment should be properly provided.

Occupational Health and Safety

- ✓ The layout of the project should be such that the high risk zones are separated from the low-risk zones Green belt development shall be at the periphery and not within the plant area-the plant area should have an open lawn.
- ✓ Roads inside the plant area should be broad and spacious so that fire brigades can operate smoothly. All high-risk zones must be easily accessible.
- ✓ Hazard and risk-prone areas should be identified and characterized by conducting risk assessment.
- ✓ On-site and off-site disaster management plans, based on impact magnitude and its severity, need to be prepared.
- ✓ Pre job risk assessment must be done for new and hazardous work. This should be also followed by work permits specifying risks, management options and persons responsible to take corrective actions.

- ✓ Personal protective equipment (hand gloves, safety goggles, nose masks and helmets) to be provided to all the employees working in the plant.
- ✓ Training for employees to educate them about the hazardous nature of chemicals used in the process.
- ✓ Supervision of high risks jobs should be ensured.
- ✓ There should be provision for delegation of supervision to ensure more safety.
- ✓ Workers can be rotated within jobs so that they are not faced with continuous noise exposure for a long period of time.
- ✓ Trained medical personnel and first aid facilities as well as safety equipment such as fire extinguishers and fire alarms to be made available at place of work.
- ✓ Medical examinations to be conducted for the workers from time to time. if significant occupational health problems are observed, the management should take appropriate measures.
- ✓ Identification and implementation of management procedures including process safety, training, management of change, incident investigation, employee participation, contractor training and oversight.
- ✓ Developing and implementing an emergency response programmer, including Emergency response procedures, emergency equipment, training, review and updates.
- ✓ Health at safety performances of employees & Contractors must be recorded at reviewed.
- ✓ Each & every incident should be reported later investigations must be done by root cause analysis. Later action plans may be developed for continuous improvement, monitoring & review.

Mitigation & Measures already implemented

The project proponent has already taken adequate mitigation measures. The factory has all sorts' firefighting arrangements as described in chapter 3. Regular health and safety training, fire drill is Conducted. Designated floor level workers are trained and give responsibility for primary health treatments. Adequate numbers of first aid facilities are available. It has been made compulsory to use PPEs like ear plug, ear muff etc. in noisy areas like generator. Work place monitoring is done regularly by third party. The factory has renewed fire license, emergency evacuation plan is available in the factory. Fire license with details attached as annexure 06.

5.2.1.8 Impact on Offensive Odour

Impact and Origin

Most odours come from landfills, food processing plants and sewage treatment during the construction phase above factory. Industrial sources for offensive odours, such as sewage and domestic refuse processing plants, paint and plastic manufacturers are outlined.

Mitigation Measures of Offensive Odour and Management

- Odor complaints often occur at certain times of day. Odor diaries may be one way to identify the worst times of day or week for odors. It may be helpful for the odor-producing facility to shut down or reduce the odor-producing operations during the time(s) of day/week when the odors are worse.
- Local authorities can determine where (locations) odors are worse and prevent future odor-producing additions such as upgrades, new construction, new industry, etc. through zoning restrictions.
- Wet Scrubbing. Absorb odorants into a liquid solvent
- Adsorption or Dry Scrubbing
- Biofilters and Chemical Filtration.

5.2.1.9 Impact on Flora and Fauna

Impact and Origin

Fragmentation to the forest and other important habitat areas may reduce home range and cause isolation of the wildlife species. Decline in wildlife population, their flow and movement. Injury and accidents to a lesser extent as the project has largely elevated tracks leading to mortality of wildlife

Mitigation Measures of Flora and Fauna

Conservation initiatives related to forest, wildlife and flora and fauna by indigenous communities will be encouraged; Undertake a credible valuation of the ecosystem services that the forestry sector provides in Bangladesh. Strengthen protection measures for all types of forested areas by providing adequately trained manpower, requisite tools, and logistics along with support from other law enforcement agencies.

Project construction activities have the potential to generate a wide range of environmental impacts on ecologically valuable receptors (flora & fauna) including

designated sites, sensitive habitats and protected species. Examples of such adverse negative impacts include

- Vegetation loss and conversion including impacts to habitats supporting notable species;
- Felling of trees and effects on roosting bats and nesting birds;
- Loss of ponds and impacts to watercourses with associated amphibians and fish; and
- Disruption of large mammal movements.

The project seeks to proactively address such impacts and proposes to use an adaptive management approach (plan-do-check-act-re-plan) to reduce their potential severity, based around the use of 'specialists' to clear the route prior to removal of any vegetation at the paper mill project side.

5.2.1.10 Impacts on Community Safe and healthy

Impacts and Origin

Safe and healthy residents lead to stronger, more resilient communities. People feel safe when they are respected, valued, and have access to a full range of health, social, natural, and educational resources. Community Health and Safety items include public health and safety concerns that may affect employees during work activities, and may also impact time away from work. Recently COVID19 is a burning issue for the community people as paramedics. Our efforts strengthen health and safety issues, and prevent disease and promote healthy and safe living. Community Health and Safety issues may arise at any stage of a project life cycle and can have an impact beyond the life of the project. Drinking water sources, whether public or private, should at all times be protected so that they meet or exceed applicable national acceptability standards or in their absence the current edition of WHO Guidelines for Drinking-Water Quality. Air emissions, wastewater effluents, oil and hazardous materials, and wastes should be managed according to the guidance provided in the respective sections of the General EHS Guidelines with the objective of protecting soil and water resources.

Waterborne and air borne diseases may have been attacked by the workers. To maintain social distance among the working people to the paper mill project site. Besides this, hazards posed to the public while accessing project facilities may include:

- Physical trauma associated with failure of building structures
- Burns and smoke inhalation from fires

- Injuries suffered as a consequence of falls or contact with heavy equipment
- Respiratory distress from dust, fumes, or noxious odors
- Exposure to hazardous material

Mitigation Measure of **Community Safe** and healthy

The authority of JAYANA BATTERY TECHNOLOGIES will ensure pure drinking water quality at the paper mill project site and where the officers, engineer, supervisor will live in. To avoid the water borne diseases, ground tube-well water acts as drinking water. About 92% of Bangladeshi people drink tube-well water. But if the construction site will remote areas from the locality, then the authority of JAYANA BATTERY TECHNOLOGIES will ensure potable and pure water for the workers as well officers.

Disease Prevention

Effective controls protect workers from workplace hazards; help avoid injuries, illnesses, and incidents; minimize or eliminate safety and health risks; and help employers provide workers with safe and healthful working conditions. The processes described in this section will help employers prevent and control hazards identified in the previous section.

To effectively control and prevent hazards, employers should:

- Involve workers, who often have the best understanding of the conditions that create hazards and insights into how they can be controlled.
- Identify and evaluate options for controlling hazards, using a "hierarchy of controls."
- Use a hazard control plan to guide the selection and implementation of controls, and implement controls according to the plan.
- Develop plans with measures to protect workers during emergencies and non-routine activities.
- Evaluate the effectiveness of existing controls to determine whether they continue to provide protection, or whether different controls may be more effective.
- Review new technologies for their potential to be more protective, more reliable, or less costly
- Using mask and check body temperature before starting the daily work at the site of the paper mill project for protecting COVID19.
- Washing hand of all the labours, workers and stakeholders at the work place to project COVID 19

- The authority of JAYANA BATTERY TECHNOLOGIES **will** also give safety training on the prevention of diseases to the factory side during construction and operation phase.

5.2.1.11 Gender Base Violence (GBV) at paper mill area

Impacts and Origin

Sexual violence or GBV is commonly understood as one or several of the following actions: rape, incest, sexual harassment, sexual exploitation and abuse, forced prostitution, female genital mutilation (FGM), sexual slavery, child abuse images, grooming for sexual purposes and trafficking for sexual exploitation. The above-mentioned events may have occurred at the project area among the labours.

Mitigation measure of GBV

The authority of JAYANA BATTERY TECHNOLOGIES will give training to the labours about GBV, so that labours of the project do not take to above GBV. It is noted here, not to allow women and child labours in the project area. The authority of JAYANA BATTERY TECHNOLOGIES will investigate if happen any violence at the lead acid battery production project site. All fatal and serious incidents are to be investigated by a team formed for the same by the directions of the head of PIU at the earliest. The help of an expert (if required) may also be taken as a nominated member of the investigation. Incident investigation is to be carried out as per the authority of JAYANA BATTERY TECHNOLOGIES incident investigation procedure and a report submitted to the head of PIU, and safety head of JAYANA BATTERY TECHNOLOGIES.

5.3 Positive Impacts of the Proposed Project

A positive impact has been resulted from implementation of the project which includes;

- ✓ Opportunity to Expand Business
- ✓ Creation of Jobs;
- ✓ Support of local businesses;
- ✓ Infrastructure development;
- ✓ Revenue to Local Municipal Council; and
- ✓ Gains to the economy

Few are discussed below:

5.3.1 Job Opportunities

The Project has created employment opportunities for more than 60 employees. An additional job has been created indirectly from the supply of materials to the projects.

5.3.2 Gains to the Economy

They have been gains to the economy due to the establishment of JAYANA BATTERY TECHNOLOGIES Project through -

For this purpose, many incentives Lunches for foreign investor Lead Acid Battery manufacturing project. Like the other company's products marketing strategy, the marketing theory of JAYANA BATTERY TECHNOLOGIES is made up of which entertaining water park all world-famous rides.

New entrepreneurial participation will also be improved. More employment will be created & on the other hand, the country will enter into a position to explore the entertaining amusement park for a brighter future of this sector.

5.4 Environmental impacts and Mitigation

Major environmental components & activities that could affect these components was identified, finally predication and evaluations of environmental impacts have been done in this chapter. Mitigation measures that are required to minimize these impacts to allowable extent and enhancement of the positive impacts have also been identified; the following:

Table 5.1 Present Environmental significant impacts and mitigation measure

Action Affecting Environmental Resources & Values	Probable Effect on Environment	Mitigation Measures
Occupational health hazard & emergencies	Employees may suffer from occupational hazards if workplace remains unsafe, Nature & Accidental emergencies may create catastrophic incident.	Proper health & safety management system & proper emergency management system, Adequate training for employees.
Gaseous Emission	Exhaust gas emission from lead casting area and generator may pollute ambient air.	Proper chimney height 930 m). six ATP will be set up for the mitigation measure of lead pollution from air/
Traffic Incidents	Possibility of traffic incidents during transportation of raw material and occasional experience of delays	Proper maintenance & pre start check of vehicles, Training for drivers & helpers, Adequate internal parking always abides by traffic rules.
Water Pollution	Sewage water & domestic waste generated from sanitation and household from daily operation pollute surrounding surface water	120 m³/ day cubic meter per hour with zero discharged will be to mitigate water pollution in the emergency basis
Solid Waste Generation	Solid waste generated from daily operation and maintenance activities if not managed properly may pollute soil & water	Ensure proper solid waste management facility as per solid waste management rule 2021.
Noise Pollution	Noise May be generated during generator & air compressor running.	Mandatory ear protection usage in noise areas. Proper maintenance of machineries
Employment Opportunity	Lot of Manpower is required during operational stages	Local community people may be given priority during recruitment

CHAPTER-6
ENVIRONMENTAL
MANAGEMENT
PLAN

CHAPTER-6

ENVIRONMENTAL MANAGEMENT PLAN

6.1 General Consideration

In the context of a project, Environmental Management Plan (EMP) is concerned with the implementation of the measures necessary to minimize or offset adverse impacts and to enhance beneficial impacts, A the measures are said to be successful when they comply with the Environmental Quality Standard (EQS) of the host country in this case Bangladesh. Thus the objectives of EMP for the proposed project would be:

- ✚ Propose Mitigation measures to reduce or eliminate negative impacts
- ✚ Propose Enhancement measures to maximize positive impacts
- ✚ Propose Mitigation measures to reduce or eliminate negative impacts
- ✚ Propose Enhancement measures to maximize positive impacts
- ✚ Define Monitoring requirement and monitoring indicators
- ✚ Propose budgeting and allocation of funds for environmental management system

In preparation of the EMP, Environmental components, sub-components and major activities of the project were identified. Probable impacts of the activities on the environment and their magnitude and duration were also identification.

During the life span of the project, JAYANA BATTERY TECHNOLOGIES will need to integrate to its existing Environmental Management Plan (EMP) and with the one proposed in the Section so as to harmonize and mitigate all significant impacts from the existing facilities and any future development works. To achieve this JAYANA BATTERY TECHNOLOGIES need to put in place and document policies that will govern their operations to this end. This will also ensure that management will be committed to avail necessary finances to be used in implementation Management options the EMP. To achieve objectives of this EMP it will consist of the following sections

- ✚ Overview the project
- ✚ Environmental Impacts and Mitigation;
- ✚ Management Policies;
- ✚ Institutional arrangement;
- ✚ Management plans; and implementation Program

6.2 Project Overview

JAYANA BATTERY TECHNOLOGIES located at Vill: Uttar panapukur, Borobil, P.S: Gangachara, Dist: Rangpur on a 100 Decimals of land. JAYANA BATTERY TECHNOLOGIES will be manufacturing lead acid battery from Sulfuric acid, Lead Oxide, PP Battery Container & Separator. JAYANA BATTERY TECHNOLOGIES will have about 250 well compensated employees in an excellent work environment provided with free in-house medical facility. The factory specializes in the production of lead acid battery. JAYANA BATTERY TECHNOLOGIES not only ensure quality production of lead acid battery though sophisticated machinery setup, ETP and ATP.

6.2.1 Environmental Impact and Mitigation

Major environmental components & activities that could affect these components was identified, finally prediction and evaluations of environmental impacts have been done in chapter 5. Mitigation measures that are required to minimize these impacts to allowable extent and enhancement of the positive impacts law also been identified; the following Table 6.1 presents a summary of only the significant impacts and mitigation measures.

Table 6.1 Significant Environmental impacts mitigation/Enhancement measures

Action Affecting Environmental Resources & Values	Probable Effect on Environment	Mitigation Measures
Occupational health hazard & emergencies	Employees may suffer from occupational hazards if workplace remains unsafe, Nature & Accidental emergencies may create catastrophic incident.	Proper health & safety management system & proper emergency management system, Adequate training for employees.
Gaseous Emission	Exhaust gas emission from lead casting area and generator may pollute ambient air.	Proper chimney height 930 m). six ATP will be set up for the mitigation measure of lead pollution from air/
Traffic Incidents	Possibility of traffic incidents during transportation of raw material and occasional experience of delays	Proper maintenance & pre start check of vehicles, Training for drivers & helpers, Adequate internal parking always abides by traffic rules.
Water Pollution	Acidic wastewater generated from process and Wastewater generated from domestic use and if not treated properly will pollute surrounding surface water	120 cubic meter per day with zero discharged will be to mitigate water pollution in the emergency basis
Solid Waste Generation	Solid waste generated from daily operation and maintenance activities if not managed properly may pollute soil & water	Ensure proper solid waste management facility as per solid waste management rule 2021.
Noise Pollution	Noise May be generated during generator & air compressor running.	Mandatory ear protection usage in noise areas. Proper maintenance of machineries
Employment Opportunity	Lot of Manpower is required during operational stages	Local community people may be given priority during recruitment

6.3 Management Policies:

JAYANA BATTERY TECHNOLOGIES should review and enhance its current policies that will guide operations of the plants activities. The policies are vital in that;

- ✚ These will enable management to develop and maintain sound relations with company employees and the neighboring community;
- ✚ These will enable management put in place measures and structures that will care for the safety, health welfare of all company employees and customers;
- ✚ These will ensure that management will plan for, and put in place, monitoring programs that will ensure emissions do not exceed the required maximum limits, and wastes generated by the project are properly managed; and
- ✚ These will ensure that management assumes its corporate responsibility for its activities with regard to conservation of the environment as well as for the well-being of the neighboring community.

The following policies may need to be reviewed and enhanced with respect to the existing facilities and enhanced with respect to the existing facilities and any development plans:-

- a) Environmental Management Policy;
- b) Occupational Health and Safety Policy;
- c) Local Community Policy; and
- d) Employment Policy.

6.3.1 Environmental Management Policy

JAYANA BATTERY TECHNOLOGIES may already have developed an environmental policy for its facilities. This environmental policy for its existing facilities. This environmental policy is to be reviewed and enriched. This will help JAYANA BATTERY TECHNOLOGIES to carry out its activities with the highest regard to the natural environment and sustainable utilization of environmental resources therein. The policy should therefore cover the following, among other issues:

- Ensure that all company activities operate within legal requirements of all relevant national legislation;
- That there will be continuous environmental improvement and performance through monitoring of company activities;
- Ensure that utilization of natural resources is optimal with measures in place to ensure resource availability for future generation;

- Awareness creation to the surrounding community regarding sustainable utilization of natural "resources, protection of sensitive ecosystems and bio-diversity maintenance for communal livelihood; and
- Balancing between natural resource use, environmental conservation and economic development.

According to the developed environmental policy environmental stewardship should be both a management obligation and the responsibility of every employee. To achieve this everyone should;

- ✓ Maintain and continuously improve the Environment, Health and Safety Management (MI/3" (EHSMS) across the organization.
- ✓ Ensure that all employees and contractors receive appropriate training to full their individual EHSMS and environmental responsibilities.
- ✓ Establish annual environmental objectives and targets and implement programs to achieve them.
- ✓ As a minimum comply with relevant legal and other requirements
- ✓ Ensure that JAYANA BATTERY TECHNOLOGIES have the resources and skills necessary to achieve our environmental commitments,
- ✓ Incorporate environmental performance in the annual appraisal of employees and contractors an recognize accordingly
- ✓ Formally monitor, audit, review and report annually on our environmental performance and EHSMS requirements against defined objectives.

6.3.2 Occupational Health and Safety Policy

JAYANA BATTERY TECHNOLOGIES may already have developed an Occupational Health and Safety Policy. This policy should be reviewed and revised. This will enable the company put in place appropriate measures that will ensure that the health, safety and welfare of all employees; together with the health requirements of the local community in which the company is conducting business. The policy should highlight on the following, among others:

- Safety measures for all machines and equipment to be used;
- Appropriate safety and rescue equipment to be availed in all work places;
- Emergency procedures and actions;
- Risk minimization of accidental damage to employees, community and environment;
- Machine maintenance and machine operator proficiency; and
- Training in safety

There should be (and the authority may conduct awareness campaign to make employee believe) believe within employees that

- No business objective will take priority over health and safety.
- All injuries and incidents are preventable.
- No task is so important or urgent that it cannot be done safely.
- Without diminishing management's obligations, the responsibility and accountability for health and safety rests with every individual.

Best practice in health and objectives safety management should be encouraged. To achieve this everybody should:

- Maintain and continuously improve the Environment, Health and Safety Management System (EHSMS) across the organization.
- Provide a balanced focus on the management of health and wellbeing, personnel and process f safety.
- Proactively pursue the identification of all hazards and eliminate or, if not possible, manage the risk to as low as reasonably practicable
- Consult with and promote active participation of employees in the management, of their own and other's health, wellbeing and safety.
- Provide resources to achieve a systematic approach to health, personnel safety and process safety management to ensure continuous performance improvement.
- Identify performance measures, set improvement targets, measure and report performance at all levels.
- As a minimum comply with relevant legal and other requirements develop a culture where all employees and contractors are constantly aware of safety hazards around them and act accordingly at and away from work.
- Include health and safety performance in the appraisal of employees and contractors and recognize accordingly.
- Steward the health and safety performance of Joint Venture activities operated by others.

6.3.3 Local Community Policy

The Local Community Policy can be developed by JAYANA BATTERY TECHNOLOGIES to ensure that the company develops and maintains sound relations with its employees and the local community on mutual respect and active partnership. The policy should highlight on ways the company should:

- ✓ Work with the local community and relevant government departments and agencies to achieve sustainable community development;
- ✓ Ways of enhancing information flow from management to the community and employees, and vice versa;
- ✓ Community capacity building; and Active engagement of the local community in the project

6.3.4 Employment Policy

JAYANA BATTERY TECHNOLOGIES has in place an employment policy. This policy will require updating to reflect the social economic realities that the company is operating in. View of future development, should take into consideration the varying employment needs of the community. The policy should endeavor to protect the local community from unfair competition when it comes to recruitment of workers for the project. The policy should cover the following, among other issues:

- ✓ Local community considerations in employment;
- ✓ Training needs for employees;
- ✓ Employment of people with specialized skills;
- ✓ Casual Workers;
- ✓ Compensation, allowances and benefits; and
- ✓ Terms of payment and scales

6.4 Institutional Arrangements

JAYANA BATTERY TECHNOLOGIES should develop a management cell namely Environmental Management Cell in order to manage all environmental related activities on the site. This cell will may be headed by a Manager Environmental Health and Safety along with supporting staff. With the existing manpower JAYANA BATTERY TECHNOLOGIES could easily form environmental management cell. Each individual will have his responsibility and together the cell will perform the following functions:

- Identification of Environmental Management Needs
- Prioritize development and monitoring needs

- Develop management, implementation and monitoring plans according to the needs
- Budget allocation and timely implementation of management actions
- Continued monitoring & assessment of Environmental parameters.
- To work for continuous & regular improvement in environmental performance.
- To ensure systematic and routine housekeeping to reduce generation of pollutants inside the plant core area.
- To develop & maintain green belt and plant nurseries.
- To keep close liaison with environmental regulating authorities.
- To conduct monthly, quarterly and yearly monitoring and submit statements.
- To manage post project-monitoring plan as per approved EMP.
- To follow proper documentation and monitoring practices and procedures, this will facilitate the company to go for ISO 14001 or any equivalent international accreditation.

To help implementing an effective environmental management system the management cell should establish an in-house monitoring facility with all relevant monitoring equipment. The management cell can follow the follow the "Plan. Do, Check. and Act" model (EPA, 2005) for ongoing improvement.

Plan - Planning, including identifying environmental impacts and establishing environmental goals.

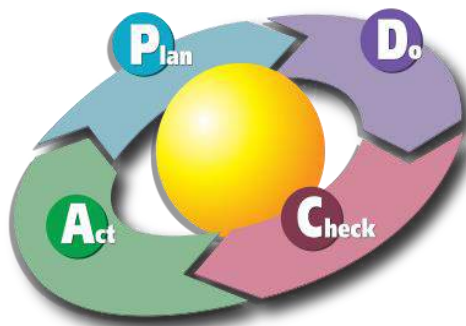


Figure: 6.1 PDCA Cycle for Environmental Management Cell for JAYANA BATTERY TECHNOLOGIES

Do- Implementing, including employee training and establishing operational controls.

Check- Checking, including auditing, monitoring and taking corrective action.

Act -Reviewing, including progress reviews and taking action to make needed changes

6.5 Management Plans

Potential impacts associated with the operation of the existing facilities have been identified in the previous sections. The following management plans have mainly been proposed only for managing the environmental situations arising from the operation of the existing facilities. Since Occupational health hazards & emergencies, air, water & acoustic are environment of major concern only the following management plan have been proposed here:

- ✚ Health, Safety & Emergency Management Plan (HSEMP))
- ✚ Emission Control and Management Plan (ECMP)
- ✚ Water and Wastewater Management Plan (WWMP);
- ✚ Solid Waste Management Plan(SWMP)
- ✚ Noise Management Plan (NMP);

6.5.1 Health, Safety & Emergency Management plan (HSEMP)

6.5.1.1 Objective

The objective of the Health, Safety & Emergency Management plan (HSEMP) is to ensure that the daily operation of the plant does not result in occupational hazards and also in all conditions the plant is ready to face any emergencies with minimal loss of life and property. The HSEMP covers possible occupational hazards and emergencies such as falls, exposure to high noise levels and collapse of structures, fires & explosions. The plan is to be achieved by continuous monitoring of work standards at site, incident statistics, implementation of recommendations and mitigation measures made in this report in respect to occupational hazards and ensuring the conditions subjected to license approval with respect to occupational hazards are adhered to.

6.5.1.2 Enforcement

The HSEMP guiding principle will be continuous and sustained improvement of site working conditions and activities, environmental performance, supported by regular feedback from employees, neighbors and general public through consultative meetings, management reviews and evaluations. To ensure adherence to the set conditions, all the concerned local and National regulatory authority will be enjoined in actions taken. This will include giving them unlimited access to construction site to assess working conditions of employees, implementations of proposed mitigation measures and adherence to set standards and give government directives as provided for in the law.

6.5.1.3 Health, Safety & Emergency Management

Emergency situations like fire are managed JAYANA BATTERY TECHNOLOGIES by following the steps below:

1. Operate nearest hand siren and shout "FIRE-FIRE".
2. Hand siren to be picked up by electric siren.
3. Electric siren to operate for 2 minutes.
4. Fire pump house operator to stand in fire pump house and watch for drop in outlet pressure of sprinkler/ hydrant lines. In case of drop in pressure, the Engine in manual mode should be started in case it does not start in auto mode.
5. PPH/TLD operator to usher out TT crew & close all valves. All ROV will be closed and motors stopped through ILSD.
6. One of the security guards to show the locations of fire on the tire indicator and then to go to the location of fire with a red flag.
7. The other security guard to take a head count and direct all personnel to the assembly zone. Emergency gates to be opened in case of instructions from Fire-in-chief.
8. All combating members should reach the site of emergency immediately.
9. The rescue team should reach the site of emergency with First-Aid, Stretcher, Fire Entry Suit, Low Temperature cloth, breathing apparatus, rope, resuscitator and emergency rescue kits. Rescue team leader should standby for further instructions from fire-in chief.
10. Auxiliary team members except PMCC/FPH operators should reach the site of emergency. They should collect additional hydrant hoses, nozzles, fire extinguishers, water jet blankets and wait for instructions of fire-in-chief. The members should stand separately under their heads.
11. One of the filling shed officers should stand guard in filling shed, close all operations, ensure removal of all filling guns, and ensure that all cylinders are capped.
12. S & D Officer will be in-charge of control room and await instructions from tire-in-chief for contacting outside agencies. (Fire Brigade, Ambulance, Disaster Management Cell, Police, Collector/Commissioned Factory Inspector, Railways). He should advise canteen to switch off all flames.
13. Emergency Vehicle Driver to take out the Car and keep it in readiness in front of Administrative building.

14. Safety Officer should identify wind direction and should advise fire in-chief keeping in view of the nature of emergency.

15. Fire-in-chief to nominate one officer to take roll call at the main gate with DGR security in case of major fire.

16. Fire-in chief will issue instructions to stop the movement of rail wagons.

Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems. PPE is considered to be a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection. Table presents general examples of occupational hazards and types of PPE available for different purposes. Recommended measures for use of PPE in the workplace include:

- Active use of PPE if alternative technologies, work plans or procedures cannot eliminate, or sufficiently reduce, a hazard or exposure
- Identification and provision of appropriate PPE that offers adequate protection to the worker, co-workers, and occasional visitors, without incurring unnecessary inconvenience to the individual Proper maintenance of PPE, including cleaning when dirty and replacement when damaged or worn out. Proper use of PPE should be part of the recurrent training programs for employees
- Selection of PPE should be based on the hazard and risk ranking described earlier in this section, and selected according to criteria on performance and testing established
-

Table 6.2 Summary of Recommended Personal Protective Equipment According to Safety to single unit of work			
Objective	Workplace	Suggested PPE	Picture
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation.	Safety Glasses with side-shields, protective shades, etc.	
Head protection	Falling objects, inadequate height clearance, and overhead power cords.	Plastic Helmets with top and side impact protection.	

Hearing protection	Noise, ultra-sound.	Hearing protectors (ear plugs or ear muffs).	
Foot protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids and chemicals.	
Hand protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.	
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors. COVID 19	Facemasks with appropriate filters for dust removal and air purification (chemicals, mists, vapors and gases). Single or multi-gas personal monitors, if available	
	Oxygen deficiency	Portable or supplied air (fixed lines). On-site rescue equipment.	
Work at height	Safety belt	The safety belt will be used to work at certain height during erection and stringing	
Body/leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.	
Musk	The project work site	Protect COVID 19 and dust	

Management Procedures for Medical Aid:

Occupational health center

JAYANA BATTERY TECHNOLOGIES has got one occupational health center fully equipped with essential medical equipment like, stretcher, dressing trays, Kidney tray, weighing scale and some important medicines as recommended by doctor in attendance. In addition, Plant will train employees who will be qualified by Red Cross Society in attending First Aid treatment.

1. For electric shock casualties

Electric shock results in irreversible damage to brain cell followed by deterioration of other organs.

2. Rescue and first-aid

- Do first thing first, quickly and without fuss or panic.
- Switch-off the supply if this can be done at once.
- If not possible, use a dry -stick, dry cloth or their nonconductor to separate the victim 4 of an electrical contact.
- The rescue must avoid receiving shock himself by wearing gloves or using a jacket to pull the victim.
- Always keep in mind those delays in rescue and resuscitation maybe fatal. Every second counts.

Artificial respiration

Give artificial respiration, if breathing has stopped. There are several methods of artificial respiration, if the victim is not injured over the face, try mouth to mouth. If the victim is injured above the face, try mouth to mouth. If the victim is injured above the face, use Sylvester Borsch method.

(a) Mouth to mouth method.

(b) Sylvester Borsch method

6.5.2 Emission Control and Management Plan (ECMP) Objective

The objective of the Emission Control and Management Plan (ECMP) is to ensure that Operations in the plant at all stages do not release significant amount of gaseous emission to the air environment beyond acceptable limit. The ECMP will take into

critical account electricity project and sewage treatment activities that can result in generation of gaseous emission to pollute surrounding air. This is to be achieved by continuous monitoring of air quality on site, implementation of recommendations and mitigation measures made in this report in respect to air pollution and ensuring that the conditions subjected to license approval with respect to pollution control are adhered to.

Enforcement

The ECMP guiding principle will be proper and optimum operation generator, providing sufficient stack height and regular monitoring of stack exhaust gases.

To ensure adherence to the set conditions, the all regulatory authority will be enjoined in actions taken. This will include giving them access to the facility to assess working conditions as far as air quality is concerned and give government directives as may be required by law.

Sources of Gaseous Emission& management options

There is practically no source for continuous emission of air pollutants from the existing facilities for the production of conductor and guy accessories. Sources of intermittent discharge of pollutants are insignificant and are limited to the following:

- Generator operated during failure of grid power supply.

However, if the pollutants emission from the production conductor and guy accessories is not managed properly it may affect the ambient air quality due to unburned hydrocarbon and different gases like carbon dioxide, carbon monoxide, and sulfur dioxide. The situation aggravates when oil contains high percentage of impurities like sulfur etc. The high temperature of flue gases also impact the air quality terms of thermal pollution. This is a long term adverse impact.

From stack emission point of view, since generator runs very rare, the impact on air quality will not be significant. However air pollution from gas and diesel based generators could be minimized by providing proper stack height for the well dispersion of exhaust gasses. For generator this could be determined applying the thumb rule that, the stack height is taken as height of the building where generator is installed plus 0.2 times of square root value of generator capacity in KVA. ($H=h+0.2\sqrt{\text{KVA}}$). According to this thumb rule as the height of the utility building is 5 m & capacity of the generator is 650 KVA a minimum of 30 m of stack height from the ground level is suggested.

It should be mentioned here that, emission are best controlled through the air –fuel ratio. Adequate quantities of air, about 1.4 time’s stoichiometric amounts, assure complete combustion of the fuel and Consequent reduction in hydrocarbon and carbon monoxide emissions.

Table 6.3 Emission Control & Management plan (ECMP)

Issue/ concern	Potential negative environmental impact	Proposed mitigation measures	Environmental Monitoring	Responsible actors	Time frame	Cost Estimate
Air Pollution	Exhaust gas emission from lead casting area may pollute ambient air.	Six ATP will be set up for mitigation measure of lead pollution in air	-Monitoring of Indoor air as per air pollution control rule 2022 (Schedule - 5, rule -3 sub-rule (2) and rule -8 sub-rule (1,2)	JAYANA BATTERY TECHNOLOGIES Top management	Quarterly Monitoring of stack gases	-
	-Release of hot flue with gaseous pollutants (SO _x , NO _x , CO, CO ₂) -GHG Emission -Deterioration of indoor air quality -Occupational health Impact	-Proper stack height for generators ($H=h+0.2\sqrt{KVA}$) -Optimum Air Fuel ratio - Regular maintenance of generators -Heat recovery from generator -Use of PPE	-Monitoring of Indoor, ambient and stack gases -Monitoring of use of PPE	JAYANA BATTERY TECHNOLOGIES Top management -Workers	Quarterly Monitoring of stack gases Annual Indoor Air Quality Monitoring	-

6.5.3 Noise Management Plan (NMP)

Objective

The objective of the Noise Management Plan (NMP) is to ensure that operation of JAYANA BATTERY TECHNOLOGIES do not generate and result in noise pollution to the employees and local community.

The NMP is to be achieved by continuous monitoring of noise levels on site, implementation of recommendations and mitigation measures made in this report in respect to noise pollution and ensuring the conditions subjected to license approval with respect to noise management are adhered to.

Sources of noise

The sources of noise in the project unit, generators set and fire water pumps.

Noise minimization

The following measures are practiced for control and abatement of noise & vibration.

- The foundations of generator set and Fire Water pumps are provided with anti-vibration padding.
- The generator sets are housed inside a building so that the noise is reduced by the acoustic enclosures. ,
- Regular condition monitoring e.g. speed, vibration and regular preventive maintenance including schedule lubrication are being conducted for the moving machines to keep them in good condition and also to reduce vibration.

6.5.4 Solid Waste Management Plan (SWMP) Objective

The objective of the Solid Waste Management Plan (SWMP) is to ensure that solid waste is properly collected, transported, and disposed of, that may be generated from operational activities at JAYANA BATTERY TECHNOLOGIES as per solid waste management rule 2021. The SWMP is to be achieved by developing solid waste inventory, implementation of recommendations and mitigation measures made in this report in respect to solid waste generation and ensuring the conditions subjected to license approval with respect to solid management are adhered to.

Sources of Solid waste

Waste will be generated solid waste; stapler pin, small kraft, plastic/polythene, rope and glass metal waste fabrics, used paper, poly bags and packing wastes, dirt, kitchen/canteen wastes; however liquid waste will be generated from domestic activities as domestic wastewater and used lube oil from the generator.

Management Plan

The management plan includes effective implementation of mitigation measures as discussed in chapter 5 and as summarized in Table 6.4.

Table 6.4 Solid Waste Management plan (SWMP)

Issue/ concern	Potential negative environmental impact	Proposed mitigation measures	Environmental Monitoring	Responsible actors	Time frame	Cost Estimate
Solid Waste Generation and its management	* Air, water and Soil Pollution by a) Odor emanating from degradable waste b) Discharge of solids to lake water *Poorly disposed waste may block drainage	√Proper Solid waste management system which should include - a) Solid waste inventory which should clearly define source, category and quantity of solid waste b) Solid waste collection, storage and re-cycling facility c) Waste Reduction and Recycling facilities d) Solid waste disposal plans √Awareness and training campaign √Sell solid waste having reselling value to DoE approved vendors	√Regular monitoring of the solid waste management facilities √Monitoring acceptability and effectiveness of the Solid waste Management plan	JAYANA BATTERY TECHNOLO GIES Top management JAYANA BATTERY TECHNOLO GIESEMC JAYANA BATTERY TECHNOLO GIES Workers - Occupational safety and health officer -District Environment al officer -Neighbors; and -The general public	JAYANA BATTERY TECHNO LOGIES Must keep inventory/ daily register for solid waste Yearly Reporting	BDTK 50,000

6.5.5 Water and Wastewater Management (WWMP)

Objective

The objective of the WWMP is to ensure that operations of the project at all stages do not result in releasing significant amount of waste water to the environment and at the same time it ensures good and acceptable quality of drinking water. The WWMP will take into critical account all possible sources of water usage and discharge that can result in generation of waste water to pollute surrounding water environment. This is to be achieved by continuous monitoring of water quality on site, implementation of recommendations and mitigation measures made in this report in respect to water pollution and ensuring that the conditions subjected to license approval with respect to pollution control are adhered to.

Enforcement

The WWMP guiding principle will be installation of proper effluent and sewage treatment facilities followed by good housekeeping practices, and safety and environmental performance, management reviews and evaluations. To ensure adherence to the set conditions, all regulatory authority will be enjoined in actions taken. This will include giving them access to the facility to assess working conditions as far as water quality is concerned and give government directives as may be required by law. The management cell in this regard will play the main role ensuring that planning, implementation, monitoring is done regularly and in time and all the condition.

Existing Situation at JAYANA BATTERY TECHNOLOGIES

Existing water usage and demand

JAYANA BATTERY TECHNOLOGIES using total 105 m³/day water will be for its domestic purposes and water are used to make lead acid battery. The According to the project authority the 105 m³/day water demand is met through Ground water extraction.

Treatment Discharge of Liquid wastewater

JAYANA BATTERY TECHNOLOGIES will setup a Modern ETP of capacity 120 m³/day with zero discharged plan. However, household/domestic wastewater is treated in the septic tanks & soaks wells. The septic tank and soak pit shall be designed in such a way to restrict vertical percolation of the wastewater to protect the existing quality of ground water in the surrounding area. The condition is aggravated due to the settlement of Suspended Solids (SS) and subsequent decomposition of the deposited sludge in an anaerobic condition. The used water has Suspended Solid (SS) and it is settled in three tank system before discarding at the project site throughout by drainage system.

Table 6.5 Water & Waste Management plan (WWMP)

Issue/ concern	Potential negative environmental impact	Proposed mitigation measures	Environmental Monitoring	Responsible actors	Time frame	Cost Estimate
Environment Pollution (Water, Air and Soil Environment)	Surface and Ground water pollution, Odor and soil Pollution -Occupational illness	-Proper design and installation ETP of capacity 120 m ³ /day and continuous and effective operation of septic tank and soak well -Proper collection, segregation, inventory and disposal of solid waste s -workers to use appropriate PPE; -Strict enforcement on PPE use	√Regular monitoring of surface & ground water quality √Regular monitoring of drinking water quality √Monitoring of Solid waste Management plan (SWMS)	JAYANA BATTERY TECHNOLOGIE S Authority & workers Occupational safety and health officer -District Environmenta l officer -Neighbors; and -The general public	-Water quality should be checked in-house regularly and quarterly to submit DoE -Regularly monitorin g / Auditing of SWMS	BDTK 80,000

6.6 Environmental Monitoring Program

6.6.1 Monitoring Requirement

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

- ✚ To check on whether mitigation and benefit enhancement measures are actually being adopted and are providing effective in practice
- ✚ To provide a means whereby impacts which were subject to uncertainty at the time of preparation of EMP, or which were unforeseen, can be identified, and steps to be taken to adopt appropriate control measures.
- ✚ To provide information on the actual nature and extent of key impacts and the effectiveness of the mitigation measures which, through a feedback mechanism, can be taken into account in the planning and execution of similar projects in future.

There are two basic forms of monitoring:

- ✚ Visual observation or checking, coupled with inquiries
- ✚ Physical measurement of selected parameters

In the case projects in general, monitoring is done by physical measurement of some selected parameters like air, water, noise etc. It should be mentioned here that the monitoring program should be such so that it can ensure compliance with national environmental regulations and standards. The importance of this monitoring program is also for ensuring that the project does not create adverse environmental changes in the area and providing a database of operations and maintenance, which can be utilized if unwarranted complaints are made. JAYANA BATTERY TECHNOLOGIES will require that regular monitoring of possible change in environmental parameters to be undertaken during the operational life of the project.

6.6.2 Monitoring Indicators

Keeping in mind the pollution factors, there will be a need to put in place elaborate and sound environmental management system and mechanisms of monitoring on a continuous basis. Undertaking monitoring and auditing of key environmental parameters and putting in place of all approved recommendation of the environmental management plan and conditions of the license will achieve this.

6.6.3 Monitoring Parameters

Environmental monitoring requires a set of indicators that could be conveniently measured, assessed and evaluated periodically to establish trends of impacts. The indicators may be independent or may be functionally related. The monitoring program, in View of the possible impacts as assessed earlier, should consider the indicators for the impact assessment related to following issues as presented in the tables in the following pages. Monitoring will involve measuring, observing, recording and evaluation of physical, socio-economic and ecological variables within the project area and the neighborhood

It is important for the facility management to set up regular monitoring programs to assess parameters of the environment as stipulated in ECR 2023. This monitoring program will help to identify changes in the environmental situations giving opportunities for adopting appropriate control measures. A comprehensive checklist must be developed for operational usage. The basic activities for a sound-monitoring program should at least include:

- ✓ Collection and analysis of relevant environmental data of the project area;
- ✓ Preparation of proper effluent monitoring program; and
- ✓ Proper Risk Assessment programs

This would be the responsibility of the Environment Management cell.

Table 6.6: Monitoring Parameters & Frequency

Issue	Parameters	Location	Monitoring Frequency
Frequency Stack emissions from generator	NO _x , SO ₂ , SPM	Final Exhaust	Once in 3 months
Ambient air quality	Lead, SPM, NO _x , SO ₂ , CO and CO ₂	Around the project site	Once in 3 months
Noise Level	Noise at different locations at day & night	Around the project site and nearest receptor	Once in 3 months
Drinking water Quality	pH, Total Alkalinity (as CaCO ₃ , Manganese (Mn), Total Hardness as CaCO ₃ , Total dissolved Solid (TDS), Arsenic (As), Iron (Fe), Chloride (Cl), Fecal coliform & total coliform	Drinking water outlet	Once in a Year
Surface and treated ETP water quality	pH, Total Alkalinity (as CaCO ₃ , Manganese (Mn), Total Hardness as CaCO ₃ , BOD ₅ , COD, DO, salinity Total Coliform	Surface water from nearest sources	Quarterly
Work place dust & fugitive emission	PM _{2.5} , O ₃ , CO ₂ , and VOC	At different locations of work place	Once in six months
Work place noise level	Noise level at work place	Noise at different locations at work place	Once in 3 months
Offensive odor	Parameters of odor component as per ECR	At different locations of work place	Once in 3 months
Hazardous waste	Oil and graces in soil and water sample	Project water and soil	Half yearly

6.6.4 Materials, Supplies and Equipment Monitoring Budget

To be an environmentally acceptable unit, JAYANA BATTERY TECHNOLOGIES should have its own environment monitoring unit/cell with trained manpower with necessary equipment and other logistics along with required budget. Hence, EMC will undertake the activity of monitoring the water quality, ambient air quality, noise level etc. either departmentally or by appointing external agencies wherever necessary. Regular monitoring of environmental parameters will be carried out to find out any

deterioration in environmental quality and also to take corrective steps, if required, through respective internal departments or third party. The Cell will also collect data about health of workers, green belt development etc. JAYANA BATTERY TECHNOLOGIES; has obtained DoE clearance certificate and NOC from local authority, BIDA, Trade license from Chairman) attached with annexure 07.

The materials, supplies, equipment and personnel requirements are largely guided by technical aspects of monitoring and such requirements thus, largely control the budget of the monitoring program. JAYANA BATTERY TECHNOLOGIES should arrange all kinds of equipment, laboratory instruments, chemicals and engage technically efficient personals and set up own laboratory. Otherwise, JAYANA BATTERY TECHNOLOGIES may engage any government approved Private organization or apply to DoE for conduct monitoring.

However, for conducting the monitoring program by third party a proposed budget based on current market price has been tabulated in Table-6.6

Table 6.7 Cost Estimates for Environmental Mitigation and Monitoring

Item	Parameters	Unit Cost (Taka)
Stack emissions from generator	Lead, SPM, NO _x , SO ₂ , CO and CO ₂	35000.00
Ambient air quality	NO _x , SO ₂ , CO, O ₃ , NH ₃ , PM ₁₀ , and PM 2.5,	35000.00
Noise Level	Noise at different locations at day & night	10000.00
Drinking water Quality	pH, Total Alkalinity (as CaCO ₃ , Manganese (Mn), Total Hardness as CaCO ₃ , Total dissolved Solid (TDS), Arsenic (As), Iron (Fe), Chloride (Cl), Fecal coliform & total coliform	50000.00
Surface water quality	pH, Total Alkalinity (as CaCO ₃ , Manganese (Mn), Total Hardness as CaCO ₃ , BOD ₅ , COD, DO, Total Coliform	40000.00
Work place dust & fugitive emission	SPM, PM 2.5 , , CO, and VOC	30000.00
Work place noise level	Noise level at work place	10000.00
Offensive odor	Parameters of odor component as per ECR	45000
Hazardous waste	Oil and graces in soil and water sample	15000

CHAPTER-7
EMERGENCY RESPONSE
& DISASTER
MANAGEMENT PLAN

CHAPTER-7

EMERGENCY RESPONSE & DISASTER MANAGEMENT PLAN

7.1 Emergency Response and Disaster Management Plan

The initial response to an incident is a critical step in the overall emergency response. Like all other Industries and installations, battery manufacturing facilities must have adequate measures against accidents or incidents to meet the emergency. The purpose of having an Emergency Response Plan (ERP) is to:

- ✚ Assist personnel in determining the appropriate response to emergency.
- ✚ Provide personnel with established procedures and guidelines.
- ✚ Notify the appropriate Company Emergency Response Team personnel and regulatory/ Govt. agencies.
- ✚ Manage public and media relations.
- ✚ Notify the next-to-kin of accident victims.
- ✚ Promote inter-departmental Communications to ensure a “Company Wide” Coordinated emergency response.
- ✚ Minimize the effects that disruptive events can have on company operations by reducing recovery times and costs.
- ✚ Respond to immediate requirements to safeguard the subtending environment and community.

Generally, the initial response is guided by three priorities Ranked in importance these priorities are:

- a) People
- b) Property
- c) Environment

Emergency Response Procedures will identify who does what and when in the event of an emergency. Responsibility for who is in charge and their coordination of emergency actions shall be identified. Nature of Emergency & Hazardous Situations may be of any or all of the following categories:

I. Emergency

- ✚ Fire,
- ✚ Explosion,
- ✚ Medical emergency,

II. Natural Disasters '

-  Flood,
-  Earthquake/cyclone,
-  Storm/ typhoon/ tornados, and
-  Cloud burst lightning.

III. External Factors

-  Food poisoning/ water poisoning,
-  Sabotage, and.
-  War.

7.2 Six Steps in Emergency Response

Step1)

- a) Determine the potential hazards associated with the incident, substance or circumstances and take appropriate action to identify the type and qualities of dangerous goods involved and any known associated hazards.
- b) Determine potential hazards stemming from local conditions such as inclement weather, water bodies etc. and ensure that the initial response team is aware of these conditions.

Step-2)

Determine the source/ cause of the event resulting to the emergency and prevent further losses.

Step-3)

Conduct an assessment of the incident site for any further information on hazards or remedies.

Step-4)

Initiate redress procedures.

Step-5)

Report the incidence its nature cause impact applied redress procedures and any further assistance required etc. to the appropriate company, government and/or land owner.

Step-6)

Take appropriate steps with respect to hazards to wildlife, other resources and addressing public and media concerns and issues, as applicable. Response priorities are to protect human lives, property and the environment.

7.2.1 Emergency Procedures in Case of Fire

- a) Alert the supervisory staff who will have the structure evacuated immediately by calmly notifying all occupants of a fire condition.
- b) When you are warned of a fire, leave the structure immediately using the nearest and safest exit.
- c) Call the Fire Department from a safe location and then give the location of the emergency.

7.2.1 Fire Extinguishment and Confinement

Fire extinguishment is the responsibility of the fire department. Only after ensuring that the fire alarm has been activated and the fire department are notified, should an attempt made to extinguish a small fire.

If a small fire cannot be extinguished with the use of a portable extinguisher or a fixed extinguishing system, or the smoke presents a hazard to the operator, then leave the fire area, ensure the fire department has been notified and wait in a safe area for the fire department.

Attempting to extinguish a fire is a voluntary act. Only persons who are properly trained and feel confident in the use of a portable extinguisher should contemplate their use. Improper use of a portable extinguisher can lead to severe injury or death.

7.2.2 Portable Extinguisher Instructions

Portable extinguishers can be a lifesaving tool and prevent the spread of fire, saving lives and property. It is important to know the proper type of extinguisher to use and how to use it in an emergency situation.



Fig 7.1: Different parts of Portable Extinguisher

7.2.3 Types of Fire

There are four types of fire such as:

- A - Ordinary combustibles (wood, paper, plastics, etc.)
- B - Combustible liquids (oils, gas, cooking oil, etc.)
- C - Electrical (energized equipment appliances, wiring, etc.)
- D -Combustible metals (aluminum, magnesium, zinc, etc.)

It is extremely important to choose the proper rated fire extinguisher for the class of fire that is burning.

7.2.4 Basic Operation of Portable Extinguisher

- P - Pull the safety pin (usually a twist-pull action)
- A - Aim the nozzle, horn or hose at the base of the fire
- S - Squeeze the trigger handle
- S - Sweep from side to side (watches and ensure the fire will not re-ignite)

Portable fire extinguishers apply an extinguishing agent that will cool burning fuel, displace or remove oxygen, or stop the chemical reaction so a fire cannot continue to burn. When the handle of an extinguisher is compressed, agent is expelled out the nozzle. A fire extinguisher works much like a can of hair spray. Never re-hang an extinguisher once it has been discharged (even if it is only used for a few seconds). Have it recharged by a service company.

Only persons who have been properly trained and feel confident in use of an extinguisher should contemplate their use. Improper use of a portable extinguisher can lead to severe injury or death.

7.3 Fire Safety Risk Assessment

A fire safety risk assessment is an organized and methodical look at the premises, the activities within the premises, the potential for a fire to occur and the harm it could cause to the people in and around the premises. The existing fire safety measures are evaluated and kept under review to establish whether they are adequate or if more requires to be done.

The aims of a fire safety risk assessment are:

- ✚ To identify hazards and reduce the risk of those hazards causing harm to as low as is reasonably practicable;
- ✚ To identify what fire safety measures and management policies are necessary to ensure the safety of people in the building should a fire occur.

There are 5 steps in the assessment process and they are:

1. **Identify people at risk**
2. **Identify fire hazards**

- ✚ Sources of ignition
- ✚ Sources of fuel
- ✚ Sources of oxygen

3. **Evaluate the risk and decide if existing fire safety measures are adequate**

- Evaluate the likelihood of a fire starting
- Evaluate the consequence to people from fire
- Implement fire safety measures like remove or reduce fire hazards, remove or reduce risks to people, the alarm, fire-lighting equipment, escape routes and lighting, signs and notices, maintenance, effective management and staff training.

4. **Record**

- Record significant findings and action taken / action to be taken
- Keep assessment under review

5. **Review**

- Keep assessment under review
- Revise where necessary

7.4 Managing Fire Safety

A management commitment to fire safety is essential to assist with achieving suitable fire safety standards in premises and in the maintenance of a staff culture of fire safety. This chapter covers management standards that should be achieved within all premises, in respect of:



Fig 7.2: Various Fires Fighting Equipment

- ✚ Fire safety policy;
- ✚ Emergency fire action plan;
- ✚ Fire Safety Information and training;
- ✚ Fire drills
- ✚ Maintenance of fire safety measures; and
- ✚ Recording information and keeping records.

It is important to provide further information which will assist in evaluating the risk from fire and its prevention. A long-term workable and effective strategy should be developed to reduce hazards and the likelihood of a fire starting. At its Simplest this means separating flammable and combustible materials from ignition sources. Advice under the following headings is given in this chapter:

- + Housekeeping and storage;
- + Storage and use of dangerous substances;
- + Safe use of equipment;
- + Electrical;
- + Smoking;
- + Managing building work and alterations;
- + Particular hazards in escape routes; and
- + Fire rising.

To reduce the risk to persons if there is a fire, it is necessary to consider how to control or restrict the spread of fire and smoke. The majority of people who die in fires are overcome by the smoke and gases. To evaluate the risk to people in premises requires a basic appreciation of the way fires grow and how smoke and poisonous gases can spread through a building. A fire in a building can generate smoke that is thick and black, obscures vision, causes great difficulty in breathing, and can block the escape routes. Smoke is a serious threat to life which should not be underestimated.

Fire is spread by three methods:

- + Convection;
- + Conduction and
- + Radiation.

Fire and smoke spread by convections the most dangerous and causes the major proportion of injuries and deaths. When fire starts in an enclosed space such as a building, the smoke rising from the fire becomes trapped by the ceiling and then spreads in all directions to form an ever-deepening layer over the entire room space. The smoke will pass through any holes or gaps in the walls, ceiling and floor into other parts of the building. The heat from the fire gets trapped in the building and the temperature rises. Some materials, such as metal can absorb heat readily and transmit it to other rooms by conduction, where it can set fire to combustible items that are in contact with the heated material. Radiation transfers heat in the air in the same way that an electric bar heater heats a room. Any material close to a fire will absorb the heat until the item starts to smolder and then burn.

In this chapter, restricting the spread of fire is considered under the headings of:

- + Fire compartmentation;
- + Doors;
- + Smoke control;
- + Fire separation;
- + Fire spread through cavities;

- + Ventilation systems;
 - + Fire spread on internal linings;
 - + Fire spread on external walls; and
 - + Fire spread from neighboring buildings.
- + These areas should be considered to the extent that they are appropriate to life safety objectives in individual premises.

7.4.1 Reporting Incidents and Accidents

All accidents and near-miss incidents shall be investigated to determine what caused the problem and what action is required to prevent a recurrence. Employees required to perform investigations shall be trained in accident investigation techniques. The incident/accident investigation should be a fact-finding exercise rather than faultfinding. The investigations will focus on collection of evidence to find out the “root cause” of the incident. The recommendations of the investigation report are implemented in phases.

7.5 Approaches to Emergency Response

For this project, emergency response systems should be in place to deal with dangerous goods uncontrolled releases of dust and gaseous emission, natural calamities fires burns and injuries. There are to be trained emergency response teams, specific contingency plans, and incidence specific equipment packages in place to cope with these types emergency. In case of an emergency incident occur, immediate action must be taken to mitigate the impacts.

In order to minimize the possibility of injury to the responders and others it is important that emergency responders follow a specific sequence of action as stepped out in the preceding paragraphs

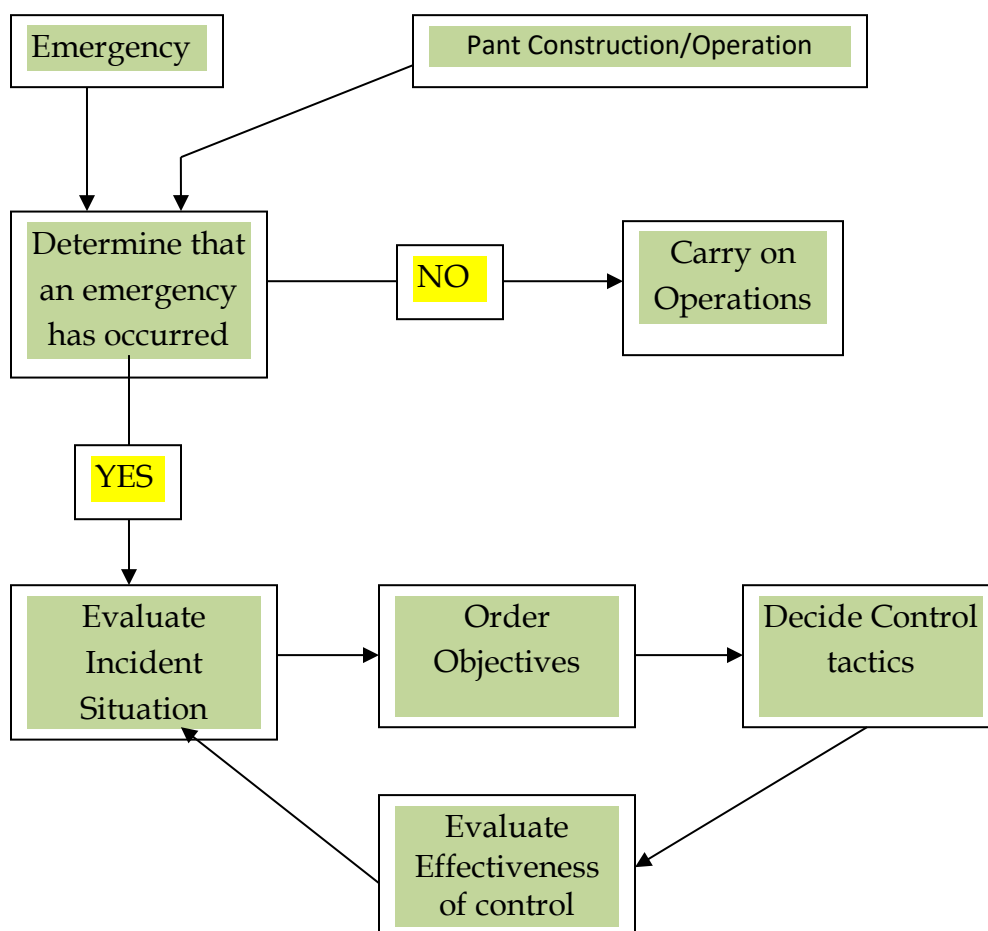


Figure-7.3: Illustrates an example system approach to Plant construction & operations

JAYANA BATTERY TECHNOLOGIES has taken license from the Fire Service and Civil defense, Dhaka. It attached with as an annexure 05.

7.6 Disaster Management Plan

In normal operation of the plant, when all environmental protection equipment works according to design specification, then there would be no environmental problems for the present plant.

Disaster (to certain degree) may occur if the environmental protection equipment fails to work at normal condition. This situation may arise for any of the following causes

- o When plant runs at abnormal situation e.g. if emission level increases than its normal level or if the engines give unwanted noise than normal level
- o If liquid waste over flows and pollutes the surroundings

Therefore, appropriate management plan should have to be taken by the project proponent to prevent any unwanted disaster in the plant. In this regard. There should be a provision to stop the production immediately during any process failure as discussed above.

The disaster management plan should consist of preventive measures including, among others, the following.

- + Formulation and strict implementation of safety codes and measures;
- + Periodic inspection of safety relief valves provided with pressure vessels and equipment;
- + Preventive maintenance;
- + Aware the workers about electric shock
- + Declaring the factory a “no smoking zone”
- + Mock drills by the fire fighting cells/ groups
- + Provision and inspection of fire lighting equipment and fire hydrant system in all the sections;
- + Proper training of the employees about the importance of codes;
- + Training the employees and the residents of the surrounding villages about the actions to be taken during an accident, disaster etc.

It is imperative to develop entire facility environment policy and display necessary documentation for ease in accessing information. Some of these documents include:

- + Emergency contacts;
- + Emergency response procedures for fires

The facilities operations and monitoring are carried out under the management and help from both the employees and relevant government lead agencies. In order to take care of any hazards the following control should be adopted:

- + All safety precautions and provisions covering the general cleanliness of the entire facility down to, ventilation, lighting, sanitary, waste collection, first aid box provision, adequate fire extinguishers and site security by fencing.

7.6.1 Environment, Health and Safety (EHS)

Health and safety aspects of the entire facility should be given due attention. Protective devices as provided should continuously be used within the unit's operations to ensure the safety of the natural resources and boat owners is guaranteed. The maintenance of Material Safety Data Sheets (MSDS) will be followed to ensure safety all section of the facility that chemicals are utilized.

An Environment, Health and Safety register is essential for monitoring of performance of the entire facility community in relation to the environment. The management will use this as a self-auditing tool. This register should include:

CHAPTER-8
ANALYSIS OF
ALTERNATIVES

CHAPTER-8

ANALYSIS OF ALTERNATIVES

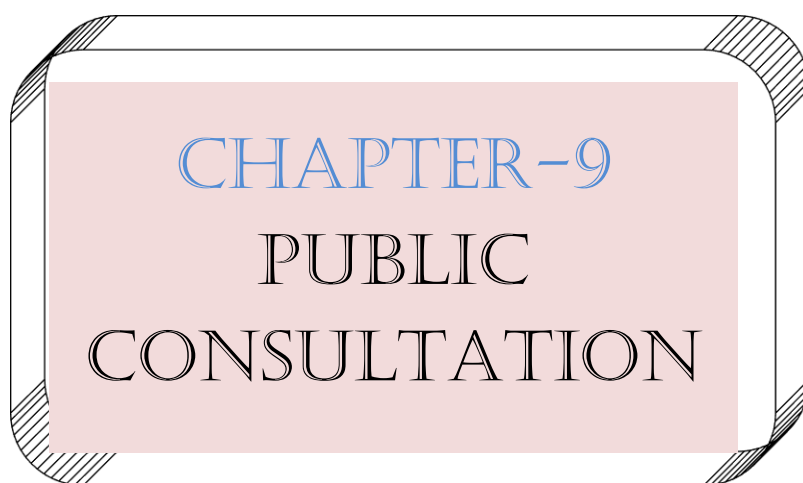
8.1 The 'No Build' Scenario

From a purely physical environmental point of view, the 'do-nothing' is preferable to any project implementation, since it would avoid creation of any of the adverse impacts associated with the project. However, the potential socio-economic benefits to the nation would be foregone and industrial growth would be hampered.

It is concluded that the 'No build' alternative is unacceptable, and the potential socio-economic benefits of implementation of such project far outweigh the adverse impacts, all of which can be controlled and minimized.

8.2 Site Alternatives

As mentioned earlier that the project site is finalized for JAYANA BATTERY TECHNOLOGIES is located in areas, which have every scope for developing as an industrial area. The project aesthetic looks are modern and Environment compatible, the site is environmentally acceptable, the project is staying a pre-construction stage and the EIA carried out earlier concluded about the suitability of this project location. So there is no logical need to look into alternative sites. Hence this has not been done in the present EIA.



CHAPTER-9

PUBLIC CONSULTATIONS

9.1 Public meeting and survey

Public Consultation was initiated with an explicit objective to ensure people participation right from the planning stage of the project. More specially, this was aimed at improving the study taking into account opinions from the people of the impacted area. While undertaking household survey through semi-structured questionnaire, knowledgeable persons, and community leaders and local chairman & members were identified and contracted.

The company has arranged a public meeting at the project site. The meeting was attended by about 81 persons who included local people, local community leaders and other interested persons from different corners. JAYANA BATTERY TECHNOLOGIES will be increased the job for local people at Vill: Uttar panapukur, Borobil, P.S: Gangachara, Dist: Rangpur in the operation phase.

9.1.1 Objectives

The Public Consultation (PC) was undertaken as a part of the EIA in order to obtain the views of members of the immediate community and interested and project affected persons (PAPs) within the site's immediate area of influence. The consultations were done with randomly selected people at the neighborhood of the proposed sites and involved use of a semi-structured public participation form. The stone paper project was acceptable and no objections were raised concerning the development as proposed by the local people.

The Public Consultation has been conducted during 15 September, 2026 at 12.00 pm (project location) through Stakeholder Consultations (SC), during the environmental study of the proposed project in conformity with DOE's environmental guidelines to achieve the following objectives:

- To share information of the proposed project of JAYANA BATTERY TECHNOLOGIES;
- To understand stakeholders' including PAPs' concerns regarding various aspects of the proposed project including the production of stone paper and environmental impacts along with possible mitigation measures during construction & operation stages of the proposed paper mill project;

- To identify the conflict issues in advance & to find acceptable solutions; and
- To gather local knowledge of project proponent, it will help to make any of the proposed project during the operation phase;

9.1.2 Categories of Stakeholders

Consultations have been carried out with the following stakeholders at project side venues:

- Project related government and non- government officials (Project proponent, DOE official, Union Parishad Chairman & members, students, local people, PAPs, Consultant of the project etc.);
- Project Affected Persons (PAPs):
 - People (direct PAPs) who will lose their lands permanently and temporarily due to implementation of the proposed stone paper project;
 - Union Parishad Chairman & members whom are authorized person of local government of the project
 - People (indirect PAPs) living in the proposed project area
- Local beneficiaries;
- Villagers;
- Urban people;
- Businessmen; and
- General public.

These public consultations have been provided key inputs for the identification of the potential environmental impacts along with possible mitigation measures for the negative impacts and enhancement for the positive impacts due to implementation of the subprojects of proposed project.

9.1.3 Consultation Process

The consultation locations at the subproject sites were selected based on the criteria which are as follows:

- The environmental, social and cultural importance of the stone paper mill area;
- The selected location is the human settlement areas, at the local authority (such as union parishad) which are located nearby the stone paper mill;
- So, the consultants were able to discuss on the project features, environmental and social impacts due to the implementation of the stone paper mill along with mitigation measures with the local people specially PAPs. Moreover, the selected locations are rich in terms of availability of surface water sources, vegetation, agricultural land, cultural sites etc.

Prior to fixed date of public consultation meeting, JAYANA BATTERY TECHNOLOGIES has given the schedule in the newspaper. The date of schedule of public consultation meeting has fixed by DOE (Rangpur DOE office).

The consultants held meeting with the stakeholders. The stakeholder consultations were held at Vill: Uttar panapukur, Borobil, P.S: Gangachara, Dist: Rangpur sites and local people, project proponent, DOE official, students). At the starting of the consultations, the consultant of JAYANA BATTERY TECHNOLOGIES described about the production process and set of machineries at the project side. The consultant of Ion Water Technology (BD) described the activities including environmental impacts, mitigation measure. In the meetings, the participants shared their valuable questions, opinions & suggestions with the consultants which were noted & incorporated in the report.

9.2 General Finding of the meeting and Consultation

In general, the local people's response to JAYANA BATTERY TECHNOLOGIES is positive. Most of the people who live close the project site has no objection towards the project being set up at the selected site. Most the people as interviewed are not aware of pollution hazard and also do not feel that JAYANA BATTERY TECHNOLOGIES would-be source of any hazard to them.

Most neighbors close to the proposed project sites especially expected the project to create casual and permanent employment opportunities during the proposed project construction work, operation and decommissioning phases. The employment opportunities could be either directly in the project or indirectly through associated businesses. One of the main positive impacts during projects construction phase will be the availability of job opportunities especially to casual workers and several other specialized workers.

Through the use of available materials during the construction phase of the proposed stone paper mill will contribute towards growth of the economy by contributing to the gross domestic product. Most of the benefit is" decrease of tree cutting for making pulp" if the stone paper is available in the market. There should have been a bottom-up approach taken while designing the project with opportunity and arrangement for public participation.

The people of the Uttar panapukur area are seemed to be happy for setting up a lead acid battery production project since they would have a chance to get job after operation of the project. More than 81 public participations were engaging in the consultation meeting. Also, some people will participate indirectly in various economic activity and support systems associated with JAYANA BATTERY TECHNOLOGIES. The list of participants and photographs of the consultation meeting is attached in Appendix

9.3 Summary of special concern

9.3.1 Issues

Some issues as described by those who attended the meetings are summarized below:

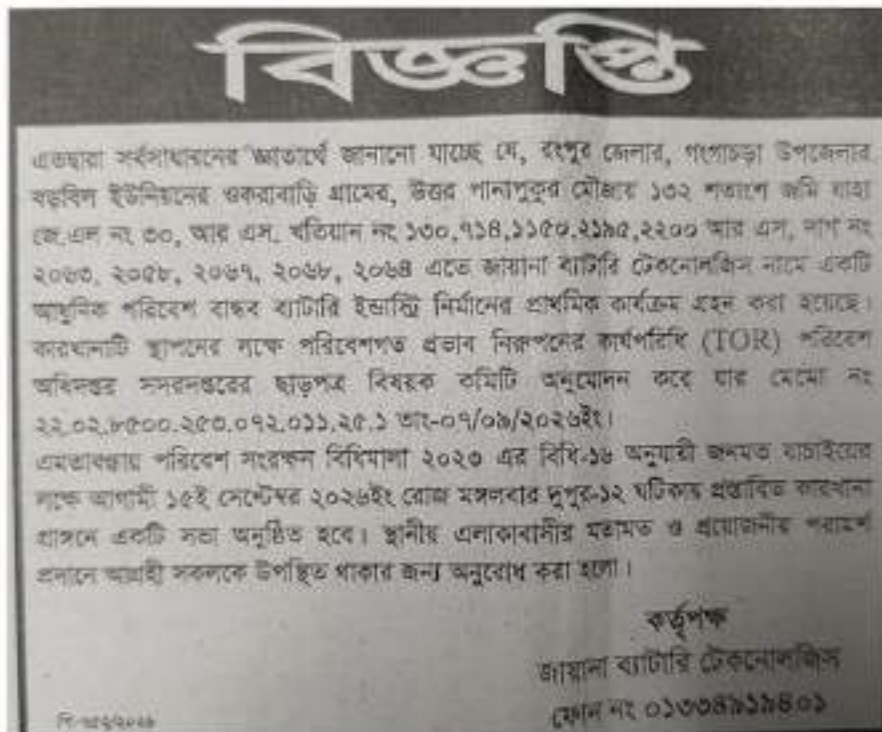
- o Employment for local people
- o Contribution to the local stone paper manufacturing projects

9.3.2 Suggested measure

Suggestions were also provided of persons who attend the meeting. The suggested measures for above issue are as follows:

- o Where ever possible local people should be given priority for employment in the factory.
- o JAYANA BATTERY TECHNOLOGIES should contribute both in kind for different development projects like total literacy program (TLP), development in medical facility, local road etc. in the local area.



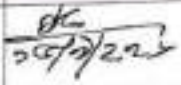
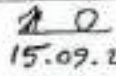
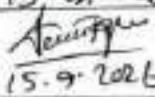
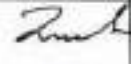
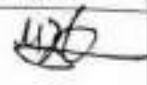






PARTICIPANTS LIST

Date: 15.09.2026

SL. NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
1.	Nur Alam Director	DoE		01718150295	
2.	Md. A. Salam Enver Deputy Director	DoE		01712-414741	 15.09.2026
3.	Md. Malin Miah Senior Chemist	DoE Rangpur		01789967086	 15.09.2026
4.	Md. Nur Alam Siddique	ION Water for Environment Speaker	EP	0181701323	 15.9.2026
5.	HAMUNUR RAHID	ION WATER Dhaka, BD.	CEO.	01715861893	
6.	MD. Shafiq Rahman	Jayana Battery	Head of Maintenance	01736672913	
7.	KM Rezul Zannah	Jayana Batteries	Architect	01785156555	
8.	Md. Farukuzzaman	Jayana Batteries		01786850305	 15/9/26
9.	Md. Jonyed Chow. Shury.	Jayana Batteries	Advaitor.	01713-765286	
10.	Pritmochandra dey	Jayana Battery	Manages.	01722543189	 15/9/26
11.					
12.					

PARTICIPANTS LIST

SL. NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
১	আবুল কালাম	হা: মাদারাসা আবুল কালাম	কাজ	০১৭২১৫ ৪০৫০	আবুল কালাম
২	আবুল কালাম	হা: মাদারাসা	কাজ	০১৭২২৪১২১৫৫	আবুল কালাম
৩	আবুল কালাম	হা: মাদারাসা	কাজ	০১৭২২৪১১১০ ৩৪	আবুল কালাম
৪	আবুল কালাম	হা: মাদারাসা	কাজ	০১৭২০৭১১৫৭৮	আবুল কালাম
৫	আবুল কালাম	হা: মাদারাসা	কাজ	০	আবুল কালাম
৬	আবুল কালাম	হা: মাদারাসা	কাজ	০	আবুল কালাম
৭	আবুল কালাম	হা: মাদারাসা	কাজ	০১৭৩০২৬২৪ ৬০	আবুল কালাম
৮	আবুল কালাম	হা: মাদারাসা	কাজ	০১৩২২৭৩০৫৫৭	আবুল কালাম
৯	আবুল কালাম	হা: মাদারাসা	কাজ	০১৪৪৫৬২০৫২৫	আবুল কালাম
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১১	আবুল কালাম	হা: মাদারাসা	কাজ	০১৭২৫৫৫৫৫৫	আবুল কালাম
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PARTICIPANTS LIST

SL. NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
13.	মিঃ মোঃ আলী	মুন্সিগঞ্জ	মাস্টার	0183344533	মিঃ মোঃ আলী
14.	মাস্টার	মুন্সিগঞ্জ	মাস্টার	0178508717	মাস্টার
15.	মাস্টার	মুন্সিগঞ্জ	মাস্টার	0177039500	মাস্টার
16.	মাস্টার	মুন্সিগঞ্জ	মাস্টার	0161264892	মাস্টার
17.	মাস্টার	মুন্সিগঞ্জ	মাস্টার	0178106086	মাস্টার
18.	মাস্টার	মুন্সিগঞ্জ	মাস্টার	0133168889	মাস্টার
19.	মিঃ মোঃ আলী	মুন্সিগঞ্জ	মাস্টার	01718261062	মিঃ মোঃ আলী
20.	মাস্টার	মুন্সিগঞ্জ	মাস্টার	0171091809	মাস্টার
21.	মাস্টার	মুন্সিগঞ্জ	মাস্টার	0171711982	মাস্টার
22.	মাস্টার	মুন্সিগঞ্জ	মাস্টার	0198588882	মাস্টার
23.	মাস্টার	মুন্সিগঞ্জ	মাস্টার	0184255705	মাস্টার
24.	মাস্টার	মুন্সিগঞ্জ	মাস্টার	0183344533	মাস্টার

PARTICIPANTS LIST

SL. NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
25.	সুজিতা হোসেন	বাগাইচাঁদ	কৃষক	০১৭২৩৫৭৭৭০	সুজিতা
26.	সালিম	সালিমপুর	কৃষক	০১৭৬১১৩৩১৩	সালিম
27.	জাহাঙ্গীর	বাগাইচাঁদ	কৃষক	০১৭২৩৫৭৭০০	জাহাঙ্গীর
28.	মাহবুব হোসেন	সালিমপুর	কৃষক	০১৭১৫৩১৭১২	মাহবুব
29.	সালিম হোসেন	সালিমপুর	কৃষক	০১৭১৫৩২০০২	সালিম হোসেন
30.	সালিম হোসেন	সালিমপুর	কৃষক	০১৭১৫৩২০০২	সালিম
31.	সালিম হোসেন	সালিমপুর	কৃষক	০১৭১৫৩২০০২	সালিম
32.	সালিম হোসেন	সালিমপুর	কৃষক	০১৭১৫৩২০০২	সালিম
33.	সালিম হোসেন	সালিমপুর	কৃষক	০১৭১৫৩২০০২	সালিম
34.	সালিম হোসেন	সালিমপুর	কৃষক	০১৭১৫৩২০০২	সালিম
35.	সালিম হোসেন	সালিমপুর	কৃষক	০১৭১৫৩২০০২	সালিম
36.	সালিম হোসেন	সালিমপুর	কৃষক	০১৭১৫৩২০০২	সালিম

PARTICIPANTS LIST

SL NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
৪৭	মুহম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৬২৬৭৬০৬	মুহম্মদ হামিদ
৪৮	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ
৪৯	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ
৫০	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ
৫১	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ
৫২	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ
৫৩	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ
৫৪	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ
৫৫	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ
৫৬	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ
৫৭	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ
৫৮	মো: মোহাম্মদ হামিদ	ডি: নান্দাবুড় চাঁদা	কৃষক	০১৭৭৪৬৪৪৮০	মুহম্মদ হামিদ

JAYANA BATTERY
TECHNOLOGIES

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT
PUBLIC CONSULTATION

PARTICIPANTS LIST

SL NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
49	ডাঃ-তুহিন	উকতাবাড়ি	জ্যোতিষ	01723516854	
50	বাবু মণ্ডল	মুন্সীগঞ্জ	কৃষক	01576464866	
51	সুজন	আবদুল	আমল	01705893970	
52	সাব্বাস	হুগলি	কৃষক	01983512901	
53	মোহাম্মদ হারুন	হুগলি	আমল	01779043609	
54	ডাঃ সুমিত্রা	নগর	গার্মেন্ট	01754546464	
55	সেখা হোসেন	হুগলি	কৃষক	01722798926	
56	ডি/ও নীল	উকতাবাড়ি	কৃষক	017162954650	
57	ডাঃ ইয়াসিন আলি	উকতাবাড়ি	কৃষক	01703311649	
58	ডাঃ অক্ষা	হুগলি	কৃষক	01760603953	
59	বাবু মণ্ডল	হুগলি	আমল	01510188299	
60					

JAYANA BATTERY
TECHNOLOGIES

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT
PUBLIC CONSULTATION

PARTICIPANTS LIST

SL NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
13.	শাহিদুল আলম	মহাস্থানগড়	কাজ	01833945553	শাহিদুল আলম
14.	কাজ	মহাস্থানগড়	কাজ	01785087777	কাজ
15.	আব্দুল হক	মহাস্থানগড়	কাজ	0177039999	আব্দুল হক
16.	ইদ্রিস আলি	মহাস্থানগড়	কাজ	01619269192	ইদ্রিস
17.	রাজিউল	মহাস্থানগড়	কাজ	01781060586	রাজিউল
18.	মাহমুদ	মহাস্থানগড়	কাজ	01331688149	মাহমুদ
19.	মিলন (মিলন)	মহাস্থানগড়	কাজ	0171846062	মিলন
20.	কাজ	মহাস্থানগড়	কাজ	0171091555	কাজ
21.	মাহমুদ	মহাস্থানগড়	কাজ	01717119827	মাহমুদ
22.	মাহমুদ	মহাস্থানগড়	কাজ	01985888888	মাহমুদ
23.	মাহমুদ	মহাস্থানগড়	কাজ	01842557885	মাহমুদ
24.	মাহমুদ	মহাস্থানগড়	কাজ	01833945553	মাহমুদ

CHAPTER-10
CONCLUSIONS &
RECOMMENDATIONS

CHAPTER-10

CONCLUSION & RECOMENDATIONS

10.0 Conclusion

JAYANA BATTERY TECHNOLOGIES is located Vill: Uttar panapukur, Borobil, P.S: Gangachara, Dist: Rangpur. An EIA study has been carried out for the project according to the requirement of DoE for necessary environmental clearances. The EIA report has been prepared through identifying the potential impacts, assessing them, recommending possible mitigating, and enhancing measure for negative and positive impacts, respectively.

The project has very insignificant amount adverse environmental impacts. This was also justified by the environmental ambient air, ambient noise & water quality monitoring at the project site. So far the study found, the risks control measures which has already been implemented in the project and also by implementing all necessary protection and regulatory measures as suggested here in EIA, the plant is expected to control fire and explosion risks to the minimal possible level. Also, it can undoubtedly be said that the plant will meet all the National Environmental Quality Standards. JAYANA BATTERY TECHNOLOGIES will be made 100 lead acid battery per day in the project area. ATP and ETP will be set up for the management of air pollution and waste water treatment. JAYANA BATTERY TECHNOLOGIES will be recruited 250 workers for the project.

Fire hazard, health and safety issues, and impacts due to solid and liquid sewage wastes are the major impacts associated during operation phase JAYANA BATTERY TECHNOLOGIES. This may create long term and irreversible effect to a limited degree on the receiving environment if no mitigation measures are adopted.

However, JAYANA BATTERY TECHNOLOGIES has already under taken all necessary implementation measures to mitigate adverse environmental and health and safety impacts to meet National Environmental Quality Standards. On the other hand, the plant has a positive impact in terms of employment in the operation phase. Further, this will indirectly help boosting up the national economic condition through foreign investment. An outline of EMP has been given in the present report to mitigate/enhance the impacts, which generally occurs during operation phase of the plant.

Other than afore mentioned impacts, there are no environmental issues of sensitive nature, which might have any potential of serious ill effects due to the project in this area. Since it is understood that the project proponent is committed to take necessary steps to address any environmental problems, the project JAYANA BATTERY TECHNOLOGIES is accepted.

However, no development can be expected without any adverse impact on environment. The beneficial impacts on the nation as well as human beings would only be meaningful and sustainable development would only be possible if the adverse effects are minimized through strict maintenance and control measures as adopted and further suggested for this project.

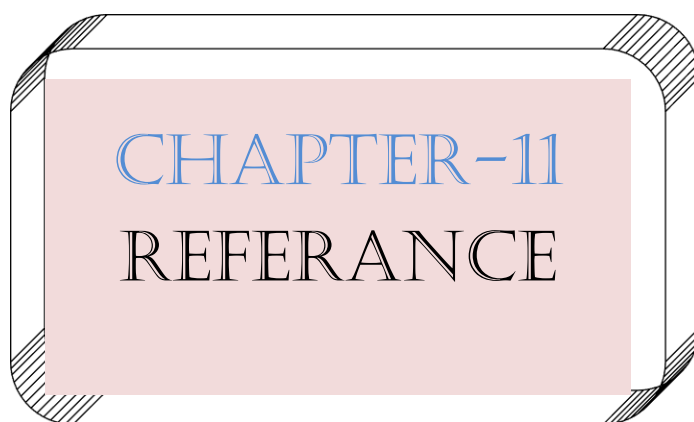
Finally, it can be concluded that the location of JAYANA BATTERY TECHNOLOGIES is environmentally acceptable and it is expected that JAYANA BATTERY TECHNOLOGIES will follow all environmentally compatible steps. No follow-up study is required for the existing fad of the project and it is also expected that DoE will do surveillance monitoring of the project performance.

10.1 Recommendations

Several environmental and social considerations need to be comprehensively addressed to improve the sustainability of the project. Some of these improvement proposals are summarized below:

In case of any future Expansion, major construction and development project JAYANA BATTERY TECHNOLOGIES must conduct adequate Environmental studies and must get approval from DoE. ,

1. Local people may be given priority during recruitment;
2. JAYANA BATTERY TECHNOLOGIES, should start & continue tree planting program within the project and its environments;
3. JAYANA BATTERY TECHNOLOGIES management should continue contributing corporate socially responsible projects in the field of education, anti-drug, child labor etc.
4. Continue giving adequate training & appropriate personal protective equipment to current and newly appointed operators and engineers.

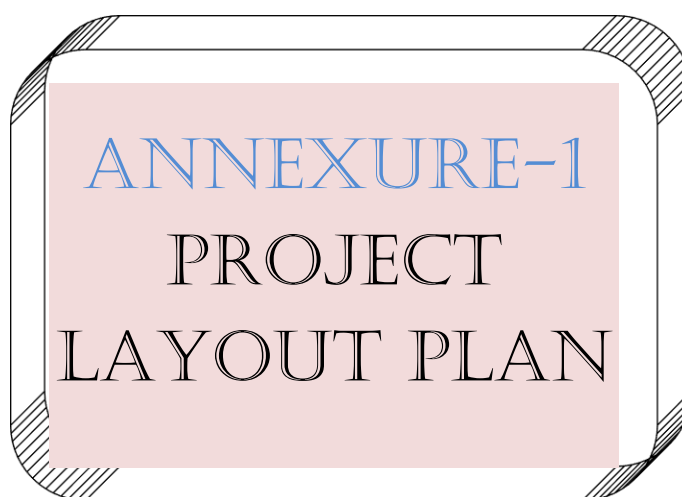


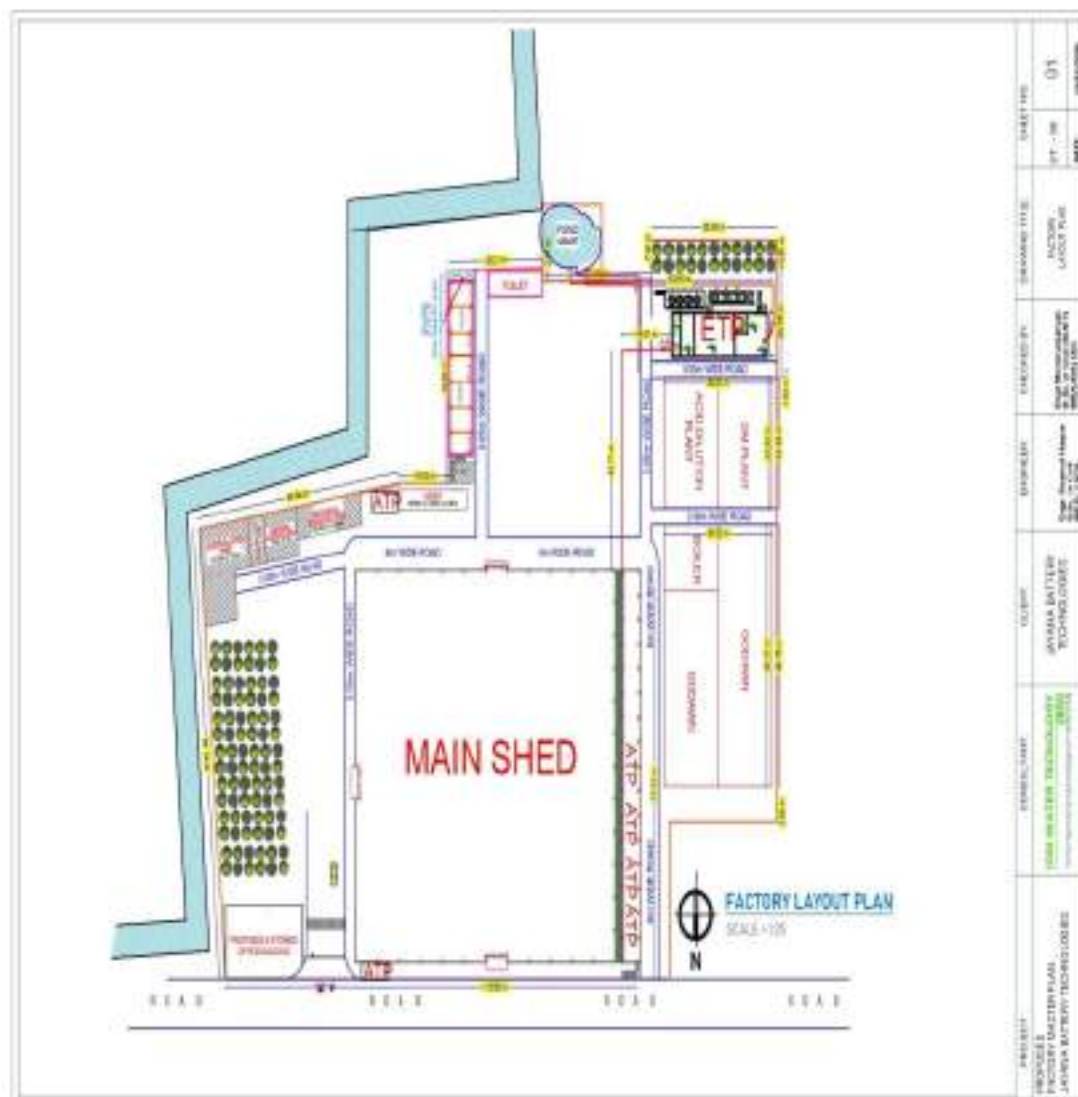
CHAPTER-11

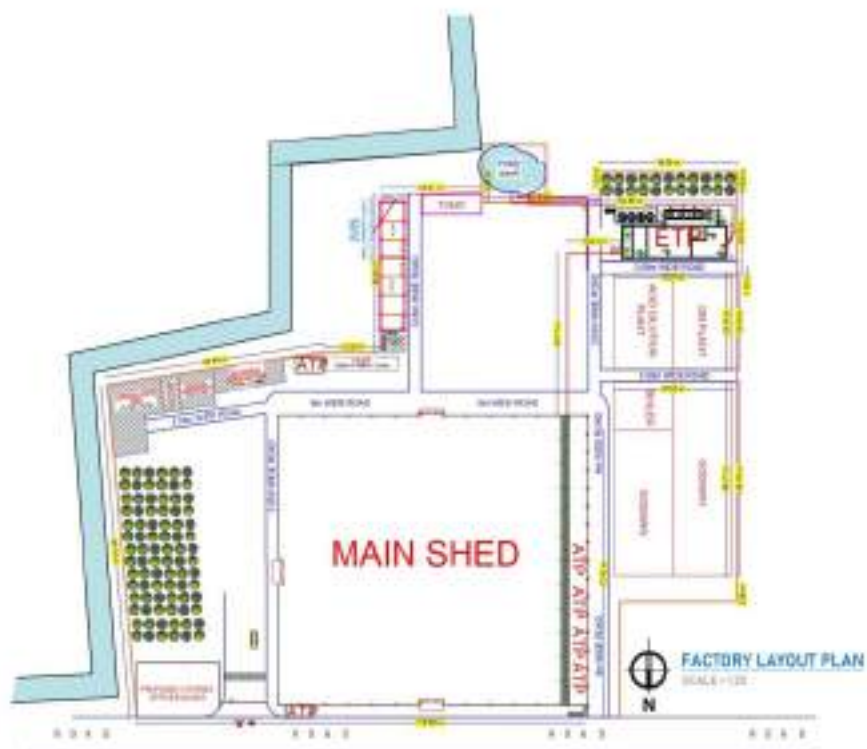
REFERENCES

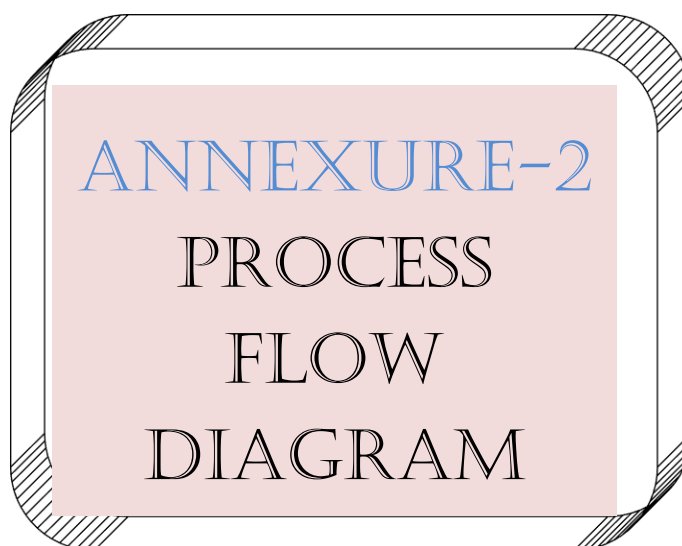
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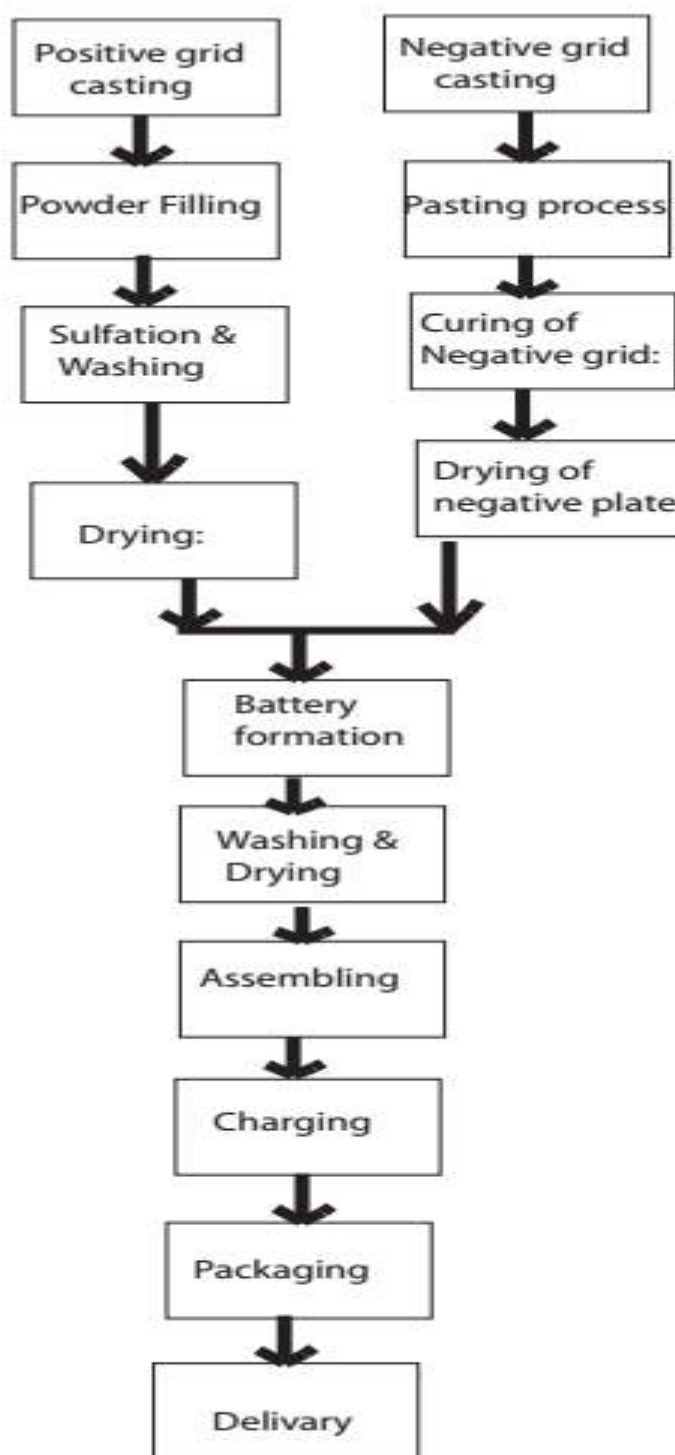
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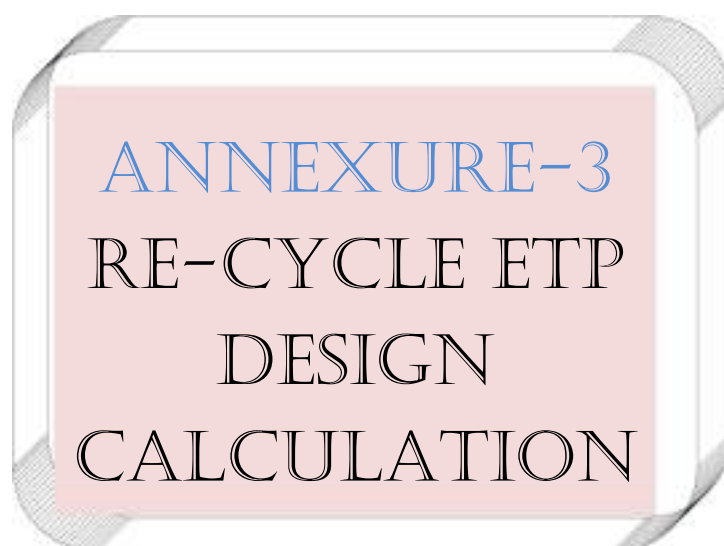








Process flow diagram



JAYANA BATTERY TECHNOLOGIES

UTTAR PANAPUKUR, BOROBIL, GANGACHARA, RANGPUR, BANGLADESH

RE-CYCLE ETP DRAWING & DESIGN CALCULATION, CAPACITY-6.0M³/HR.

PREPARED BY

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WATER CONSUMPTION CALCULATION FOR BATTERY HOUSE FOR JAYANA BATTERY TECHNOLOGIES

BATTERY MANUFACTURING

SL. No.	Name of Section	No. of Machine/Section	Total water Consumption m ³ / (daily).
1.	Pasting Section	1	30.0m ³ / day
2.	Plate section	1	10.0m ³ / day
3.	Formation Section	1	60.0m ³ / day
4.	Others section	1	5.0m ³ / day
Total Waste water consumption			105.0m ³ /Day

Operation Hour – 20.0Hours

So, Total amount of Waste water = 105.0m³/day Or 5.25m³/hr.

With safety margin, we have ensured 6.0m³/ hr. or 120.0m³/day flow rate of the Recycle ETP Capacity.

The ETP will run on Physico-chemical process filtration plant and will comprise of equipment's that have **100% recyclable** in Gardening & Road watering (zero discharge) facility. The treated effluent water of course comply with the standards stated by the Bangladesh Department of Environment.

DESIGN BASISCHARACTERISTICS OF EFFLUENT WATER

Based on the secondary data and experienced, the following Characteristic of Effluent water from the Effluent line of the factory has been drawn.

Parameters	Unit	Inlet Effluent water	Outlet Effluent Water	Re-Cycle Water Standard
Flow Rate	m ³ /hr.	6.0	6.0	
BOD (Max)	mg/L	100 - 120	<30	<30
COD (Max)	mg/L	200 - 400	<200	<200
DO	mg/L	0.5	4.5 - 8	5 - 8
pH		2 - 3	6 - 9	6 - 9
Suspended Solids	mg/L	300 - 400	<100	<150
Colour	Pt/Co unit	<500	<150 Clear Water	
Temperature	°C	30 - 45	<35	<35
TDS	mg/L	<2100	<2100	<2100
Oil & Grace	mg/L	<30	<10	<10

Note : **Before treatment** – The figures taken from the same existing factories in the others location.

Outlet – The taken from “Bangladesh Gazette”- ECR 2023, Ministry of Environment and Forest.

TREATMENT PROCESS (PHYSICO-CHEMICAL)

The following unit operation are designed for the Re-cycle Effluent Treatment Plant (ETP) ---

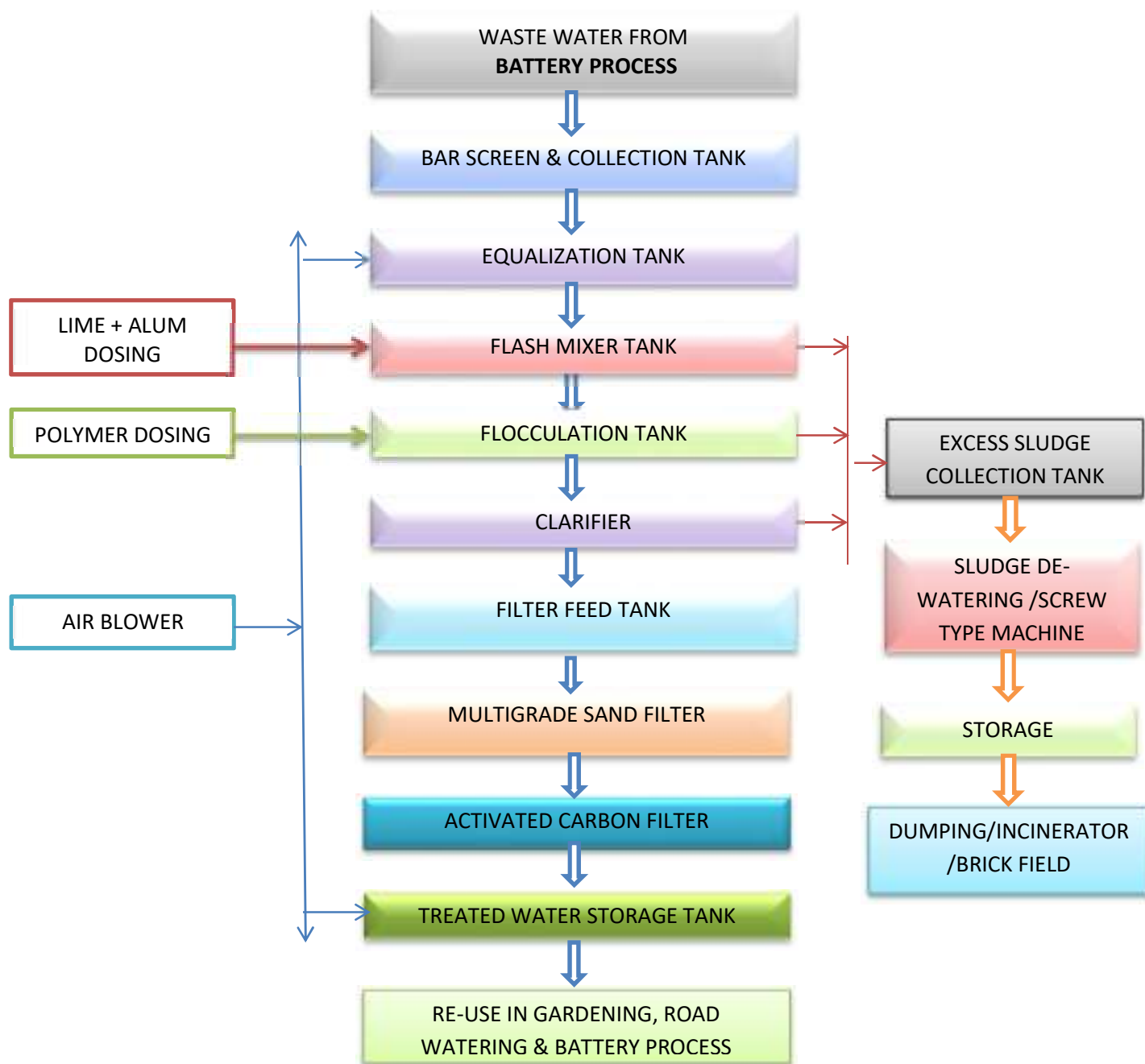
- BAR SCREEN
- COLLECTION TANK
- EQUALIZATION TANK
- FLASH MIXER TANK
- FLOCCULATION TANK
- PRIMARY CLARIFIER TANK
- FILTER FEED TANK
- MULTIGRADE SAND FILTER
- ACTIVATED CARBON FILTER
- TREATED/ZDP WATER STORAGE TANK
- RE-USE (GARDENING & ROAD WATERING)

RE-CYCLE
EFFLUENT TREATMENT PLANT (ETP)
Capacity-6.0M³/hr.

(TANK SIZE, VOLUME, HRT)

SN	Name of Tank	Use full Dimension	Volume of water (m ³)	Retention time (Hours)
1.	Collection Tank	2.0 x 5.5 x 2.4m	26.4	4.4
2.	Equalization Tank	3.0 x 5.5 x 3.0m	49.5	8.25
3.	Flash Mixer Tank	1.5 x 0.5 x 0.8m	0.6	0.1 (5Min)
4.	Flocculation Tank	1.5 x 1.2 x 1.7m	3.0	0.5 (30Min)
5.	Clarifier Tank	5.1 x 1.7 x 2.0m	17.34	2.89/SOR-0.7
8.	Filter Feed Tank	1.2 x 5.5 x 3.0m	19.8	3.3
9.	Treated water Storage Tank	3.0 x 5.5 x 3.0m	49.5	8.25
10.	Sludge Drying Bed - 3nos	1.7 x 2.0 x 1.2m		
11	Multigrade Sand Filter	Dia-1000 x 1828 mm		
12.	Activated Carbon Filter	Dia-1000 x 1828 mm		

RE-CYCLE ETP PROCESS FLOW DIAGRAM



DESIGN CALCULATION
FOR
RE-CYCLE ETP PLANT, Capacity-6.0m³/hr.

DESCRIPTION OF THE UNIT OPERATIONS

BAR SCREEN

Manual Bar Screen is a mechanical device which is used to remove large objectives such as floating dust and pieces of fabrics, from inlet waste water. The waste water comes from only Level printing section. Three types of Manual Bar Screen which are used in drain line. Such as:

1. **Coarse Screen** : It is used to remove coarse particles. It is made by stainless steel. Coarse Screen pore size is 1 inch.
2. **Medium Screen** : It is used to remove medium particles. It is made by stainless steel. Medium Screen pore size is ½ inch.
3. **Fine Type Screen**: It is used to remove fine particles. It is also made by stainless steel. Fine Type Screen pore size are (2mm -3mm).

Purpose of Manual Bar Screen:

-  To remove suspended solid.
-  Increasing efficiency of effluent transfer pump.

DESIGN CALCULATION FOR EQUALIZATION TANK

Influent flow, $Q = 6.0\text{m}^3/\text{hr}$. Or $120.0\text{m}^3/\text{day}$.

If the retention time is taken as 8 Hours

Then, Volume of equalization tank is $(6 \times 8) = 48.0\text{m}^3$

Including Safety Factor,

Total Volume of Equalization Tank = $(3.0 \times 5.5 \times 3.0) \text{ m} = 49.5\text{m}^3$, **RT = 8.25Hours**.

Air Required for Mixing & Equalization $Q_A = V \times a$ [Mixing Factor, $a = 1.2 - 1.5 \text{ m}^3/\text{m}^3$]
 $= 49.5 \times 1.5 = 74.25\text{m}^3/\text{hr}$.

Required Air Diffuser:

Assuming air flux of diffuser = $F_A = 5\text{m}^3/\text{hr}$. [4 – 12 depends on diffuser]

Number of Diffuser:

$N_D = Q_A/F_A = 74.25/5 = 14.85 \sim 15.0\text{nos}$

So, the design is satisfactory.

DESIGN CALCULATION FOR FLASH MIXER TANK

100 RPM Agitator is used to maintain regular mixing at coagulation tank.

Influent flow, $Q = 6.0\text{m}^3/\text{hr}$. Or $120.0\text{m}^3/\text{day}$.

Volume of Coagulation tank = $(1.5 \times 0.5 \times 0.8) \text{ m} = 0.6\text{m}^3$

Retention Time (RT) = 0.1 Hour/5Min.

DESIGN CALCULATION FOR FLOCCULATION TANK

Here, 20 RPM Agitator is used to maintain regular mixing at flocculation tank.

Influent flow, $Q = 6.0\text{m}^3/\text{hr}$. Or $120.0\text{m}^3/\text{day}$.

Volume of Flocculation tank = $(1.5 \times 1.2 \times 1.7) \text{ m} = 3.0\text{m}^3$

Retention Time (RT) = 0.5Hour/30Min.

DESIGN CALCULATION FOR PRIMARY CLARIFIER

Influent flow, $Q = 6.0 \text{ m}^3/\text{hr. Or } 120.0 \text{ m}^3/\text{day.}$

Retention time = 2.5 Hours

So, permissible volume of primary Clarifier tank is $(3 \times 2.5) = 7.5 \text{ m}^3$

Designed Volume = $(5.1 \times 1.7 \times 2.0) \text{ m} = 17.34 \text{ m}^3$, **RT-2.88Hours**

And, Area = $(5.1 \times 1.7) \text{ m} = 8.67 \text{ m}^2$

Surface Overflow Rate (SOR):

Surface Area of Primary Clarifier Tank = $(5.1 \times 1.7) \text{ m} = 8.67 \text{ m}^2$

$$\begin{aligned}\text{Surface Overflow Rate (SOR)} &= \frac{\text{Flow to tank (m}^3/\text{hr.)}}{\text{Surface Area of Tank (m}^2\text{)}} \\ &= \frac{6.0 \text{ (m}^3/\text{hr.)}}{8.67 \text{ (m}^2\text{)}} \\ &= 0.7 \text{ (m}^3/\text{m}^2/\text{ hr.)}\end{aligned}$$

$$\begin{aligned}\text{Weir Overflow Rate (WOR)} &= \frac{\text{Flow to the tank (m}^3/\text{hr.)}}{\text{Length of Weir (m)}} \\ &= \frac{6.0 \text{ (m}^3/\text{hr.)}}{5.1 \text{ (m)}} \\ &= 1.17 \text{ m}^3/\text{hr./m}\end{aligned}$$

So, the design is satisfactory

FILTER FEED TANK

Design Criteria

Design Parameter/Basis	Plant Data
Retention Time (HRT)	3.3 hr.
Volume	19.8m ³
Dimension (Use full)	(1.2 x 5.5 x 3.0) m
Free board	0.5 m

FILTRATION (MF + ACF) DETAILS

Sl No.	Description	Value/Calculation		Remarks
		MF	ACF	
1.	Filtration Flow rate	6.0m ³ /hr.	6.0m ³ /hr.	
2.	Design Operation Hours	20 Hours	20 Hours	
3.	Filtration Design Velocity	12 - 15 m/h	10 - 12 m/h	
4.	Diameter of Filters	0.8m	0.9m	
5.	Height of State for Filters	1.8m	1.8m	

➤ **Multi-Grade Filter (MGF)**

Removes remaining Total Suspended Solids (TSS) downstream of the clarifier.

Filtration Velocity: Typically, 12 - 15 m/hr.

Area Calculation:

$$\begin{aligned}\text{Area, A} &= \frac{\text{Flow Rate}}{\text{Velocity}} \\ &= \frac{6.0 \text{ m}^3/\text{hr.}}{12 \text{ m/h}} \\ &= 0.5 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Diameter Calculation : } A &= \frac{\pi d^2}{4} \\ D &= \sqrt{4A/\pi} \\ &= \sqrt{4 \times 0.5/3.14} \\ D &= 0.79 \text{ meter,} \\ &\approx 0.8 \text{ meter}\end{aligned}$$

➤ **Activated Carbon Filter (ACF)**

Removes trace organic compounds, color, odor, and residual chlorine/chemical trace components

Filtration Velocity: Typically, 10 - 12 m/hr.

Area Calculation:

$$\begin{aligned}\text{Area, A} &= \frac{\text{Flow Rate}}{\text{Velocity}} \\ &= \frac{6.0 \text{ m}^3/\text{hr.}}{10 \text{ m/h}} \\ &= 0.6 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Diameter Calculation : } A &= \frac{\pi d^2}{4} \\ D &= \sqrt{4A/\pi} \\ &= \sqrt{4 \times 0.6/3.14} \\ D &= 0.84 \text{ meter,}\end{aligned}$$

≈ 0.9 meter

FILTRATION

Sodium Hypo chloride Dosing:

Sodium Hypo chloride is used to remove odor & water disinfection. It is used after Clarifier Tank before. The dosing range is (2ppm-3ppm).

Filter Feed water tank:

The Clear water from Clarifier tank is reserved or stored in this tank before releasing to the filtration process.

Multi grade sand filter:

The working principle of a multigrade filter is quite straight forward. In a multigrade filter sand filter, water is passed through media as consisting graded sand, gravels and pebbles layers. The contaminants in the water are captured in the media bed and filtered water passes into the discharge manifold at the bottom of the tanks. The next and last step is backwashing, a process of effectively removal of suspended solids.

Active Carbon Filter:

Activated carbon filtration is made with various Active Carbon particles to clear various floating substances if any remained in the treated effluent which is pumped in to this filter. The activated carbon filter helps in removing the bad odor, dust, clay from the treated effluent.

SLUDGE STORAGE TANK

Sludge from the Clarifiers is collected to a Sludge Holding tank 1 & 2. Waste activated sludge is also collected to the sludge holding tank after maintaining certain microorganism level into the aeration tank. The solid content of Bio Sludge is 0.8-1% and Chemical Sludge is 3-5%. The Combined sludge is also considered as 2-5%.

Sludge Calculation

BOD Load = 120mg/l

$$= 120 \times 120 / 1000 \text{ kg/day}$$

$$= 14.4 \text{ kg/day}$$

Dry Sludge calculation from BOD Load = $14.4 \times 0.25 = 3.6 \text{ kg/day}$ [Factor = 0.25]

Sludge Consistency = 30% - 50% [0.3 - 0.5]

Slurry Volume = $3.6 / 0.3 \times 100 = 1200 \text{ Liters/day}$ Or $1.2 \text{ m}^3/\text{hr}$.

Taken Dislodge Frequency = 10 days

Total Sludge Volume of 10 days = $10 \times 1.2 = 12.0 \text{ m}^3$

Sludge tank volume, $V = (1.2 \times 5.5 \times 3.0) \text{ m} \times 1 = 19.8 \text{ m}^3$

Slurry Sludge:

$$\begin{aligned} \text{Sludge Storage Time} &= (19.8 \text{ m}^3 \div 12.0 \text{ m}^3/\text{day}) \\ &= 1.65 \text{ day} \end{aligned}$$

SLUDGE TREATMENT

The under flow from the Flocculation Tank & Primary clarifier having a sludge consistency of around 1-1.5% is pumped into the sludge drying bed for dewatering from Primary Sludge Pit. The dewatered sludge is then disposed of suitably while the liquid is taken back to the equalization tank.

SLUDGE MANAGEMENT

Sludge Drying Bed & Sludge Disposal:

The Sludge Generated by effluent treatment needs to be further processed & disposed of safely. It is the byproduct of the effluent treatment process, produced in form of solid waste. In fact, the production of sludge is a good indicator as to out whether the ETP is running continuously or not. Sludge can be generated at different stages of treatment, including Screening, Settling & chemical precipitation but most are coming from the physical-chemical stage of treatment. The Sludge collected from different stages Such as Coagulation, Flocculation & Clarifier Tank. Despite the differences in the nature of sludge from each process stage, all the sludge is usually combined & handed together. Solid Cake Sludge is collected from Sludge drying bed. After bagging solid cake sludge are disposing and storing at sludge dumping area in the factory area, which is recommended by Department of Environment (DOE) of Bangladesh Government.

- Prepare a sludge room at factory side, where factory can store sludge At least 6 months.
- The room should have a good distance from any water body, drainage area or kitchen.
- The sidewall along the bottom of the room should be lined with RCC.
- Dry the sludge properly and store it at least 6 months at this store.

The sludge management is done under a close shed. There are sufficient windows is arranged in the wall of the shed for easy movement of air.

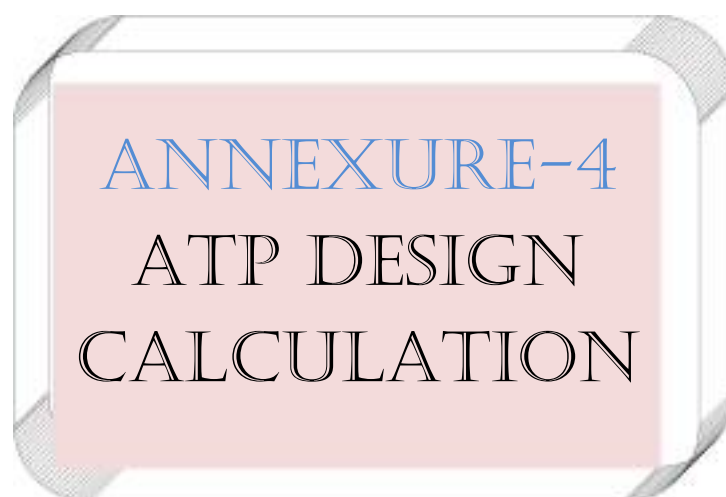
EQUIPMENT LIST & TECHNICAL DATA

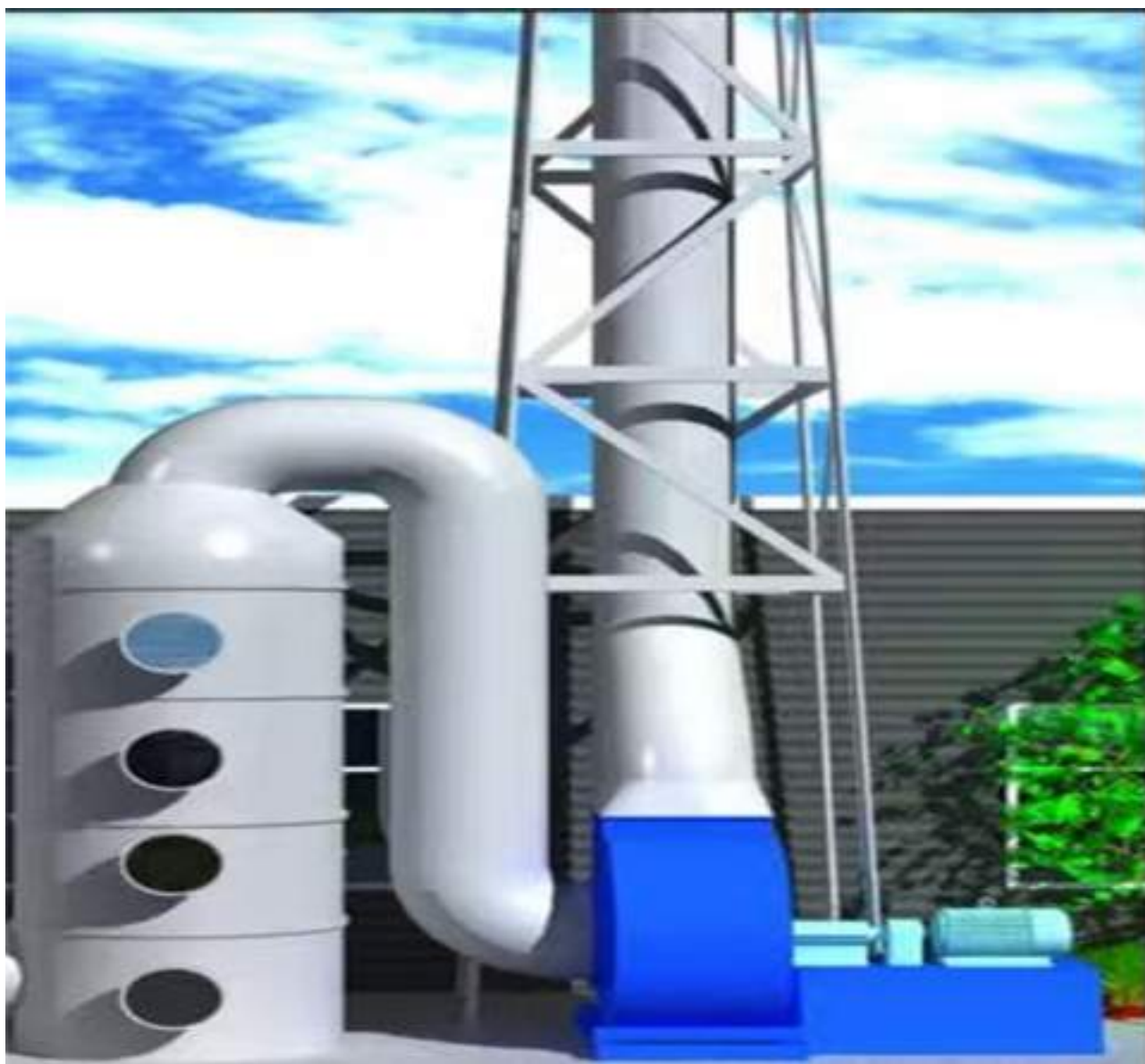
S/L	Items	Description	Qty.
1.	Mechanical Screener	Type – Manual MOC – SS 304 Mesh Size – 12mm, 5mm & 2mm Brand – Local	03 nos
2.	Raw Effluent Transfer Pump	Type: Self Priming /Submersible (Cutter) Capacity: 6.0m ³ /Hr. Head (Max): 15m MOC: CI Motor: 1.5KW/2HP Voltage: 380VAC, Hz:50Hz Brand: Grampus/Eqv Origin: Taiwan	02 nos
3.	Roots Air Blower	Capacity: 100m ³ /Hr Pressure: 6000mmAq Motor: 3.7KW (5HP), Voltage: 380VAC Noise Level: 70dB Time Duty: Continuous Brand: Trundean/Goldentech/Eqv Origin: Taiwan	02 nos (1w + 1s)
4.	Coarse Bubble Air Diffuser (Disk Type)	Disk Type Diffuser, Size: 6" MOC: EPDM Connector: 1"/3/4 " NPT Male Threat Bubble Size: 4-5 mm Design Flow: 1-5 m ³ /Hr Flow Range: 6-10 m ³ /Hr SOTE: =10% (06 m Submerged) Brand: Trundean/Greatch/Holly Origin: Taiwan	15 pcs
5.	Agitator /Mixer For Flash & Flocculation Tank	Type: Spiral Installation: Horizontal Output RPM: 100 & 20 Motor Power: 1.0HP Motor RPM: 1450 Shaft Height: 10' Blade Size: 4" Qty of Blade: 01 Brand: Germana Viem Electric/Eqv. Origin: Taiwan	2nos

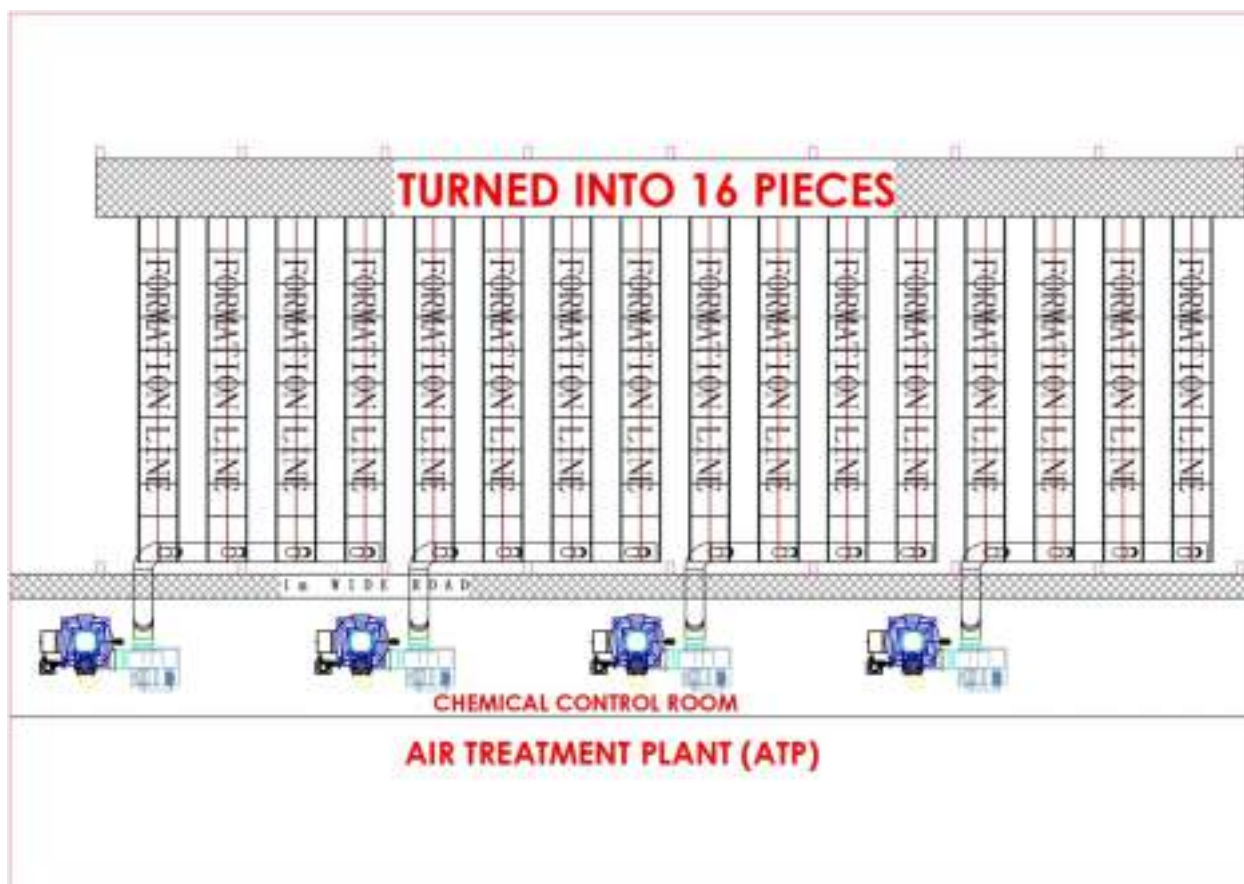
6.	Agitator/ Chemical Stirrer Machine	Type: Spiral Installation: Horizontal Output RPM: 155 Motor Power: 1HP Motor RPM: 1450 Shaft Height: 10' Blade Size: 4" Blade Qty: 01 Brand: Germana Viem Electric/Eqv. Origin: Taiwan	3nos
7.	PAC -1 Dosing Pump	Capacity: 350LPH & 1000LPH MOC – PVC/SS304 Pressure (Max):3.5 - 5/7 Bar Head: EPDM/Eqv, Seal: FPM/Eqv Power: 0.4KW/1HP Voltage: 220VAC/380VAC Brand: Seko/EMEC/HT Origin: Italy/Taiwan	02 nos (1w + 1s)
8.	Polymer Dosing Pump	Capacity: 20LPH MOC – PVC Pressure (Max): 7 Bar Head: EPDM/Eqv/PVC, Seal: FPM/Eqv/PVC Power: 0.4KW/1HP Voltage: 220VAC/380VAC Brand: Seko/EMEC Origin: Italy	02 nos (1w + 1s)
9.	Primary Clarifier	Type : plan clarifier type Internal MOC: PVC internal pipe, fittings, and standard accessories etc.	1set
10.	Filter Feed Pump (Centrifugal)	Capacity: 6.0m ³ /Hr Head (Max): 30 meters Type : Centrifugal, MOC - CI Motor: 2.0kW (3HP) Voltage: 380VAC Brand: Willo/Jhonson/Eqv Origin – Germany/India	02 nos (1w + 1s)
11.	Multigrade Sand Filter (MF) Pipe works & Media	Vesel Size: (Dia 800 x HOS-1828) mm MOC: FRP Frontal & inner Pipe works, fittings and Valves etc PVC Pipe Size – 2” , Origin – ERA, China Multiport Valve or Ball Valve: Size -2” Media: Filtering mesh Sand, Gravels & Pebbles Origin: BD	01 set

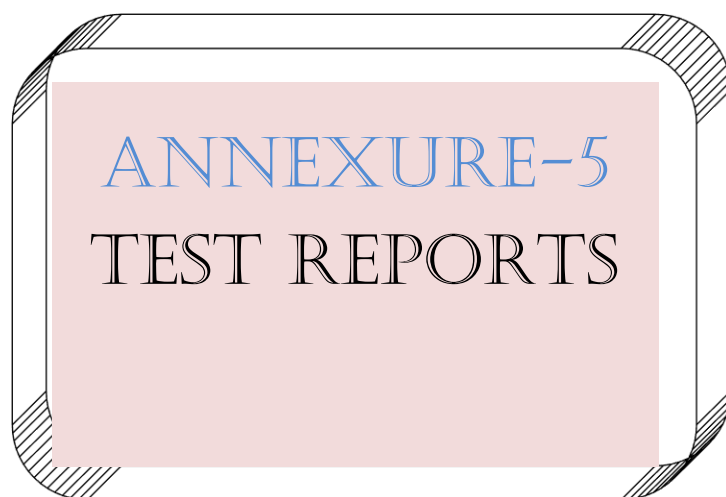
12.	Activated Carbon Filter (ACF) Pipe works & Media	Vessel Size: (Dia 900 x HOS-1828) mm MOC: FRP Frontal & inner Pipe works, fittings and Valves etc PVC Pipe Size – 2", Origin – ERA, China Multiport Valve or Ball Valve: Size -2" Media: Activated Carbon, Gravels & Pebbles Origin: BD	01 set
13.	Water Flow Meter	Type: Electromagnetic Flow meter (Flange Type) Size : 2" & 3" Flow Range: 0-50m ³ /Hr. MOC: CI Brand: Techange/ Mecon (Germany Brand) Origin: China/Taiwan (Assemble)	2Pcs
14.	Sludge Transfer Pump	Type : Submersible (Cutter) Capacity : 3.0m ³ /Hr Head (Max) : 15m Power : 380VAC, MOC : CI Brand : Grampus/HT/ALGO/Eqv Origin : Taiwan/India/Eqv	1no
15.	Electric Control Panel Board	MPCB, MCCB, MC, Phase Failure, Multi Meter, CT, Bus Bar, Emergency Switch, Push Switch, Selector Switch, Indication Lamp, RT Fuse, Connector Base Etc. Metal clad type Three phase 400 V, ±5% v, 50 Hz, Automatic indicator	1no
16.	Pipe & Fittings	All pipe lines for Aeration & Equalization Tank and inter connecting Valves, Flanges, with all other Accessories Tank Outer/External Pipe MOC : GI/MS (Epoxy Painted) Tank Inner/Internal Pipe MOC : PVC (Lira Class D), Fittings : PVC (ERA-China) Valves : KITZ -Japan	1 Job
17.	CHEMICAL DOSING TANK	Chemical Dosing tank : PVC Capacity – 500Liter MOC – PVC (White Colour) Origin : Gazi/Madina –BD	2nos
18.	CHEMICAL DOSING TANK	Chemical Dosing tank : PVC Capacity : 500Liter -1pc & 500Liter-1pc MOC – PVC (White Colour) Origin : Gazi/Madina –BD	2nos
19.	Sludge Drying Bed (Sludge Management)	Type -Sludge drying Bed With Pebbles , Gravels and Mesh Sand etc. Origin : BD	2set

20.	Erection & Commissioning Works	Erection & Commissioning Works Install All Pump, Blower & Machines Cutting, Welding & Joining All Pipe & Fittings. Complete Setup Filtration System	1 Job
21.	Inter Connecting Pipe Works	PVC Pipe : Class D grade PVC fittings: ERA – China MS/GI pipe : GI/MS – Korea Butterfly Valve : KITZ – Japan	1 Job











AIR QUALITY PARAMETERS ANALYSIS REPORT

Report No. : GECL/JBT/AQP/2026/026
 Name of the Client : JAYANA BATTERY TECHNOLOGIES
 Project location : Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur
 Name of Sample : Air Quality Parameters
 Sampling date : 14-15 September 2026
 Reporting Date : 25 September 2026

Table 1: Results of Ambient Air Quality Sampling Location & GPS Coordinate

Air sampling points	Address	GPS Coordinate
Air sampling point-1 (ASP-1)	Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur	25°50'11.1"N, 89°10'21.4"E
Air sampling point-2 (ASP-2)	Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur	25°50'11.7"N, 89°10'34.7"E
Air sampling point-3 (ASP-3)	Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur	25°50'11.4"N, 89°10'09.9"E
Air sampling point-4 (ASP-4)	Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur	25°50'14.3"N, 89°10'51.4"E

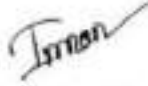
Table A: Test Results of Air Quality Parameters at Four Air Sampling Points

Air quality Parameters	Unit	Air sampling point-1 (ASP-1)	Air sampling point-2 (ASP-2)	Air sampling point-3 (ASP-3)	Air sampling point-4 (ASP-4)	Air quality Standard as per APCR 2022
PM ₁₀	µg/m ³	61	58	57	62	150
PM _{2.5}		30	29	27	31	65
NO _x		18	15	13	14	80
SO ₂		9	10	11	12	80
CO		541	621	517	419	5000
Pb		0.01	0.01	0.01	0.01	0.5
O ₃		18	22	23	17	100
NH ₃		8	10	8	7	400

Equipment Used Details: - This ambient air monitoring report was usually accomplished by - High Volume Sampler (APN 127) and Equipment calibrated by NABL Accredited Lab.

Comment: The four air samplings were carried out from Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur and its adjacent area of JAYANA BATTERY TECHNOLOGIES project. The level of PM_{2.5} and PM₁₀ have determined from air collected sample for further analysis by gravimetric method. Glass fibre filter were using for the determination of PM_{2.5} and PM₁₀. Gaseous pollutants and lead in PM_{2.5} & PM₁₀ were determined UV-visible spectrophotometers and AAS respectively. HNO₃ and HClO₄ are used for digestion of filter paper. The high-volume sampler has been using for collecting air within a certain period of time. The values of gaseous pollutants including lead metal & PM₁₀ and PM_{2.5} were showed in the above-mentioned table. It is observed that the concentrations of gaseous pollutants including lead metal and PM₁₀ and PM_{2.5} were below the allowable ambient limit as per ambient air quality standard (APCR 2022), Bangladesh Standard.


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A House of Environmental Monitoring, Research, Polluted Control, Management & Development



NOISE LEVEL ANALYSIS REPORT

Report No. : GECL/JBT/NI/2025/027
 Name of the Client : JAYANA BATTERY TECHNOLOGIES
 Project location : Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur
 Name of Sample : Noise Level report
 Sampling date : 14-15 September 2025
 Reporting Date : 25 September 2025

Table: Results of Ambient Noise Sampling Location and GPS Coordinate.

Address of noise level monitoring	Noise level point for sampling- Day -Night	GPS -Coordinate
Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur	Noise Sampling point (NSP-1)	25°50'11.1"N 89°10'21.4"E
	Noise Sampling point (NSP-2)	25°50'11.7"N 89°10'34.7"E
	Noise Sampling point (NSP-3)	25°50'11.4"N 89°10'09.9"E
	Noise Sampling point (NSP-4)	25°50'14.3"N 89°10'51.4"E
	Noise Sampling point (NSP-5)	25°50'08.1"N 89°10'24.1"E
	Noise Sampling point (NSP-6)	25°50'07.4"N 89°10'21.5"E
	Noise Sampling point (NSP-7)	25°50'08.0"N 89°10'19.2"E
	Noise Sampling point (NSP-8)	25°50'11.9"N 89°10'20.9"E

Table C: Results of Ambient Noise levels at Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur

Table 3: Results of Ambient Noise levels at Grid 1 (Anapara, Chakashi, Doroi, Gangachara, Rangpur)											
Parameters	Unit	Noise level at Day-night								Noise Standard as per Noise pollution control rule 2025 (Day-Night time)	
		NSP-1	NSP-2	NSP-3	NSP-4	NSP-5	NSP-6	NSP-7	NSP-8		
Noise level	dB(A) at Night Time	52.9	47.7	49.0	48.0	42.3	45.1	40.3	41.8		
	dB(A) at Day time	56.5	51.2	53.2	52.1	46.2	48.3	44.1	45.2		
Bangladesh (DoE) standard as per Noise pollution control rule 2025										Day	Night
Industrial area										75	70
Commercial Area										70	60
Mixed Area										60	50
Residential Area										55	45
Silent area										50	40
World Bank/IFC Standard										Day	Night
Industrial										70	
Residential, Institutional, Educational										55	

All units are in (LA_{eq}) dBA, note: This noise data was usually accomplished by – Lutron Sound Level Meter (Model – 4012)

Comments: According to Noise pollution control rule 2025 ("SRO no 452-law/2025"), the noise level of mixed and residential area has been considering 60 and 55 dBA (day time- 7 am to 9 pm) day time and 50 and 45 dBA (day time- 9 pm to 7 am) night time as per noise pollution control rule 2025. The noise levels were measured at the pre-construction stage of JAYANA BATTERY TECHNOLOGIES project area. The noise levels were found between mixed area & residential area as per standard of Noise pollution control rule 2025 at day -night time.

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A House of Environmental Monitoring, Research, Pollution Control, Management & Development



GROUNDWATER QUALITY ANALYSIS REPORT

Report No. : GECLUST/GWI/2026/024
 Name of the Client : JAYANA BATTERY TECHNOLOGIES
 Project location : Uttar Panspukur, Okrabari, Borobil, Gangachara, Rangpur
 Name of Sample : Groundwater quality parameters
 Sampling date : 14-15 September 2026
 Reporting date : 26 September 2026

Table: Groundwater quality Sampling Location and GPS Coordinate.

SN	Name of samples	Sampling Code	GPS Coordinate
01	Deep tube well water (Groundwater)	GW-1	25°50'08.4"N 89°10'21.6"E
02	Deep tube well water (Groundwater)	GW-2	25°50'08.4"N 89°10'20.3"E
03	Deep tube well water (Groundwater)	GW-3	25°50'10.6"N 89°09'59.9"E
04	Deep tube well water (Groundwater)	GW-4	25°50'09.9"N 89°09'54.2"E
05	Deep tube well water (Groundwater)	GW-5	25°50'09.0"N 89°09'46.5"E
06	Deep tube well water (Groundwater)	GW-6	25°50'11.9"N 89°10'21.7"E

Table A: Test Results of Groundwater (deep tube well) quality parameters

Groundwater quality parameters	Unit	GW-1	GW-2	GW-3	GW-4	GW-5	GW-6	Drinking water quality Standard as per ECR 2023	WHO Standard 4 th edition (Guidelines for Drinking Water 2011)
pH	-	7.21	7.14	7.26	7.17	7.12	7.2	6.5-8.5	6.5-8.5
Total Dissolved Solids (TDS)	mg/L	132	113	106	111	123	121	1000	1000
Arsenic	mg/L	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01
Manganese	mg/L	0.013	0.014	0.017	0.017	0.012	0.017	0.04	0.08
Hardness as CaCO ₃	mg/L	125	134	83	104	107	106	500	-
Iron	mg/L	0.11	0.10	0.12	0.21	0.18	0.12	0.3-1.0	0.3
Fecal Coliform	CFU/100ml	0	0	0	0	0	0	0	-
Total Coliform	CFU/100ml	0	0	0	0	0	0	0	-

Chloride*= Standard level of Chloride for groundwater of sea area is 1000 mg/l as per ECR 2023.

Comments: Groundwater has been collected from own deep tube well of at Anandabazar and Existing Khulshi Substation Project. The selected parameters were determined by different analytical methods. The concentration of ground water parameters was within the limit of standard for drinking water quality as per ECR 2023, Department of Environment (DOE), Bangladesh. This water may be used as potable water to labours.

Md Mosharraf Hossain
Technician & sample Collector
Global Environment Consultant Ltd
(GECL)

Md Imran Hossen Shagor
Senior Environmental Engineer
Global Environment Consultant Ltd
(GECL)

Md Golam Mostafa
Chief Executive Officer
Environmental Analysis and Development
Global Environment Consultant Ltd
(GECL)

A House of Environmental Monitoring, Research, Pollution Control, Management & Development

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Report No. : GECL/JBT/SW/2026/025
 Name of the Client : JAYANA BATTERY TECHNOLOGIES
 Project location : Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur
 Name of Sample : Surface water (Pond and river water) Quality Parameters
 Sampling date : 14-15 September 2026
 Reporting Date : 24 September 2026

SURFACE WATER QUALITY ANALYSIS REPORT

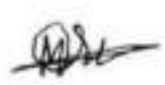
Table: Surface water quality Sampling Location and GPS Coordinate

SN	Name of samples	Code	GPS Coordinate
01	Ghaghat River Water (Upstream)	River water -1	25°50'24.9"N 89°09'25.8"E
02	Ghaghat River Water (Downstream)	River water -2	25°49'51.8"N 89°09'33.6"E
03	Surface water sampling point-1	SWSP-1	25°50'10.6"N 89°10'26.3"E
04	Surface water sampling point-2	SWSP-2	25°50'11.3"N 89°10'21.7"E
05	Surface water sampling point-3	SWSP-3	25°50'10.4"N 89°10'29.1"E
06	Surface water sampling point-4	SWSP-4	25°50'10.9"N 89°10'19.4"E

Table: Test Results of surface and River water quality parameters

Surface water quality Parameters	Unit	SWSP-1	SWSP-2	SWSP-3	SWSP-4	River water -1 (Upstream)	River water-2 (Downstream)	Surface water quality Standard as per ECR 2023
pH	-	7.22	7.12	7.20	6.98	7.13	7.10	6-9
Suspended Solid (SS)	mg/L	1.5	1.6	1.9	1.9	2.1	2.2	100
Dissolved Oxygen (DO)	mg/L	4.5	4.1	4.3	4.9	4.8	4.7	>6
Chemical Oxygen Demand (COD)	mg/L	38	39	33	24	29	28	200
Biological Oxygen Demand (BOD)5 days	mg/L	14	17	13	12	11	12	30
Temperature	°C	23.6	23.5	23.4	23.8	22.8	22.7	>5°C

Comments: Four surface waters have been collected from different ponds and two waters have been collected from Ghaghat River (upstream and downstream) near JAYANA BATTERY TECHNOLOGIES project area during the pre-construction stage. Approved analytical methods have been followed for the above surface water quality parameters. The concentration of water quality parameters is within the acceptable limit as per surface water quality standard of ECR 2023.


 Md Mosharraf Hossain
 Technician & sample Collector
 Global Environment Consultant Ltd
 (GECL)


 Md Imran Hossen Shagor
 Senior Environmental Engineer
 Global Environment Consultant Ltd
 (GECL)


 Md Golam Mostafa
 Chief Executive Officer
 Environmental Analysis and Development
 Global Environment Consultant Ltd
 (GECL)



Date: 07/09/2026

Record No: 22.02.8500.253.072.011.25.1

Subject: Approval of Terms of Reference (ToR) for the EIA of Jayana Battery Technologies at Uttarpanapukur, Okrabari, Borobeel, Gnagachhara, Rangpur

Reference: The 542nd Meeting Minutes

With reference to the subject mentioned above, the Department of Environment hereby gives approval of the Terms of Reference (ToR) for Environmental Impact Assessment (EIA) of **Jayana Battery Technologies** at Uttarpanapukur, Okrabari, Borobeel, Gnagachhara, Rangpur, subject to fulfilling the following terms and conditions:

- A. The project authority shall conduct a comprehensive Environmental Impact Assessment (EIA) considering the overall activity of the said project in accordance with the ToR submitted to the Department of Environment (DoE). The EIA study shall be conducted as per the provisions laid down in the Environmental Conservation Rules, 2023.
- B. The EIA report shall be prepared in accordance with the guidelines provided in Schedule-11 and Rules-15, 16 of the ECR, 2023.
- C. Multidisciplinary experts are required in the study team to prepare the EIA report.
- D. Consultation with Stakeholders/Public Consultation should be done in accordance with Rule 16 of the Environmental Conservation Rules, 2023.
- E. Hence, the Department of Environment issues additional ToR to include in the EIA as follows:

Environmental and Social Baseline information should include:

Project site-specific micro-meteorological data including temperature, humidity, wind speed & direction and rainfall;

Surface water quality of the nearby river (100 meters upstream and downstream of the discharge point) and other surface drains at 8 locations;

Noise level monitoring at 8 (eight) locations within the study area.

Detailed description of flora and fauna existing in the study area with special reference to rare, endemic and endangered species.

Socio-economic status of the study area.

Methodology for Data Collection:

One season (non-monsoon) baseline survey will be carried out for data collection

Sampling locations will be indicated on the location map

The testing methods and instruments to be used shall be clearly specified

Anticipated Environmental and Social Impacts due to the project shall be

Identified and assessed for their magnitude:

Water Quality (Surface & ground water)

Hazardous waste

Noise

Offensive Odor

Flora and fauna

Livelihoods, community health and safety, vulnerable groups and gender issues

Production Process, Pollution Source, Environmental Mitigation, Management and Monitoring Plan shall include:

Detailed description of the complete Lead Acid Battery manufacturing process, including raw material handling (lead ingot, lead oxide, sulphuric acid, separators, etc.), paste preparation, grid casting, plate curing, assembly, acid filling, formation, finishing, and recycling operations. The process flow diagram shall clearly indicate a closed production system and identify all potential source points of pollution load (air emissions, wastewater generation, solid and hazardous waste).

Comprehensive list of plant and machinery/equipment used in each manufacturing unit (e.g., lead melting furnace, oxide mill, paste mixer, curing chamber, formation tanks, acid storage tanks, battery assembly line, recycling unit, etc.) along with a detailed layout plan showing individual unit, pollution control devices, material flow, and designated hazardous waste storage areas.

Detailed description of the Air Pollution Control Systems (APCS) installed, such as bag filters, cartridge filters, wet scrubbers, mist eliminators, and fume extraction systems, specifically designed to control lead dust, lead fumes, and acid mist. The system shall ensure that no emission of lead/lead fumes/acid fumes escapes into the ambient air and complies with applicable emission standards. Monitoring and maintenance protocols shall also be described.

Installation of a continuous SO₂ monitoring system inside the plant, particularly in lead melting, refining, and formation areas, with provisions for real-time monitoring, alarm systems, data logging, and compliance reporting to the DoE.

Detailed plan for treatment of wastewater generated from various plant operations (formation process, washing, floor cleaning, scrubber blowdown, etc.), including collection, segregation, neutralization, heavy metal removal, and treatment through an Effluent Treatment Plant (ETP). Provisions for recycling and reuse of treated wastewater within the plant shall be described. Facilities for safe handling, treatment, and reuse/recycling of lead-bearing sludge (Pb sludge) for authorized purposes must be included.

Treatment of wastewater from different plant operations, the recycling and reuse of wastewater, Pb sludge reuse facilities for different purposes shall be included. In the EIA report, information regarding ETP and STP should be included following Schedule 12 of the Environmental Conservation Rules, 2023.

The Occupational Health and Safety Plan should include:

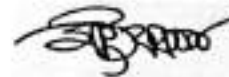
A comprehensive assessment detailing workers' exposure to specific occupational health and safety hazards associated with lead-acid battery manufacturing, including chemical, physical, and ergonomic risks.

A clearly defined plan, supported by adequate budget allocation, outlining the measures, resources, and responsibilities necessary to ensure the occupational health and safety of all employees.

An annual health status report of all workers, with particular emphasis on occupational health indicators, exposure monitoring results, and OHS-related medical surveillance

findings.

- F. As per Rule 16 of the ECR'23, a soft copy of the draft EIA report shall be sent to the DoE (mimshameem@gmail.com and nrahmanasir@gmail.com) in order to publish the report on the DoE's website for public comments.
- G. The project authority shall submit the final EIA report to the Head Office of DoE in Dhaka.
- H. Without approval of the EIA report by the Department of Environment, the project authority shall not make any land and infrastructure development.



07-09-2026

Masud Iqbal Md Shameem

Director

222218342

direc@doe.gov.bd

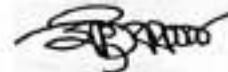
K.M. REIDWANUL BARI ZION, Managing Partner
Jayana Battery Technologies, Uttar Panapukur, Okrabari, Borobil, Gangachara, Rangpur
01764812354, kazolshafiar@gmail.com.

Record Number: 22.02.8500.253.072.011.25.1/1 (1)

Date: 07/09/2026

A Copy for has been sent consideration and necessary (if applicable) action :

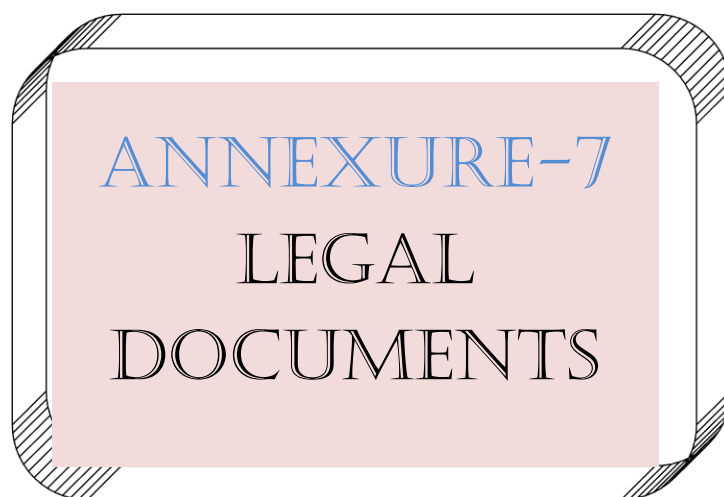
1. Deputy Director, Department of Environment, Rangpur District Office, Rangpur.



07-09-2026

Masud Iqbal Md Shameem

Director





৩নং বড়বিল ইউনিয়ন পরিষদ

ডাকঘরঃ উত্তর পানাপুকুর, পোতাঃ গংগা চড়া, জেলাঃ রংপুর।

ট্রেড লাইসেন্স

লাইসেন্স নং : BBUP-20250112-1432 লাইসেন্স ইস্যু তারিখ : ১৩/৭/২০২৫
অর্থ বছর : ২০২৫ - ২০২৬ ওয়ার্ড নং : ৯

স্থানীয় সরকার (ইউনিয়ন পরিষদ) আইন, ২০০৯ এর ৬৬ ধারার ক্ষমতা বলে প্রণীত আদর্শ কর তফসিল, ২০১৩ এর ১৭ ধারা অনুসারে নিম্নবর্ণিত প্রতিষ্ঠান/ব্যক্তির অনুকূলে এই লাইসেন্স ইস্যু করা হলো।

প্রতিষ্ঠানের নাম : জায়ানা ব্যাটারি টেকনোলজিস
প্রোপাইটর/মালিক : কে এম রিদওয়ানুল বারী জিয়ন এবং জোয়াহিরিয়া মোস্তারী
পিতার নাম : কাজী মোঃ শরিফুল্লাহমান এবং মোঃ জোনায়েদ চৌধুরী
মাতার নাম : মোছাঃ নীলুফার ইয়াসমিন এবং মোছাঃ জেসমিন আক্তার
এনআইডি/জ.নি.নং : ৬৪২৩৪৫৮১৮৮, ৬০০০৫০২৭৯৬
স্থায়ী ঠিকানা : গ্রামঃ ধামুর বোল্লার পাড়, উপজেলাঃ গংগাচড়া, জেলাঃ রংপুর
ব্যবসার স্থান : উত্তর পানাপুকুর ওকড়াবাড়ী, বড়বিল, গংগাচড়া, রংপুর
দোকান/হোডিং নং : মোবাইল নং-০১৭১৪৬০৫৩০৩ এবং ০১৭৫১৭১৯৩৭৪
ব্যবসার বিবরণ : ব্যাটারী প্রস্তুতকরন
লাইসেন্সের প্রদেয় টাকা :

হাল	বকেয়া	অগ্রিম/অনুল	কাট	সর্বমোট
২০০.০০	০.০০	০.০০	০০.০০	২০০.০০

এই ট্রেড লাইসেন্স এর মেয়াদ ২০২৬ সালের ৩০ জুন পর্যন্ত বলবৎ থাকবে।



১৬/০৭/২০২৫
ইউপি প্রশাসনিক কর্মকর্তা
৩নং বড়বিল ইউনিয়ন পরিষদ
গংগাচড়া, রংপুর।

স্বাক্ষরিত কর্তৃক
প্রশাসনিক কর্মকর্তা
৩নং বড়বিল ইউনিয়ন পরিষদ

উল্লেখ্য যে, যদি কোন ব্যক্তি/ব্যক্তির ইচ্ছা করে এই লাইসেন্স প্রদান করা হয়।
কিন্তু না করিয়া এই লাইসেন্স প্রদান হয়।

KE REIDWANUL BARI ZION
Member & CEO
Jayana Battery Technology

৩নং বড়বিল ইউনিয়ন পরিষদ

গংগাচড়া, রংপুর।
মোঃ সামছুল হক
চেয়ারম্যান

৩নং বড়বিল ইউনিয়ন পরিষদ
উল্লেখ্য যে, যদি কোন ব্যক্তি/ব্যক্তির ইচ্ছা করে এই লাইসেন্স প্রদান করা হয়।
কিন্তু না করিয়া এই লাইসেন্স প্রদান হয়।

জাতীয় পরিচয়পত্র / National ID Card



কে, এম রিদওয়ানুল বারী জিয়ন

K.M. REIDWANUL BARI ZION

কাজী মোঃ শরিফুজ্জামান

মোহাঃ নীলুগর ইয়ামগিন

Date of Birth: 15 Feb 1992

(१९७८) विद्युत्पादन

NID No

642 345 8188



ঠিকানা: বাসা/হোষ্টিং - , গ্রাম/রাপা: ধামুর বোল্লার
পাড়, ধামুর, ডাকঘর: গদাচড়া - ৫৪১০, গংগাচড়া,
বংপুর

Place of Birth: RANGPUR

Pran
KM DEWANDA BARIJON
 Managing Director & CEO
 Jayana Battery Technologies

Issue Date: 13 Aug 2021

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ZION<<KM<REIDWANUL<BARI<<<<<<



Ref No: BR-30Jul2025-00006

Date: 31 August, 2025

Subject: Registration of Proposed industrial project under the title JAYANA BATTERY TECHNOLOGIES

Dear Sir/ Madam,

With reference to your application received on 31.08.2025 concerning the above subject, I am pleased to confirm that your proposed industrial project has been duly registered with the Bangladesh Investment Development Authority (BIDA). The Registration number for this project is **L-202508310016850-RR** and the particulars of the terms and conditions of which are appended.

If we could be of any further assistance to you, please do not hesitate to call our service center representative who could be reached at telephone # +880255007241

In the meantime, we would like to take this opportunity to extend our best wishes to you in your future endeavors.

Your Faithfully

(Sunil Kumar Adhikary)
Director

Phone: 44826786
Email: dir.aftercare@bida.gov.bd

K. M Reidwanul Bari Zion
Managing Partner
JAYANA BATTERY TECHNOLOGIES
H-44, Asa Center, R-2/A, Jagata, Dhanmondi, Dhaka-1209



Copy forwarded for information and necessary action (Not according to seniority):

1. Director General, Department of Environment, Poribesh Bhaban, Sher-e-Bangla Nagar, Dhaka
2. Registrar, Registrar of Joint Stock Companies & Firms, TCB Bhaban, Karwan Bazar, Dhaka
3. General Manager, Statistics Department, Bangladesh Bank, Motijheel, Dhaka
4. Chairman, National Board of Revenue, Segunbagicha, Dhaka
5. Commissioner, Customs Bond Commissionate, Segun Bagicha, Dhaka
6. Chief Controller, Office of The Chief Controller of Imports & Exports (CCI&E), Level 15, National Sports Council Tower, Palton, Dhaka

KM REIDWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

Bangladesh Investment Development Authority, Plot # E-6/1, Agargaon, Sher-E-Bangla Nagar, Dhaka-1207.
Phone : PABX 88-02-55007241-5, Fax : 88-02-55007238, E-mail : info@bida.gov.bd, Web : www.bida.gov.bd

To verify the authenticity of the approval copy, please scan the QR code & log on to <https://bidaquickserve.org> Document Generated Time: 8/31/2025, 1:42:00PM

This Industrial Project is registered with BIDA on the basis of the following information submitted by the investor's



Registration No : L-202508310016850-RR

Dated: 31 August, 2025

1. Name of the Organization: JAYANA BATTERY TECHNOLOGIES
2. Title of the Registered Project: JAYANA BATTERY TECHNOLOGIES
3. Office address: H-44, Asa Center, R-2/A, Jagatala, Dhanmondi, Dhaka-1209
4. Factory Address: Uttar Panapukur, Okrabari, Borobol, Gangachara, Rangpur-5410
5. Type of industry: (27101) Manufacture of power generators (except battery charging alternators for internal combustion engines), motor generator sets (except turbine generator set units)
6. Date of Commercial Operation: 01 December, 2025

Product Name	Quantity/ Pieces	Sales Value
Battery	36000 (Piece)	432 Taka (Million)

8. Sales: Local 80%, Foreign 20%

9. Investment (Taka in Million):

SL	Description	Value (Million)
1	Land	1.5 Taka (Million)
2	Building	5 Taka (Million)
3	Machinery & Equipment	5 Taka (Million)
4	Others	0 Taka (Million)
5	Working Capital	7 Taka (Million)
Total Investment (BDT)		18.50000 Taka in Million (18500000.00 Taka)

10. Equity (Taka in Million):

1	Local Equity	18.5 Taka (Million)	100.00% of total equity
2	Local Loan	0 Taka (Million)	
3	Foreign Loan	0 Taka (Million)	
Total Financing (BDT)		18.50000 Taka in Million (18500000.00 Taka)	

11. Number of Employee: Local 280 Persons, Foreign 12 Persons, Total 292 Persons.

12. Principal Promoter's Information:

Name: K. M Reidwanul Bari Zion, Country: BANGLADESH

Address: H-44, Asa Center, R-2/A, Jagatala, Dhanmondi, Dhaka-1209

13. List of share holders/Directors (Please see the enclose)



K. M. Reidwanul Bari Zion
K. M. REIDWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

K. M. Reidwanul Bari Zion
K. M. REIDWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

(Sunil Kumar Adhikary)
Director
Phone: 44826786
Email: dir.afterscare@bida.gov.bd



Registration No : L-202508310016850-RR

Dated: 31 August, 2025

1. As per the industrial policy the sub-sector is neither in the reserved list nor discouraged list. Therefore the proposal of the project may be registered on the following conditions:

Investors should be aware that:

(a) They are free to procure infrastructural and other services/utilities (including environment clearance) needed for the implementation and operation of their projects directly from the concerned agencies/departments. Alternatively, the BIDA will also assist investors in obtaining requisite services/utilities from the concerned government agencies/departments on request from your company. In this connection, investors shall have to contact the BIDA Utility services cell.

(b) BIDA is ready to assist/provide a range of services, including advice, information and clarification on a range of investment related issues, government policies procedures and regulations.

(c) The project, eligible for various tax incentives, as articulated in the government's industrial and economic policies and in public notices issued from time to time by relevant government agencies, may obtain copies from BIDA Utility Services Cell.

(d) Certain products are required to conform to standards established by the Bangladesh Standards & Testing (BSTI), prior to marketing. Please check your product standard.

2. Investors shall have to follow/take the under mentioned conditions/measures:

3. You shall have to take necessary safety measures as per Factories Act, 1965.

4. You shall have to import the machinery, spare parts and raw materials as per existing import policy order of the Government.

5. You shall have to arrange sufficient fire fighting equipments as safety measure to the project.

6. You shall have to obtain necessary clearance from the Department of Environment before implementation of your project.

7. A half yearly project performance report (PPR) in prescribed format must be submitted on or before 30th June and 31st December every year till the project goes into commercial operation/production. After commencing commercial operation/production an annual PPR must be submitted by 31st December every year through OSS portal.

8. You shall have to arrange preservation of rain water for using in your factory to reduce pressure on ground water.

9. You shall have to take prior permission from BIDA in case of any amendment of this registration letter including ownership or location of the project.

10. Any effluent of the industrial unit should not be discharged into the river connecting lake or general water reservoir without proper treatment.

11. You shall have to provide/create the following facilities, if applicable;

(a) Day care center (b) Maternity leaves

(c) Low cost & safe housing facilities for the low paid female works, near & around the establishment

(d) Equal pays & allowance for male & female workers in your organization

(e) Low priced canteen for workers

(f) Enact effective rules of conduct to enable working atmosphere among the male & female workers.

You shall not be allowed to do any business/trade other than services at column No. 7 under this registration.

13. You shall have to abide by the guidelines of the government in case of employment of expatriate personnel in your project.

* You shall have to market 80% and export 20% of your products

* You shall have to implement your project within 01 December, 2025

14. As per decision of National Disaster Management Council a disaster response team along with contingency plan will have to be made and required equipment will have to be procured.

The Bangladesh Investment Development Authority reserves the right to cancel the registration of the investment if any of the above conditions or any part of the conditions is violated. You are requested to mention Registration Number in all your future correspondence with BIDA



R. Z. H.
KM REIDWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

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KM REIDWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

Sunil Kumar Adhikary

(Sunil Kumar Adhikary)
Director

Phone: 44826786

Email: dir.af@reare@bida.gov.bd

Bangladesh Investment Development Authority, Plot # E-6/B, Agargaon, Sher-E-Bangla Nagar, Dhaka-1207.
Phone : PABX 88-02-55007241-5, Fax : 88-02-55007238, E-mail : info@bida.gov.bd, Web : www.bida.gov.bd

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ক্রমিক নং

জরুরী প্রয়োজনে ফায়ার সার্ভিস :
গংগাচড়া ফায়ার স্টেশন :
মোবাইল নং- ০১৯০১-০২৩২৩৭



আন.বর্গ ০০৩
প্রথম সংকরণ ২০১২

ফায়ার লাইসেন্স

V= ০১

P= ৬৬

লাইসেন্স নম্বর

এ ডি / ১২ / ০ ০ ৬ ৬ / ২ ০ ২ ৫

এতদ্বারা অগ্নি প্রতিরোধ ও নির্বাপন আইন ২০০৩ এর ৪ ধারা অনুযায়ী এবং অপর পৃষ্ঠায় উল্লিখিত শর্তাবলী বাস্তবায়ন সাপেক্ষে ফায়ার লাইসেন্স ইস্যু করা হইল।

১। মালিকানা/কারখানার মালিক/ব্যবহারকারী/কর্তৃপক্ষের নাম, পদবী ও ঠিকানা :

প্রতিষ্ঠানের নামঃ জায়ানা ব্যাটারী টেকনোলজিস

লাইসেন্সধারীর নামঃ কে এম রিদওয়ানুল বারী জিয়ন এবং জোয়াইরিয়া মোস্তারী

উত্তর পানাপুকুর ওকড়াবাড়ী, বড়াবল, গংগাচড়া, রংপুর।

ফোন : ফ্যাক্স : ই-মেইল :

২। মালিকানা/কারখানার অবস্থান : (ক) প্লট নং/হোতা নং.....

(খ) মাপ নং..... (গ) বর্তমান নং..... (ঘ) জে এল নং.....

(ঙ) মৌজা..... (চ) রোড নং..... (ছ) ডাকঘর.....

গংগাচড়া গংগাচড়া রংপুর
(জ) থানা..... (ঝ) উপজেলা..... (ঞ) জেলা.....

৩। ভবনের ব্যবহার শ্রেণী : জি-০১

৪। ভবনের নির্মাণ শ্রেণী ও পরিমাণ : সেমিপাকা।

শ্রেণী-১	শ্রেণী-২	শ্রেণী-৩	দৈর্ঘ্য	প্রস্থ	উচ্চতা	মোট মেঝের ক্ষেত্রফল (বর্গ মিটার)
						১৮০০০ বর্গফুট

Pan 282
KM REIDWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

স্মারক নম্বর : ০৪.৪৪.৮৪০০.০১০.০০.০০০০.২৬- ৬৬৮(৮)

তারিখ : ০২ জুন ১৪০২
১৬ জুন ২০২৬

প্রাপক : ব্যবস্থাপনা পরিচালক
আওয়ান ব্যাটারী টেকনোলজিস
ঠিকানা- উত্তর পানাপুকুর, গংগাচড়া, রংপুর।

বিষয়: কৃষি জমি অকৃষি কাজে ব্যবহারের উদ্দেশ্যে ক্রয়ের অনুমতি প্রদান

সূত্র : ১। এ.এম. রিফাতুল্লাহ ব্যাটারী লিমিটেড কর্তৃক আবেদন।

২। উপজেলা নির্বাহী অফিসার, গংগাচড়া, রংপুর-এর পত্র ১৬/০১/২০২৪/বি। তারিখের ০১.০১.১৪২৭.০০০.০১.০৪১.২৪-১১৭১ নং স্মারক
৩। জেলা প্রশাসকের কার্যালয়, রংপুরের স্বাক্ষর শাখার মিসকেস নং- ২৪/২০২৪-২০২৪ এ পের ১২/০১/২০২৬/বি। তারিখের প্রসব
আদেশ মোতাবেক।

উপর্যুক্ত বিষয়ের পরিপ্রেক্ষিতে জানানো যাচ্ছে যে, আনব এ.এম. রিফাতুল্লাহ ব্যাটারী লিমিটেড, ব্যবস্থাপনা পরিচালক, আওয়ান ব্যাটারী টেকনোলজিস, ঠিকানা- উত্তর পানাপুকুর, গংগাচড়া, রংপুর; রংপুর জেলার গংগাচড়া উপজেলায় উত্তর পানাপুকুর মৌজার তফসিলভুক্ত ১.৪২৪০ একর কৃষি জমি অকৃষি কাজে ব্যবহারের জন্য ক্রয়ের অনুমতির জন্য সুপ্রোপ ১ নং স্মারকমূলে আবেদন করেন। উক্ত আবেদনের বিষয়ে সরেজমিন তদন্তপূর্বক রেকর্ডপত্র যাচাই করে প্রতিবেদন দাখিল করার জন্য উপজেলা নির্বাহী অফিসার, গংগাচড়া, রংপুরকে বলা হয়ে, তৎপ্রেক্ষিতে প্রতিবেদন দাখিল করেন। জরিপ দাখিলকৃত প্রাপ্ত প্রতিবেদনের আলোকে The State Acquisition and Tenancy Act, ১৯৫০ এর ২০(৩) ধারা মোতাবেক এবং কৃষি ব্যবস্থাপনা ম্যানুয়েল ১৯৯০ এর ১৬১ নং অনুচ্ছেদ অনুযায়ী এতদ্ব্যতীতের মানুশের কর্মসংস্থান সৃষ্টি ও সার্বিক অর্থনৈতিক উন্নয়নের স্বার্থে প্রতিষ্ঠানের পক্ষে ব্যবস্থাপনা পরিচালক, আওয়ান ব্যাটারী টেকনোলজিস, ঠিকানা- উত্তর পানাপুকুর, গংগাচড়া, রংপুরের অনুকূলে কৃষি জমি অকৃষি কাজে ব্যবহারের উদ্দেশ্যে প্রত্যাবৃত্ত ১.০২৪০ একর জমি ক্রয়ের অনুমতি সুপ্রোপ ০৩ নং স্মারকমূলে জেলা প্রশাসক, রংপুর মহোদয়ের কর্তৃক প্রদান করা হয়।

রংপুর জেলার গংগাচড়া উপজেলায় উত্তর পানাপুকুর মৌজার স্মারক নং- ৩০

স্মারক নং	স্মারক তারিখ	প্রতি	জমির পরিমাণ
১০০	২০৬৩	ঘলা	০.৪৭ একর
৭১৪	২০৪৮	ঘলা	০.০৮৪০ একর
১১৪০	২০৬৭	ঘলা	০.০৪ একর
২১২৪	২০৬৮	ঘলা	০.০৭ একর
২২০০	২০৬৪	ঘলা	০.০৪ একর
সর্বমোট জমির পরিমাণ=			১.০২৪০ একর

২. এমতাবস্থায়, উপর্যুক্ত মিসকেস নং- ২৪/২০২৪-২০২৪ এ পের ১২/০১/২০২৬/বি। তারিখের প্রসব আদেশ মোতাবেক এতদ্ব্যতীতের মানুশের কর্মসংস্থান সৃষ্টি ও সার্বিক অর্থনৈতিক উন্নয়নের স্বার্থে প্রতিষ্ঠানের পক্ষে ব্যবস্থাপনা পরিচালক, আওয়ান ব্যাটারী টেকনোলজিস, ঠিকানা- উত্তর পানাপুকুর, গংগাচড়া, রংপুরের অনুকূলে কৃষি জমি অকৃষি কাজে ব্যবহারের উদ্দেশ্যে প্রত্যাবৃত্ত তফসিল বর্ণিত ১.০২৪০ একর জমি ক্রয়ের ক্ষুদ্রাঙ্গক অনুমতি নিম্নোক্ত শর্তসাপেক্ষে নির্দেশক্রমে প্রদান করা হলো।

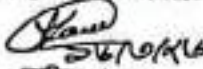
শর্তসমূহ :-

- ০১। এ অনুমতি অনুমোদনের তারিখ থেকে কার্যকর হইবে।
- ০২। তফসিলভুক্ত জমি ব্যবহারের জন্য আবেদনে যে সুস্পষ্ট প্রকৃতির উদ্দেশ্য বিবৃত হয়েছে সে উদ্দেশ্য ও প্রকৃতির পরিবর্তন অন্য কোন উদ্দেশ্য অনুমোদিত জমি ব্যবহার করা যাবে না।
- ০৩। যে ব্যক্তি/প্রতিষ্ঠান বস্তাবর অনুমতি প্রদান করা হয়েছে, অনুমতি প্রদানকারী পক্ষের পুনঃঅনুমতি ব্যতীত সে ব্যক্তি/প্রতিষ্ঠান ব্যতীত অন্য কোন ব্যক্তি/প্রতিষ্ঠান কর্তৃক তফসিলভুক্ত জমি ব্যবহার করা যাবে না।
- ০৪। আবেদিত জমিতে যাবতীয় প্রকল্পে পরিবেশ সংরক্ষণমূলক এবং পুষ্কবিহীন প্রয়োজ্য উপযুক্ত পল্লীকরণ গ্রহণ করতে হবে।
- ০৫। আবেদিত জমির পার্শ্ববর্তী কৃষি বা অকৃষি জমির কোনরূপ ক্ষতি সাধন হয় এমন কোন কার্যক্রম গ্রহণ বা পরিচালনা করা যাবে না।

Formal Letter No

KM REJOWANUL BARU ZION
Managing Director & CEO
Jayana Battery Technologies

- ০৯। প্রতিবছর অ্যাসসমের অভ্যন্তরীণ জমির দুই টরান কর অনুমতিস্বত্বাধিকারিক হারে প্রদান করতে হবে।
- ০৭। এ অনুমোদনের অংশে সুস্বাস্থ্য জমির স্বত্বাধিকারিক প্রেসি পরিবর্তন হবে এবং রেকর্ডার প্রেসি কোম্পানি পরিবর্তন হবে না।
- ০৮। সরকারের বিদ্যমান প্রাপ্তির ও সময়ে সময়ে এতদসংশ্লিষ্ট প্রাপ্তি অপরাপর আইনসমূহ স্বত্বাধিকারিক সেনে রূপে হবে।
- ০৯। আবেদিত অভ্যন্তরীণ জমি স্বত্বাধিকারিক সরকারি রাস্তা, সরকারি/বেসরকারি অন্য কোন স্থাপনা বা সম্পদের কোনরূপ ক্ষতিসাধন করা যাবে না বা স্বত্বাধিকারিক হবে না।
- ১০। কৃষি জমি অকৃষি ভাবে ব্যবহারের উদ্দেশ্যে এ অনুমোদনপত্র কোন আইন/উপযুক্ত আদালত/নীতিমালায় ভিত্তির হলে প্রযোজ্য হবে এ অনুমোদনপত্র বাতিল বলে লগ্ন হবে।
- ১১। অনুমোদনকৃত অভ্যন্তরীণ জমির সম্পত্তির ভিতর কোন সরকারি সম্পত্তি থাকলে সেই সম্পত্তির অনুমোদন প্রযোজ্য হবে বাতিল বলে লগ্ন হবে।
- ১২। অনুমোদনকৃত অভ্যন্তরীণ জমির সম্পত্তিতে যে কোনো ধরনের পিল কারখানা স্থাপনের পূর্বে পরিবেশ অধিদপ্তরসহ সংশ্লিষ্ট সকল কর্তৃপক্ষের অনুমোদন গ্রহণ করতে হবে; অন্যথায় অনুমোদনপত্র বাতিল বলে লগ্ন হবে।
- ১৩। সংশ্লিষ্ট শর্তসমূহের মধ্যে যে কোনো শর্ত ভঙ্গ হলে কোনো ফাল দণ্ডনো অভিযোগে এ অনুমোদনপত্র প্রযোজ্য হবে বাতিল হবে এবং সরকার বা অনুমোদনকারী কর্তৃপক্ষ আবেদনকারী অভিযোগের বিরুদ্ধে যথাসময় আইনি ব্যবস্থা গ্রহণ করতে পারবেন।
- ১৪। অন্যান্য কর্তৃপক্ষ পরবর্তীতে যে কোনো সময় যে কোনো প্রকার কারণ উল্লেখ বাস্তবিক এ অনুমোদনপত্র বাতিল করতে পারবেন।



(কোম্পানি সচিব)
বেক্তিগত ডেপুটি সচিব
রংপুর।

ফোনঃ ০২৪৮-১১৬২৬৪৮
ই-মেইল: rdcrangpur@gmail.com

অনুমতিস্বত্ব প্রদানকারী/অনুমোদনকারী ও কার্যার্থে:

- ০১। অভ্যন্তরীণ জেলা প্রশাসক (রংপুর), রংপুর।
- ০২। সরকারী কলিনার (জমি), রংপুর।
- ০৩। সরকারি-বেসরকারি, রংপুর।
- ০৪। উপজেলা কৃষি অফিসার, রংপুর।
- ০৫। সরকারী কলিনার (শোশলী), জেলা প্রশাসকের কার্যালয়, রংপুর (জেলা প্রশাসক মহোদয়ের সদর অধিকারি অফিস)।

- ০৬। প্রতি বছর যখনমধ্যে ততসমিকৃত জমির কৃষি উন্নয়ন কর অকৃষি/ব্যবহারভিত্তিক হারে প্রদান করতে হবে।
- ০৭। এ অনুমোদনের ফলে পুনরায় জমির ব্যবহারভিত্তিক শ্রেণি পরিবর্তন হবে এবং রেকর্ডের শ্রেণির কোনকণ পরিবর্তন হবে না।
- ০৮। সরকারের বিদ্যমান প্রচলিত ও সময়ে সময়ে এতদসংশ্লিষ্ট প্রণীত অপরূপ আইনসমূহ যথাযথভাবে মেনে চলতে হবে।
- ০৯। অধিবেশিত ততসমিকৃত জমি ব্যবহারকারী সরকারি, রাজ্য, সরকারিবেশসরকারি অন্য কোন স্থাপনা বা সম্পদের কোনকণ অতিসংরন করা হবে না বা মনলে রাখা হবে না।
- ১০। কৃষি জমি অকৃষি কাজে ব্যবহারের উদ্দেশ্যে এ অনুমোদনপত্রে কোন আইন/উপযুক্ত অফালত/নীতিমালায় তিমতর হলে অসংক্রিয় াবে এ অনুমোদনপত্র বাতিল হলে পণ্য হবে।
- ১১। অনুমোদনকৃত ততসমিক স্থগিত সম্পত্তির তিতর কোন সরকারি সম্পত্তি থাকলে সেই সম্পত্তির অনুমোদন অসংক্রিয় াবে বাতিল হলে পণ্য হবে।
- ১২। অনুমোদনকৃত ততসমিক স্থগিত সম্পত্তিতে যে কোনো ধরনের শিল্প কারখানা স্থাপনের পূর্বে পরিবেশ অধিবরণসং সংশ্লিষ্ট সকল কর্তৃপক্ষের অনুমোদন গ্রহণ করতে হবে; অন্যথায় অনুমতিপত্র বাতিল হলে পণ্য হবে।
- ১৩। সংশ্লিষ্ট শর্তসমূহের অধি যে কোনো শর্ত তলা হলে কোনো কারণ মর্শনো ব্যতিরেকে এ অনুমতিপত্র অসংক্রিয় াবে বাতিল হবে এবং সরকার বা অনুমোদনকারী কর্তৃপক্ষ আবেদনকারী ব্যক্তি/প্রতিষ্ঠানের বিরুদ্ধে যথাযথ আইনি ব্যবস্থা গ্রহণ করতে পারবেন।
- ১৪। অন্যভাবে কর্তৃপক্ষ পরবর্তীতে যে কোনো সময় যে কোনো প্রকার কারণ উল্লেখ ব্যতিরেকে এ অনুমোদনপত্র বাতিল করতে পারবেন।



(কারিমুল হাওলা)
রেজিনিট ডেপুটি কমিশনার
রংপুর।

ফোনঃ ০২৫৮-২২৬২৩৪৮

ই-মেইল: rderangpurb@gmail.com

অনুলিপিঃ সদর জাতাবে/জাতাবে ও কার্যাবে-

- ০১। অতিরিক্ত জেলা প্রশাসক (রাজস্ব), রংপুর।
- ০২। সহকারী কমিশনার (কৃষি), পংগাডা, রংপুর।
- ০৩। সার-রেজিস্টার, পংগাডা, রংপুর।
- ০৪। উপজেলা কৃষি অফিসার, পংগাডা, রংপুর।
- ০৫। সহকারী কমিশনার (সোপনী), জেলা প্রশাসকের কার্যালয়, রংপুর (জেলা প্রশাসক মহোদয়ের সদর অবগতির জন্য)।



Government of the People's Republic of Bangladesh

National Board of Revenue

Taxpayer's Identification Number (TIN) Certificate

TIN : 216560628481

This is to Certify that **M/s. JAYANA BATTERY TECHNOLOGIES** is a Registered Taxpayer of National Board of Revenue under the jurisdiction of **Taxes Circle-343 (Company)**, **Taxes Zone 16, Dhaka**.

Taxpayer's Particulars :

- 1) Name : **M/s. JAYANA BATTERY TECHNOLOGIES**
- 2) Registered Address/Permanent Address : **Millenium City, Ghatarchar, Keraniganj, Keraniganj, Dhaka, PO : 1310, Bangladesh**
- 3) Current Address : **Millenium City, Ghatarchar, Keraniganj, Keraniganj, Dhaka, PO : 1310**
- 4) Previous TIN : **Not Applicable**
- 5) Status : **Firm**

Date : November 26, 2025

Please Note:

1. A Taxpayer is liable to file the Return of Income under section 166 of the Income Tax Act, 2023.
2. Failure to file Return of Income under Section 166 is liable to:
(a) Penalty under section 206, and
(b) Prosecution under section 311 of the Income Tax Act, 2023.



Deputy Commissioner of Taxes
Taxes Circle-343 (Company)
Taxes Zone 16, Dhaka
Address : Scout Shatabdi Bhawan, 60, Anjuman Mufaddil
Islam Shuruj, Katrad, Dhaka 1000 Phone :

N. B. This is a system generated certificate and requires no manual signature.

For Jha.
MD REJWAUL KARIM ZION
Managing Director & CEO
Jayana Battery Technologies

LEAD-ACID BATTERY PROJECT PROFILE

JAYANA BATTERY TECHNOLOGIES

Uttar Panapukur Okrabari, Gangachara, Rangpur


KM REIDWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

Lead-Acid Battery Manufacturing Project Profile

1. Project Introduction

Field	Description
Project Name	Jayana Battery Technologies
Location	Uttar Panapukur, Okhrabari, Barobil, Gangachara, Rangpur
Product Type	Automobile Batteries (SLI), Stationary Batteries (UPS/Inverter, Telecom, Solar), and E-Rickshaw/Three-Wheeler Batteries
Market Potential	Very high. Due to rapid industrialization in Bangladesh, increasing number of vehicles, the growth of e-mobility (e-rickshaws), and rising demand for uninterrupted power supply (UPS/Inverter) as a result of power shortages.

2. Market Analysis and Demand

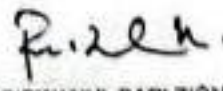
Major Market Drivers:

- Rising demand for e-rickshaw and three-wheeler batteries.
- Expansion of the vehicle and automobile industries.
- Growing requirement in the telecommunication sector (tower backup systems).
- Renewable energy systems (solar).
- Widespread use of UPS and inverters.

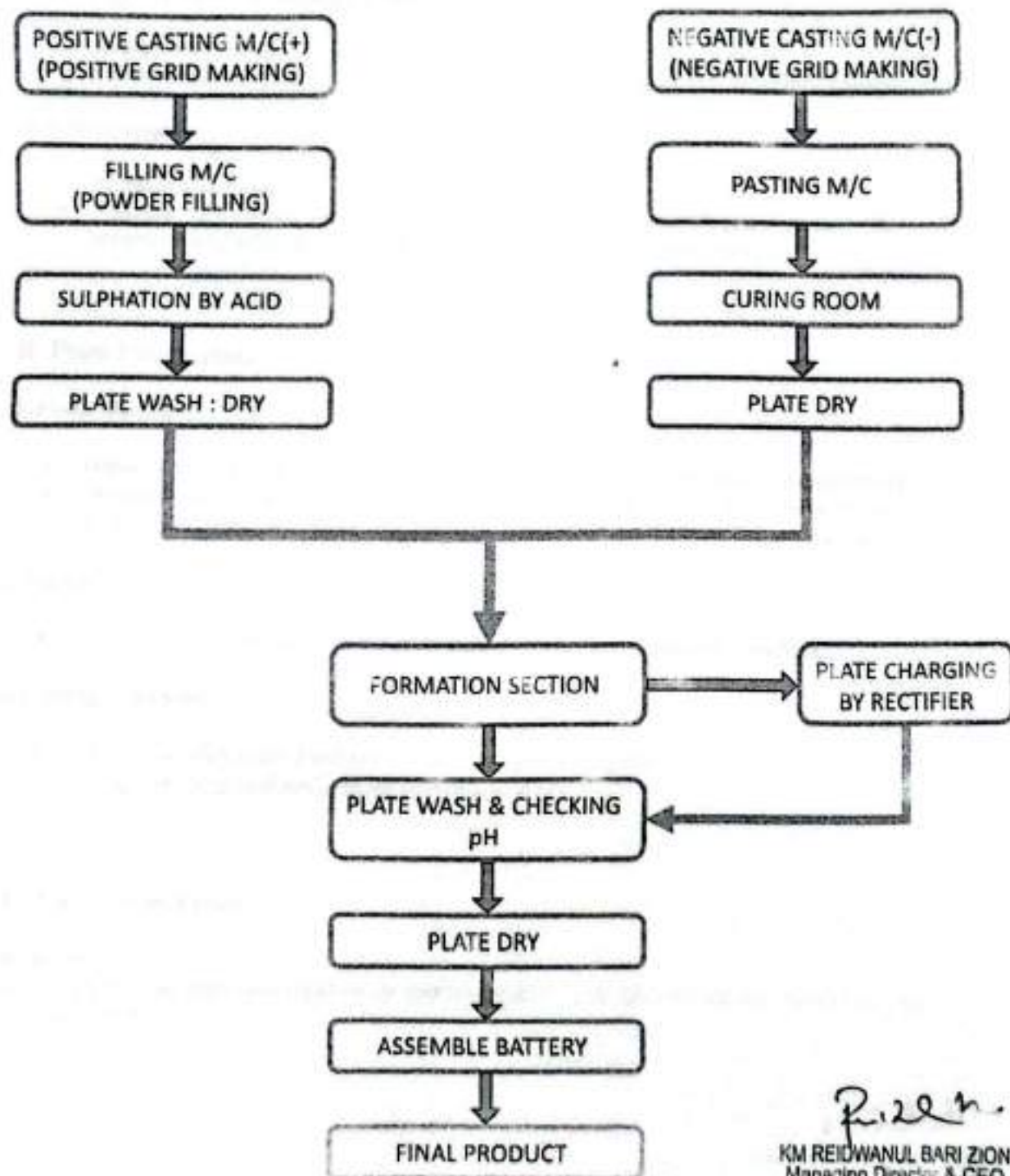
Market Size:

The lead-acid battery market is growing rapidly and, according to various research reports, is expected to exceed USD 163.95 billion globally.


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Managing Director & CEO
Jayana Battery Technologies


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Managing Director & CEO
Jayana Battery Technologies

BATTERY MANUFACTURING PROCESS FLOW CHART



KM Reidwanul Bari ZION
KM REIDWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

KM Reidwanul Bari ZION
KM REIDWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

4. Manufacturing Process (Summary)

I. Plate Material Preparation

1. Lead Oxide Manufacturing (Oxide Making):

- **Input:** Pure Lead.
- **Process:** Lead is melted and reacted with air to produce lead oxide (PbO) powder.

2. Grid Casting:

- **Input:** Lead Alloy.
- **Process:** The molten lead alloy is cast in automatic machines to form grids — the internal framework that holds the active material and conducts electricity.

II. Plate Fabrication

1. Paste Mixing:

- **Input:** Lead oxide powder, sulfuric acid, demineralized (DM) water, and additives.
- **Process:** These materials are mixed to form paste for positive and negative plates. (For e-bike, rickshaw, solar, the positive plate is filled with lead oxide Powder.)

2. Pasting:

- The paste is evenly applied to the grids under pressure using automatic machine.

3. Curing & Drying:

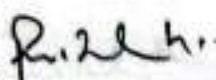
- The pasted plates are dried and cured under controlled humidity and temperature to strengthen them and make them chemically ready.

III. Formation Process

Objective:

To convert the raw materials (lead oxide and lead sulfate) into their active, electricity-storing chemical forms.


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Managing Director & CEO
Jayana Battery Technologies


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- **Positive Plate (+):** During formation, lead sulfate converts into lead dioxide (PbO_2) — the active material of the positive plate.
- **Negative Plate (-):** Lead sulfate converts into spongy lead (Pb) — the active material of the negative plate.

Process Steps:

1. **Electrolyte Filling:** The formation case is filled with electrolyte (sulfuric acid H_2SO_4) of specific gravity and temperature.
2. **Long Charging:** plates are charged at a very low current using a rectifier under controlled conditions.
3. **Chemical Conversion:** Electrolyte reacts with the pasted materials, producing active materials on the plates.
4. **Duration:** Typically 24 to 72 hours, depending on design and size. Strict temperature control is maintained.

Importance:

The quality of the formation process directly affects battery performance, life cycle, and capacity. Poor formation reduces efficiency and shortens battery life.

IV. Assembly & Finishing

1. Plate Assembly:

- **Input:** Positive and negative plates, and separators.
- **Process:** Plates are alternately stacked with separators to form cell groups.
- **Cast-On-Strap (COS) / Burning:** The connecting lugs of the plates are fused together using molten lead to form a single element.

2. **Short Circuit Test:** The Short Circuit Test is performed to ensure battery safety and to prevent fire or explosion caused by user error OR accident, by ensuring its internal protection mechanisms (BMC/PTC) function effectively."

3. Casing & Sealing:

- **Input:** Plastic case and cover.
- **Process:** The assembled elements are placed inside the plastic case and sealed.

4. Leak Testing:

- The battery is checked for leaks or defects.

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KM REIDWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

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5. Charging & Final Testing

1. Electrolyte Filling:

- **Input:** Diluted sulfuric acid (electrolyte).
- **Process:** Electrolyte of specific gravity and volume is filled into the case.

2. Formation Charging:

- The battery is slowly charged for the first time.
- During this step, chemical reactions activate the materials — the positive plate becomes PbO_2 and the negative plate becomes spongy lead (Pb).

3. Finishing & Testing:

- The batteries are washed, labeled, and tested for voltage, capacity, and discharge performance.

4. Packaging & Dispatch:

- Finished batteries are packed and sent to the market.

Note: In the case of e-rickshaw, rickshaw, and IPS batteries, there is often no need for charging at the factory. After assembly, the dry batteries are packaged and sent for delivery.

6. Required Resources and Infrastructure

Category	Requirements
Land & Building	Production unit, warehouse, raw material storage, administrative block, and Effluent Treatment Plant (ETP) — total area of approximately 60,000 square feet.
Machinery & Equipment	Oxide mill, grid casting machine, filling machine, pasting machine, curing chamber, drying chamber, formation rectifier, assembly tools, testing instruments, generator, air compressor, DM plant, laboratory equipment, and pollution control system.
Raw Materials	Pure lead, lead oxide, Sulfuric acid(H_2SO_4), plastic casing (polypropylene/ABS), separators, vent plugs, handles, packing cartons, etc.
Human Resources	Skilled engineers, technicians, skilled and unskilled workers, administrative and sales staff.

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Jayana Battery Technologies

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Jayana Battery Technologies

7. Financial Aspects (Indicative)

- **Total Project Cost:** *(To be determined — depends on production capacity and technology.)*
- **Fixed Capital:** Land, building, machinery, and office equipment.
- **Working Capital:** Raw materials, labor, utilities, and sales expenses.
- **Revenue Sources:** Sales of automobile, UPS, solar, and e-rickshaw batteries.

8. Employment Opportunities (Approximate)

Employee Type Origin Number

Executive Local 30

Supporting Staff Local 250

Executive Foreign 4

Supporting Staff Foreign 8

Total=292

9. Environmental and Social Aspects

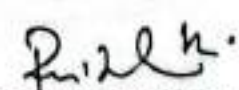
Preventive Measures:

- Conduct **Environmental Impact Assessment (EIA)** as per government guidelines.
- Install strict **pollution control systems** in the production process.
- Establish **Effluent Treatment Plant (ETP)** and **Air Scrubber** systems.
- Ensure a proper **battery recycling system** for used batteries.

Social Impact:

- **Job Creation:** When a factory is established, it directly and indirectly creates job opportunities for many people, helping to reduce local unemployment.
- **Economic Growth:** The income of the local population increases, and their standard of living improves. The presence of factories also leads to the expansion of other businesses and services in the surrounding areas, such as shops and transportation, which contributes to overall economic development.
- **Skill Development:** Local workers are trained for factory jobs, enhancing their technical skills.
- **Infrastructure Development** – The construction of factories often leads to improvements in infrastructure, such as roads, electricity supply, and other amenities, benefiting the entire area.
- **Technological Advancement** – Especially with the establishment of eco-friendly factories like those producing lithium-ion batteries, it paves the way for electric vehicles (EVs) and renewable energy, contributing to the long-term reduction of carbon emissions in the country.


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Managing Director & CEO
Jayana Battery Technologies


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Managing Director & CEO
Jayana Battery Technologies

JAYANA BATTERY TECHNOLOGIES

Uttar Panapukur, Okrebari, Borubill, Gangachara, Rangpur

Factory Machinery List

SL	Machine Name
1	Diesel Generator
2	Air Screw Compressor
3	Positive Grid Casting Machine
4	Negative Grid Casting Machine
5	Powder Filling Machine
6	Bottom Sealing Machine
7	Plate Brushing Machine
8	Pasting Machine
9	Paste Mixture Machine
10	Curing Chamber
11	Ball Mill / Oxide Mill
12	Plate Formation Rectifier
13	Battery Charger / Discharger
14	Dryer Chamber
15	Intercell Welding Machine
16	Heatseal Machine
17	Leakage Tester Machine
18	Wrapping Machine
19	Hole Punch Machine
20	Laser Machine
21	Foil Print Machine
22	Small Parts Making Machine
23	Plate Cutting Machine
24	Acid Leaching Machine
25	Boiler
26	ATP Plant
27	ETP Plant
28	Acid Dilution Plant

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 KM REIDWANUL BARI ZHON
 Managing Director & CEO
 Jayana Battery Technologies

Septic Sludge Disposal Procedure

All sludge management will follow the Protocol:

1. Sludge will be removed using vacuum tanker/sludge pump.
2. All workers involved will use PPE: gloves, rubber boots, face shield, respirator.
3. Sludge will be transported to:

Authorized Municipal Dumping Facility

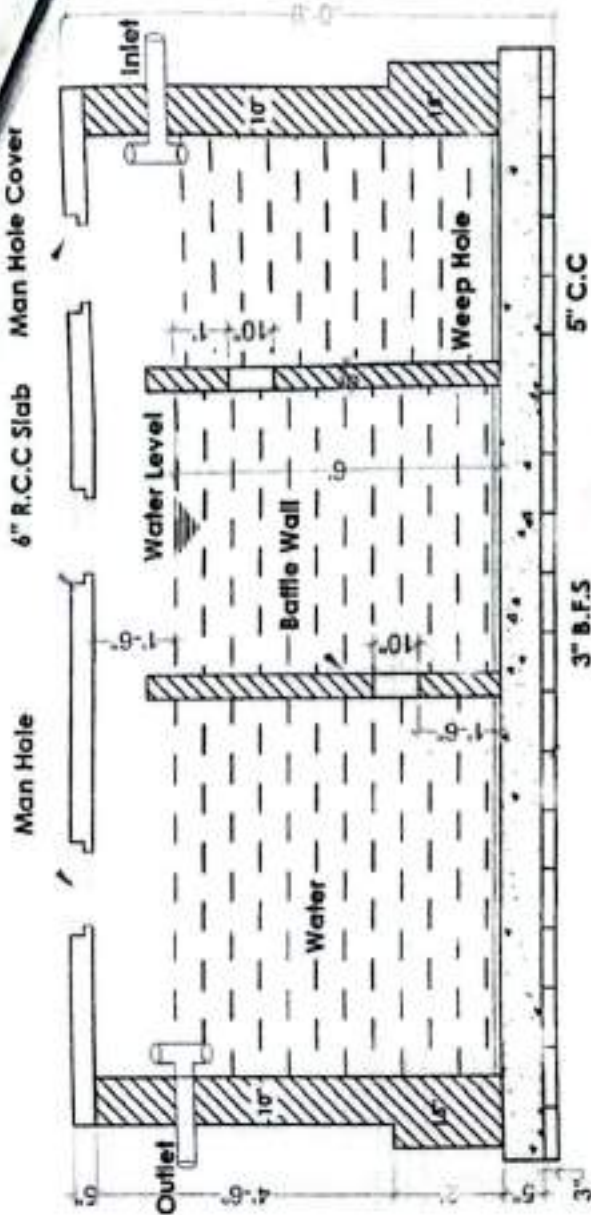
4. Dry sludge will be disposed as solid waste, and liquid effluent treated before release.
5. Direct discharge to open land/drain/waterbody is prohibited.
6. Logbook/Record shall be maintained for each desludging cycle including:
 - Date & time
 - Volume removed
 - Transport contractor name
 - Disposal location certification


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Jayana Battery Technologies

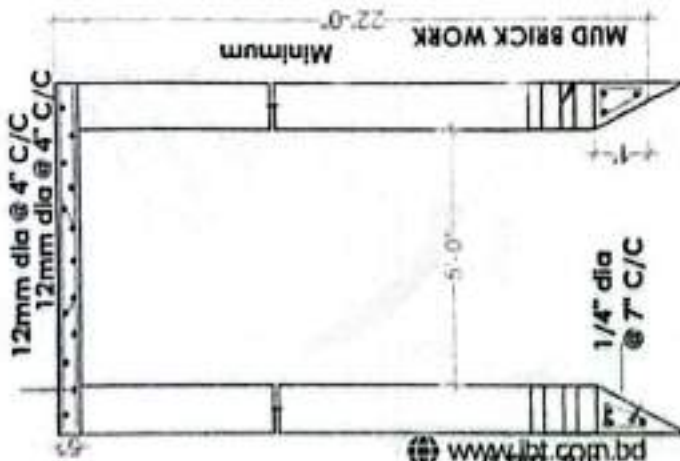
 www.jbt.com.bd

 info@jbt.com.bd

 Address, Gangachara, Rangpur, Bangladesh.



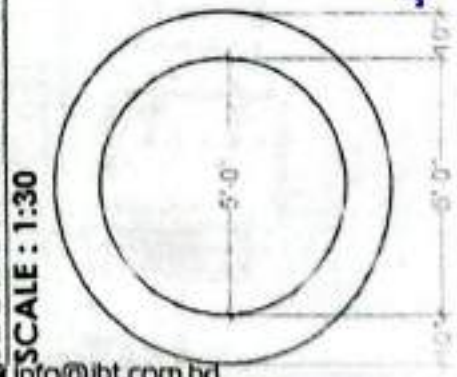
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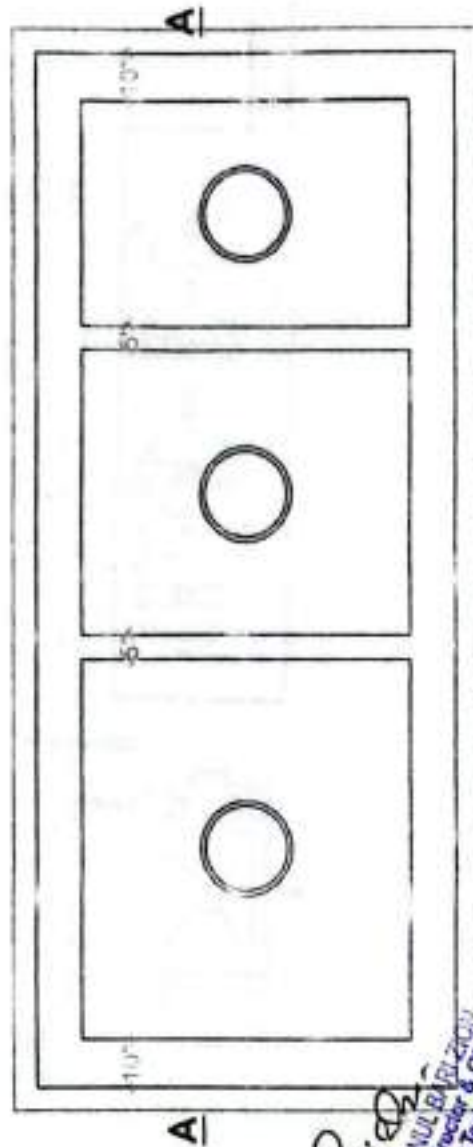
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SECTION OF SOAK WELL
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PLAN OF SOAK WELL
SCALE : 1:30



PLAN OF SEWAGE TREATMENT PLANT
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For Design
K.M. REIDWANUL BARI
Managing Director & CEO
Jayana Battery Technologies

Sludge Management Procedure of ETP

Effluent Treatment Plant (ETP) sludge will be managed through a safe, compliant, and environmentally responsible process. Sludge handling, treatment, storage, disposal and record-keeping will strictly follow DoE (Department of Environment, Bangladesh) Environmental Conservation Rules (ECR-1997) and relevant guidelines.

1. Sludge Generation & Characteristics

Sludge will be produced from primary clarifier, secondary treatment system and chemical dosing units.

Type of sludge: Biological sludge + Chemical/Physico-chemical sludge.

Sludge moisture content, pH, heavy metal and organic load will be periodically tested to determine disposal method.

2. Sludge Collection System

Sludge will be periodically extracted from sludge sump using sludge pump.

Sludge will flow to sludge thickening tank for volume reduction.

Polymer/ coagulant may be used to increase settling rate where needed

3. Sludge Treatment Process

Following process will be followed step-by-step:

Step	Process	Purpose
1	Thickening	Reduce water content, improve handling
2	Sludge Drying Bed or Filter Press	Convert sludge to semi-solid cake
3	Sun Drying / Mechanical drying	Final drying to safe handling consistency
4	Screening & Removal of impurities	Remove plastics, grit, foreign materials

Signature
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Drying beds will be cement-lined and leak-proof.

Leachate will be redirected back to ETP inlet for re-treatment.

4. Temporary Storage & Handling

Dried sludge will be stored in a covered, concrete-lined storage area to prevent water infiltration and contamination.

Storage capacity will be minimum 30 days sludge generation.

Proper PPE (gloves, masks, goggles, gumboot) will be used during handling.

5. Sludge Reuse / Disposal

Approved disposal options:

A) Utilization (if non-hazardous)

Use as raw material for brick manufacturing / cement kiln / landfilling in greenbelt development.

Must be supported by laboratory analysis confirming it meets disposal standards.

B) Final Safe Disposal

If sludge contains hazardous contaminants or heavy metals:

Dispose through DoE-approved hazardous waste disposal facility.

Maintain disposal challan, vendor approval license & manifest record.

No sludge shall be disposed into open land, waterbodies or agricultural soil.

6. Monitoring & Testing Schedule

Parameter	Frequency
Moisture content	Monthly
pH, TSS, BOD, COD	Quarterly
Heavy metal (Cr, Pb, Cd, Ni)	Half-yearly

Land disposal suitability test as required

Testing will be done in DoE-approved laboratory.

7. Documentation, Record & Compliance

KM Reidwanul Bari ZION
Managing Director & CEO
Jayana Battery Technologies

The following registers will be maintained:

- ☐ Sludge Volume Recording Log
- Sludge Drying & Storage Register
- Laboratory Test Report Files
- Disposal Manifest & Vendor Approval Copies
- PPE & Worker Safety Instruction Record

All documents will be kept minimum 5 years for DoE audit.

8. Health & Safety Measures

Workers will receive training on safe sludge handling.

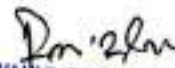
Hand wash station, emergency eye wash & first-aid box will be available.

No sludge storage near food-processing or drinking water source.

9. Reporting

Annual waste generation & disposal report will be submitted to DoE as per ECR compliance.

Any accidental spill or leakage will be reported immediately to authority.


KM REJWANUL BARI ZION
Managing Director & CEO
Jayana Battery Technologies

লিড-অ্যাসিড ব্যাটারি উৎপাদন প্রকল্প প্রোফাইল

জায়ানা ব্যাটারি টেকনোলোজিস

উত্তর পানাপুকুর, ওকড়াবাড়ি, গঙ্গাচড়া, রংপুর

লিড-অ্যাসিড ব্যাটারি উৎপাদন প্রকল্প প্রোফাইল

১. প্রকল্প পরিচিতি

বিষয়	বর্ণনা
প্রকল্পের নাম	জায়ানা ব্যাটারি টেকনোলোজিস
অবস্থান	উত্তর পানাপুকুর, ওকড়াবাড়ি, বড়বিল, গঙ্গাচড়া, রংপুর
পণ্যের ধরন	অটোমোবাইল ব্যাটারি (SLI), স্টেশনারি ব্যাটারি (UPS/Inverter, Telecom, Solar), এবং ই-রিকশা/থ্রি-হুইলার ব্যাটারি
বাজার সম্ভাবনা	অত্যন্ত উচ্চ। বাংলাদেশের দ্রুত শিল্পায়ন, যানবাহনের সংখ্যা বৃদ্ধি, ই-মোবিলিটি (ই-রিকশা) সম্প্রসারণ এবং বিদ্যুৎ ঘাটতির কারণে নিরবচ্ছিন্ন বিদ্যুৎ সরবরাহ (UPS/Inverter)-এর চাহিদা বৃদ্ধির ফলে এই খাতের বাজার দ্রুত সম্প্রসারিত হচ্ছে।

২. বাজার বিশ্লেষণ ও চাহিদা

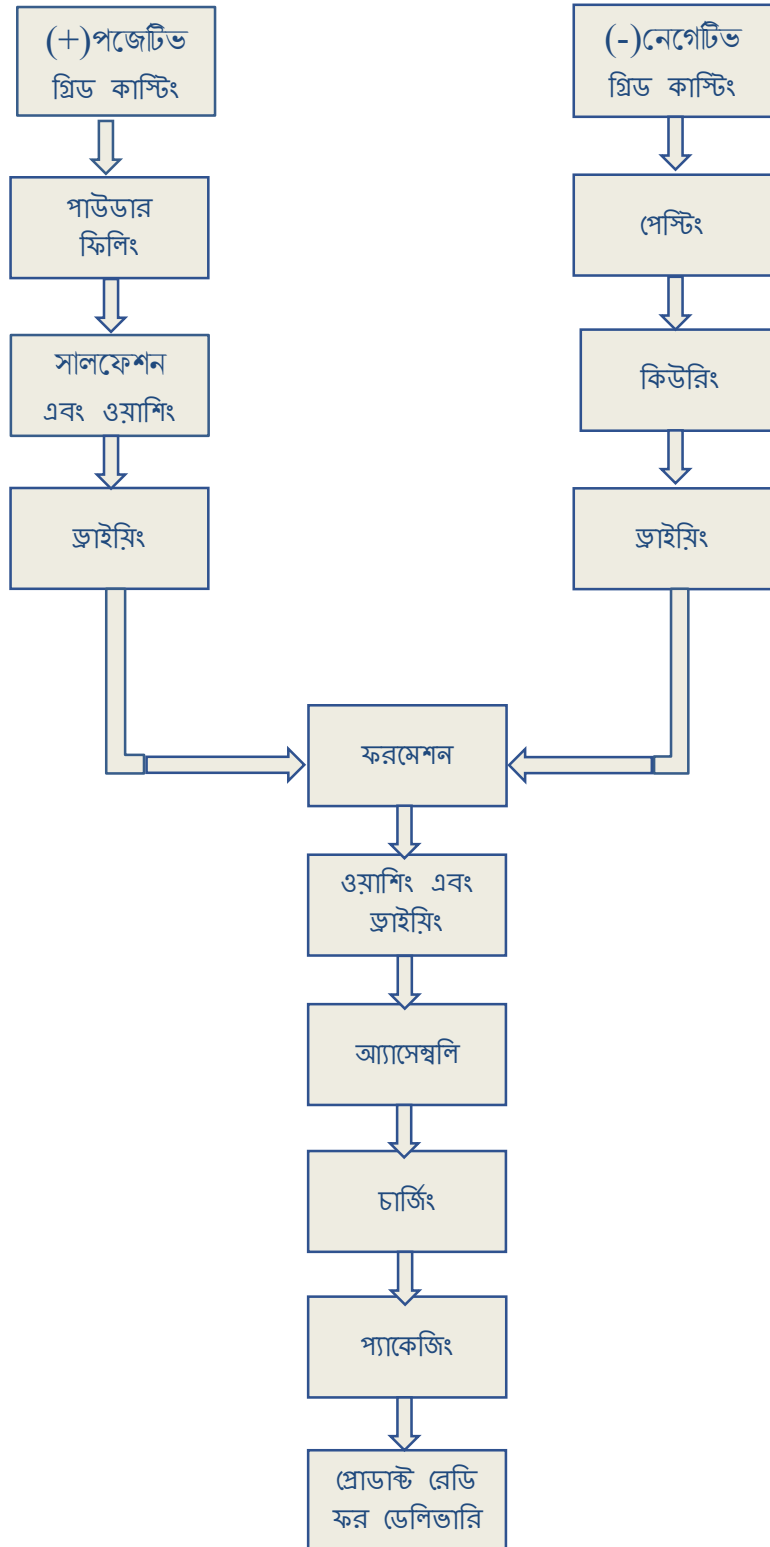
প্রধান বাজার চালিকা শক্তি:

- ই-রিকশা ও থ্রি-হুইলার ব্যাটারির চাহিদা বৃদ্ধি।
- যানবাহন ও অটোমোবাইল শিল্পের সম্প্রসারণ।
- টেলিযোগাযোগ খাতে (টাওয়ার ব্যাকআপ সিস্টেম) ক্রমবর্ধমান চাহিদা।
- নবায়নযোগ্য জ্বালানি ব্যবস্থা (সোলার)।
- ইউপিএস ও ইনভার্টারের ব্যাপক ব্যবহার।

বাজারের আকার:

বিভিন্ন গবেষণা প্রতিবেদনের তথ্য অনুযায়ী, বিশ্বব্যাপী লিড-অ্যাসিড ব্যাটারি বাজার দ্রুত বৃদ্ধি পাচ্ছে এবং এর বাজারমূল্য USD 163.95 বিলিয়নের বেশি হওয়ার সম্ভাবনা রয়েছে।

৩. উৎপাদন প্রবাহ চিত্র



৪. উৎপাদন প্রক্রিয়া (সংক্ষিপ্ত বিবরণ)

৪.১. প্লেট উপাদান প্রস্তুতি

৪.১.১. লিড অক্সাইড প্রস্তুতকরণ

- ইনপুট: বিশুদ্ধ সীসা
- প্রক্রিয়া: সীসা গলিয়ে বাতাসের সাথে বিক্রিয়া করিয়ে লিড অক্সাইড (PbO) পাউডার তৈরি করা হয়।

৪.১.২. গ্রিড কাস্টিং

- ইনপুট: লিড অ্যালয়
- প্রক্রিয়া: গলিত লিড অ্যালয় স্বয়ংক্রিয় মেশিনে ঢালাই করে গ্রিড তৈরি করা হয়, যা সক্রিয় পদার্থ ধারণ ও বিদ্যুৎ পরিবহনের জন্য অভ্যন্তরীণ কাঠামো হিসেবে কাজ করে।

৪.২. প্লেট প্রস্তুতকরণ

৪.২.১. পেস্ট মিক্সিং

- ইনপুট: লিড অক্সাইড পাউডার, সালফিউরিক এসিড, খনিজমুক্ত (DM) পানি, এবং সংযোজনী
- প্রক্রিয়া: এই উপাদানগুলো মিশিয়ে পজিটিভ ও নেগেটিভ প্লেটের জন্য পেস্ট তৈরি করা হয়।
- (ই-বাইক, রিকশা ও সোলার ব্যাটারির ক্ষেত্রে পজিটিভ প্লেটে লিড অক্সাইড পাউডার ব্যবহার করা হয়।)

৪.২.২. পেস্টিং

- স্বয়ংক্রিয় মেশিনের মাধ্যমে চাপ প্রয়োগ করে গ্রিডের উপর সমানভাবে পেস্ট প্রয়োগ করা হয়।

৪.২.৩. কিউরিং ও শুকানো:

- নিয়ন্ত্রিত আর্দ্রতা ও তাপমাত্রায় প্লেট শুকানো ও কিউরিং করা হয়, যাতে তা শক্তিশালী এবং রাসায়নিকভাবে প্রস্তুত হয়।
-

৪.৩. ফরমেশন প্রক্রিয়া

উদ্দেশ্য:

কাঁচামাল (লিড অক্সাইড ও লিড সালফেট) কে সক্রিয় বিদ্যুৎ সংরক্ষণকারী রাসায়নিক রূপে রূপান্তর করা।

- **পজিটিভ প্লেট (+):** ফরমেশন চলাকালে লিড সালফেট রূপান্তরিত হয়ে লিড ডাইঅক্সাইড (PbO_2) এ পরিণত হয়।
- **নেগেটিভ প্লেট (-):** লিড সালফেট রূপান্তরিত হয়ে Spongy Lead (Pb) এ পরিণত হয়।

প্রক্রিয়ার ধাপসমূহ:

১. **ইলেক্ট্রোলাইট ফিলিং:** নির্দিষ্ট ঘনত্ব ও তাপমাত্রার ইলেক্ট্রোলাইট (সালফিউরিক অ্যাসিড - H_2SO_4) ফরমেশন কেসে ভর্তি করা হয়।
২. **লং চার্জিং:** রেজিফায়ার ব্যবহার করে খুব কম কারেন্টে নিয়ন্ত্রিত পরিবেশে চার্জ প্রদান করা হয়।
৩. **রাসায়নিক রূপান্তর:** ইলেক্ট্রোলাইট পেস্টকৃত উপাদানের সাথে বিক্রিয়া করে প্লেটে সক্রিয় উপাদান তৈরি করে।
৪. **সময়কাল:** ডিজাইন ও আকার অনুযায়ী সাধারণত ২৪-৭২ ঘণ্টা সময় লাগে। তাপমাত্রা কঠোরভাবে নিয়ন্ত্রণ করা হয়।

গুরুত্ব:

ফরমেশন প্রক্রিয়ার মান সরাসরি ব্যাটারির কার্যক্ষমতা, আয়ুষ্কাল ও ধারণক্ষমতার উপর প্রভাব ফেলে। দুর্বল ফরমেশন ব্যাটারির দক্ষতা কমিয়ে দেয় এবং আয়ুষ্কাল হ্রাস করে।

৪.৪. সংযোজন ও সমাপ্তিকরণ

৪.৪.১ প্লেট অ্যাসেম্বলি:

- **ইনপুট:** পজিটিভ ও নেগেটিভ প্লেট এবং বিভাজক।
- **প্রক্রিয়া:** বিভাজক ব্যবহার করে প্লেটগুলো পর্যায়ক্রমে সাজিয়ে Cell Group তৈরি করা হয়।
- **কাস্ট-অন-স্ট্র্যাপ (সিওএস) / বার্নিং:** প্লেটের সংযোগ অংশ গলিত সীসা ব্যবহার করে একত্রিত করা হয়।

৪.৪.২. শর্ট সার্কিট পরীক্ষা: ব্যাটারির নিরাপত্তা নিশ্চিত করতে এবং আগুন বা বিস্ফোরণের ঝুঁকি প্রতিরোধে শর্ট সার্কিট টেস্ট করা হয়। এর মাধ্যমে অভ্যন্তরীণ সুরক্ষা ব্যবস্থা (BMS/PTC) সঠিকভাবে কাজ করছে কিনা যাচাই করা হয়।

৪.৪.৩. কেসিং এবং সিলিং:

- **ইনপুট:** প্লাস্টিক কেস ও কভার।
- **প্রক্রিয়া:** সংযোজিত অংশগুলো প্লাস্টিক কেসের ভিতরে স্থাপন করে সিল করা হয়।

৪.৪.৪. ফুটো পরীক্ষা:

- ব্যাটারিতে কোনো লিকেজ বা ত্রুটি আছে কিনা পরীক্ষা করা হয়।

৪.৫. চার্জিং ও চূড়ান্ত পরীক্ষা

৪.৫.১. ইলেকট্রোলাইট ফিলিং:

- **ইনপুট:** লঘু সালফিউরিক অ্যাসিড (ইলেকট্রোলাইট)।
- **প্রক্রিয়া:** নির্দিষ্ট ঘনত্ব ও পরিমাণ অনুযায়ী ইলেকট্রোলাইট ভর্তি করা হয়।

৪.৫.২. ফর্মেশন চার্জিং:

- ব্যাটারিকে প্রথমবার ধীরে ধীরে চার্জ দেওয়া হয়।
- এই ধাপে রাসায়নিক বিক্রিয়ার মাধ্যমে পজিটিভ প্লেট $\rightarrow \text{PbO}_2$ এবং নেগেটিভ প্লেট $\rightarrow \text{Spongy Lead (Pb)}$ এ পরিণত হয়।

৪.৫.৩. ফিনিশিং ও টেস্টিং:

- ব্যাটারি ধোয়া, লেবেলিং এবং ভোল্টেজ, ক্ষমতা এবং ডিসচার্জ পারফরম্যান্স পরীক্ষা করা হয়।

৪.৫.৩. প্যাকেজিং এবং প্রেরণ:

- প্রস্তুতকৃত ব্যাটারি প্যাকেজিং করে বাজারে পাঠানো হয়।

নোট: ই-রিকশা, রিকশা ও IPS ব্যাটারির ক্ষেত্রে অনেক সময় কারখানায় চার্জিংয়ের প্রয়োজন হয় না। এসেম্বলী সম্পন্ন হওয়ার পর ড্রাই ব্যাটারি সরাসরি প্যাকেজিং করে সরবরাহ করা হয়।

৫. প্রয়োজনীয় সম্পদ ও অবকাঠামো

বিভাগ	প্রয়োজনীয়তা
জমি ও ভবন	উৎপাদন ইউনিট, গুদাম, কাঁচামাল সংরক্ষণাগার, প্রশাসনিক ভবন এবং Effluent Treatment Plant (ETP) – মোট প্রায় ৬০,০০০ বর্গফুট এলাকা।
যন্ত্রপাতি ও সরঞ্জাম	অক্সাইড মিল, গ্রিড কাস্টিং মেশিন, ফিলিং মেশিন, পেস্টিং মেশিন, কিউরিং চেম্বার, ড্রাইং চেম্বার, ফরমেশন রেকটিফায়ার, অ্যাসেম্বলি টুলস, টেস্টিং ইন্সট্রুমেন্টস, জেনারেটর, এয়ার কম্প্রেসার, ডিএম প্ল্যান্ট, ল্যাবরেটরি সরঞ্জাম এবং দূষণ নিয়ন্ত্রণ ব্যবস্থা।
কাঁচামাল	বিশুদ্ধ সীসা, সীসা অক্সাইড, সালফিউরিক অ্যাসিড (H_2SO_4), প্লাস্টিকের আবরণ (পলিপ্রোপিলিন/এবিএস), বিভাজক, ভেন্ট প্লাগ, হাতল, প্যাকিং কার্টন, ইত্যাদি।
মানবসম্পদ	দক্ষ প্রকৌশলী, টেকনিশিয়ান, দক্ষ ও অদক্ষ শ্রমিক, প্রশাসনিক ও বিক্রয় কর্মী।

৬. আর্থিক বিষয়াবলি (নির্দেশক)

- মোট প্রকল্প ব্যয়: (পরবর্তীতে নির্ধারিত হবে — উৎপাদন ক্ষমতা ও প্রযুক্তির উপর নির্ভরশীল)
- স্থায়ী মূলধন: জমি, ভবন, যন্ত্রপাতি ও অফিস সরঞ্জাম।
- চলতি মূলধন: কাঁচামাল, শ্রম, ইউটিলিটি ও বিক্রয় ব্যয়।
- আয়ের উৎস: অটোমোবাইল, ইউপিএস, সোলার এবং ই-রিকশার ব্যাটারি বিক্রয়।

৭. কর্মসংস্থানের সুযোগ (প্রায়)

কর্মচারীর ধরন	উৎস	সংখ্যা
এক্সিকিউটিভ	স্থানীয়	৩০
সাপোর্টিং স্টাফ	স্থানীয়	২৫০
এক্সিকিউটিভ	বিদেশী	৪
সাপোর্টিং স্টাফ	বিদেশী	৮

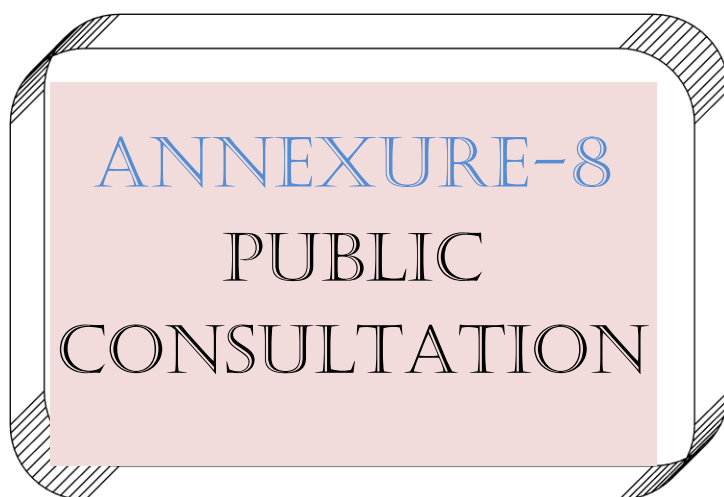
৮. পরিবেশগত ও সামাজিক বিষয়াবলি

প্রতিরোধমূলক ব্যবস্থা:

- সরকারি নির্দেশিকা অনুযায়ী এনভায়রনমেন্টাল ইমপ্যাক্ট অ্যাসেসমেন্ট (EIA) সম্পন্ন করা।
- উৎপাদন প্রক্রিয়ায় কঠোর দূষণ নিয়ন্ত্রণ ব্যবস্থা স্থাপন।
- এফ্লুয়েন্ট ট্রিটমেন্ট প্ল্যান্ট (ETP) এবং এয়ার ক্লিয়ার সিস্টেম স্থাপন।
- ব্যবহৃত ব্যাটারির জন্য কার্যকর পুনর্ব্যবহারযোগ্য সিস্টেম নিশ্চিত করা।

সামাজিক প্রভাব:

- **কর্মসংস্থান সৃষ্টি:** কারখানা স্থাপনের ফলে প্রত্যক্ষ ও পরোক্ষভাবে বহু মানুষের কর্মসংস্থান সৃষ্টি হবে, যা স্থানীয় বেকারত্ব কমাতে সহায়তা করবে।
- **অর্থনৈতিক বৃদ্ধি:** স্থানীয় জনগণের আয় বৃদ্ধি পাবে এবং জীবনযাত্রার মান উন্নত হবে। পাশাপাশি দোকান, পরিবহনসহ অন্যান্য ব্যবসা ও সেবাখাত সম্প্রসারিত হবে।
- **দক্ষতা উন্নয়ন:** স্থানীয় কর্মীদের কারখানাভিত্তিক প্রশিক্ষণের মাধ্যমে তাদের প্রযুক্তিগত দক্ষতা বৃদ্ধি পাবে।
- **অবকাঠামো উন্নয়ন** – কারখানা স্থাপনের ফলে রাস্তা, বিদ্যুৎ এবং অন্যান্য সুবিধার উন্নয়ন হবে, যা পুরো এলাকার জন্য উপকারী হবে।
- **প্রযুক্তিগত অগ্রগতি** – বিশেষ করে লিথিয়াম-আয়ন ব্যাটারি এর মতো পরিবেশবান্ধব কারখানা স্থাপনের মাধ্যমে বৈদ্যুতিক যানবাহন (EV) এবং Renewable Energy ব্যবহারের পথ সুগম হবে, যা দীর্ঘমেয়াদে কার্বন নিঃসরণ কমাতে সহায়তা করবে।



জায়ানা ব্যাটারি টেকনোলজিস প্রকল্পের পরিবেশগত প্রভাব নিরূপণের জন্য জনমত যাচাই সভার কার্যবিবরণী

সভার তারিখঃ ১৫ সেপ্টেম্বর ২০২৬ ইং (২৮ ভাদ্র, ১৪৩৩ বাংলা)

সভার সময়ঃ দুপুর ১২:০০ ঘটিকায়

সভার স্থানঃ জায়ানা ব্যাটারি টেকনোলজিস, গ্রাম: উত্তর পানাপুকুর, ওকড়াবাড়ী, ডাকঘর: বড়বিল, থানা: গঞ্জাচড়া, জেলা: রংপুর, বাংলাদেশ।

সভায় আলোচ্য বিষয়সূচিঃ জায়ানা ব্যাটারি টেকনোলজিস, সালফিউরিক অ্যাসিড, লেড অক্সাইড, পিপি (PP) ব্যাটারি কন্টেইনার এবং সেপারেটর ব্যবহার করে লেড-অ্যাসিড ব্যাটারি উৎপাদন করবে। লেড-অ্যাসিড ব্যাটারি উৎপাদন কারখানার স্থাপনে পরিবেশগত প্রভাব নিরূপন প্রতিবেদন কার্যপরিধি (TOR) অনুমোদনসহ অবস্থানগত ছাড়পত্রের জন্য পরিবেশ অধিদপ্তর, রংপুর জেলা কার্যালয়ে আবেদন করা হয়। এর প্রেক্ষিতে পরিবেশ অধিদপ্তর, সদর দপ্তরের ছাড়পত্র বিষয়ক কমিটির ৫৪২তম সভার সিদ্ধান্তের গ-১১ এর সুপারিশক্রমে ২২.০২.৮৫০০.২৫৩.০৭২.০১১.২৫.১ সংখ্যক স্মারকে পরিবেশগত প্রভাব নিরূপন প্রতিবেদনের কার্যপরিধি অনুমোদন করা হয়। অনুমোদিত কার্যপরিধি (TOR) অনুযায়ী ইআইএ (EIA) প্রতিবেদন প্রণয়ন করে পরিবেশ সংরক্ষন বিধিমালা, ২০২৩ এর বিধি ১৬ অনুযায়ী জনমত যাচাইয়ের উদ্দেশ্যে ১৫ সেপ্টেম্বর ২০২৬ ইং তারিখে বহুল প্রচলিত দৈনিক প্রথম আলো ও দৈনিক যুগের আলো পত্রিকায় বিজ্ঞাপন দেয়া হয়। উক্ত সভায় পরিবেশ অধিদপ্তর রংপুর জেলা কার্যালয়ের প্রতিনিধিগণ উপস্থিত ছিলেন। প্রধান অতিথি হিসাবে উপস্থিত ছিলেন রংপুর বিভাগীয় কার্যালয়ের পরিচালক জনাব নুর আলম। সভায় সভাপতিত্ব করেন কে. এম. রিদওয়ানুল বারী জিয়ন, আর্কিটেক্ট এবং ডি.এম.ডি, জায়ানা ব্যাটারি টেকনোলজিস। সভায় অন্যান্যদের মধ্যে উপস্থিত ছিলেন;

সভার উপস্থিতিঃ

১. নুর আলম- পরিচালক, রংপুর বিভাগীয় কার্যালয়, রংপুর।
২. মোঃ আঃ সালাম সরকার - উপ-পরিচালক, রংপুর জেলা কার্যালয়, পরিবেশ অধিদপ্তর, রংপুর।
৩. মোঃ মলিন মিয়া - সিনিয়র কেমিস্ট, রংপুর বিভাগীয় কার্যালয়, পরিবেশ অধিদপ্তর, রংপুর
৪. মোঃ জুনায়েদ চৌধুরী - উপদেষ্টা, জায়ানা ব্যাটারি টেকনোলজিস
৫. পৃথু চন্দ্র দে - প্রজেক্ট ম্যানেজার, জায়ানা ব্যাটারি টেকনোলজিস
৬. কে. এম. রিদওয়ানুল বারী জিয়ন - আর্কিটেক্ট এবং ডি, এম ডি, জায়ানা ব্যাটারি টেকনোলজিস
৭. মোঃ ফাকরুজ্জামান - হেড অফ একাউন্টস, জায়ানা ব্যাটারি টেকনোলজিস
৮. মোঃ সাফিউর রহমান - মেইন্টেনেন্স অফিসার, জায়ানা ব্যাটারি টেকনোলজিস
৯. মোঃ মামুনুর রশিদ -সি ই ও, আয়ন ওয়াটার টেকনোলজি (বিডি)
১০. মোঃ নূর এ আলম সিদ্দিক - EIA বিশেষজ্ঞ, আয়ন ওয়াটার টেকনোলজি (বিডি)
১১. বিভিন্ন পেশা ও স্থানীয় গণ্যমান্য ব্যক্তিবর্গসহ মোট ৮১ (একাশি) জন উপস্থিত ছিলেন (উপস্থিতি তালিকা সংযুক্ত)

সভার উদ্দেশ্যঃ

সভা সঞ্চালনা করেন কে. এম. রিদওয়ানুল বারী জিয়ন - আর্কিটেক্ট এবং ডি.এম.ডি, জায়ানা ব্যাটারি টেকনোলজিস, জনমত যাচাই কার্যক্রমের শুরুতে, পরিবেশ সংরক্ষণ বিধিমালা, ২০২৩ এর বিধি (৭) অনুযায়ী নিম্নলিখিত তথ্যাদি উপস্থাপন করেনঃ-

- ক) জায়ানা ব্যাটারি টেকনোলজিস এর সম্পর্কে প্রাথমিক তথ্য;
- খ) এই প্রকল্পের সম্ভাব্য সুফল;
- গ) শিল্প প্রতিষ্ঠান বা প্রকল্পের পরিবেশগত ও সামাজিক প্রভাব;
- ঘ) শিল্প প্রতিষ্ঠান হতে সম্ভাব্য পরিবেশগত ও সামাজিক প্রভাব গুলির প্রশমন ব্যবস্থা;
- ঙ) অন্যান্য বিষয় সম্পর্কে তথ্যাবলী

পরিবেশ অধিদপ্তরের প্রতিনিধির মন্তব্যঃ

পরিবেশ অধিদপ্তর, রংপুর বিভাগীয় কার্যালয়ের প্রতিনিধি পরিচালক জনাব নুর আলম, সভার কার্যপত্রে উল্লেখিত পরিবেশ সংরক্ষণ বিধিমালা ২০২৩ আলোকে। তিনি এই শিল্প উদ্যোক্তাদের ব্যাটারী নির্মাণ কারখানা নির্মাণকালে কোন রকম পরিবেশের উপর বিরূপ প্রভাব, প্রকল্প চলাকালে পরিবেশ দূষণ, প্রকল্প এর সাথে জড়িত শ্রমিক ও কর্মচারীদের স্বাস্থ্যগত যেমন পয়ঃনিষ্কাশন ব্যবস্থা, কর্মস্থলে স্বাস্থ্যগত মান সম্মুখিত রাখার উপর গুরুত্ব দেওয়ার জন্য পরামর্শ প্রদান করেন। তিনি উল্লেখ করেন যে, পরিবেশ অধিদপ্তর কখনোই শিল্প উদ্যোক্তাদের কারখানা স্থাপনের বিপক্ষে নয়, বরং পরিবেশ বান্ধব কারখানা স্থাপনের লক্ষ্যে নিষ্ঠার সাথে কাজ করে যাচ্ছে। তিনি উপস্থিত জনগনের মতামত জানার উদ্দেশ্যে মুক্ত আলোচনার আহ্বান জানান। জায়ানা ব্যাটারি টেকনোলজিস যদি কারো জমি দখল করে এই ফ্যাক্টরি করে -সে সম্পর্কে উন্মুক্ত জনগন কে অবহিত করেন। জনমত যাচাই সভায় উপস্থিত অংশীজনের মতামত ও তদানুযায়ী পরিবেশগত প্রভাব নিরূপন (EIA) প্রতিবেদনে গৃহীতব্য ব্যবস্থাবলীর নিম্নরূপঃ

ক্রমিক/নং	উপস্থিত অংশীজনের নাম ও পেশা	বক্তব্য/ মতামত	EIA প্রতিবেদনে গৃহীতব্য ব্যবস্থাবলী
১।	মোঃ মামুন শাহ, শিক্ষার্থী, স্থানীয় যুবক	আপনারা বলেছিলেন EIA প্রতিবেদনে বর্ণিত পরিবেশগত ব্যবস্থাপনা ও প্রশমনমূলক ব্যবস্থার আলোকে রিসাইকেলিং ভিত্তিক ETP (Effluent Treatment Plant) স্থাপন করা হবে এবং পরিশোধিত পানি যথাসম্ভব পুনঃব্যবহারের মাধ্যমে পানি সম্পদের সাশ্রয় ও পরিবেশগত ভারসাম্য বজায় রাখা হবে। একইসঙ্গে, শিল্পকারখানা থেকে সৃষ্ট সম্ভাব্য বায়ু দূষণ নিয়ন্ত্রণের লক্ষ্যে ATP (Air Treatment Plant) স্থাপন ও পরিচালনা করা হবে। উল্লিখিত পরিবেশবান্ধব প্রযুক্তি ও নিয়ন্ত্রণ ব্যবস্থা যথাযথভাবে বাস্তবায়ন ও পরিচালনা করা হলে প্রস্তাবিত শিল্পপ্রতিষ্ঠানটি আধুনিক, পরিবেশসম্মত ও টেকসই শিল্পকারখানা হিসেবে গড়ে উঠবে। এর মাধ্যমে শিল্প কার্যক্রমের পরিবেশগত প্রভাব নিয়ন্ত্রণের পাশাপাশি স্থানীয় পর্যায়ে কর্মসংস্থান সৃষ্টি, অর্থনৈতিক কর্মকাণ্ড বৃদ্ধি এবং অবকাঠামোগত ও সামগ্রিক আর্থ-সামাজিক উন্নয়নে ইতিবাচক ভূমিকা রাখার সুযোগ সৃষ্টি হবে।	EIA প্রতিবেদনের ৫.২.১.৩, ৫.২.১.৫ নং অনুচ্ছেদ বিস্তারিত উল্লেখ আছে
২।	জনাব তাজুল ইসলাম, স্থানীয় জনগন	তিনি কারখানা কর্তৃপক্ষকে সৃষ্ট তরল বর্জ্য যথাযথ পরিশোধনের মাধ্যমে পুনর্ব্যবহার নিশ্চিত করা এবং বায়ু ও শব্দদূষণ রোধে কঠোর ব্যবস্থা গ্রহণের অনুরোধ জানান, এবং এ বিষয়ে পরিবেশ অধিদপ্তরের যথাযথ তদারকি নিশ্চিতকরণে রংপুর বিভাগীয় কার্যালয়ের পরিচালক জনাব নূর আলমের দৃষ্টি আকর্ষণ করেন।	EIA প্রতিবেদনের ৫.৩ নং অনুচ্ছেদ বিস্তারিত উল্লেখ আছে
৩।	জনাব সামিউল আলম, স্থানীয় জনগন	তিনি কারখানায় ইটিপি (বর্জ্য পরিশোধনাগার) স্থাপন করা হবে কিনা তা উদ্যোক্তাদের কাছে জানতে চান।	EIA প্রতিবেদনের ৫.২.১ নং অনুচ্ছেদ বিস্তারিত উল্লেখ আছে
৪।	জনাব বাবলু মিয়া, স্থানীয় জনগন	তিনি কারখানা প্রতিষ্ঠার ফলে স্থানীয় নারীদের কর্মসংস্থানের সুযোগ সৃষ্টি হবে কিনা জানতে চান।	EIA প্রতিবেদনের ৫.৩ নং অনুচ্ছেদ বিস্তারিত উল্লেখ আছে
৫।	আব্দুল মালেক সরকার, স্থানীয় জনগন	তিনি কারখানা প্রতিষ্ঠার ফলে স্থানীয় জনগণের কর্মসংস্থান ও এলাকার সড়ক-অবকাঠামোর উন্নয়ন হবে কিনা জানতে চান।	EIA প্রতিবেদনের ৫.২.১নং অনুচ্ছেদ বিস্তারিত উল্লেখ আছে

৬।	কে. এম. রিদওয়ানুল বারী জিয়ন - আর্কিটেক্ট ও ডি.এম.ডি, জায়ানা ব্যাটারি টেকনোলজিস	তিনি জানান, সালফিউরিক এসিডযুক্ত তরল বর্জ্য যথাযথভাবে পরিশোধন করে শতভাগ পুনর্ব্যবহার করা হবে এবং ছয়টি এয়ার ট্রিটমেন্ট প্ল্যান্ট (এটিপি) স্থাপন করা হবে, যাতে কারখানার আশপাশের বাতাসে বায়ু দূষণ থেকে স্থানীয় জনগণ সুরক্ষিত থাকেন। তিনি আরও উল্লেখ করেন, এলাকায় প্রচলিত ব্যাটারিচালিত রিকশায় প্রতিষ্ঠানের উৎপাদিত ব্যাটারি ব্যবহারের ফলে কার্বন নিঃসরণ হ্রাস পাবে এবং কারখানায় রেইন ওয়াটার হার্ভেস্টিং পদ্ধতি চালু করা হবে।	EIA প্রতিবেদনের ৫.২.১.৩ নং অনুচ্ছেদ বিস্তারিত উল্লেখ আছে
৭।	মোঃ আঃ সালাম সরকার - উপ- পরিচালক, রংপুর জেলা কার্যালয়, পরিবেশ অধিদপ্তর, রংপুর	তিনি অনুমোদিত (TOR) মোতাবেক কারখানার সমস্ত কার্যক্রম পরিচালনার করার জন্য উদ্যোক্তার প্রতি আহবান জানান। তিনি উপস্থিত এলাকাবাসীর কাছে কারখানা স্থাপিত হলে তাদের কোন অভিযোগ আছে কিনা জানতে চান। উপস্থিত সবাই জানান তাদের কোনো অভিযোগ নাই। কারখানা স্থাপিত হলে এর কার্যক্রমের ফলে যাতে মাটি, পানি, বায়ু দূষিত না হয় সে ব্যবস্থা গ্রহণ পূর্বক পরিচালনা এবং সর্বদা সতর্ক থাকার জন্য উদ্যোক্তাকে নির্দেশনা প্রদান করেন। উপস্থিত তাঁর জেলা কার্যালয়ের সিনিয়র কেমিস্টিকে কারখানার কার্যক্রম তদারকির মাধ্যমে সর্বদা মনিটরিং করার জন্য নির্দেশ প্রদান করেন।	EIA প্রতিবেদনের ৫.৩ নং অনুচ্ছেদ বিস্তারিত উল্লেখ আছে
৮।	জনাব নূর আলম, পরিচালক, রংপুর বিভাগীয় কার্যালয়, পরিবেশ অধিদপ্তর, রংপুর	তিনি কারখানা স্থাপনকালে কারো জমি জোরপূর্বক দখল করা হয়েছে কিনা তা উপস্থিত স্থানীয় জনগণের কাছে জানতে চান। তিনি পানি, মাটি ও বায়ু আধুনিক ব্যবস্থাপনা রাখার জন্য এবং কারখানায় সুষ্ঠু বর্জ্য ব্যবস্থাপনা নিশ্চিত রাখার জন্য উদ্যোক্তার প্রতি আহবান জানান।	EIA প্রতিবেদনের ৫.২.১ নং অনুচ্ছেদ বিস্তারিত উল্লেখ আছে
৯।	পৃথু চন্দ্র দে -ম্যানেজার, জায়ানা ব্যাটারি টেকনোলজিস	তিনি জানান, প্রকল্পের প্রয়োজনে সড়ক উন্নয়ন, ভূমি উন্নয়ন ও অন্যান্য কার্যক্রমে এলাকার জনগণ, পরিবেশ, প্রাণিকুল বা অন্য কারো কোনো ক্ষতি হবে না এবং ভবিষ্যতেও পরিবেশগত বা সামাজিক কোনো ক্ষতি হবে না। তিনি সভায় উপস্থিত সকলকে এবং পরিবেশ অধিদপ্তর, রংপুর জেলা কার্যালয়ের পরিচালক জনাব নূর আলম ও উপ-পরিচালক জনাব মোঃ আঃ সালাম সরকারকে সভায় উপস্থিত থাকার জন্য ধন্যবাদ জ্ঞাপন করেন।	EIA প্রতিবেদনের ৫.২.১ ও ৫.২.১.৯ নং অনুচ্ছেদ বিস্তারিত উল্লেখ আছে

সমাপনী মন্তব্যঃ

পরিবেশ অধিদপ্তর রংপুর বিভাগীয় কার্যালয় রংপুর এর পরিচালক জনাব নুর আলম সভায় অংশগ্রহণকারীদের কোন প্রশ্ন মতামত বা পরামর্শ আছে কিনা জানতে চান। প্রকল্প নিয়ে অধিকাংশ উপস্থিতি পক্ষে মতামত প্রকাশ করেন এবং এক-দুইজন ভিন্ন মতামত প্রকাশ করেন। EIA এর ব্যাখ্যা উল্লেখ্য করায় নির্দেশনা প্রদান করেন। অবশেষে সভায় উপস্থিত সকলকে অংশগ্রহণের ধন্যবাদ জানিয়ে সভার সমাপ্তি ঘোষণা করেন ও তিনি চলমান পরিবেশগত বেসলাইন পর্যবেক্ষণ (Environmental Baseline Monitoring) পরিদর্শন করেন।

ভিন্ন মন্তব্য/আপত্তিঃ

এলাকাবাসী কর্তৃক কোনো অভিযোগ/আপত্তি উত্থাপিত হয়নি।

আয়ন ওয়াটার টেকনোলজি বিডি পরামর্শক দলের মন্তব্যঃ

সভার মাধ্যমে অংশীজনদের প্রশ্নের উত্তর দেওয়া এক পর্যায়ে মোঃ মামুনের রশিদ -সি ই ও, আয়ন ওয়াটার টেকনোলজি বিডি, জায়ানা ব্যাটারি টেকনোলজিস এর পক্ষ হতে EIA তে যে বিষয়গুলি বিবরণ দেয়া হবে জনসন্মুখে তা আলোচনা করা হয়। বিশেষ করে জায়ানা ব্যাটারি টেকনোলজিস এর পরিবেশগত প্রভাব নিরূপণ ও প্রশমন ব্যবস্থা সম্পর্কে স্থানীয় জনগণকে অবহিত করা হয়। জায়ানা ব্যাটারি টেকনোলজিস প্রতিষ্ঠার আলোকে EIA তে যুক্তিখন্ডন/ যথাযথ সুরক্ষা ব্যবস্থা উপস্থিতিদের মধ্যে উল্লেখ করা হয়েছে। এখানে উল্লেখ্য যে সৃষ্ট তরল বর্জ্য রিসাইকেল ইটিপি দ্বারা পরিশোধিত করে পুনরায় ব্যবহার করা হবে। বায়ু দূষণে আধুনিক ATP (Air Treatment Plant) দ্বারা পরিশোধিত করা হবে এবং শব্দ দূষণ এ পর্যাপ্ত আধুনিক ব্যবস্থা গ্রহন করা হবে। । প্রকল্প বাস্তবায়িত হলে স্থানীয়দের জীবনযাত্রার মান-উন্নয়ন, রাস্তা ঘাটের উন্নয়ন ও কর্মসংস্থানের ব্যবস্থা হবে বলে স্থানীয় বাসিন্দারা অভিমত ব্যক্ত করেন। জনমত যাচাই সভার মতামত, পরামর্শ এবং আলোচিত বিষয়গুলো ইআইএ (EIA) প্রতিবেদন এবং প্রকল্প পরিকল্পনায় যুক্ত করা হবে।

জনমত যাচাই সভার কার্যবিবরণী অনুমোদনঃ

১. জায়ানা ব্যাটারি টেকনোলজিস,
এর পক্ষেঃ

২. পরামর্শক প্রতিষ্ঠান,
আয়ন ওয়াটার
এর পক্ষেঃ

৩. পরিবেশ অধিদপ্তর,
রংপুর জেলা
এর পক্ষেঃ

অনুমোদিত স্বাক্ষর

অনুমোদিত স্বাক্ষর

অনুমোদিত স্বাক্ষর

শনিবারের

প্রথম আলো

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১৪৫ নং, লক্ষ্য ১৪৫

১২ সেপ্টেম্বর ২০২৬, ২৮ ভাদ্র ১৪৩৩, ২৯ রবিউল আউয়াল ১৪৪৮

বিজ্ঞপ্তি

এতদ্বারা সর্বসাধারণের জ্ঞাতার্থে জানানো যাচ্ছে যে, রংপুর জেলার, গংগাচড়া উপজেলার বড়বিলা ইউনিয়নের গুরুবাড়ি গ্রামের, উত্তর পানাপুকুর মৌজায় ১৩২ শতাংশ জমি যাহা জে.এল নং- ৩০, আর এস. খতিয়ান নং- ১৩০, ৭১৪, ১১৫০, ২১৯৫, ২২০০, আর এস. দাখা নং- ২০৬৩, ২০৫৮, ২০৬৭, ২০৬৮, ২০৬৪ এতে জায়ানা ব্যাটারি টেকনোলজিস নামে একটি আধুনিক পরিবেশ বান্ধব ব্যাটারি ইভাসিটি নির্মাণের প্রাথমিক কার্যক্রম গ্রহণ করা হয়েছে। কারখানাটি স্থাপনের লক্ষে পরিবেশগত প্রভাব নিরূপনের কার্যপরিধি (TOR) পরিবেশ অধিদপ্তর সদরদপ্তরের ছাড়পত্র বিষয়ক কমিটি অনুমোদন করে যার মেমো নং- ২২.০২.৮৫০০.২৫৩.০৭২.০১১.২৫.১ তাং ৭/০৯/২০২৬ ইং।

এমতাবস্থায় পরিবেশ সংরক্ষন বিধিমালা ২০২৩ এর বিধি- ১৬ অনুযায়ী জনমত যাচাইয়ের লক্ষে আগামী ১৫ ই সেপ্টেম্বর ২০২৬ ইং রোজ মঙ্গলবার দুপুর- ১২ ঘটিকায় প্রস্তাবিত কারখানা প্রাঙ্গনে একটি সভা অনুষ্ঠিত হবে। স্থানীয় এলাকাবাসীর মতামত ও প্রয়োজনীয় পরামর্শ গ্রনানে আগ্রহী সকলকে উপস্থিত থাকার জন্য অনুরোধ করা হলো।

কর্তৃপক্ষ

জায়ানা ব্যাটারি টেকনোলজিস
ফোন নং- ০১৩৩৪৯১৯৪০১



বিজ্ঞপ্তি

এতদ্বারা সর্বসাধারণের জ্ঞাতার্থে জানানো যাচ্ছে যে, রংপুর জেলার, গংগাচড়া উপজেলার বড়বিল ইউনিয়নের গুকাবাড়ি গ্রামের, উত্তর পানাপুকুর মৌজায় ১০২ শতাংশ জমি যার জে.এল.নং ৩০, আর.এস. নথিয়ান নং ১৩০, ৭১৪, ১১৫০, ২১৯৫, ২২০০ আর.এস. নং ২০৬৫, ২০৫৮, ২০৬৭, ২০৬৮, ২০৬৮ এতে জায়ানা ব্যাটারি টেকনোলজিস নামে একটি আধুনিক পরিবেশ বান্ধব ব্যাটারি ইভালিউ নির্মাণের প্রাথমিক কার্যক্রম গ্রহণ করা হয়েছে। কারখানাটি স্থাপনের লক্ষে পরিবেশগত প্রভাব নিরূপণের কার্যপরিধি (TOR) পরিবেশ অধিদপ্তর সদরনগরের ছাড়পত্র বিষয়ক কমিটি অনুমোদন করে যার মেমো নং ২২.০২.৮৫০০.২৫৩.০৭২.০১১.২৫.১ তাং-০৭/০৯/২০২৬ইং।

এমতাবস্থায় পরিবেশ সংরক্ষন বিধিমালা ২০২৩ এর বিধি-১৬ অনুযায়ী জনমত যাচাইয়ের লক্ষে আগামী ১৫ই সেপ্টেম্বর ২০২৬ইং রোজ মঙ্গলবার দুপুর-১২ ঘটিকায় প্রত্যাবিত কারখানা প্রাঙ্গনে একটি সভা অনুষ্ঠিত হবে। স্থানীয় এলাকাবাসীর মতামত ও প্রয়োজনীয় পরামর্শ প্রদানে আয়োজী সকলকে উপস্থিত থাকার জন্য অনুরোধ করা হলো।

কর্তৃপক্ষ

জায়ানা ব্যাটারি টেকনোলজিস
ফোন নং ০১৩৩৪৯১৯৪০১

পি-৭৪৬/১০২৪

জায়ানা ব্যাটারি টেকনোলজিস এর সাধারণ তথ্যাবলিঃ

জায়ানা ব্যাটারি টেকনোলজিস একটি লেড এসিড ব্যাটারী উৎপাদনকারী শিল্প কারখানা। কারখানাটির অবস্থান- গ্রাম: উত্তর পানাপুকুর, ওকড়াবাড়ী ডাকঘর: বড়বিল থানা: গঞ্জাচড়া, জেলা: রংপুর, বাংলাদেশ।। প্রকল্পের স্থানটি জিরো পয়েন্ট, ঢাকা (জিপিও)- ১০০০ হতে প্রায় ২৬৪.৯৭ কিলোমিটার এবং হযরত শাহজালাল আন্তর্জাতিক বিমানবন্দর থেকে ২৫৩ কিলোমিটার দূরে অবস্থিত। প্রকল্পের স্থানটি রংপুর থেকে প্রায় ১১.৪৯ কিলোমিটার গঞ্জাচড়া থেকে প্রায় ৪.৯৬ কিঃমিঃ এবং দূরত্বে অবস্থিত। ভৌগোলিকভাবে প্রকল্পটি ২৫. ৮৩৫৭১৬৬৬" উত্তর, ৮৯°১৭২১৭৫ পূর্বে অবস্থিত।

কারখানাটিতে সর্বমোট ২৫০ জন দক্ষ ও অদক্ষ শ্রেণির কর্মচারী নিযুক্ত হবেন। তন্মধ্যে ০৫ জন পরিবেশগত ব্যবস্থাপনার লক্ষ্যে নিয়োজিত। কারখানাটির উৎপাদন ক্ষমতা দৈনিক ১০০টি ব্যাটারী। মানসম্পন্ন পণ্য উৎপাদনের লক্ষ্যে কারখানাটি সর্বাধুনিক যন্ত্রপাতি দিয়ে সজ্জিত। মোট এলাকার পরিমাণ ১৩২.৫ শতাংশ এবং প্রকল্প কর্তৃক দখলকৃত এলাকা প্রায় ১০০ শতাংশ (প্রায়)।

প্রকল্পের উপাদানঃ

জায়ানা ব্যাটারি টেকনোলজিস নিম্নলিখিত ১৩ টি প্রধান ইউনিট নিয়ে গঠিত, যা হল-

১. চার তলা প্রশাসন/অফিস এলাকা ২০০ বর্গমিটার
২. ডি এম প্ল্যান্ট এবং এসিড ডাইলুশন এলাকা -৭৪৩.৮৩৩৮ বর্গমিটার
৩. ওয়েল টাঙ্ক এলাকা -১৮.৫৮ বর্গমিটার
৪. বয়লার প্ল্যান্ট এবং ওয়্যারহাউস এলাকা -১৪৮৮.৪৬০৪ বর্গমিটার
৫. মেইন শেড ও ৬ টি এটিপি এলাকা -৮৩৭৫.৩৭৩ বর্গমিটার
৬. ওয়াটার রিজারভার এলাকা ১১.১৫ বর্গফুট
৭. সাবস্টেশন রুম ১১১.৪ বর্গমিটার
৮. জেনারেটর রুম ৮৩.৬১ বর্গমিটার
৯. ইটিপি এলাকা- ২২২.২২ বর্গমিটার
১০. ইউ. জি .ডবলু .আর ৫৭.৬১৪৫ বর্গমিটার
১১. কেমিক্যাল স্টোর ১২৫.৫৩৮ বর্গমিটার
১২. ইলেক্ট্রিক্যাল ওয়ার্কসপ ১১১.৩২৫২ বর্গমিটার
১৩. মেকানিক্যাল ওয়ার্কসপ ৮৩.৭২২৫ বর্গমিটার

প্রাথমিক তথ্যাদি

জায়ানা ব্যাটারি টেকনোলজিস প্রকল্পের প্রাথমিক তথ্যাদি নিচের সারণীতে দেখানো হয়েছে-

প্রকল্পের নাম	জায়ানা ব্যাটারি টেকনোলজিস
প্রকল্পের উদ্যোক্তা	কে. এম. রিদওয়ানুল বারী জিয়ন - ব্যবস্থাপনা পরিচালক
প্রকল্পের অবস্থান	গ্রাম: উত্তর পানাপুকুর, ওকড়াবাড়ী ডাকঘর: বড়বিল থানা: গঙ্গাচড়া, জেলা: রংপুর, বাংলাদেশ।
অফিসের ঠিকানা	বাড়ি ৪৪, ধানমন্ডি, ঢাকা-১২০৯, বাংলাদেশ.
প্রকল্পের ধরন	লেড-অ্যাসিড ব্যাটারি উৎপাদন
প্রকল্প ব্যয়	১৮.৫ মিলিয়ন (বিডিটি)
উৎপাদন ক্ষমতা	১০০ টি দৈনিক
উৎপাদিত পণ্য	লেড এসিড ব্যাটারী
কর্মচারীর সংখ্যা	২৫০ জন
পরিবেশগত ব্যবস্থাপনার সাথে সংশ্লিষ্ট কর্মকর্তার সংখ্যা	০৫ জন
কর্মঘন্টা	২৪ ঘন্টা প্রতিদিন
মোট জমির পরিমাণ	১৩২.৫ শতাংশ
প্রকল্প কর্তৃক ব্যবহৃত জমির পরিমাণ	১০০ শতাংশ
ব্যবহৃত কাঁচামাল ও কাঁচামালের উৎস	সালফিউরিক অ্যাসিড, লেড অক্সাইড, পিপি (PP) ব্যাটারি কন্টেইনার ও সেপারেটর
দৈনিক ব্যবহৃত পানির পরিমাণ	১০৫.০ ঘনমিটার/দিন
দৈনিক ব্যবহৃত পানির উৎস	নিজস্ব ডিপ টিউবওয়েল
প্রয়োজনীয় বিদ্যুতের পরিমাণ	২৫০০ কিলোওয়াট/দিন, আরইবি (REB)
তরল বর্জ্য উৎপাদনের পরিমাণ	৮০ ঘনমিটার/ দৈনিক
তরল বর্জ্য শোধনাগারের ক্ষমতা	৬.০ ঘনমিটার/ঘন্টা এবং ১২০ ঘনমিটার/দিন
তরল বর্জ্য শোধন পদ্ধতি	রাসায়নিক পরিশোধন পদ্ধতি
তরল বর্জ্য শোধনাগারের ইউনিটসমূহ	ইকুয়ালাইজেশন ট্যাঙ্ক, নিউট্রাইজেশন ট্যাঙ্ক, কোয়াগুলেশন ট্যাঙ্ক, ফ্লোকুলেশন ট্যাঙ্ক, ক্লারিফায়ার ট্যাঙ্ক, স্লাজ কালেকশন ট্যাঙ্ক, ফিল্টার ফিড ট্যাঙ্ক, মাল্টি গ্রেড ফিল্টার, একটিভেটেড কার্বন ফিল্টার, ট্রিটেড ওয়াটার ট্যাঙ্ক, স্লাজ ড্রাই বেড।
প্রকল্প কর্তৃক উৎপাদিত তরল	রিসাইকেল ইটিপি মাধ্যমে পরিশোধিত হয়ে ১০০% পানি , বাগান পরিচর্যা ও ফ্লোর এবং বাকেট ওয়াশে ব্যবহৃত হবে।
বর্জ্যের চূড়ান্ত নিষ্কাশন ব্যবস্থা	পুনঃ ব্যবহারিত হবে।
ড্রেনের মালিকানা	নিজস্ব মালিকানাধীন ড্রেন।
কঠিন বর্জ্য ব্যবস্থাপনা পদ্ধতি	পুনঃচক্রায়ন

সম্ভাব্য ইতিবাচক প্রভাবঃ

এই প্রজেক্টের সম্ভাব্য ইতিবাচক প্রভাব গুলো নিম্নরূপ-

- নতুন কর্মসংস্থানের সুযোগ
- স্থানীয় ব্যবসাসমূহের সহায়তা ও অগ্রগতি
- অবকাঠামো উন্নয়ন এবং
- স্থানীয় পরিষদের অবকাঠামো উন্নয়ন এবং রাজস্ব বৃদ্ধি
- সরকারী কোষাগারে বড় পরিমাণে রাজস্ব জমা হবে।

সম্ভাব্য নেতিবাচক পরিবেশগত প্রভাব এবং প্রশমন ব্যবস্থা

ক্ষতিগ্রস্থ পরিবেশগত উপাদান	প্রত্যাশিত প্রভাব	প্রস্তাবিত/বাস্তবায়িত প্রশমন/বর্ধিতকরণ
পানি	পানি দূষণ	* প্রকল্পের ইটিপি এবং তরল বর্জ্য শোধনাগারের যত্ন নিতে হবে। * যথাযথ স্যানিটেশন সুবিধা নিশ্চিত করতে হবে * সচেতনতা এবং প্রশিক্ষণের মাত্রা বৃদ্ধি করতে হবে
শব্দ	শব্দ দূষণ	* বাধা বা বিল্ডিং দ্বারা শব্দ প্রতিরোধ * গ্রীন বেল্ট তৈরি * কোলাহলপূর্ণ এলাকায় পিপিই এর কঠোর ব্যবহার * নিয়মিত শব্দের মান পর্যবেক্ষণ
বায়ুর গুণমান	বায়ু দূষণ	* ৬ টি এটিপি স্থাপন * কঠিন বর্জ্যের সঠিক ব্যবস্থাপনা * যানবাহন চলাচলের কার্যকর নিয়ন্ত্রণ * ভালো মানের জ্বালানি পোড়ানো
কঠিন বর্জ্য	বায়ু পানি এবং মাটি দূষণ	* সঠিক কঠিন বর্জ্য ব্যবস্থাপনা ব্যবস্থা * পর্যাপ্ত সংখ্যক বর্জ্য হ্যান্ডলিং বিন * সচেতনতা এবং প্রশিক্ষণ



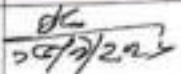
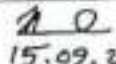
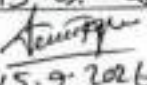
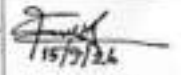
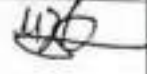






PARTICIPANTS LIST

Date: 15.09.2026

SL. NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
1.	Nur Alam Director	D.O.E		01718150 295	
2.	Md. A. Salam Khan Deputy Director	D.O.E		01712-41474	 15.09.2026
3.	Md. Malin Nigh Senior Chemist	D.O.E Rangpur		01789967088	 15.09.2026
4.	Md. Nurul Alam Siddique	ION WATER Environmental Specialist	EP	0181701323	 15.9.2026
5.	HAMUNUR RAHID	ION WATER Bdaka, BD.	CEO.	01715861893	
6.	MD. Shafiq Rahman	Jayana Battery	Head of Maintenance	01736622913	
7.	KM Rezaul Zannab	Jayana Batteries	Architect	01783158555	
8.	Md. Farukuzzaman	Jayana Batteries		01786850305	 15/9/26
9.	Md. Jonyed Chow. Shury.	Jayana Batteries	Advaijor.	01713-765286	
10.	Prithuchandra dey	Jayana Battery	Managers.	01722543189	 15/9/26
11.					
12.					

PARTICIPANTS LIST

SL. NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
১	আবুল কালাম	হি: আলহাজ্ব আবুল কালাম	কাজ	০১৭২১৪৫ ৪০৫০	আবুল কালাম
২	আবুল কালাম	হি: আলহাজ্ব	কাজ	০১৭২৪১২১৫৫	আবুল কালাম
৩	আবুল কালাম	হি: আলহাজ্ব	কাজ	০১৭১৭৭৬৬০ ৩৪	আবুল কালাম
৪	আবুল কালাম	হি: আলহাজ্ব	কাজ	০১৭১০৭১৬৬৭	আবুল কালাম
৫	আবুল কালাম	হি: আলহাজ্ব	কাজ	০	আবুল কালাম
৬	আবুল কালাম	হি: আলহাজ্ব	কাজ	০	আবুল কালাম
৭	আবুল কালাম	হি: আলহাজ্ব	কাজ	০১৭৩০২৬২৪	আবুল কালাম
৮	আবুল কালাম	হি: আলহাজ্ব	কাজ	০১৩২২৭৩০৫৫	আবুল কালাম
৯	আবুল কালাম	হি: আলহাজ্ব	কাজ	০১৪৪৫৬২০৫২৫	আবুল কালাম
১০	আবুল কালাম	হি: আলহাজ্ব	কাজ		আবুল কালাম
১১	আবুল কালাম	হি: আলহাজ্ব	কাজ	০১৭১৫৫৫৬৬০	আবুল কালাম
১২	আবুল কালাম	হি: আলহাজ্ব	কাজ	০১৭২৫৭৭১৪৪	আবুল কালাম

PARTICIPANTS LIST

SL NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
13.	শ্রীমতি সত্যজিৎ	শ্রীমতি সত্যজিৎ	শ্রীমতি	01833445333	শ্রীমতি সত্যজিৎ
14.	সত্যজিৎ	(শ্রীমতি সত্যজিৎ)	শ্রীমতি	01785087177	সত্যজিৎ
15.	সত্যজিৎ সত্যজিৎ	সত্যজিৎ	শ্রীমতি	01770399009	সত্যজিৎ
16.	সত্যজিৎ সত্যজিৎ	সত্যজিৎ	শ্রীমতি	0161264892	সত্যজিৎ
17.	সত্যজিৎ	সত্যজিৎ	শ্রীমতি	01781060586	সত্যজিৎ
18.	সত্যজিৎ	সত্যজিৎ	শ্রীমতি	01311688849	সত্যজিৎ
19.	সত্যজিৎ (সত্যজিৎ)	সত্যজিৎ	শ্রীমতি	01718461062	সত্যজিৎ
20.	সত্যজিৎ	সত্যজিৎ	শ্রীমতি	01710018888	সত্যজিৎ
21.	সত্যজিৎ	সত্যজিৎ	শ্রীমতি	01717119882	সত্যজিৎ
22.	সত্যজিৎ	সত্যজিৎ	শ্রীমতি	01985888882	সত্যজিৎ
23.	সত্যজিৎ	সত্যজিৎ	শ্রীমতি	01842557085	সত্যজিৎ
24.	সত্যজিৎ	সত্যজিৎ	শ্রীমতি	01983444333	সত্যজিৎ

PARTICIPANTS LIST

SL NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
25.	সুজাতা হোসেন	মৌচাকীয়া	কৃষক	০১৭২৩৫৭৭৭০	সুজাতা
26.	আবুল	সরকারী	কৃষক	০১৭৭৭৩৩৭১৩	আবুল
27.	জাহাঙ্গীর	সরকারী	কৃষক	০১৭২৩৭৭৭০০	জাহাঙ্গীর
28.	মাহবুব হোসেন	সরকারী	কৃষক	০১৭১৫৩০৭১২	মাহবুব
29.	ফারহান	সরকারী	কৃষক	০১৩১৫৩২০০২	ফারহান
30.	আবুল হোসেন	সরকারী	কৃষক	০১৭৩৩০০০৬৭	আবুল
31.	আবুল হোসেন	সরকারী	কৃষক	০১৩০০০৭২২৬	আবুল
32.	আবুল হোসেন	সরকারী	কৃষক	০১৭৩৪৬৭৭৭১৫	আবুল
33.	সুজাতা হোসেন	সরকারী	কৃষক	০১৭৬৩৭৩৭১২	সুজাতা
34.	আবুল হোসেন (মহা)	সরকারী	কৃষক	০১৭৬১২৬৪৬৩২	আবুল
35.	আবুল হোসেন	সরকারী	কৃষক	০১৭৩০৩৭৭১৬	আবুল
36.	আবুল হোসেন	সরকারী	কৃষক	০১৩৩৪৭৫৫১২১	আবুল

PARTICIPANTS LIST

SL NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
89	ଜୟରାମ	ଝି: ନାମାଗୁଡ଼ା ପାମାଡ଼ା	ହୁଅର	0962109606	Jayaram
90	(ମା: ଚାନ୍ଦିନୀ ସାହୁ)	ମ: ଶ୍ରୀନାଥପୁର ପିତାମାତା	ହୁଅର	01778938478	(ମା: ଚାନ୍ଦିନୀ)
90	ସା: ସାହୁ ସମ୍ପଦ	ପଞ୍ଚମାଡ଼ା ଚାନ୍ଦିନୀ ମାମୁ	ହାତୁଆଳୀ	012424250 82	ସାହୁ
90	ସା: ସାହୁ ସମ୍ପଦ	ପଞ୍ଚମାଡ଼ା	ହୁଅର	0171690693	ସାହୁ
91	ସା: ଅନୁରାଗ	ମା: ଶ୍ରୀନାଥପୁର ପାମାଡ଼ା	ହୁଅର	013714744	ଅନୁରାଗ
92	ମା: ଅନୁରାଗ	ପଞ୍ଚମାଡ଼ା	ଦିନ ଅନୁରାଗ	0171428703	ଅନୁରାଗ
93	ଶ୍ରୀ ଅନୁରାଗ	ଝି: ନାମାଗୁଡ଼ା ପାମାଡ଼ା	ଦିନ ଅନୁରାଗ	0131828703	ଶ୍ରୀ ଅନୁରାଗ
94	ସା: ସାହୁ ସମ୍ପଦ	ଝି: ନାମାଗୁଡ଼ା ପାମାଡ଼ା	ହୁଅର	01223420 489	ସାହୁ
95	ଶ୍ରୀ: ଅନୁରାଗ	ଝି: ନାମାଗୁଡ଼ା ପାମାଡ଼ା	ହୁଅର	0171609090	ଅନୁରାଗ
96	ସା: ସାହୁ ସମ୍ପଦ	ଝି: ନାମାଗୁଡ଼ା ପାମାଡ଼ା	ହୁଅର	01318103953	ସାହୁ
97	ସା: ଅନୁରାଗ	ଝି: ନାମାଗୁଡ଼ା ପାମାଡ଼ା	ହୁଅର	0176771288	ଅନୁରାଗ
98	ସା: ଅନୁରାଗ	ଝି: ନାମାଗୁଡ଼ା ପାମାଡ଼ା	ହୁଅର	01	ଅନୁରାଗ

PARTICIPANTS LIST

SL NO	NAME	ADDRESS	OCCUPATION	MOBILE NO	SIGNATURE
49	ডাঃ-তুহিন	উকানগড়ী	জ্যোতিষ	01723516854	
50	ব্রজ মণ্ড	লক্ষীনাথ	কৃষক	01576464866	
51	সাবিত্রী	কাননগড়ী	শ্রমিক	01705893970	
52	সাবিত্রী	কাননগড়ী	কৃষক	01943512901	
53	(মহাশয় মণ্ড)	কাননগড়ী	শ্রমিক	01729043609	
54	ডাঃ সুমিত্রা	কাননগড়ী	শ্রমিক	01754546464	
55	সেখাচন্দ্র	কাননগড়ী	কৃষক	01722798926	
56	জি/ও নীল	কাননগড়ী	কৃষক	017162954650	
57	ডাঃ ইমরুল আলী	উকানগড়ী	কৃষক	0170331649	
58	ডাঃ অমিত	কাননগড়ী	কৃষক	01760603353	
59	ব্রজ মণ্ড	কাননগড়ী	শ্রমিক	0131018829	
60					