2024

M/S. National Automotive Components (Pvt.) Ltd.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PLOT # 34-C,

QUAID-E-AZAM BUSINESS PARK,

SHEIKHUPURA

Sep, 2024

SUBMITTED BY:

AAA ENVIRONMENTAL ADVISERS

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CHECKLIST (EIA)

PAK EPA GUIDELINES FOR PREPARATION AND REVIEW OF ENVIRONMENTAL REPORTS, 1997

Required Content	EIA Report		
	PAGE NO.	REMARKS (If Any)	LACKING
Executive summary: **1.** Title and location of project			
2. Name of the proponent			
3. Name of the organization preparing the report			
4. A brief outline of the proposal (type, process, technology and land requirement)			
5. The major impacts			
6. Recommendations for mitigation measures			
7. Proposed monitoring			
Introduction: 1. Purpose of report			
2. Identification of project and proponent			
3. Details of consultant			
4. Brief description of nature, size, and location of project			
Screening: Whether the Project requires IEE or EIA as per Regulations			
Scoping			
1. Spatial and Temporal Boundaries of Environmental Assessment			
2. Important issues and concerns raised during consultation			
3. Significant impacts and factors to be determined			
Consideration of Alternatives			
1. Site alternatives, their selection and rejection criteria			
2. Design/Technology alternatives, their selection and rejection criteria			
3. Environmental Alternatives, their selection and rejection criteria			

Required Content	EIA Report		
	PAGE NO.	REMARKS (If Any)	LACKING
4. Economic Alternatives, their selection and rejection criteria			
Description of the project:			
1. Objectives of Project			
2. Location and Site Layout of the project (May be annexed at the end of report)			
3. Land use on the site			
4. Road access			
5. Vegetation features of the site			
6. Cost and Magnitude of operation			
7. Schedule of implementation			
8. Description of the project (Process flow chart/steps, Technology, Raw material and products, by-products)			
9. Restoration and rehabilitation plans			
Description of Environment: Clear-cut picture of existing environmental resources:			
1. Baseline Physical Environment			
2. Baseline Ecological Environment			
3. Baseline Socioeconomic Environment			
4. Lab reports of environmental analyses (along with soil tests, geo investigation in case of building projects and industries)			
5. Suitability of the site (not prohibited, environmentally sensitive, incompatible to surroundings and unsuitable)			
Impact Assessment 1. Methodologies for impact identifications (One/more)			
✓ Checklists			
✓ Matrices			

Required Content	EIA Report

	PAGE NO.	REMARKS (If Any)	LACKING
✓ Networks			
✓ Overlays			
✓ GIS and Computer expert systems			
2. Characteristics of impacts (nature, magnitude, extent and location, timing, duration, reversibility, risk)			
Screening of potential Environmental Impacts and mitigation measures on/during:			
1. Project Location			
2. Design			
3. Construction phase			
4. Operational phase			
5. Potential Environmental Enhancement Measures			
Environmental management and monitoring program			
i. Description of proposed mitigation actions along with:			
ii. Schedule for implementation and Environmental budget			
iii. Environmental Management Team along with their Roles and responsibilities (by name or position)			
iv. Proposed monitoring program to assess performance or output of EMP			
v. Proposed EMP reporting and reviewing procedures			
vi. Any training needs required to ensure implementation of EMP and Monitoring plans			

Required Content	EIA Report		
	PAGE NO.	REMARKS (If Any)	LACKING
Stakeholders Consultation: Communicate the possible impacts and concerns to the following to assist further analysis and decision making:			
i. Proponent's Environment Management Team			
ii. The responsible authority			
iii. Other departments and agencies			
iv. Environmental practitioners and experts			
v. Affected and wider community			
Appendices			
1. Glossary			
2. List of abbreviations			
3. Lists of individuals and organizations consulted along with their written feedback			
4. Sources of data and a full list of all reference material used			
5. Terms of references of environmental reports and those given to individual specialists			
6. List of names, qualifications and roles of team members carrying out the IEE/EIA study			
7. Approvals from other concerned departments			

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

1. Title and Location of the Project

This Environmental Impact Assessment (EIA) Report is for the project "National Automotive Components (Pvt.) Ltd.". The location of the project is Plot No. 34-C, Quaid-e-Azam Business Park, Sheikhupura. The coordinates of the site are 31°43'59.0"N 74°03'59.0"E.

2. Name of the Proponent

The proponent of the proposed project is Mr. Salman Saleem who is Chief Executive of the proposed unit.

3. Name of the Organization Preparing the Report

In order to comply with IEE/EIA regulations, 2000 as per Punjab Environmental Protection Act (PEPA), 1997 (Amended 2017), the proponent has entrusted AAA Environmental Advisers. to carry out Environmental impact Assessment Study for the proposed project named "National Automotive Components (Pvt.) Ltd."

4. A Brief Outline of the Proposal (Type, Process, Technology and Land Requirement)

The Proponent, National Automotive Components (Pvt.) Ltd, intends to establish an automobile component manufacturing unit at Plot No. 34-C, Quaid-e-Azam Business Park, Sheikhupura, over an area of 1.33 acres. The estimated cost of the proposed project is PKR 400 million (approx.). The project includes the production of various parts of automobiles like axle, shaft, bracket, crossmember, panel, leaf spring, speedometer, shock absorber etc. as per consumer demand. The total estimated production capacity of the entire project will be approximately 1,000,000 pieces, combining all the products.

Two generators with capacity of 500 KVA each will be installed. The proposed project will significantly contribute to the industrial development of the country and the national GDP. The manufacturing process involves Shearing, Heating, Forging, Turning of Head, Grinding, Drilling, Hole Chamfering, Threading, Paint, Quality Inspection, Packing & Dispatch. State-of-the-art machinery will be employed for manufacturing purposes.

5. The Major Impacts

The development of the proposed automotive components manufacturing unit will have both positive and negative impacts during the construction and operational phases. Appropriate mitigation measures are proposed to address the negative impacts. The major concerns and potential impacts include:

Ambient Air Quality: The air quality may deteriorate during the pre-construction (site clearing) and construction phases. Major contributing factors will include the generation, suspension, and deposition of particulate matter, as well as gaseous emissions due to vehicular movement and operation of construction machinery.

Noise Levels: Noise levels around the project site may increase due to the operation of machinery and equipment, as well as the transportation of construction materials.

Construction Waste: Improper management of construction waste could negatively impact the project site and surrounding areas, leading to issues like littering and pollution.

Maintenance of Equipment: Poor maintenance of vehicles, machinery, and generators could result in increased noise levels and higher emissions of harmful gases.

Ecological Impact: The proposed project site is located in an industrial area with no existing plants or trees. Therefore, there will be no significant negative impact on the ecological environment.

Wastewater Management: Untreated disposal of wastewater from the manufacturing process could lead to contamination of surface and groundwater, posing environmental and health risks.

Oil Spillages: Oil spillages from construction machinery and operational equipment could lead to soil and water contamination, affecting the local environment.

Health and Safety Hazards: There is a potential risk to the health and safety of workers during both construction and operational phases due to the use of heavy machinery, exposure to hazardous materials, and other industrial activities.

Local Employment: The proposed unit will prioritize hiring local residents, which will positively impact the local economy by providing job opportunities and reducing regional unemployment.

6. Criteria for Impacts Characterization

Potential environmental impacts are characterized based upon the following criteria;

Table 0-1: Criteria for Characterization of Impacts

Sr. No.	Impacts Characteristics	Categories
1	Nature of the Impact	**Direct:** The environmental parameter is directly changed by the project.
		Indirect: The environmental parameter changes as a result of change in another parameter.
	Duration of the	**Short Tenn:** Lasting only till the duration of the project such as noise from the construction activities.

2	Impact	**Medium Term:** Lasting for a period of few months to a year after the project before naturally reverting to the original condition.
		Long Term: Lasting for a period much greater than medium term impacts before naturally reverting to the original condition.
3	Geographical location of the impact	**Local:** Within the area of project i.e. operation site and access road.
		Regional: Within the boundaries of the project area.
		National: Within the boundaries of the country.
		Global: Trans-boundary impacts
4	Timing	Construction and Operation
5	Likelihood of the impact	**High:** High likelihood of occurrence during lifetime of operation, Regular/continuous part of operations.
		Moderate: Moderate possibility of occurrence during lifetime **of operation, Periodic/occasional part of operations**.
		Low: Unlikely to occur during lifetime of operation.
6	Reversibility of the impact	**Reversible:** When a receptor resumes its pre-project condition.
		Irreversible: When a receptor does not or cannot resume its pre-project condition.
7	Significance of the impact	**Major, Moderate, Minor, Negligible and Beneficial;** Based on the consequence, likelihood, reversibility, geographical extent, duration, level of public concern and conformance with legislative or statutory requirements.
8	Consequence severity of impact	**High:** Serious/catastrophic damage to environment
		Medium: Measurable damage to the environment, potential to reduced efficiency
		Low: Negligible damage to the environment or no risk to business

7. Recommendations for Mitigation Measures

All the potential impacts of the proposed project should be prevented through appropriate measures and if happen, they should be properly mitigated. Appropriate mitigation measures have been suggested after this EIA study and a comprehensive Environmental Management and Monitoring Plan (EMMP) has been formulated and given in this **EIA** study. The execution of EMP will help to reduce the adverse impacts of the proposed project. Thus, the project should be made environment friendly by implementing this Environmental Management & Monitoring Plan (EMMP) with fidelity.

8. Proposed Monitoring

The environmental performance of the proposed project should be overseen through proper monitoring during its construction and operational phases. The Environmental Monitoring Plan should be enforced during the project lifecycle to ensure effective surveillance of the environmental parameters at various stages of the project development and compliances with NEQS and legal obligations. Following parameters should be monitored;

- Ambient air quality should be monitored as per EPA PEQS Rules 2001
- Monitoring for noise levels should be conducted as per EPA PEQS Rules 2001
- Monitoring for waste water & drinking water quality should be conducted as per EPA PEQS Rules 2001

The proponent shall be responsible for environmental monitoring and reporting throughout project life and assure proper implementation of mitigation measures, where needed, through adequate monitoring.

9. Conclusions and Recommendations

The development of the proposed manufacturing industry in the region will not only help in availability of automotive components at cheaper rates but it will also contribute towards the economy of the country to a greater extent. Also, industrialization generates employment opportunities, provides educational opportunities, encourages advancement and innovation, and better utilizes resources. AH of these benefits and more make industrial development extremely valuable to a population and the local economy.

Apart from the beneficial impacts of the project; the proposed project can also have adverse environmental impacts during all phases. Most of the impacts during construction are of a temporary nature. These potential impacts can be avoided or mitigated by adopting suitable mitigation or remedial measures as mentioned in this EIA Report.

Following are the recommendations based upon this EIA Study:

- Proposed mitigation measures for potential environmental impacts should be implemented to avoid/ minimize those impacts
- Tree plantation plan should be followed
- Proper implementation of EMMP should be ensured during all three phases of the proposed project.
- Training programs should be arranged and all working personnel and contractors should be given appropriate training prior to construction to ensure they are aware of the on-site responsibilities in respect of all environmental and social issues.
- EMMP should be made a part of contract document of Contractor and executed properly.

1. INTRODUCTION

1.1. Purpose of the Report

This EIA report has been prepared to conform to the requirements of the Punjab Environmental Protection Act, 1997 2012(Amended 2012) which states that;

"No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an initial environmental examination or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained from the Provincial Agency approval in respect thereof"

The proponent feels its social, moral and legal obligation to protect environment. It is in this context that he initiated the process of gaining Environmental Approval from the EPA, Government of Punjab and entrusted AAA Environmental Advisers to carry out EIA Study for this project. Accordingly, this EIA Report is being submitted for issuance of the said Environmental Approval in compliance with Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012).

This EIA report has been prepared following the format conforming to the "Guidelines for the preparation and review of Environmental Reports, October 1997" approved by the Government of Pakistan. The other relevant regulations and guidelines considered while preparing this EIA report include:

- Guidelines for the preparation and review of environmental reports
- Policy and procedures for filing, review and approval of environmental assessments
- Detailed sectorial guidelines
- Guidelines for sensitive and critical areas
- Guidelines for public participation

The EIA study ensures that environmental consequences are considered at all stages of the project. In addition, it will assist the proponent to minimize the potential adverse impacts of the project. This EIA report considers socio economic, physical, and environmental, land use, forestry, crops, water bodies, biodiversity (flora and fauna), heritage, and other relevant aspects associated with the project itself and the area around the project. The report also describes mitigation measures that shall be adopted to undo environmental impacts on any segment of the environment i.e. human health and environmental health around the project site both during

construction and operation of the project. The report provides relevant information, as required under the officially approved format, to help the decision makers (EPA, Punjab in the Present case) before issuing the desired environmental approval.

1.2. Identification of the Project and Proponent

The proposed project is development of an automotive component manufacturing unit by the name "National Automotive Components (Pvt.) Ltd. to be located at Plot No. 34-C, Quaid-e-Azam Business Park, Sheikhupura.

The proponent of the proposed project is Mr. Salman Saleem who is Chief Executive of the proposed industrial unit.

Contact Details

Contact No: 0333-0417127

1.3. Details of the Consultant

AAA Environmental Advisers has carried out the Environmental Impact Assessment (EIA) study for the proposed project

Contact Details

Contact No. 0321-4226196

Address: Office No. MZ-32, Aashiana Center, Main Boulevard, Gulberg III, Lahore.

1.4. Brief Description of Nature, Size and Location of the Project

The proposed project is a manufacturing unit of automobile components manufacturing unit like axle, shaft, bracket, crossmember, panel, leaf spring, speedometer, shock absorber etc. as per consumer demand. The total estimated production capacity of the entire project will be approximately 1,000,000 pieces, combining all the products. The cost of the project is PKR 400 million (approx.). The project will spread over an area of 1.33 Acres. Two generators with capacity of 500 KVA each will be installed.

The project site is located at Plot No. Plot No. 34-C, Quaid-e-Azam Business Park, Sheikhupura. As the proposed project site is located in EPA approved industrial estate therefore, no places of historical importance such as ancient monuments, forts, sculpture, etc. or other sensitive land/area uses such as archeological sites, national parks or wildlife

reserves are found in or around the project site.

1.5. Study Approach & Methodology

The study was conducted in accordance with Environmental Protection Agency (EPA), Government of Pakistan (GOP) Guidelines, 2000. The study was based upon both primary and secondary data and information. Discussions were held with stakeholders including government officials, community representatives and a wide range of local residents. The main purpose of this approach was to obtain a fair impression on the people's perceptions of the project and its environmental impacts.

Following methodology was adopted to carry out EIA study for the proposed Project:

- Meetings and discussions were held among study team to achieve a common ground of understanding regarding various concerns of the study.
- Data acquiring plan having data requirement and their sources, set time schedules and identified responsible person, was developed.
- Primary and secondary data was collected through field observations, environmental monitoring in the field, from concerned departments and published materials to establish baseline profile for physical, biological and socio-economic conditions.
- The impacts of the proposed project on the physical, biological and socio-economic environment prevailing in the project area were visualized at the design, construction and operational phases of the project.
- Adequate mitigation measures were proposed to the proponent to incorporate them beforehand in the design phase.

1.6. Structure of the Report

This EIA study has been accomplished following the requirements serial 2.3 of the "Guidelines for the preparation and review of Environmental Reports, October 1997".

Section 1: **Introduction** briefly presents the project background, objectives, methodology and need of the EIA study.

Section 2: **Screening:** Whether the project requires IEE or EIA as per Regulations

Section 3: **Scoping:** Identifies key environmental issues, focusing the assessment on

significant impacts and ensuring all relevant concerns are addressed efficiently.

Section 4: **Consideration of Alternatives** presents the details of alternatives considered and reasons of their rejection

Section 5: **Description of the Project** furnishes information about the location of the proposed Project, cost and size of the project, its major components and alternatives considered for the proposed project to select at the preferred alternative for detailed environmental assessment.

Section 6: **Description of the Environment** establishes baseline conditions for physical, biological and socio-economic conditions prevalent in the project area.

Section 7: **Impact Assessment** presents the methodologies used for assessment and identification of the impacts

Section 8: **Screening of Potential Environmental Impacts and Mitigation Measures** identifies, predicts and evaluates impacts of the project activities during the construction and operation stages cµ1d deals with the measures proposed to mitigate potential environmental impacts of the proposed project.

Section 9: **Environmental Management and Monitoring Plan** outlines institutional arrangements for the implementation of the proposed mitigation measures, training needs of the staff for implementation of the mitigation measures, monitoring requirements and monitoring cost.

Section 10: **Stakeholder Consultation** identifies the main stakeholders and their concerns rose through scoping sessions, and deals with the measures to mitigate the social impacts.

Section 11: **Conclusions and Recommendations**-provide the outcome of the study and major observations of EIA and suggestions for environmental management and pollution control.

2. SCREENING

The proposed project is a manufacturing unit of automobile components manufacturing unit like axle, shaft, bracket, crossmember, panel, leaf spring, speedometer, shock absorber etc. as per consumer demand. The total estimated production capacity of the entire project will be approximately 1,000,000 pieces, combining all the products. The cost of the project is PKR 400 million (approx.). The project will spread over an area of 1.33 Acres. Two generators with capacity of 500 KVA each will be installed.

The project site is located at Plot No. Plot No. 34-C, Quaid-e-Azam Business Park, Sheikhupura. As the proposed project site is located in EPA approved industrial estate therefore, no places of historical importance such as ancient monuments, forts, sculpture, etc. or other sensitive land/area uses such as archeological sites, national parks or wildlife reserves are found in or around the project site.

Screening was performed at the first stage of the EIA process which resulted in a key EIA decision, namely to either conduct the assessment (based on the likely significant impacts) or not conduct it (in the anticipated absence of such impacts). Screening was done as early as possible in the development of the proposal in order for the proponent and other stakeholders to be aware of possible EIA obligations.

The standardized approach i.e. defined in applicable regulations was applied. The proposed project was assessed based upon a set of criteria determined by Environmental Protection Department (EPD) i.e. Review of IEE/EIA Regulations, 2000 provided by Government of Pakistan, Ministry of Environment, Local Government and Rural Development were considered for the purpose of screening mainly. Accordingly, the project falls under schedule II (List of projects requiring an EIA), Category B (Manufacturing and processing) and sub category 20 "Automobile manufacturing and assembling unit" of the IEE / EIA Regulations 2000, made under section 12 of Punjab Environment Protection Act l997 (Amended 2012) under which the Environmental Impact Assessment (EIA) study is mandatory for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project.

Moreover, following factors were also considered at the earlier stage;

- Magnitude of change in environmental conditions
- Diversity of new features with the existing environment
- Potential for trans-boundary or over large area impact

- Number of people effected
- Likelihood of effecting receptors of other types (fauna and flora, businesses, facilities) be affected?
- Probability of affecting valuable or scarce features or resources be
- Risk of breached environmental standards
- Risk of affected protected sites, areas, features
- High/low probability of the effect occurring
- Long/short duration of effect
- Either effect is permanent or temporary
- Is the impact continuous rather than intermittent
- If it is intermittent, will it be frequent rather than rare
- Reversibility of impacts
- The likelihoods to avoid, or reduce or repair or compensate for the effect

After detailed analysis on the basis of these factors; the proposed project was found suitable for Environmental Impact Assessment (EIA) Study rather than Initial Environmental Examination (IEE) Study.

3. SCOPING

Scoping is the process of identifying the key environmental issues and is perhaps the most important step in an EIA. It occurred early in the project cycle at the same time as outline planning and pre-feasibility studies. Several groups, particularly decision makers, the local population and the scientific community contributed in helping deliberate the issues which should be considered, and scoping is designed to canvass their views. At this stage the option exists for cancelling or drastically revising the project; equally it may be the end of the EIA process if the impacts be found to be insignificant. Once this stage has passed, the opportunity for major changes to the project is restricted.

Scoping for this particular proposal was carried out with two main objectives

1. To pinpoint the problems early allowing mitigating design changes to be made before expensive detailed work is carried out.
11. To ensure that detailed prediction work is carried out for important issues. So that after identifying the key issues, a full-scale EIA is considered and it incorporates terms of reference for further studies.

3.1. Methodology

Before the scoping exercise can be fully started, the remit of the study was defined and agreed by the relevant parties depending on the institutional structure. At a minimum, those who contributed to determining the remit included those who decide whether a policy or project is implemented, those carrying out the EIA (AAA Environmental Advisers.) and those carrying out parallel engineering studies relating to the proposal. Following is the step-wise methodology adopted for the scoping of subject proposal.

The key interest groups, both governmental and non-governmental, were identified - they include EPA, QABP, surrounding community and workers & management of adjacent industries.

Since, the people who can be affected by the project need to hear about it as soon as possible; so, scoping session was held inviting the representatives from identified groups and briefing them about the proposal while establishing good lines of communication. Their concerns are discussed in the coming sections.

The main EIA techniques used in scoping were baseline studies, checklists and matrices. These techniques collected and presented knowledge and information in a straight forward way so that logical decisions can be made about which impacts are most significant.

The concerns of the stakeholders were listened to and noted down. If possible negative ones were resolved at the spot whereas others area incorporated in the EIA study and decisions are made accordingly.

3.2 Spatial and Temporal Boundaries of Environmental Assessment

Temporal and spatial boundaries for the effects assessment are defined by the characteristics of the project and the Valued Environmental and Cultural Components (VECC) being assessed. These boundaries encompass time periods and areas during and within which the VECCs are likely to interact with or be influenced by the project.

Spatial boundaries vary according to the nature of the VECC but generally are defined in terms of:

• A local study area (LSA), where project effects can be predicted with a reasonable degree of accuracy and confidence and impacts are likely to be most concentrated- most of the subject project impacts are local e.g. air emissions, increased noise levels, wastewater and solid waste management etc.

• A regional study area (RSA) where, depending on conditions (e.g., seasonal conditions, habitat use, more intermittent and dispersed project activities) - subject proposal does not impose any regional impacts

Following table represents the characterization of potential impacts of subject proposal based upon the spatial boundaries;

Tab1e 3.1: Characterization of potential impacts based upon the spatial boundaries

Sr. No.	Potential Impacts	Spatial Boundaries	
		LSA	RSA
l	Air Quality	✓	✓ (if beyond limits)
2	Increased noise levels	✓	
3	Groundwater degradation	✓	
4	Surface water deterioration	✓	

5	Soil quality	✓	
6	Working personnel's Health & Safety	✓	
7	Lowering of groundwater table		✓
8	Flora & fauna	✓	

Temporal boundaries for project-related effects are defined in terms of the project phases:

- **Baseline** - covers ecological, physical and human-related characteristics of the environment, prior to the initiation of the construction phase;
- **Construction -** includes all activities associated with project construction and before commencement of operational phase such as.:
  - ► Infrastructure development;
  - ► mobilization of equipment and supplies to the site by road and air;
  - ► Construction of site facilities including camp, infrastructure, stockpile, waste rock storage dump, water management facilities (diversions, settling ponds, seepage collectors) etc.
- **Camp operations** and personnel transport during construction;
- **Operations** - includes ongoing industrial processing, effluent disposal, waste management, noise levels, transport of raw materials, end products and personnel;
- **Decommissioning** - includes all activities to decommission industry and remove equipment and materials from the site, re-contour the site and restore drainage patterns to stable long-term conditions, and implement the final site reclamation procedures to prevent erosion and restore vegetation cover where feasible;
- **Closure**- refers to conditions that will exist on the site after the site is abandoned and re-vegetation is complete.

Temporal boundaries are also defined for the cumulative effects assessment, spanning baseline to a point in the future, within which project effects on VECCs are predicted to overlap with effects of other _projects or activities.

3.3. Issues and Concerns Raised during Consultation

The representatives from QABP, EPA, surrounding industries and community attended the scoping session. They were briefed about the objective of session, the-proposal and its type, applicable regulations and potential environmental and socioeconomic impacts that can be anticipated. Following is a list of concerns raised during the session;

What are checks and balances that exist to make sure mitigation is implemented correctly and bow will follow-up happen?

- Will the locals be preferred for every sort of employment - skilled or un-skilled?
- How health & safety of workers will be ensured throughout the construction and operational phase?
- What arrangements will be made for firefighting?
- How water will be conserved?
- How process solid waste and wastewater will be disposed of to not harm the environment?
- How noise levels will not be let increased?

All of these issues were sorted out during the session and recommendations are incorporated in the EIA study. However, most of the concerns were positive as the proposed industry is believed to provide employment to a lot of local people thus contributing to national GDP. Also, it will bring industrial development in the country at the time when it is already trying to cope up with economic challenges.

3.4. Significant Impacts and Factors to be Determined

Substantial impacts that can be caused by the establishment of subject unit were identified and discussed with the key stakeholders. Recommendations for appropriate mitigation measures were also exchanged to be incorporated well in EIA study. Following is a summary of the determined impacts and recommended mitigations for them.

Impact	Mitigation Measure
Owing to construction activities; generation, suspension and deposition of particulate matter, dust, *S01*, NOx and. CO emissions can cause health issues to workers	Spray by water boozer to minimize the dust. Maintenance of construction machinery shall be made mandatory. Haul-trucks carrying earth, sand, aggregate and other 1uaterials will be kept covered with tarpaulin to reduce dust pollution.
Noise generated during construction and installation of construction machinery can cause interference with speech, hearing impairment, and sleep disturbance	Engines of vehicles visiting project site will be kept properly tuned-up. Temporary noise barriers will be installed. The green zone of plants will also help reduce sound levels.
There will always be the possibility regarding hazard to health and safety of	To handle emergency medical situation, first aid facilities will be made readily available at the site and the

Impact	Mitigation Measure
workers to occur during construction phase	contractor will ensure availability of transport to handle any emergency condition. Safety equipment such as belts, gloves, masks and helmet will be provided to working personnel and wearing them will be made mandatory for them. Also, Health & Safety trainings will be conducted time to time.
The construction phase of the project will produce solid waste; disposal of which if not managed properly can have negative impacts on the site and surrounding area	A site waste management plan will be made the responsibility of the contractor. The Construction and Demolition (C & D) waste will be properly segregated to encourage recycling of useful waste materials. The involved stakeholders will be trained about the importance and means of waste management and its proper handling.
Lack of proper disposal system of solid waste may lead to different disease	Arrangements will be made for regular garbage collection and removal from the construction site.
Ground water quality can be contaminated when the pollutants, such as diesel and oil, paint, solvents, cleaners and other hannfu1 chemicals, on construction sites soak into the groundwater	Effective management will be ensured during construction activities and any sort of accidental spillage will be avoided.
No negative impact on ecological environment will take place on account of cutting of trees in the project area and clearing of vegetation from the site.	Currently there is no flora and fauna are present a project site. Landscaping is deemed to be a powerful mitigation activity with a positive impact. Trees and ornamental plants will be planted along the project boundary to increase the aesthetic value of the site and combat pollution.
A number of categories of employees will be required during the construction phase which will have positive impact on the local economy and regional unemployment	Socially responsible attitude of the project management towards local people and resources will make project people friendly. Awareness and educational pro61Tatn introduced ln the area by project management will reduce the fear among the people regarding non-local people.
There will be slight increase in traffic due to transportation of raw material and final product. As a result, concentrations of emissions of flue gases will increase. Also, diesel fired generator may cause emissions.	Proper maintenance and tuning of the vehicles will be done by proponent. Proposed Site is in load shedding free zone area, so, generator only use- to handle emergency condition. Generators will be maintained well in time to avoid emission of black smoke. Plantation will be done-along the boundary walls will help protecting the environment.
The movement of transportation vehicles and running of generator can cause slight increase in noise levels.	The machinery to be used in the plant is noise-free. However, the vehicles and generator will be kept well-

Impact	Mitigation Measure
Operation of machinery e.g. cutting, and welding of sheets will cause noise emission.	maintained and Strict rules will be made by the project administration to control speeds of vehicles. Use of Personal Protective Equipment's will be used to reduce the noise impact on surrounding environment.
There will always be the possibility regarding hazard to health and safety of workers to occur during operational phase of the project.	The workers working near operating machines or high noise zone will be made sure to wear personal protection equipment. Irrelevant workers and visitors shall also be directed to wear personal protective equipment. Noise absorbing paint will be used on indoor walls to minimize its impacts on outer environment. To handle emergency medical situation, first aid facilities will be made readily available at the site and the contractor will ensure availability of transport to handle any emergency condition.
The improperly managed solid waste may impact the factory surrounding aesthetically, occupationally as well as from health, safety and environment point of view.	PIE approved vendors shall collect the solid waste on daily basis. Domestic waste will be handled properly by industrial management.
The wastewater of the proposed unit, if disposed of without any treatment, can cause water pollution and soil contamination if seeped through.	The major usage of water during operational phase is for the domestic use only. There is not any waste used in during the process. So, there is no wastewater generated during the process. The domestic wastewater produced will be disposed to internal chain after treated by septic tank.
Operational phase impacts are likely to be restricted to maintei1ance activities within the Site such as vegetation clearing through brush cutting from the internal road network.	The process of plantation should be kept sustainable throughout project life. Proponent ensure the plantation around the project vicinity and in surrounding of project site.
A number of employees will be required in operational phase and it will have a positive impact on the local economy and regional unemployment.	The management of the project can capitalize positive attitude of people of study area towards this project by offering them maximum employment opportunities. Measurements and steps should be taken to keep undisturbed the privacy of adjoining workplaces.

Following is the criteria adopted for determining significance of the potential impacts such as acceptability and mitigation measures requirement in relation to Ecological importance, Social importance, and Environmental standards;

Table 3-2: Criteria for Significance of Impacts

Categories	Impact	Characteristics
Nature	Direct (D)	The environmental parameters are directly affected by the project construction or operation.
	Indirect (ID)	The environmental factor changes as a result of alteration in another parameter.
Duration of Impact	Short Term (Sr)	The impacts that last only during the construction of the Impact proposed Project e.g., noise from the construction activities.
	Medium Term **(MT)**	Lasting for a period of few months to a year; the project before naturally returning to the original condition such as loss of vegetation due to clearing of campsite, contamination of soil or water by fuels or oil.
	Long Term (LT)	Lasting for period much greater than medium term impact before naturally reverting to the original condition such as loss of soil due to emission.
Geographical Extent	-	The geographical extent may be local or regional.
Project Phases	-	Pre-construction Phases (designing), Construction Phases, Operational Phases
Reversibility of Impact	Temporary (T)	The impacts that don't cross ecosystem threshold value of resilience.
	Permanent (P)	The impacts that exceed ecosystem threshold value of resilience.
Likelihood of the Impact	Likely (L)	Impact will probably occur under most circumstances.
	Unlikely (UL)	Impact could occur at some time
	Possibly **(P)**	Impact may possibly occur at some tin1e
	Rare **(R)**	Impact may occur but only under exceptional circumstance.
Impact Consequence Severity	Major **(M)**	When an activity causes irreversible damage to a, unique Environmental feah1re; causes a decline in abundance or change in distribution over more than one generation of an entire population of species of flora or fauna; has long-tem1effects (period of years) on socio-economic activities of significance or regional level.
	Moderate (Mo)	When an activity causes long-term (period of years), reversible damage to a unique environmental feature; causes reversible damage or change in abundance or distribution over one generation of a population of flora or fauna; has short-term effects (period of months), on socio-economic activities of significance on regional level.
		When an activity causes short-term reversible damage to

	Minor (Mi:)	an environmental feature; slight reversible damage to a few species of flora or fauna, within population over a short period; has short term effects on socio- economic activities of local significance.
	Negligible (N)	When no measurable damage to physical, socio-economic, or biological environment above the existing level of public concern; and conformance with legislative of statutory requirements.

Following table represents the significance of determined impacts based upon above given criterion;

Table 3-3: Significance of the Potential Impacts

Category	Impact Significance	Potential Impacts						
		Air Quality Deterioration	Increased Noise Levels	Lowering of Groundwater Table	Surface water Degradation	Soil Quality	Health & Safety	Flora & Fauna
Nature	Direct (D)	✓	✓			✓	✓	✓
	Indirect (ID)			✓	✓			✓
Duration of Impact	Short Term (ST)		✓				✓	
	Medium Term, (MT)	✓				✓		✓
	Long Term (LT)			✓	✓			
Geographical Extent Project Phases	Local	✓	✓			✓	✓	✓
	Regional			✓	✓			
Reversibility of Impact	Temporary (T)	✓	✓		✓	✓	✓	✓
	Permanent (P)			✓				
Likelihood of the	Likely (L)	✓					✓	

Impact	unlikely (UL)							
	Possibly (P)		✓					✓
	Rare (R)			✓	✓	✓		
Impact Consequence Severity	Major (M)							
	Moderate (M o)		✓				✓	
	Minor (Mi)	✓		✓				✓
	Negligible (N)				✓	✓		

Based upon this identification mitigation measures are proposed in EIA study. Environmental Management and Monitoring Plan is prepared defining the monitoring program as well to effectively implement the recommended measures.

4. CONSIDERATION OF ALTERNATIVES

This section covers the project alternatives considered for establishment of the proposed industrial unit. An analysis of the available alternatives is necessary to establish that the most suitable management and technology options are adopted for the project, while minimizing environmental impacts. This evaluation explains the selection of the most feasible alternative in terms of economics, environment and health & safety. In particular, it outlines the following options that were considered for this project;

4.1. Site alternatives, their Selection and Rejection Criteria

Selection of the site for the proposed industrial plant was governed by many considerations, both the economic analysis of the estimated costs as well as judgment as to the modifying effects of other factors which are more the matter of judgment rather than mathematical calculations, and have considerable effect on the smooth working of the business unit

The sites were considered for the establishment of proposed unit in and around the Sheikhupura as it has become an industrial hub of the country. In the light of general discussion of the factors influencing the industrial location; the sites were evaluated based upon the following criteria;

- **Land:** Suitability, adequacy, and comparable cost of the sites to install the plant and to expand it whenever feasible.
- **Labor:** Availability and affordable wage rates - taking cost to benefit analysis into consideration - of the skilled, semi-skilled, un-skilled person is required.
- **Transportation:** Regular and sufficient transportation facilities for delivery of materials, dispatch of finished products and for the use of the employees.
- **Market:** Size of the local market and the cost of transporting to central markets vis-a-vis the extent of demand.
- **Auxiliary Facilities:** Character of community regarding taxes, legal regulations, public up lift services, financial facilities, educational opportunities, etc.

In the light of this criteria; it was found most feasible to establish the proposed unit in industrial estate Quaid-e-Azam Business Park, Sheikhupura which is already EPA approved - owing to the availability of all the facilities under one roof and minimized hassle of management. The decision was made based upon the following merits;

Roads and other Basic Infrastructure

Basic infrastructures such as roads, water, electricity, telephone, internet etc. is available in the industrial area. The project site is, veil connected to the rest of the country by a network of roads and railway lines for transportation of raw materials and final product at cheaper cost. Proponent selected this Industrial estate for establishment of his manufacturing unit due to availability of world class industrial infrastructure and safe and secure working environment.

Availability of Manpower

Technical, skilled and unskilled labor is required for construction and operation of the proposed. unit. All categories of the labor required for the subject project are available conveniently and plentifully at affordable cost at the present site. This factor also supports the selection of present site for establishment of the unit.

Market for the End Product

Automobile Components:

There is a consistent demand for products such as axle, shaft, bracket, crossmember, panel, leaf spring, speedometer, shock absorber etc., driven by the automotive industry's growing production rates and the increasing focus on safety and vehicle durability. As manufacturers strive to meet higher safety standards, these components play an essential role in vehicle assembly.

Environment

The proposed project is located at Plot No. 34-C, Quaid-e-Azam Business Park, Sheikhupura, an EPA approved Industrial estate. Environmental considerations are extremely important for project sitting Baseline Environmental Study was carried out in and around the project site to develop an idea about the physical and biological receptors of the area. Settings around the project area do not show any sensitivity of environment.

Quaid-e-Azam Business Park is an ideal project situated on Lahore-Islamabad Motorway M2 at Sheikhupura, in the heart of economic hub, almost equally connected to the major cities around. With its lucrative location and state-of-the-art infrastructure, the park serves as a key destination for businesses and investors alike. This landmark project is spread over 1860 acres of land. Additional 200 acres have been dedicated for a labor colony that will provide accommodation facility to 30,000 project workers. It offers vibrant opportunities for commercial activities, fostering growth and development in various industries. The park's well-planned layout encompasses modern office spaces, cluster zones, and advanced facilities, catering to the diverse needs of businesses operating at both local and international levels. To fulfill the purpose, a 200,000 sqft Center Way Business Square is being constructed at the most central location of the park, construction of dedicated motorway interchange is ready to go and special emphasize is also being given on construction of Combine Effluent Treatment

plant. Furthermore, this project will have the capacity to generate 250,000 new jobs for skilled and unskilled workers along with empowering a skilled women workforce.

The project will be regulated according to Punjab Environmental Protection Act 1997 (Amended 2012) and in compliance with the National Environmental Quality Standards (NEQS). Even Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMP) will be operational. Taking into consideration all the above-described factors, the selected site is most suited for development of the proposed project.

4.2. Design/Technology Alternatives, their Selection and Rejection Criteria

The objective of considering design and technology alternatives is to identify the most suitable technology for establishing the proposed manufacturing unit. The unit's primary processes include. The manufacturing process involves several stages, each with different technological alternatives like Shearing, Heating, Forging, Turning of Head, Grinding, Drilling, Hole Chamfering, Threading, Paint, Quality Inspection, Packing & Dispatch. The selection of the right technology is critical to ensure cost-efficiency, quality, and operational effectiveness. Below is an evaluation of possible alternatives and their viability.

Shearing:

Alternative 1: Manual Shearing

Description: Shearing is performed manually using hand-operated shears or mechanical presses with manual control.

Advantages:

- Low initial investment.
- Suitable for low-volume production.

Disadvantages:

- Inconsistent precision.
- Slower production rates.
- Higher labor costs.

Rejection Criteria: Manual shearing was rejected due to inefficiency, lack of precision, and inability to meet the demands of large-scale production.

Alternative 2: Automated Shearing

Description: Shearing is performed using fully automated CNC-controlled shearing machines.

Advantages:

- High precision and consistency.
- Faster production speeds.
- Lower labor costs.

Disadvantages:

- High initial capital investment.
- Requires skilled operators for maintenance.

Selection Criteria: Automated shearing was selected for its precision, speed, and suitability for large-scale production.

Heating:

Alternative 1: Conventional Heating
Description: Traditional methods such as gas or oil-fired furnaces are used to heat materials before forging.
Advantages:
- Lower setup cost.
- Simple technology that is widely available.

Disadvantages:
- Higher fuel consumption.
- Greater emissions and environmental impact.

Rejection Criteria: Conventional heating was rejected due to its inefficiency and higher environmental impact.

Alternative 2: Induction Heating

Description: Induction heating uses electromagnetic induction to directly heat materials for forging.
Advantages:
- High efficiency with precise control.
- Lower emissions and energy consumption.

Disadvantages:
- Higher initial setup cost.
- Requires specialized maintenance.

Selection Criteria: Induction heating was selected for its efficiency, precision, and lower environmental impact, making it ideal for large-scale, eco-friendly production.

Forging:

Alternative 1: Manual Forging

Description: Forging is carried out manually using hammers and presses, with human control over each step.
Advantages:
- Low initial investment.
- Suitable for custom or small-batch production.

Disadvantages:
- Inconsistent quality.
- Slow production rates.
- Higher labor costs.

Rejection Criteria: Manual forging was rejected due to its inefficiency and inability to meet the high precision and consistency required for large-scale production.

Alternative 2: Automated Forging

Description: Forging is performed using automated hydraulic or mechanical presses.
Advantages:
- High consistency and precision.
- Faster production rates.
- Lower labor costs.

Disadvantages:
- Higher initial capital investment.
- Requires skilled operators for maintenance.

Selection Criteria: Automated forging was selected for its ability to consistently meet quality standards and produce at the required scale efficiently.

Turning of Head:

Alternative 1: Manual Turning

Description: Turning of heads is done manually using conventional lathes.
Advantages:
- Low setup cost.
- Suitable for small-batch production.

Disadvantages:
- Inconsistent quality due to human error.
- Slower production rates.
- Higher labor costs.

Rejection Criteria: Manual turning was rejected because it lacks the precision and speed needed for large-scale production.

Alternative 2: CNC Turning

Description: Computer Numerical Control (CNC) lathes are used to automate the turning process.
Advantages:
- High precision and consistent quality.
- Faster production rates.
- Lower labor costs.

Disadvantages:
- High initial investment.
- Requires skilled technicians for programming and maintenance.

Selection Criteria: CNC turning was selected for its precision, speed, and reliability in large-scale production.

Grinding:

Alternative 1: Manual Grinding

Description: Grinding is done manually using hand-held grinders.
Advantages:
- Low setup cost.
- Flexibility in handling custom jobs.

Disadvantages:
- Inconsistent quality due to human error.
- Slow production speeds.
- High labor costs.

Rejection Criteria: Manual grinding was rejected due to its inefficiency and inability to maintain consistency in high-volume production.

Alternative 2: Automated Grinding

Description: Grinding is performed using automated CNC grinding machines.
Advantages:
- High precision and consistency.
- Faster production rates.
- Lower labor costs.

Disadvantages:

- High initial capital investment.
- Requires skilled technicians for operation.

Selection Criteria: Automated grinding was selected for its ability to maintain high-quality standards and efficiency in large-scale production.

Drilling:

Alternative 1: Manual Drilling

Description: Drilling is performed manually using drill presses or hand-held drills.
Advantages:

- Low initial investment.
- Suitable for custom or low-volume work.

Disadvantages:

- Inconsistent accuracy.
- Slower production speeds.
- Higher labor costs.

Rejection Criteria: Manual drilling was rejected due to its inefficiency and inability to consistently meet the precision required for large-scale production.

Alternative 2: CNC Drilling

Description: Drilling is automated using CNC-controlled machines.
Advantages:

- High precision and speed.
- Consistent quality.
- Lower labor costs.

Disadvantages:

- Higher initial capital investment.
- Requires skilled operators for maintenance.

Selection Criteria: CNC drilling was selected for its precision, efficiency, and ability to handle high-volume production with minimal errors.

Hole Chamfering:

Alternative 1: Manual Chamfering

Description: Chamfering of holes is done manually using hand tools or manual machines.
Advantages:

- Low setup cost.
- Suitable for low-volume, custom jobs.

Disadvantages:

- Inconsistent quality.
- Slow production speeds.
- High labor costs.

Rejection Criteria: Manual chamfering was rejected due to its inefficiency and inconsistency in large-scale production.

Alternative 2: Automated Chamfering

Description: Automated machines are used for precise chamfering of holes.
Advantages:

- High precision and consistency.
- Faster production rates.
- Lower labor costs.

Disadvantages:

- Higher initial capital investment.
- Requires skilled technicians for programming and maintenance.

Selection Criteria: Automated chamfering was selected for its precision and speed, making it suitable for large-scale production.

Threading:

Alternative 1: Manual Threading

Description: Threads are cut manually using hand-operated tools or basic threading machines.

Advantages:

- Low initial investment.
- Suitable for small or custom batches.

Disadvantages:

- Inconsistent thread quality.
- Slow production rates.
- Higher labor costs.

Rejection Criteria: Manual threading was rejected due to its inefficiency and inability to maintain consistent quality in large-scale production.

Alternative 2: Automated Threading

Description: Threading is performed using CNC machines for high precision.

Advantages:

- High consistency and precision.
- Faster production rates.
- Lower labor costs.

Disadvantages:

- High initial capital investment.
- Requires skilled operators for maintenance.

Selection Criteria: Automated threading was selected for its precision and ability to meet the demands of high-volume production.

Painting:

Alternative 1: Manual Painting

Description: Painting is done manually using spray guns or brushes.

Advantages:

- Low setup costs.
- Suitable for custom or low-volume work.

Disadvantages:

- Inconsistent paint coverage and quality.
- Higher labor costs.
- Slower production rates.

Rejection Criteria: Manual painting was rejected due to inconsistency in quality and inefficiency for large-scale production.

Alternative 2: Automated Painting

Description: Automated spray booths or robotic arms are used for precise and consistent painting.

Advantages:
- Consistent paint quality and coverage.
- Faster production rates.
- Lower labor costs.

Disadvantages:
- High initial capital investment.
- Requires skilled technicians for maintenance.

Selection Criteria: Automated painting was selected for its efficiency, speed, and ability to consistently meet high-quality standards.

Quality Inspection

Alternative 1: Manual Inspection

Description: Quality inspection is performed manually by human operators using tools like calipers and gauges.

Advantages:
- Low setup costs.
- Suitable for low-volume inspection.

Disadvantages:
- Inconsistent results due to human error.
- Slow and labor-intensive.

Rejection Criteria: Manual inspection was rejected due to inefficiency and inconsistency in maintaining quality for large-scale production.

Alternative 2: Automated Inspection

Description: Automated inspection systems using cameras, sensors, and measurement tools for precision.

Advantages:
- Consistent and accurate results.
- Faster inspection times.
- Lower labor costs.

Disadvantages:
- High initial investment.
- Requires skilled operators for maintenance.

Selection Criteria: Automated inspection was selected for its ability to maintain high-quality standards with greater efficiency in large-scale production.

Packing & Dispatch:

Alternative 1: Manual Packing

Description: Packing and dispatch are done manually by operators.

Advantages:
- Low setup costs.
- Suitable for small batches or custom orders.

Disadvantages:
- Inconsistent packing quality.
- Slow packing speeds.
- Higher labor costs.

Rejection Criteria: Manual packing was rejected due to inefficiency and inability to meet the demands of large-scale production.

Alternative 2: Automated Packing

Description: Automated packing systems are used for precise and fast packing.
Advantages:

- Consistent packing quality.
- Faster packing and dispatch.
- Lower labor costs.

Disadvantages:

- High initial capital investment.
- Requires skilled operators for maintenance.

Selection Criteria: Automated packing was selected for its consistency and efficiency in large-scale production.

4.3. Environmental Alternatives, their Selection and Rejection Criteria

Every development project causes alteration in the existing environment inevitably that can be positive as well as negative. The negative environmental impacts of the proposed industry can be gaseous emission, increased noise levels, excessive water usage, groundwater contamination, and surface water contamination etc. The 'no-go' alternative, also referred as the 'no-action' alternative or 'zero-alternative', can be a consideration in this case. It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. It is basically a consideration of the original and undisturbed environment without any development. This option is considered to ensure that all possibilities have been taken into consideration before deciding on a final course of action and also to provide a baseline situation against which the other suggested alternatives can be measured.

1n a situation where negative envirorui1ental impacts have high significance, the 'no-go' alternative takes on particular importance. In some cases, the 'no-go' alternative may be the only realistic alternative and then it has a critical role to play. It is not true to assume that the 'no-go' alternative is necessarily the best from an environmental perspective. In many cases expansions and upgrades of existing industries (the 'go' alternative) permit the implementation of technological improvements such as the replacement of outdated equipment that leads to reduced emissions to the air or water, in addition to the primary aim of increased production capacity.

The 'no-go' alternative provides the means to compare the impacts of project alternatives with the scenario of a project not going ahead. In evaluating the 'no-go' alternative here; the benefits of the proposed project are more valued for the country.

4.4. Economic Alternatives, their Selection and Rejection Criteria.

Economic alternatives were considered taking into consideration the capital and operational costs for the proposed unit. Land cost, infrastructure cost and machinery cost were taken into account as the deciding economic factor. Accordingly, land is selected in an already established industrial estate, QABP so that the infrastructure and management costs gets minimized due to a heady developed road.

Also, state of the art machinery will be employed considering it as one-time investment and thus minimizing the maintenance cost during the operational phase. Additionally; it will contribute towards uninterrupted production during operational phase.

5. DESCRIPTION OF THE PROJECT

5.1. Objectives of Project

The overall objective of the proposed project is manufacturing of automotive components by establishing an industrial unit namely M/S National Automotive Components (Pvt.) Ltd. Development of the project is envisaged having the following objectives;

- ✓ To manufacture good quality automobile Components
- ✓ To contribute towards industrial development in the country and national GDP
- ✓ To provide employment opportunities to laborers and semi-skilled staff
- ✓ To upgrade the socio-economic conditions of the area

5.2. Location and Site Layout of the Project

The project site is located at Plot No. 34-C, Quaid-e-Azam Business Park, Sheikhupura developed and managed by Punjab Industrial Estate Development & Management Company (PIEDMC). The building layout plan and site layout plan are provided in the document file submitted with the report.

5.3. Land Use on Site

The project site lies in industrial area and is available for industrial development. So, there exists no vegetation. The site is no use currently, it is vacant.

5.4. Vegetation Features of the Site

The project site lies in industrial area and is available for industrial development. So, there exists no vegetation. The site is no use currently, it is vacant.

5.5. Road Access

QABP is just next to the city of Sheikhupura and has access from both M2 motorway from the front side and Lahore – Sheikhupura Road (N60) from the city side.

5.6. Cost and Magnitude of Operation

The project will spread over an area of 1.33 Acres. The estimated cost of the proposed project is PKR 400 million (approx.). The proposed project is a manufacturing unit of automobile components manufacturing unit like axle, shaft, bracket, crossmember, panel, leaf spring, speedometer, shock absorber etc. as per consumer demand. The total estimated production capacity of the entire project will be approximately 1,000,000 pieces, combining all the products. The cost of the project is PKR 400 million (approx.). The project

will spread over an area of 1.33 Acres. Two generators with capacity of 500 KVA each will be installed.

The project aims to manufacture the following final products:

- Axle
- Shaft
- Bracket
- Crossmember
- Panel
- Leaf spring
- Speedometer
- Shock absorber etc. as per consumer demand.

The total estimated production capacity of the entire project will be approximately 1,000,000 pieces, combining all the products.

5.7. Schedule of Implementation (Tentative)

The various phases involved in the implementation of the project at different Levels are given below:

Preliminary Phase

The proposed project is to be located in Quaid-e-Azam Business Park, Sheikhupura which is administered by Punjab Industrial Estate Development and Management Company (PIEDMC). The project is to be established over an area of 1.33 Acres. Plot No. 34-C, Sheikhupura has been allotted for the industry by PIEDMC dated Dec 27, 2022. The Provisional Allotment Letter is provided in the documents file submitted with EIA report.

Design Phase

This phase was started soon after getting Provisional Allotment Letter from PIEDMC. During this phase, the proponent hired the services of an Architect Engineering Firm to design the complete structural designs for the building of proposed industry. It took almost 2 months to complete. A copy of the design in the form of layout plan is attached in the document file provided with the report.

Legal Phase

In order to comply with Pakistan Environmental Protection Act, 1997 (amended 2012) and

get electricity connection from QABP; the proponent had to obtain No Objection Certificate (NOC) from Environmental Protection Agency (EPA). The proponent hired the services of AAA Environmental Advisers for this. This Environmental Impact Assessment (EIA) Study is carried out and report is submitted in this regard.

Construction Phase

After getting NOC from EPA, proper construction work will be started. The NOC is expected to be issued till November, 2024 and thus construction activities will be started soon after that. This phase will get completed in next 6 months i.e. till May 2025.

Machinery Purchasing, Transportation & Installation Phase

The machinery to be employed in the proposed industrial unit is both local and imported. The vendors will be contacted and agreements will be made for machinery purchasing after developing infrastructure. All legal work will also be done to import the machinery. The machinery will be transported to the project site through access roads and installation will be done. The safety equipment shall also be installed as per layout plan. Also, the power supply system will be done. This whole process will take almost next 2 months and can be expected to get completed by July 2025.

Commissioning Phase

After machinery installation, commissioning phase will start. During this phase, all machinery and associated sections will be operated on trial basis. The machinery and operational procedures will be evaluated for the purpose of quality and efficiency assurance before entering into regular project operations. This phase will take about 1 week to complete.

Wrap-up Phase

This phase will be started side-by-side the Commissioning phase. During this phase, all the required steps shall be taken to get regulatory approvals and licensing from the related bodies. At the end of wrap up stage, the project will be available for commercial purposes. Thereafter, EPA shall be approached for obtaining NOC for regular operations of the industry.

Operational Phase

After completing wrap-up & commissioning phases and getting NOC for operational phase

of the project form EPA; the operational phase of the project will be started. Manufacturing of automotive components will be started out. This phase will continue throughout the project life with modifications and enhancements as per requirement.

5.8. Description of the project

The proposed project is establishment of the industrial unit namely M/S National Automotive Components (Pvt.) Ltd. The objective of the unit is to manufacture good quality automobile components to meet the growing market demand of them. Total cost of the project is estimated to be PKR 400 million.

5.8.1. Manufacturing Process

The subject project involves manufacturing of automotive components. Product wise process description is as follows;

5.8.2. Axle Manufacturing Process

The axle manufacturing process involves several precise steps to ensure the production of high-quality, durable components suitable for automotive applications. Below is a detailed breakdown of each step involved in the process.

Shearing of Material: The raw material, typically steel, is cut into desired lengths using high-precision shearing machines. This step ensures the material is cut to the exact size required for further processing in the axle production.

Heating: The cut material is heated using induction furnaces to soften it for the forging process. Heating prepares the material for shaping without causing cracks or defects, ensuring the malleability needed for forging.

Forging: The heated material is placed into a forging press where it is shaped into the basic form of the axle. Forging provides the axle with its initial form and structure, making the raw material suitable for further machining and finishing.

Turning of Head: The head of the forged axle is turned using a CNC lathe to achieve the desired dimensions. This step ensures that the head of the axle is machined to precise specifications, ensuring it fits perfectly in the final assembly.

Length Cut Size: The axle is cut to the exact length required using CNC-controlled machines. This step ensures the axle is of the correct length, maintaining consistency across the batch and ensuring compatibility with vehicle specifications.

Turning of Threaded Portion: The threaded portion of the axle is machined using a lathe to create the threads required for fastening. Threading allows the axle to be securely fastened

during vehicle assembly.

Grinding: The axle undergoes grinding to remove any excess material and ensure a smooth surface finish. Grinding improves the axle's surface quality, removing imperfections and preparing it for further machining.

Drilling for Hole: Holes are drilled at specific locations on the axle using CNC drilling machines. This step allows for the installation of fasteners or other components during the vehicle's final assembly.

Hole Chamfering: Chamfering tools are used to smooth the edges of the drilled holes on both sides. Chamfering ensures that there are no sharp edges around the holes, reducing the risk of damage or wear during vehicle operation.

Threading: The drilled holes are threaded using CNC threading machines. This allows the axle to accommodate bolts or screws securely during assembly.

Surface Treatment: The axle undergoes surface treatment, such as electroplating or powder coating, to prevent corrosion and improve durability. Surface treatment enhances the axle’s resistance to environmental factors, ensuring longevity and reliability.

Inspection: The finished axle is inspected for dimensional accuracy, surface finish, and overall quality using both manual and automated inspection systems. Inspection ensures that each axle meets the required specifications and quality standards before proceeding to packing.

Packing: The axles are carefully packed to avoid damage during transportation. Proper packing ensures that the axles are protected from environmental factors and handling damage during shipping.

Dispatch: The packed axles are loaded for transportation to the automotive assembly plant or distribution center. Dispatching completes the manufacturing process, delivering the finished axles for use in vehicle production.

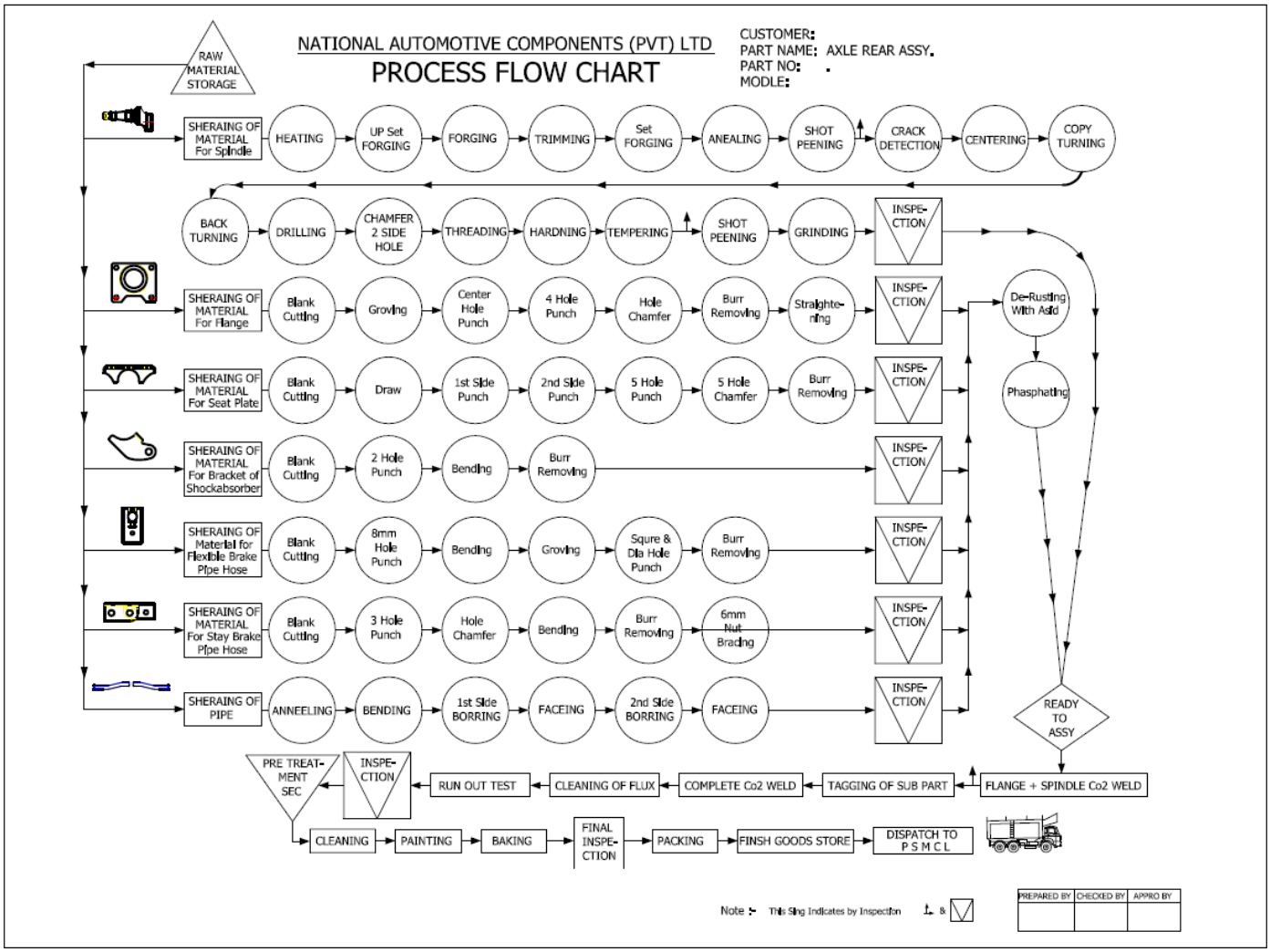


Figure 6-2: Process Flow Diagram

5.8.3. Cross Member Manufacturing Process

The cross member is a critical structural component in vehicles, providing support to the vehicle's chassis and helping maintain its rigidity. The manufacturing process of a cross member involves several steps to ensure precision, strength, and durability. Below is a detailed explanation of each step involved in the process:

Shearing: In the first step, the raw sheet metal (often high-strength steel) is sheared or cut into the desired shape and size using high-precision shearing machines. Shearing prepares the raw material into the correct blank size for subsequent operations, ensuring that the sheet is ready for forming processes.

Lubrication & Polyether Application on Both Sides: Both sides of the sheared sheet metal are coated with a lubricant and polyether solution to reduce friction during the forming processes. Lubrication minimizes wear on the tooling and prevents the metal from sticking to the dies during drawing operations. It also reduces the risk of cracks or deformation in the material.

1st Draw: The lubricated sheet metal undergoes the first drawing operation in a hydraulic press, where it is partially formed into the basic shape of the cross member. The first draw gives the raw material its initial form, gradually stretching and shaping it into the desired cross member profile without causing tearing or stress concentrations.

Trimming: After the first draw, the excess material around the edges is trimmed using specialized trimming tools or presses. Trimming removes the unwanted material from the edges, ensuring that the cross member has smooth, precise edges that meet the required dimensions for the next forming step.

2nd Draw: The cross member undergoes a second drawing operation to refine its shape and dimensions further. This process deepens or completes the form started in the first draw. The second draw fine-tunes the cross-member's profile, ensuring the final shape is accurate and meets the design specifications. This step ensures the part has the correct strength and rigidity.

Piercing: In the piercing step, holes are punched into the cross member for mounting or assembly purposes, using CNC-controlled piercing machines. Piercing creates precise holes or slots required for assembling the cross member onto the vehicle chassis or for attaching other components during vehicle assembly.

Inspection Process: After all the forming and machining processes are complete, the cross member is thoroughly inspected for dimensional accuracy, surface finish, hole positions, and overall quality. Automated and manual inspection techniques are often used. Inspection ensures that each cross member meets the required quality standards and specifications. Any defects or deviations from the design are identified and addressed before the cross members are sent for packaging and dispatch.

5.8.4. Bracket Laterad Rod Manufacturing Process

The Bracket Laterad Rod is a critical component in a vehicle's suspension or chassis system, often used to provide structural support and alignment for other components. The manufacturing process involves a series of precise operations to ensure the rod's strength, durability, and accurate dimensions. Here's a breakdown of the process using the steps: Shearing, Blanking, Forming, Bending, Piercing, Restacking, and Inspection.

Shearing: The raw material, typically high-strength steel or aluminum, is cut into flat sheets or strips using a shearing machine. This step ensures that the material is cut to the correct size required for further processing. The precise shearing reduces material wastage and ensures the blanks are ready for the next steps.

Blanking: The sheared material is then processed through a blanking press to cut out the basic shape of the bracket laterad rod. Blanking provides the raw form or "blank" of the rod, cutting the material into the general dimensions needed for the rod while leaving excess material for further forming. This step ensures uniformity in the blanks.

Forming: The blanked piece is transferred to forming presses, where the material is shaped into the initial contour and dimensions of the bracket rod. Forming gives the blank the three-dimensional shape necessary for the rod's functionality. The material is stretched and shaped, forming the basic design features of the rod.

Bending: In this step, the bracket laterad rod is bent at specific angles using a bending press or a CNC bending machine to match the design specifications. Bending is crucial to shaping the rod according to the required design, ensuring that it fits properly within the vehicle's suspension or chassis system. The angles must be precise to ensure functionality and strength.

Piercing: Holes or slots are punched into the formed and bent rod using piercing machines. This is often done with CNC-controlled precision piercing tools. Piercing creates the necessary openings for bolts, screws, or other fasteners that will be used to assemble the rod onto the vehicle or connect it to other components. Accurate piercing ensures proper alignment during assembly.

Restacking: After piercing, the completed rods are carefully restacked in specific order, often for ease of transport or for further processing, such as surface treatments. Restacking helps organize the components for the next stages of production, such as heat treatment, coating, or shipment. Proper

stacking prevents damage or distortion of the rods.

Inspection Process: The manufactured bracket laterad rods undergo a thorough inspection using both manual and automated systems. Dimensional checks, surface finish quality, hole positioning, and overall compliance with design specifications are assessed. The inspection process ensures that each rod meets the quality and dimensional standards required for its role in the vehicle. Any defective or out-of-spec parts are identified and either corrected or rejected.

Sr#	Part Number	Part Name	Supplier	Qty	Critical Process
1	62631-67LGO	Cross member RR Floor 3rd	NAC	1	
2	62632-82KOO	Bracket Laterad Rod	NAC	1	
3	62633-67LGO	Brace Laterad Rod	NAC	1	
4	62640-67LOO	Bracket Towing Hook	NAC	1	
5	62642-67LB	Towing Hook	NAC	1	
6	62636-67LOO	Bracket Flexible Hose	NAC	2	

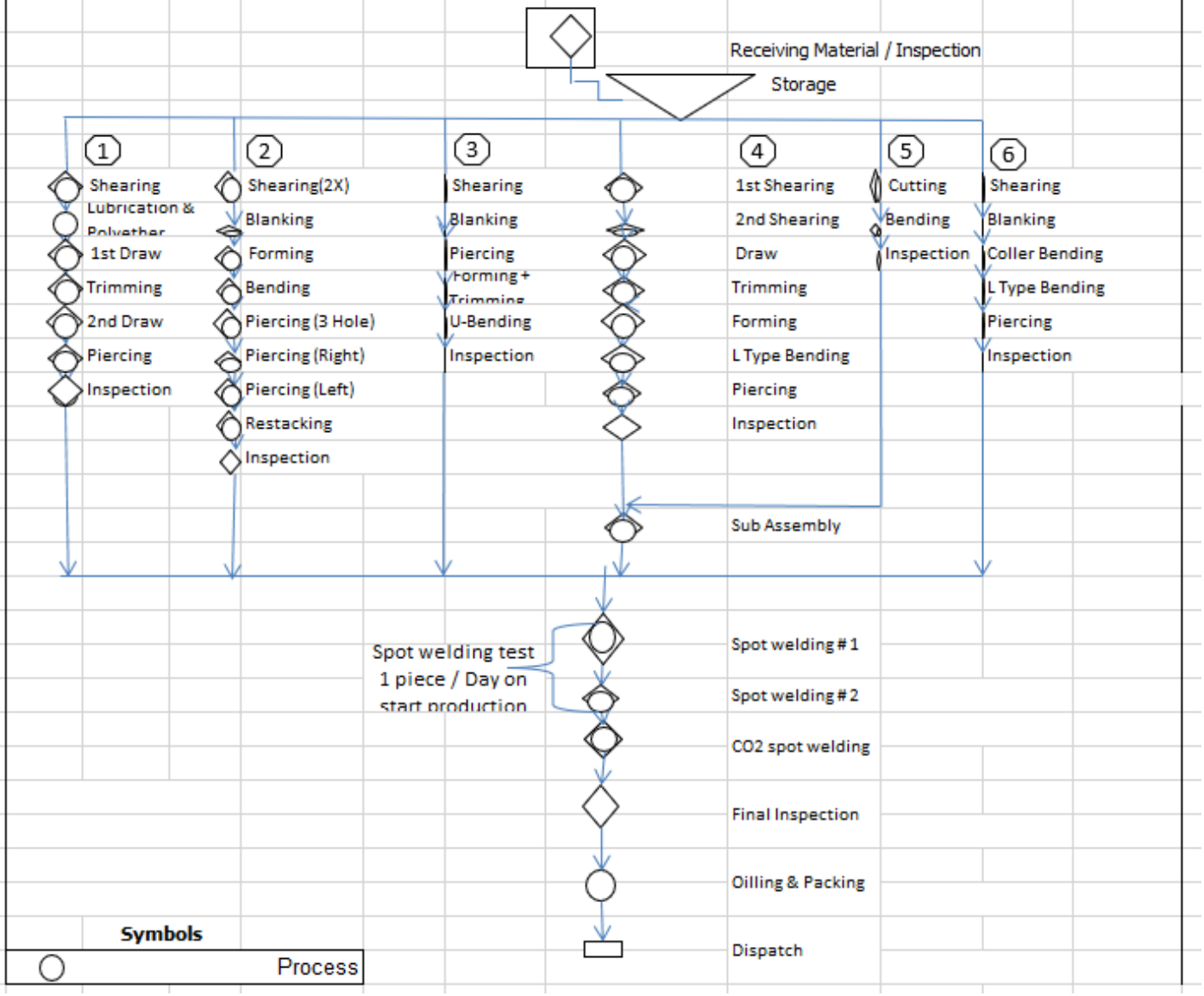


Figure 6-2: Process Flow Diagram

5.8.5. Details of Raw Materials

The raw materials to be used in the manufacturing process of the proposed unit include both domestic as well as imported. List of raw materials along with their source is as follows;

- SUP Series: Spring steel, ideal for high-strength spring applications.
- JSC, JSH, and JAC Series: Cold-rolled and galvanized steel, varying in strength, used in automotive body and structural parts.
- A3004P: Aluminum alloy for lightweight and corrosion-resistant applications.
- MS Sheets

Transportation Details

The raw materials will be transported to the site through trucks.

Storage

The raw materials will be stored sending to production line. A separate warehouse is to be constructed for the purpose.

5.8.6. Details of Final Product

The final products in the proposed project will include;

- Axle
- Shaft
- Bracket
- Crossmember
- Panel
- Leaf spring
- Speedometer
- Shock absorber etc. as per consumer demand.

Storage Details

The product will be dispatched to market as per requirement and if needed, storage will be done for maximum a month.

5.9. Plantation Plan

No trees are to be cut or vegetation to be removed for project development. However, proponent will ensure proper landscaping after completion of construction of the project; flowering plants and grass will be planted inside / outside the premises of the project for beautification purpose. A planation plan will be developed and implemented during construction as well as operation phases of the project. Approximately 500-1000 plants will be planted in and around the project vicinity on area especially of indigenous species in

consultation with District Officer (Environment) & Management of QABP during every plantation season to enhance the landscape beauty and make the ambient air quality better. These plants will include ornamental plants as well. The funds allocated to the plantation is about PKR 100,000/- and is included in the environmental budget.

5.10. Fire Fighting Plan

Fire hazards can erupt du1ing operational phase of the project. There will be proper arrangements for firefighting events. CO2 fire extinguishers will be installed inside the workshop/assembling unit to cope up with firefighting events. In addition to fire extinguishers, fire safety alarms, smoke detectors etc. will also be installed in the industry. The firefighting system with detection and alarms, as NFPA (National Fire Protection Association) Standards will be provided in the following areas;

- Parking area
- Offices
- Workshop
- Kitchen
- Fire hydrant along boundary wall of project site

In addition to the above-mentioned areas; portable fire-fighting equipment will also be Located at places in the building where there is any possibility of fire hazard and that too in accordance with NFPA Standards.

5.11. Restoration and Rehabilitation Plans

At the end of the life of the project, adequate repair and maintenance of the machinery will be done. Attached basic infrastructure will be updated. New machinery will be installed and old one will be recycled/ reused, when and where required - for the project to run successfully during its new lifetime.

All activities will be carried out in accordance with prevailing environmental management laws and controls so as to avoid any damage to any segment of environment or human health around the project site. Rehabilitation would not be required as such at current project site, however, restoration plans to be practiced during different phases of the project at various levels are illustrated hereunder:

Pre-construction Phase

The proponent of the project either will take necessary measures himself or shall pay charges to the concerned line departments regarding the restoration of the relevant areas disturbed

during clearing of the site and its preparation prior to the construction of building parts and development of infrastructure.

Construction Phase

The project proponent shall keep eye on the construction operations while the QABP management, through its authorized officer, wi11 exercise continuous vigilance and inspection any time during execution of work or any time after completion. Only approved structural designs shall be erected. Also, at the completion of building, the owner will intimate to the QABP accordingly for the issuance of certificate regarding completion.

5.12. Government approvals

The project site is located in Quaid-e-Azam business park, Sheikhupura. Accordingly, following applicable approvals have been obtained;

i. Provisional allotment letter issued by Punjab Industrial Estate Development & Management Company dated Dec, 27, 2022.
ii. Site Plan issued by Punjab Industrial Estate Development & Management Company
iii. Form A& Form 29
iv. Certificate of Incorporation
v. Certificate of Registration under Sales Tax Act, 199
vi. National Tax Number Certificate
vii. Memorandum of Association

Copies of these approvals are provided in the document file submitted with the EIA Report.

Furthermore, Environmental Approval in the form of No Objection Certificate (NOC) is required from Environmental Protection Agency (EPA), Punjab as it is mandatory before the start of construction of the unit in compliance of Section 12 of the Punjab Environmental Protection Act 1997, (amended 2012); this EIA report is submitted in this regard.

6. DESCRIPTION OF THE ENVIRONMENT

6.1. General

An environmental baseline study is intended to establish a data base against which potential impacts can be predicted and managed subsequently. The EIA of the proposed project covers a comprehensive description of the project area, including regional .resources which are expected to be affected by the project, as well as, those which are not expected to be directly affected by the construction and operation of the project.

A site visit was conducted to survey the field area for collection of relevant data. Interviews were conducted with the general public and stakeholders of the project area in order to seek the public opinion on the implementation of the proposed project. Various Governmental and Non-Governmental Organizations (NGO's) were also visited for the collection of relevant data and their views on the proposed project were recorded for incorporation into the EIA report. The environmental impacts of any activity or process will be assessed on the basis of deviation from baseline or normal situation. The following components form part of the environmental baseline:

- Physical Environment
- Ecological Environment
- Socioeconomic Environment

6.2. Baseline Physical Environment

6.2.1. Physical features around the project area

The project lies in district Sheikhupura. The city is known for its rich agricultural base, primarily producing rice, wheat, and sugarcane, contributing to its local economy. In addition to agriculture, Sheikhupura is home to a variety of industries, including textiles, pharmaceuticals, and automotive manufacturing. Sheikhupura is located approximately 40 kilometers (25 miles) northwest of Lahore, Pakistan. The drive between the two cities typically takes about 45 minutes to 1 hour, depending on traffic conditions and the route taken, such as via the M2 Motorway or the Lahore-Sheikhupura Road.

7.2.2. Demographic Profile of Sheikhupura

The demographic profile of Sheikhupura shows that the total area of the district is 5,960 square kilometers. The division with respect to gender and urbanization is given below:

Males

Females

Other

According to the Census Report of 2017, the total population of District Sheikhupura is 3,460,426, out of which males are 1,781,768, females are 1,678,423, and transgender persons are 235 in numbers. The average annual growth rate is 2.52% from 1998 to 2017 (District Census Report, 2017).

Based on geography, topography and geology, the project area is briefly described below:

6.2.2. Geography, Topography and Geology

On the basis of geography, topography, and geology, the project area of Sheikhupura is briefly described below:

The city of Sheikhupura is located at latitude 31°-42' N and longitude 73°-59' E, at an elevation of approximately 695 feet above sea level. It lies to the northwest of Lahore, the provincial capital of Punjab. Nankana Sahib is to the west, Gujranwala to the northeast, and Kasur to the south of Sheikhupura. The River Chenab is approximately 90 kilometers (56 miles) to the west of the city. Sheikhupura's urban area covers nearly 50 square kilometers (19 square miles). The city is well-connected to major urban centers via road and rail networks, enhancing its industrial accessibility.

Sheikhupura is located in the Rachna Doab, the area between the Chenab and Ravi rivers, and experiences a gradual slope from northeast to southwest, with an average gradient of about 0.2 to 0.3 meters drop per kilometer (approximately 1 to 1.5 feet per mile). The city's elevation is about 212 meters (695 feet) above sea level. The topography is mostly flat, with some local depressions and small rises in the landscape.

The city is part of the Bar Upland, which is composed of older alluvium deposits found in the central parts of the Doab. This upland is above the floodplain, making it less vulnerable to flooding. Like much of the Punjab region, the soil in Sheikhupura consists of quaternary alluvium deposited by both present and ancestral rivers. The deposition is mostly made up of fluvial sediments, originating from the mountain ranges in the north. The land is fertile due to the extensive canal irrigation system and consists primarily of alluvial soil mixed with sand. The area's terrain is largely flat and suitable for agricultural and industrial use.

6.2.3. Tehsils and administrative towns

Since 2005, Sheikhupura has been organized into several Tehsils and administrative divisions. The district is composed of the following Tehsils:

- Sheikhupura
- Ferozewala
- Sharaqpur
- Safdarabad
- Muridke

Nankana Sahib (which was part of Sheikhupura before becoming a separate district in 2005)

Each Tehsil plays an important role in the local administration, governance, and development of the region.

6.2.4. Seismic Zone

Sheikhupura, like much of Pakistan, is located on an active seismic belt. Seismic observations indicate that hundreds of tremors occur annually, though most are of low intensity and do not cause significant damage. According to the seismic zoning classifications by UN-Habitat, Sheikhupura falls under Zone 2A, which indicates a moderate seismic risk. This classification suggests that while the area may experience moderate earthquake activity, the likelihood of high-magnitude earthquakes is relatively low. The seismic zoning map for the region is shown in Figure 4-3.

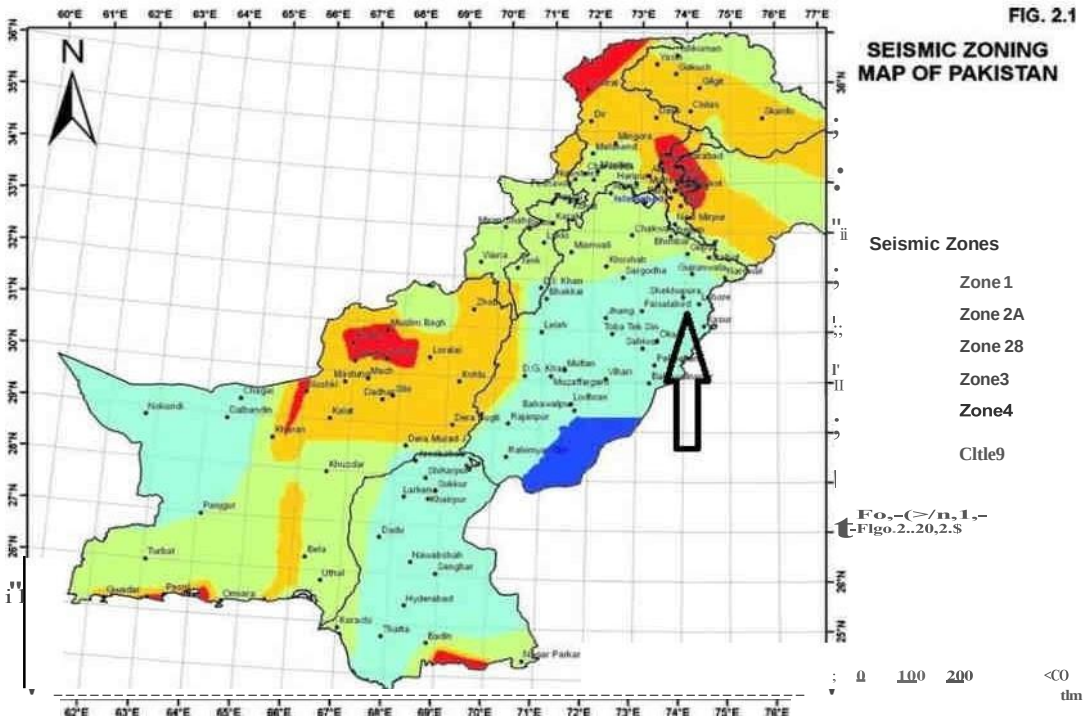


Figure 7-3: Seismic Zone Map

6.2.5. Meteorology and Climate

Temperature: The project area in **Sheikhupura** is semi-arid, characterized by significant seasonal temperature variations. The summer season typically lasts from **April to September**, with an average temperature of **32.0°C (89.6°F)**. The extreme maximum temperature during summer can reach **47.0°C (116.6°F)**, while the minimum can drop to **10.0°C (50°F)**. In winter, daytime temperatures generally range between **20°C (68°F)** to **32°C (90°F)**, while night temperatures drop between **3°C (37.4°F)** to **15°C (59°F)**. On rare occasions, the minimum temperature can fall as low as **-1°C (30.2°F)**. Western disturbances can also affect the weather during the colder months, particularly from mid-December onward, sometimes bringing well-marked cold fronts to the area.

Rainfall: Rainfall in Sheikhupura is erratic and varies greatly from year to year. A wet year may be followed by a dry one, with the bulk of the rainfall occurring in **July and August** during the monsoon season. Based on long-term observations, the **average annual rainfall** in Sheikhupura is about **635 mm (25 inches)**. Like other areas in Punjab, most of the precipitation is concentrated in the monsoon months, while the rest of the year remains dry.

Humidity: July, August, and September are the most humid months, while **May and June** are the least humid. The **average relative humidity** in Sheikhupura ranges from **20% to 75%**, with **August** being the most humid month, sometimes reaching up to **75%**. Seasonal humidity fluctuations are influenced by monsoon activity and regional weather patterns.

Wind Speed: Dust storms and hot winds frequently blow from **March to August**, affecting the project area. The monthly average wind speed ranges from **0.5 to 8.0 knots**, with variations depending on the season.

Wind speeds are generally higher during the pre-monsoon months.

6.2.6. Water Resources

Surface Water Resources: The opening of the Lower Chenab Canal in 1892 brought extensive canal irrigation to Sheikhupura, similar to other districts in Punjab. Canals like the Rakh Branch and Jhang Branch pass near Sheikhupura, providing vital irrigation to the region. The canal system plays a significant role in the region's agriculture, ensuring a regular supply of water for cultivation. Additionally, some surface water is treated for domestic and industrial use.

Groundwater Resources: Groundwater in Sheikhupura is generally saline and not suitable for human consumption in many areas. However, potable water is sourced through wells and canals where possible. Some areas in Sheikhupura have access to sweet water through tubewells and water pumped from nearby sources. The water table in some parts is supported by the Lower Chenab Canal system, and water treatment plants are operational to supply potable water to the local population.

6.3. Baseline Ecological Environment

In this section, the baseline environmental conditions pertaining to biological environment are described. These conditions have subsequently been used to identify the potential impacts on the biological environment that are likely to arise from the project activities. This Environment involves:

- Flora
- Fauna
- Endangered species

6.3.1. Flora

Based upon observations during the field visit, various types of floral species were directly observed in the project area as described below;

- **Trees**

A list of small and tall trees observed is given hereunder:

Table 7-1: List of Trees of Study Area

Sr.#	Species	Family	English Name	Urdu Name	Life Span
1.	Acacia nilotica	Mimosaceae	Gum Arabic Tree	Keekar	Perennial
2.	Dalbergia Sasso Roxb.	Fabaceae	Rose Wood	Sheesham	Perennial

3.	Albizia lebbeck	Fabaceae	Lebbeck	Shirin	Perennial
4.	Cordia myxa	Boraginaceae	Assyrian Deciduous	Lesura.	Perennial
5.	Azadirachtolide indica (L.) Adelb.	Meliaceous	Indian Lilica	Neem	Perennial

- **Shrubs**

The table: below depicts complete scenario of shrubs and sub-shrubs in the study area.

Table 7-2: List of Shrubs of Study Arca

Sr.#	Species	Family	English Name	Local Name	Life Span
I.	Calotropis procera	Apocynaceae	Mllk Weed	Ak	Perennial
2.	Tamarix iudica	Tamaricaceae:	Tamarisk	Kai	Perennial
3.	Zizyphus jujube	Rhamnaceae	Jujube	Jhangoori Ber	Perennial
4.	Helianthus annuus	Asteraceae	Sun Flower	Sooraj Mukhi	Perennial
5.	Lycopersicon sesculel1pum	Solanaceae	Tomato	Tamator	Annual
6.	Salsola imbricata Forssk.	Amaranthacea e	Spiny Amaranth	Cholai	Annual

- **Herbs**

As far as herbs of the area are concerned, these were observed as under:

Table 7-3: List of Herbs of Study Arca

Sr.#	Species	Family	English Name	Local Name	Life Span
I.	Conyza Canadensis	Asteraceae	Horse Weed	Booti	Annual
2.	Ecllpta alba	Asteraceae	False Daisy	Daryai Booti	Annual
3.	Allium cepa	Amaryllidaceae	Onion	Gandda	Annual
4.	Cressa cretica Linn.	Convolvulace ae	Rosin Weed	Rudrava-nti	Perem1ial

5.	Euphorbia thyrnifolia Linn.	Euphorbiacea e	Gulf Sandmat	Kheera wal	Annual

- **Flora in Industrial City, Punjab Industrial Estate Development and Management Company**

Based upon observations during the field visit, many species of flora were directly observed within the Industrial City, QABP around the industrial units and along internal roads including fruiting, non-fruiting and other ornamental species.

Figure 7-9: **Flora within the Industrial City QABP**

7.3.2. Fauna

A field study related to the identification of terrestrial and aquatic fauna was conducted in the study area. For the purpose of such biodiversity study, the area was divided into three distinct zones as has been done in case of flora.

As part of terrestrial fauna, various types of animals were observed in the fields and residential parts. A short description is as under:

- **Mammals**

A list of mammals noticed in residential parts, agricultural fields, etc. is given in the following table:

Table 7-4: List of Mammals of Study Area

Sr.#	Scientific Name	Family	English Name	Local Name
1.	Canis aureus	Canidae	Asiatic Jackal	Giddharh
2.	Funambulus pennantii	Scimidae	Stripped PalmSquirrel	Gaallarh
3.	Meriones hurrianae	Muridae	Indian Desert Jird	Chuwa
'4.	Tatera indica	Muridae	Indian Gerbil	Chuwa
5.	Lepus capensis	Leporidae	Cape Hare	Saya
6.	Herpestes auropunctatus	Heipestidae	Indian Mongoose	Nevla

Figure 7-10: Mammals in the Project Area

- **Reptiles**

Retiles of the study area as identified in residential parts and farmlands during filed survey in study area as well as those known from secondary data include:

Brilliant Agama

Common Indian Monitor

Figure 7-11: Reptiles in the Project Area

Table 7-5: List of Reptiles of Study Area

Sr.#	Scientific Name.	Family	English Name	Local Name
1.	Trapelus (Agama) agilis lsolepis	Agamidae	Brilliant Agama	Korkirla
2.	Naja naja	Elapidae	Indian Cobra	Kala Nag
3.	Psammophis leithii	Colubridae	Pakistai1 Ribbon Snake	Sindhi Teer Mar
4.	Calotes versicolor	Agamidae	Garden Lizard	KorK.irla
5.	Ecbis carinatus	Viperidae	Saw Scaled Viper	Khappra
6.	Bungarus caeruleus	Elapidae	Indian Krait	Sangcboor
7.	Varanus bengalensis	Varanidae	Common Indian Monitor	Goh

- **Birds**

Most common species of birds observed included;

Table 7-6: List of Birds of Study Area

Sr.#	Scientific Name	Family Name	English Name	Local Name
I.	Acridotheres ginginianus	Sttm1idae	Bank Myna	Myna
2.	Lanius vittatus	Laniidae	Bay-backed Shrike	Latora
3.	Dicrtuus macrocercus	Dicmridae	King Crow	Bhujanga
4.	Columba livia	Columbidae	Rock Pigeon	Jangli Kabootar
5.	Turdoides caudatus	Leiothrichidae	Common Babbler	Chiria
6.	Acridotheres tristis	Sturnidae	Indian Myna	Myna
7.	Upupa epops	Upupidae	Hoopoe	Hudhud
8.	Corvus Splendens	Corvidae	House Crow	Kaan
9.	Passer Domesticus	Passeridae	House Sparrow	Chiri
10.	Egretta Garzetta	Ardeidae	Little Egret	Bagla

Little Egret

House Crow

Common Babbler

Hoopoe

Figure 7-12: Birds in the Project Area

- **Amphibians**

The amphibians most common in the area like other parts of the district are:

Table 7-7: List of Amphibians of Study Arca

Sr.#	Scientific Name	Family Name	English Name	Local Name
1.	Bufo bufo	Bufonidae	Toad	Daddi
2.	Hoplobatrachus tigerinus	Dicroglossidae	Frog	Daddu

Toad

Frog

Figure 7-13: Amphibians in the Project Area

6.4. Baseline Socio-Economic Environment

6.4.1. Methodology

This section describes the key socio-economic features of the study area, including the administrative setup, population, education, health, infrastructure, occupations, and other cultural resources. Primary and secondary data sources were used to develop the socioeconomic baseline of the area. The basic aim of the study is to update local communities about project activities and obtain their views and concerns. Moreover, an in-depth socio-economic analysis to develop socio-economic baseline of project area was one of prime objective of this study.

A field visit was conducted for public consultation. A survey Performa was used as a survey tool prepared for this purpose and is attached below. The project site is located within the

industrial city; hence direct disturbance to communities from the project activities will be minimum. However, the physical extent of the study area extends surrounding the industrial city (referred as project area) considering the physical, ecological and socioeconomic boundaries beyond which the project is not likely to significantly influence local communities, and also with a view of covering a substantial sample size for collection of reliable and authentic socio-economic data.

Data was collected from published sources such as census reports, previous studies and data from government departments as well as from field survey carried out in the surroundings of the project area.

Our field survey methodology included transacts walks through villages, group interviews and focus on group-discussions with the local communities. The use of a semi-structured interview guide helped in the carrying out of the questioning process and recording of information. This activity was carried out with the objective of obtaining a clear and complete understanding of the social and economic conditions of the local communities; assessing the vulnerability of the local communities; identifying marginalized strata of the community; and gathering Local concerns and inhibitions.

6.4.2. Study objectives

The socio-economic study unde1taken for the Environmental Impact Assessment (EIA) was designed and conducted to meet the following objectives:

- To assess the human environment of the area i.e. to determine the quality of life of communities within the region of influence.
- To have an insight into the day to day activities of people especially focusing on their income generating activities, agriculture and labor.
- To access the vulnerabilities of the local communities and the effects of project activities on their quality of life.
- Consultation with communities regarding the proposed project activities and to find out their concerns and aspirations.

6.5. Quality of life values

This section covers the social structure around the project area. The team of AAA Environmental Advisers carried out a detailed survey around the project area and collected the desired information.

Socioeconomic questionnaire was used as survey tools by the survey team to collect desired information. The quality of life values around the project area has been discussed below.

6.5.1. Geographical Location and Surrounding Settlements

The proposed project is located in Quaid-e-Azam Business Park, managed by the Punjab Industrial Estates Development & Management Company (PIEDMC) in District Sheikhupura. The surrounding settlements include Muridke, Sharaqpur, Ferozewala, and Sheikhupura. As the unit is situated within an industrial park, there are no significant residential settlements in the immediate vicinity of the proposed unit.

Demography

The Demographic Study is done to assess the Socio-Economic profile of proposed project site as population studies are extremely important from Town Planning point of view. The analysis of socio-economic survey presented the following conclusions;

Gender: The gender ratio (male to female ratio) around the project area is 3:2. Most of the females are house care takers.

Age Group& Marital Status: About 50% of the people lie in the age group of 18-25 years, 25% in the age group of 25-30 years and 25% of the people are above 30 years_ Also, 40% of the people were single and 60 % were married.

Educational Level: Most of the population has educational level of Primary to Middle. Some have obtained to Higher Secondary education *also,* however, education up to graduation, at least., is trending now.

Employment Status & Income: It is found that 10% of the- surrounding inhabitants are students, 20% are housewives and others were employed people. The employment sources include small industries, business, agriculture and other private sectors. Average monthly income of the inhabitants lies between PKR 20,000 to 30,000. 25% of the stakeholders were earning above PKR 30,000 also.

Settlement Patterns: Various types of houses were observed around the project area during survey including katcha, pakka, semi pakka etc. having poor drainage system. Majority of people live in their farmhouses (Deras) while some have developed their homes at their agricultural land. So, there is no formal pattern of settlements. Family composition is dominantly joint family system, but a few nuclear families also exist in the area. The facilities of electricity and Sui-gas are also present in the area. Generally, people rely on ground water for drinking purposes.

Indigenous people: People inhibiting the project area are of different castes and races_ Most of the families have been living here from 20 to 25 years which has led to homogeneity of culture_ There is no danger of damage or elimination of indigenous community as the locals are steeped in their customs and have no intention of relocating.

Culture and Customs: The people are conservative in their lifestyle. They practice their traditional social and cultural and moral values strictly in all walks of life. Marriage-S are arranged and they are very successful. Free mixing of male and female is not liked. This tendency shows that the people are "Change Resistant" in their behavior

The citizens of Sheikhupura celebrate a variety of cultural and religious festivals throughout the year, such as arts and craft, music, local events, and religious celebrations. Festivals that are celebrated include Rang-e-Bahar, Kissan Mela and Canal Mela etc.

Health Facilities: The nearby health facilities existing around QABP area include United Hospital, Rehman Free Dialysis Center, Prime Care Hospital, Mujahid Hospital and Punjab Social Security Hospital. Inhabitants have access to private hospitals of the city also and sometimes to nearby private dispensaries. Fever, malaria and chest congestion were reported as the common diseases of the project area.

Infrastructure: Basic facilities such as electricity, gas and sewerage system etc. are readily available around the project site_ Moreover, PTCL telephone facility and mobile service is available in all parts of the industrial area - to be used as a mode of communication. Internet connection, post office service and Police station also exist in the project area.

Also, there is a fine network of metaled roads in the district. The majority of roads are under the control of the National Highway Authority, linking Sheikhupura with other cities in the country. Sheikhupura - Sahiwal Expressway is the main road passing by M2 QABP area i.e. the site of proposed Project

Archeological and Cultural Sites: There is no archaeological site in the vicinity of the project area though nearby residential areas do have mosques and graveyards.

Economy of the Area: District Sheikhupura is an industrial and commercial city having multi-occupations. The main occupation of the people is business and jobs in different industries. The remaining small portion of the population is having different occupation including government and private services as well as agriculture. The women also assist their men in the economic activity in different fields of busil1ess, service, education and other institutions.

Women mostly serve in schools, colleges and hospitals. Sheikhupura is generating large number of employment opportunities for its locals and outsiders. Industrial areas are using manpower, while nearby towns are providing business opportunities to the residents. fu this semi urban area, people are involved in daily wages jobs, while some are involved in small business. They normally travel to adjacent areas for work. Some work in the industrial area and in the surrounding universities and colleges. People are also involved in agriculture. Area having access to irrigation water is another source of income. Similarly, livestock is a secondary source of income. It is safe to assume that livestock farming is practiced uniformly in both types of areas.

Livestock owner ship is also developed in the project area; especially among poor families who sell animals during emergency days as mostly unemployed people depend on livestock and sometimes agriculture. The people have livestock which include cows, goats, sheep and donkeys. All the animals are of native breed and thus they can survive the local harsh environment and drought. Milk and butter from the livestock are consumed by the household and are not sold in the market. Good breeds of buffaloes and cows are found in the project area. Sheep, goats, camels, horses, asses and mules are also pa11 of the livestock in the district.

6.6. Suitability of the Site (not Prohibited, Environmentally Sensitive, Incompatible to Surroundings and Unsuitable)

Selection of the site for the proposed industrial plant was governed by many considerations, both the economic analysis of the estimated costs as well as modifying effects of other factors which are more the matter of judgment rather than mathematical calculations, and have considerable effect on the smooth working of the proposed business unit.

The sites were considered for the establishment of proposed unit in and around the Sheikhupura as it has become an industrial hub of the country. In the light of general discussion of the factors influencing the industrial location; the sites were evaluated based upon the following criteria;

- **Land:** Suitability, adequacy, and comparable cost of the sites to install the plant and to expand it whenever feasible.
- **Labor:** Availability and affordable wage rates - taking cost to benefit analysis into consideration - of the skilled, semi-skilled, un-skilled person is required.
- **Transportation:** Regular and sufficient transportation facilities for delivery of materials, dispatch of finished products and for the use of the employees.

- **Market:** Size of the local market and the cost of transporting to central markets vis-a-vis the extent of demand.
- **Auxiliary Facilities:** Character of community regarding taxes, legal regulations, public up lift services, financial facilities, educational opportunities, etc.

o **Environmental considerations:** They are extremely important for project sitting. Baseline Environmental Study was carried out in and around the project site to develop an idea about the physical and biological receptors of the area. Settings around the project area do not show any sensitivity of environment There is no worth mentioning forestry, biodiversity, fishery, flora, fauna and heritage that can get affected due to proposed project.

6.7. Environmental Baseline Monitoring

Following environmental components were monitored to assess the baseline condition of the project area:

- Ambient air quality monitoring,
- Noise monitoring
- Water quality monitoring

Environmental baseline monitoring was conducted at different locations. The details are as follows;

6.7.1. Ambient air quality monitoring

Pakistan lacks a comprehensive and effective air quality monitoring system that can be used to track and address specific instances of air pollution and air quality degradation. At present, monitoring of urban air pollution in Pakistan is limited to isolated instances where air pollutants are measured for brief periods at-selected locations. Urban locality, city, region, or countrywide continuous or repeated air quality monitoring data does not exist Similarly, there is no formal system of air quality data storage and reporting.

The proposed project is located in fairly open and clean air. As part of the study, ambient air quality monitoring was carried out during the EIA field visit as the part of the supplement study. Ambient air quality monitoring was carried out to observe the present condition of the project area.

Ambient air quality was measured with monitoring devices which have the capability to capture & analyze criteria air borne pollutants including SO2, NO2, NO, NOx, CO, PM10, PM2.5, Ozone and suspended particulate matter at micro levels.

NEQS for air quality standards have been introduced in Pakistan since 2010 and were recently revised as PEQS in August 2016; therefore, the monitoring values of Carbon monoxide (CO),

Sulphur dioxide (SO2), Nitrogen dioxide (NO2), and Pai1iculate Matter (PM10) were compared with standards set by PEQS. Overall air monitoring indicates that average 24 hours concentrations of CO, NO2 and SO2 were found below the permissible limits regulated by PEQS, 2016. The lab monitoring report of air quality is provided in the document file submitted with EIA Report.

6.7.2. **Noise monitoring**

As per PEQS, permissible noise level is up to 65dBA when measured with a sound meter at a distance of7.5m from the source. At proposed subprojects the main source of noise emission are the construction activities. Noise from vehicles and other powered mechanical equipment is intermittent. Use of power equipment's at proposed subprojects are just once during unloading of material and is being of temporary nature. Maintenance vehicle came only on reqL1irement basis.

As such there is no noise threat at the proposed subproject sites, where construction activities are being proposed. The noise level measurements showed that the values are much below the 85 dBA limit prescribed under the PEQS established by the EPA or the 75dBA used by DISCOs/NTDC/PEPCO in the equipment specifications. The lab monitoring report of noise levels is provided in the document file Submitted with EIA Report.

6.7.3. **Water Quality**

To assess the water quality of the project area the physical, chemical and biological parameters of ground and surface water were analyzed. The primary objective of the survey was to identify the key problems and issues in the water supply schemes hindering the supply of safe drinking water to the communities. This involved identification of the institutional, operational, technological, financial problems and reasons of non-operation of water supply schemes. In addition, the survey helped to point out the non-functional status of the water supply schemes. The lab monitoring report of water quality is provided in the document file submitted with EIA Report.

6.8. Environmental Estimates

a) Water balance

Water Quality

The water quality of the area bas been determined in laboratory; original lab report of water quality is provided in the document file submitted with EIA report.

Water Quantity

Process Water Demand: The water required in the production process is for cooling purpose in cooling tower and domestic use only. The capacity of installed cooling tower is to be 100 liters which will be filled once and kept on recycling - 15-20 liters of water is to be added in the tank on weekly basis.

So, approximately 23 Liters of water is required in the process on daily basis.

Domestic Water Demand: The man power in the industry will be about 165 persons. Water demand in industries is considered as 50 liters per capita per day. Accordingly; the domestic water demand in the proposed unit is approx. 8.25 m^3/day.

Estimated Quantity of Wastewater

Process Wastewater Quantification: The water used in the cooling tower is to be recycled completely, nothing is to be wasted. Only domestic wastewater will be discharged after primary treatment through septic tank.

Domestic Wastewater Quantification: Approximately 80% of consumed water gets wasted; so; wastewater quantification is as follows;

Quantity of Wastewater= 80% * 8.25 m^3/day

= 6.6 rn^3/day

Safety Factor= 0.5 m3/day

Quantity of Wastewater= 7.1 m3/day

This wastewater will be primarily treated through septic tank and then disposed of into QABP internal drain. The septic tank is a buried, water-tight container made of concrete. Its job is to hold the wastewater long enough to allow solids to settle down to the bottom forming sludge, while the oil and grease floats to the top as scum. The clear water thus will be disposed of into drain.

Sources of water

Portable water for drinking and domestic use will be provide to project site by QABP.

b) Treatment of liquid effluents

Primary treatment of liquid effluents will be done before discharged into drain. For this, septic tank has been proposed at site. The process water generated during cooling and domestic process will be neutralized before discharging into septic tank.

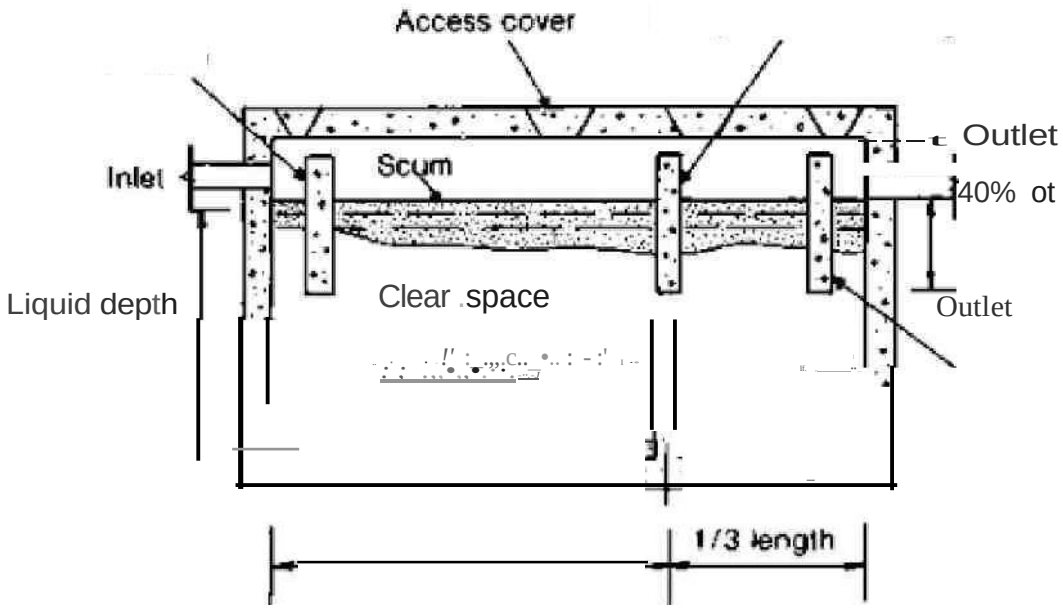
The municipal wastewater generation from the proposed industrial unit will be 7.1 m^3/day depending upon 165 working personnel and 15-20 liters of wastewater will generate during painting process on daily basis which is to be neutralized in a separate tank of capacity 30-50

liters and then dispose of into septic tank. Accordingly; design specifications of septic tank as wastewater treatment system are as follows;

Table 7-8: Specifications of Septic Tank

Detention Time	24	hrs.
Volume of Septic Tank	6.6	m3
Sludge accumulation	0.04	m3/per/yr.
De-sludging period	1	yr.
Sludge Volume	6.6	m3
Total Volume of Septic Tank	13.2	m3
Depth of Septic Tank	1	m
Free board	0.5	m
Total depth	1.5	m
Area	13.2	m2
L:W =3:1		
Widtl1 of ST	2.1	m
Length ST	6	m
Length of Ist compartment	4	m
Length of 2nd compartment	2.1	m

The layout of septic tank is as follows;



Final disposal of wastewater

The wastewater is to be disposed off into septic tank and will be collected by wastewater tanker of QABP on daily basis.

c) Solid Waste Disposal

Quantification of Solid Waste

Process Solid Waste Quantification: The process solid waste can be in form of scrap pieces of iron. Estimated quantity of scrap is 2.43 Kg/day.

Municipal Solid Waste Quantification: The domestic solid waste will be very less in quantity as working personnel will use homemade food and disposable or packed items will not be used. Its quantity will be about 3-5 kg in day.

Disposal Mechanism of Solid Waste

Process Solid Waste disposal: The process solid waste is to be recycled in the process.

Municipal solid waste disposal: The municipal solid waste will be segregated on site and collected primarily in the waste bins. The secondary collection will be carried out by QABP Management through dumpers or compactors on regular basis and its final disposal will also be the responsibility of QABP.

Intermediate Disposal Site

Three types of bins will be used as intermediate disposal site for the collection of different nature of wastes like paper, plastic, and food waste etc. The purpose of using 3 bins is to segregate the waste at source.

7. IMPACT ASSESMENT

7.1. Methodologies for Impact Identification

Potential impacts from the proposed project activities were identified by a thorough review of the project activities, study of surrounding environment, review of literature and expert judgment.

7.1.1. Checklist Methodology

The checklist methodology has been adopted for screening/ identification of impacts (Table 6.1). In addition, professional judgment has been used to additionally identify the residual impact that may persist after adoption of mitigation measures.

Table 8-1: Checklist of Environmental Impacts

Potential Environmental Impacts	Significance of Impact				Recommended Mitigation Measures
	None	Small	Medium	Large	
A. Due to Project Location					
Changes in hydrology affecting existing property values of land		✓ ST			Careful design and planning to minimize-/offset problem
Changes in drainage pattern/ water flow obstruction		✓ ST			Appropriate design to minimize/offset problem
Changes in land uses		✓ LT			Appropriate design and careful Planning
Loss of ecology		✓ ST			Careful planning and design to avoid cutting of large trees
Displacement of population/Resettlement	✓				Project lies in an approved Industrial Estate

Potential Environmental Impacts	Significance of Impact				Recommended : Mitigation Measures
	None	Small	Medium	Large	
Loss of Historical/monuments/c cultural values	✓				Project Lies in an approved Industrial Estate
Endangering of species	✓				There do not exist any endangered species at the site
Environmental aesthetics		✓ ST			Ensure minimum loss of vegetation and do excessive plantation
B. Due to Project Design					
Unnecessary damages because Operation & Maintenance **(O&M)** requirements are too high		✓ ST			Realistic O & M assumptions
Assumed pollution removals not realized		✓ ST			Appropriate design/ equipment selection
Environmental pollution control operations		✓ ST			Careful planning/designing/ monitoring and use of appropriate standards
Impairment of downstream beneficial water uses	✓				Careful planning & monitoring
Impacts on adjacent land economic users including recreation/tourism		✓ ST			Careful planning/O&M

Potentia1 Environmental Impacts	Significance Impact				Recommended: Mitigation Measures
	None	Small	Medium	Large	
Intensification of national socioeconomic imbalances			✓ LT		Planning to be consistent with policies
Traffic congestion and nuisances along routes		✓ ST			Careful planning and time preferences
C. Construction & Decommissioning Phase					
Changes in land use		✓ LT			Careful planning
Environmental aesthetics	✓				Ensure minimum loss of vegetation and do excessive plantation
Water pollution		✓ ST			Design proper sewerage system and dispose of wastewater after treatment
Dust Emissions			✓ ST		Time to time water sprinkling
Gaseous emissions		✓ ST			Regular maintenance of vehicles and other machineries
Run off erosion		✓ ST			Careful planning, Proper storage/ piling of Construction & Demolition waste
increased Noise & Vibration levels			✓ ST		Ensure prop.er lubrication of machineries and vehicles, excessive plantation, prefer day time hours
Uncovered cut & fill trenches/areas		✓ ST			Careful Planning and Implementation

Potentia1 Environmental Impacts	Significance of Impact				Recommended Mitigation Measures
	None	Small	Medium	Lar.ge	
Explosion/fire hazards/hazardous materials spills		✓ ST			Firefighting system, fire alarms, emergency response system, careful transfer of oils etc.
Sanitation disease hazards		✓ ST			Training sessions for workers, proper disposal of wastewater ru1d solid waste, provision of sanitation related stuff at the site
Thrust Boring/ Trenching / quarrying/blasting hazards		✓ ST			Careful accomplishment of the related activities and tasks
Workers. accidents/ health & safety risks			✓ ST		Conduct trainings, provide PPEs, arrange firefighting system, provide first aid kit on site
Blockage of wildlife passageways	✓				There do not exist any wildlife passageway
D. Operational Phase					
Inadequate Operation & Maintenance		✓ ST			Adequate O&M according to set procedures
Inadequate operations phase/environmental monitoring		✓ ST			Adequate monitoring as per provided monitoring plan
Hazards to workers' health & safety			✓ ST		Readiness for emergency, provision of first aid facility at the site
Air quality deterioration	✓				Vehicles and other machineries' maintenance on regular basis time to time monitoring

Potentia1 Environmental Impacts	Significance of Impact				Recommended Mitigation Measures
	None	Small	Medium	Lar.ge	
Increased noise levels		✓ ST			Regular lubrication works and maintenance, monitoring measuring noise levels time to time
Water resources' contamination	✓				Design and install proper sewerage system, dispose of water only after suitable treatment
Lowering of Groundwater table		✓ ST			Adopt water conservation strategy, check for leakages regularly
Land/ soil contamination	✓				Proper handling, collection and storage of waste materials
Nuisance to public due to industrial & transportation Activities		✓ ST			Carry out transportation during day time, careful operational activities
Changes in the human settlements	✓				Project lies in Industrial area where there is no human settlement
Depreciation of environmental aesthetics		✓ ST			Careful planning & implementation, excessive plantation in and around the project site

Once the potential impacts had been identified, the assessment of each potential impact follows these steps:

Primarily, anticipated impacts have been categorized as direct, indirect and induced impacts. These groups of impacts can be further broken down according to their nature into:

- Positive and negative impact
- Minor, major and moderate impact
- Local and widespread impact
- Temporary and permanent impact

- Short and long term impact
- Reversible and Irreversible impact

This step refers to the description, quantitatively (where possible) or qualitatively, of the anticipated impacts of the proposed project. This may be achieved through the use of models or comparison with other similar activities. The predicted level of impact magnitude may be due to uncertainties in the baseline conditions, the proposed activities, extremal developments, or the prediction model.

If it is determined that the predicted impact is significant when compared with the Criteria for Determining Significance, suitable mitigation measures are identified. There is a range of mitigation measures that can be applied to reduce impacts.

Incorporation of the suggested mitigation measures reduces the adverse impact of the project and brings it within the acceptable limit. This step refers to the identification of the anticipated remaining impacts after mitigation measures have been applied. These impacts are referred as residual impacts.

7.1.2. Impact Matrices Methodology

Project impact evaluation matrix is used for the assessment of impacts by dividing the project action into different phases (design, construction and operations) A Project impact evaluation matrix in the table below;

Table 8-2: Impact Matrix

Classification	Impacts		
	Design	Construction	Operation
Physical Environment			
Geographical Landscaping	-2 p	-3T	2P
Quality of Air	-2 p	-3 T	2P
Quality of Drinking Water	T	I	3P
Quality of Wastewater	-1 T	-2 T	**-1 T**
Noise Levels	-l p	2T	**JT**
Infrastructure Arrangement	-2 p	lP	3P
Solid Waste Management	-3 T	**-1** T	3P
Ecological Environment			
Trees	l p	*-1* T	2P

Shrubs	IP	-IT	2P
Birds	p	-1 T	1 p
Socio- Economic Environment			
Quality of Life	-2 T	-3 T	2P
Value of Assets	-2T	-3 T	3P
Traffic & Transportation	-2 T	-3T	p
Business opportunities	-2 p	-3 T	3 p
Aesthetic Value	2P	-3T	T
Public Health	-2 p	-3T	JP
Graveyard	0	0	0
Mosques	0	0	0
Key:+= Positive; - = Adverse; 3= High; 2=Medium; l= Low; O=Negligible; P= Permanent; T= Temporary			

7.2. Characteristics of Impacts

During EIA Study of Project, the predicated impacts were carefully characterized. Following is the impact characterization categories list:

- Nature (direct/indirect)
- Duration of impact (short term, medium term, long term)
- Geographical extent (local, regional)
- Timing (project phase)
- Reversibility of impact (reversible/irreversible)
- Likelihood of the impact (certain, likely, unlikely)
- Impact consequence severity (severe, moderate, mild)
- Signification of impact (High, medium, low)

Table 8-3: Characterization of Impacts

Categories	Impact	Characteristics
Nature	Direct	The Environmental parameters are directly affected by the project construction or operation.
	Indirect	The environmental factor changes as a result of alteration in another parameter.

Duration of Impact	Short Term	The impacts that last only during the coi1struction of the Impact proposed Project e.g., noise from the construction activities.
	Medium Term.	Lasting for a period of few months to a year; the project before naturally returning to the original condition such as loss of vegetation due to clearing of campsite, contamination of soil or water by fuels or oil.
	Long Term	Lasting for period much greater than medium term impact before naturally reverting to the original condition such as loss of soil due to erosion.
Geographical Extent	-	The geographical extent may be local or regional.
Project Phases	-	Pre-construction Phases (designing), Construction Phases, Operational Phases
	Temporary	The impacts that don't cross ecosystem threshold value of

Reversibility of Impact		resilience.
	Permanent	The impacts that exceed ecosystem threshold value of resilience.
Likelihood of the Impact	Likely	Impact will probably occur under most circumstances.
	Unlikely	Impact could occur at some time
	Possibly:	Impact may possibly occur at some time
	Rare	Impact may occur but only under exceptional circumstances.
	Major	When an activity causes irreversible damage to a unique Environmental feature; causes a decline in abundance or change in destitution over more than one generation of an entire population of species of flora or faun has long-term effects (period of years) on socio-economic activities of significance or regional level.
		When an activity causes long-term (period of years),

Impact Consequence Severity	Moderate	reversible damage to a unique environmental feature; causes reversible damage or change in abundance or distribution over one generation of a population of flora or fauna; has short-term effects (period of months) on socio-economic activities of significance on regional level.
	Minor	When an activity causes short-term reversible damage to an environmental feature; slight reversible damage to a few species of flora or fauna within a population over a short period; has short term effects on socio- economic activities of local significance.
	Negligible	When no measurable damage to physical, Socio-economic, or biological environment above the existing level of public concern; and conformance with legislative of statutory requirements.

Significance of Impact	-	Impact may be categorized as high; medium; or low. Based on the Consequence, likelihood, reversibility, geographical extent, duration, level of public concern; and conformance with legislative of statutory requirements.

7.3. Impact Analysis and Prediction

In order to give correct categorization to the present project Rapid Environmental Assessment Procedure was followed. It revealed that there are environmental impacts relating the proposed project which can be controlled by adopting proper mitigation measures. These impacts mainly attributed to the release of dust during construction phase and proper disposal of waste discharges from the industry but most of the impacts are projected as moderate/minor impacts. Also, the project has many positive impacts on local public and national economy. The management of prosed project will adopt proper procedures to carry out the construction and operation of the unit operation or in environmentally friendly way.

7.3.1. Meetings

For the impact analysis and predictions detailed meetings were held with the proponent, management of proposed project and with other stakeholders. Potential factors that can affect the environment or local community in any way were discussed in relation to the

implementation of proposed project. All possible mitigation measures were considered and are incorporated in the Environmental Management Plan.

7.3.2. Consultations

Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders, inhabitants of the villages, shopkeepers and workers in the area. These included local government depai1ments, educational institutes, QABP representatives, public representatives and local residents. The purpose of such consultations is to obtain the feedback from the relevant persons.

8. SCREENING OF POTENTIAL IMPACTS AND MITIGATION MEASURES

Presented in this Chapter are the screening of potential environmental, social and economic impacts and assessment of their severity based on stakeholder perceptions about the project which was obtained at the inception of the EIA activity together with the baseline data.

Screening process is an integral part of the environmental assessment process and it has been carried out for this industrial unit by identifying all significant environmental and social aspects during the stages preceding construction, establishment, & operation. Environmental aspects identified during the stakeholders' meetings and by the screening process were assessed for their severity and mitigation measures have been proposed on the basis of assessment. Institutionalizing compensatory mitigation implies giving impact assessment procedures the powers to discourage projects that may cause irreparable environmental damage. The mitigation measures proposed here will be adopted by the Proponent to reduce, minimize and compensate for the negative impact as far as possible. The mitigation measures can be identified and implemented effectively answering the following questions;

8.1. What is the problem!

Our planet is plagued by environmental problems that deplete natural resources and strain livelihoods, many of which are exacerbated by poor industrial practices. If left unchecked, environmental problems negatively impact businesses both directly, as in supply chain disruptions, and indirectly, as in health hazards that lead to loss of man-hours and efficiency. Industries and businesses need to address the environmental concerns to ensure sustainability and long-term financial viability.

8.2. When will the problem occur and when should it be addressed!

The problems will occur within the project premises and near the boundaries of the project site. The impacts will range up to the distance where project related activities are performed or up-to the geographical zone where the effects spread. The Impacts will show their presence soon after the project development starts. The potential problems should be identified at planning stage of the project and suitable mitigation measures for them should be incorporated in project design. The priority should be to prevent the environmental problem from occurring. 1f happens, it should be mitigated at the time of occurrence as soon as possible.

8.3. Where the problem should be addressed!

The problems will occur within the project premises and near the boundaries of the project site. It should be addressed and extenuated at the source i.e. where they originate.

8.4. How the problem should be addressed!

The problems should be evaluated for severity of its impact and then addressed using environmentally friendly practices accordingly. The impact should be avoided or minimized to maximum possible extent. Appropriate mitigation measures should be implemented and Environmental Management & Monitoring Plan should be followed with fidelity.

8.5. Anticipated Environmental Impacts due to Project Location

The project site is located in QABP which is already approved by Environment Protection Department. Moreover, there is neither any human settlement within the radius of the selected site nor any site of archeological importance present in the locality of the industry. In view of these findings, there is no sensitive receptor present in the vicinity of the project site. After environmental assessment of the study area, the subject project site is the most suitable to execute the project regarding project location.

Hence, no mitigation is required.

8.6. Anticipated Environmental Impacts during Project Design/ Pre-Construction Phase

The construction and operation of the industry will be carried out in well planned manner. State-of-the-art machinery will be employed. Following factors were mainly taken into account in order to predict any adverse environmental impacts.

8.6.1. Land Acquisition

The subject project is to be located at Plot No.34-C, Quaid-e-Azam Business Park, Sheikhupura. The Provisional Allotment Letter is provided in the documents file submitted with EIA Report.

8.6.2. Topography

Impact

The project area has plain topography and excavation of land is not involved. So, no significant physical change in the topography is expected.

Mitigation

No mitigation is required.

8.6.3. Changes in Land Value

Impact

The proposed project is expected to have both positive and negative impacts on the land value of the surrounding societies/commercial areas. This impact will be permanent and beneficial in nature.

Mitigation

The impact will be positive. No mitigation is required.

8.6.4. Safety of Infrastructure

Impact

As, it is already mentioned that the project area falls under zone 2A, consequently, the building structures have been designed in accordance with the requirement of seismic factor as well as after due consideration given to other structural design parameters.

Mitigations

No mitigation is required.

8.6.5. Flora

Impact

There is no significant vegetation or large trees present at the project site. Small number of self-grown shrubs and herbs are present which will be removed while land clearing.

Mitigation

Though, the impact will not significant in nature, however, plantation plan will be developed and trees will be planted -along the boundary wall of the industrial unit as environmental

enhancement measure. Also, it will be ensured that no exotic species in the plantation plan with known environmental setbacks.

8.6.6. Impacts due to Infrastructure

Development Impact

The project site is located in QABP, Sheikhupura and there is availability of infrastructure like roads, electricity, water supply, drainage system, etc. and also there is high potential for the further development of infrastructure in this area in near fuh1re.

Mitigations

No mitigation is required.

8.6.7. Traffic Patterns

Impact

There is only one entrance and exit point provided at proposed site and same shall be used in future. Hence, traffic patterns of the area will not get disturbed.

Mitigations

No mitigation is required.

8.6.8. Water availability Impact

Water at project site will be provided by QABP management. To fulfill water requirements; the industrial estate has already installed the wells at different locations.

Mitigations

No mitigation is required.

8.6.9. Seismic Hazard

Impact

Pakistan lies on an active seismic belt of earth. According to seismic zones of UN- Habitat, the project area falls under Zone 2-A. Seismic observations indicate that hundreds of shocks originate every year. Mostly, these seismic waves are of low intensity and do not have significant effect.

Mitigation

The proposed structure of the industry shall be designed and constructed for low to moderate earthquakes. For seismic hazard analysis, updated structural and seismic evaluations will be consulted by the design engineer. The structure of the proposed project will be studied to evaluate their durability/strength to withstand moderate to high intensity earthquake.

8.7. Anticipated Environmental Impacts during Construction Phase

The details of the anticipated environmental impacts owing to construction of proposed industry are as follows;

8.7.1. Topography

Impact

Project lies in the plain area and no large scale excavation is involved except for levelling. So, the impact on topography will be insignificant in nature.

Mitigation

No mitigation is required.

8.7.2. Soil

Impacts

The project area is a plain terrain with paved road structure. Soil erosion may occur on roadside, at contractors' camps. Contamination of soil may be caused by oil and chemical spills at asphalt plant sites, workshop areas and equipment washing yards. This impact is, however, of temporary and minor negative in nature.

Mitigation

All spoils will be disposed of at designated site and the site will be restored back to its original conditions. Low embankments shall be protected by planting grasses and shrubs at appropriate locations.

8.7.3. Ambient Air Quality

Impact

Air quality will be affected by fugitive dust emissions from construction machinery; dust from the unpaved surface and construction vehicles. Emissions may be carried over longer distances

depending upon the wind speed, direction, temperature of surrounding air and atmospheric stability. Also, there can be slight increase in traffic causing emissions of SO_2, NOx, CO and Suspended Particulate Matter. Moreover, uncovered vehicles for transportation of building materials as well as their storage, especially gravel, sand and cement, can lead to dispersal of particulate matter.

These fugitive construction dust emissions have the potential to cause nuisance to the working staff as well as nearby receptors.

Mitigation

In order to reduce dust emissions, a number of mitigation measures will be implemented, as appropriate, including:

- Haul-trucks carrying Eai1h, sand, aggregate and other materials shall be kept covered with tarpaulin to help contain construction materials being transported within the body of each carrier.
- Surface areas of stockpiles will be kept minimized to reduce areas of surface exposed to wind scouring. Dust producing building materials such as sand or cement should be stockpiled in low enclosures and covered, away from drainage areas where they could be easily washed away during rainfall.
- Dust-suppression methods, such as time to time water sprinkling, should be adopted
- All construction plant and equipment must be maintained in good working order and not left running when not in use
- All vehicles, machinery, equipment and generators used during construction activities should be kept in good working condition and be properly tuned and maintained in order to minimize the exhaust emissions
- Open burning of solid waste from the Contractor's camps should be strictly banned
- Preventive measures against dust should be adopted for on-site mixing and unloading operations.
- Regular water sprinkling of the site should be carried out to suppress excessive dust emission(s)
- Emissions from power generators and construction machinery are important point sources at the construction sites. Proper maintenance and repair is needed to minimize

the hazardous emissions

- PEQS applicable to gaseous emissions generated by construction vehicles; equipment and machinery should be enforced during construction works.
- Construction workers should be provided with masks for protection against the inhalation of dust
- Regular monitoring of air quality in accordance with PEQS shall be carried out

8.7.4. Noise and

Vibration Impact

During construction process compaction, blistering, mixing of raw material machinery, granulation. process, use of heavy machinery for clearing of the site and transportation. of construction materials can create some noise and vibration around the project site. The likely impacts due to increased noise levels include psychological effects of distraction of attention, irritation and short temperedness in the exposed persons due to persistently higher noise levels. The noise and vibration would not directly affect the residents of study area as residential units are at farther distances from site while noise in1pacts will be only localized. On the overall, the impact of noise generated during construction on environment would be low and mainly confined to daylight hours.

Mitigation

- A cost-effective way to reduce noise at a construction worksite is to employ quieter equipment. Avoid using equipment that is over-powered and, conversely, avoid using under powered equipment. In general, elec1rnnic powered equipment is quieter than diesel powered equipment and hydraulically powered equipment is quieter than pneumatic power
- Work activity scheduling are administrative means to control noise exposure. Planning how noise sources are sited and organized on a work site can reduce noise hazards. Jobs can be rotated so that exposure time is limited
- Noisy equipment should not be run for periods longer than necessary and should be switched off when not in use
- Attention should be given to maintenance of tools and equipment to reduce worksite noise levels. Maintaining-plant and equipment in good order not only increases its life,

but makes it safer to use and quieter. Loose and worn parts should be fixed as soon as possible.

- An effective way of reducing noise is to locate noisy equipment behind purpose-built barriers. The barriers can be constructed on the work site from common construction building material. The noise source should not be visible and barrier should be located as close as possible to either the noise source or the receiver
- Vehicles' drivers will be instructed not to play loud music and avoid usage of horn around the site. Noise control measures will be taken such as provision of silencers on the heavy construction vehicles
- The green zone of plants will also help decrease sound levels

8.7.5. Construction Waste Disposal

Impact

Due to construction activities, waste will be generated at construction and contractors camp site. If it is not managed properly, it could have negative impacts on the site and surrounding area. If not disposed of at approved disposal sites and gets dispersed; it can result in the blockage of drainage channels if.

Mitigation

- Employees will be trained in basic segregation procedures, giving incentives and rewards to ensure they follow them
- Reusable/recyclable (iron bars, aluminum) waste should be sold to waste vendors and those which cannot be sold out may be used as a filling material for leveling the depressions, subject to technical feasibility
- The material which is in good and resalable condition, such as; doors, windows, wood and wood products, some metals, cardboard, paper, plastic crates, containers, bags ad sheets, in good, will be recycled or reused
- A site waste management plan will be made the responsibility of the building contractor. A schedule for the timely collection and disposal of construction debris to an approved dump site will be developed
- Solid waste generated during construction and camp sites should be safely disposed in demarcated waste disposal sites

8.7.6. Municipal Solid & Liquid Waste

The municipal waste will be in the form of food, cans, paper and wastewater from construction camps toilets and washing yards. If not managed properly, this will result in unhygienic conditions, health risk to work force at the camp site. If left unintended, it can become a source of nuisance and environmental pollution in the project area. The impact is considered to be temporary and moderate adverse in nature.

Mitigation

- Solid waste generated during construction and camp sites should be safely disposed in demarcated waste disposal sites and the contractor should provide a proper waste management plan.
- The sewage system for camps should be properly designed (pit latrines or, as required, septic tanks) to receive all sanitary wastewaters
- Lined wash-areas should be constructed within the camp site or at site, for the receipt of wash waters from construction machinery
- Construction workers and supervisory staff should be encouraged and educated to practice waste minimization, reuse and recycling to reduce quantity of waste.

8.7.7. Health and safety

Impacts

Possibility of health and safety hazards of workers is always present during construction phases relating to working at height, moving objects, noise, slips, trips & fall, material & manual handling, electrical works, collapse and usage of harmful material. Health risks and work safety problems may result at the construction site if the working conditions provide unsafe and/or unfavorable working environment and due to storage, handling and transport of hazardous construction mate1iaL A number of factors having a negative impact on health and safety management include problems of communication due to low literacy level; unregulated practices on construction sites; adherence to traditional methods of working; non availability of equipment; extreme weather conditions; improper use of equipment and corruption.

Mitigations

- Basic medical training shall be provided to specified work staff and basic medical service and supplies to workers

- Layout plan for camp site, indicating safety measures taken by the contractor, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents shall be developed
- Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for laborers
- Protection devices (ear muffs) should be provided to the workers doing job in the vicinity of high noise generating machines
- adequate sanitation, washing, cooking and dormitory facilities including Light up to satisfaction shall be provided
- Protective clothing for laborers handling hazardous materials, e.g. helmet, adequate footwear, protective goggles, gloves etc. shall be provided and usage of wearing these protective clothing during work activities shall be ensured
- A worker will be assigned duties in relation to his physical and mental health hand skills.
- To handle emergency medical situation, first aid facilities will be made readily available at the site and the contractor will ensure availability of transport to handle any emergency condition during construction activities at the project site.
- Training programs, that supp01t the achievement of unit's staff and personnel's competency in relation to health, safety and environment, will be implemented.
- The supervisory staff and workers to the extent possible will be made to follow the messages and instructions displayed on HSE notice boards installed in the premises of the site, such as;
    - Be aware of emergency escape routes
    - Promptly report all accidents to the concerned environmental manager
    - Not smoke or produce flame in No Smoking Areas

8.7.8. Groundwater

Impact

Groundwater table can get affected in two ways; groundwater contamination and lowering of ground water table.

There is a possibility that various materials like fuel, lubricant oil and other oily products, which are used during the construction phase may contaminate groundwater, if they are not handled properly. During the construction phase, the sanitary wastewater will be generated at the workers' camp(s). If this wastewater is allowed to stagnate in water ponds on the site, it can percolate into the soil, thereby, contaminating groundwater. This impact is temporary and minor negative in nature.

Mitigation

- Groundwater reserves will be protected from any source of contamination such as construction and oily waste that can degrade its potable quality
- The solid waste should be disposed of .in designated sites to sustain the water quality for domestic requirements
- Water conservation strategy will be adopted to not cause the lowering of groundwater table
- Regular water quality monitoring shall be done

8.7.9. Surface Water

Quality Impacts

There is not any appreciable surface water body in the project influenced area in respect of wastewater discharge; hence, no impacts are predicted.

Mitigations

No mitigation is required

8.7.10. Flora & fauna

Impacts

The proposed project lies in an industrial estate, and thus there exist no flora & fauna at the project site. Hence, no negative impact on ecological environment will take place on account of cutting trees and clearing of vegetation from the site.

Mitigation

In order to reduce construction impacts on surroundings and workers, a tree plantation program has been designed by the project proponent as it would help in cleaning the environment during operational life of the project too.

The landscape plan would assure that designated trees are planted and that, areas suitable for planting are identified and landscaped using majorly local trees and shrub species used for feeding by local bird species.

9. 7.11. Socio-Economic Environment

A number of categories of employees will be required during the construction phase including skilled and unskilled laborers, engineer, contractor and a small number of other professionals. These levels of short-term employment will have a positive impact on the local economy and regional unemployment. The management of the Project shall capitalize positive attitude of people of Study Area towards this project by offering them maximum employment opportunities at construction stage of the project. Strong and comprehensive plantation plan will help lessen the fear of the local people towards environmental issues.

Sustainable development approach through conservation of natural resources will prove to be the best strategy to compensate negative socio-environmental impacts. Environmental aspects of the project should be well taken care through the implementation of the Environment-al Management and Monitoring Plan (EMMP) as recommended in this report. Socially responsible attitude of the project manageme11t towards local people and resources will make the project people friendly. This is a moderate beneficial impact.

8.8. Anticipated Environmental Impacts during Operational Phase

After completion of construction phase; operational stage will be commenced. Following impacts are foreseen during this phase;

8.8.1. Air quality

Impacts

The gaseous emissions from vehicles, and generator can deteriorate the air quality of surroundings, though there will be slight increase in vehicular movement.

Mitigation

An awareness program will be run for owners of the vehicles to keep the vehicles always tune- up and ensure proper maintenance. The standby generator will be maintained well in time to avoid the black smoke. Proper tuning & lubrication work will be ensured on regular basis.
Emissions of exhaust gases will be kept to minimal level employing state of the art and environment friendly machinery for the manufacturing process. Plantation will be done around

the boundary wall to minimize the impact of gaseous emission.

8.8.2. Noise

Impacts

Industrial noise can badly disturb the human organs and daily activities. In the proposed unit welding process can produce noise. The noise pollution can affect the communication and because increased stress, disturb sleep, lack of concentration and reduced efficiency. Generator will also cause noise in workplace.

Mitigation

Earmuffs and earplugs shall be provided to the workers working in the welding area to protect against noise. Plantation of trees along the boundary walls will help in reducing the noise levels to some extent. All the machinery shall be kept properly tuned up and regular maintenance and periodic monitoring will be done. The standby generator will be maintained well & lubrication work done on regularly basis to reduce noise. The working staff at high noisy area will be provided with earmuffs and made sure to use during operation of plant. The noise level will be maintained well within PEQS values and thus not have any significant negative impacts on the surrounding environment or the public. Proposed working hours of proposed unit is from 9:00 a.m. to 6:00 p.m. and the PEQS value of 75.0 dB (A) during daytime (6:00 a.m.-10:00 p.m.) is the PEQS standard values for industrial zones.

The noise levels will not have any significant negative impacts on the surrounding environment or the public and shall be kept within PEQS values.

8.8.3. Health & Safety

Impacts

During operational phase, there may always be the possibility of occurring hazard to health and safety of workers. Operation of generator and other related machinery may also have safety and maintenance related issues.

Mitigation

Proactive measurements will be taken that prevent incidents before they manifest as accidents. Health and safety plans will be developed and implemented during operation of the project to ensure the health and safety of workers, decrease accident risks and improve onsite

productivity. Personal Protective Equipment will be provided on regular basis and ensured to be worn by working personnel. For workers in areas of significant exposure, sufficient working clothes will be provided to enable daily change into clean clothes. Training programs that support the achievement of the unit's staff and personnel's competency in relation to health, safety and environment will be implemented.

8.8.4. Solid Waste

If solid waste is not managed properly, it can cause bad aesthetics as well as land contamination.

Mitigations

The process solid waste can be in form of scrap pieces of iron. Estimated quantity of scrap is 1.43 Kg/day. Waste is to be reused in the process.

Approximately 3-5 kg of municipal solid waste will generate on daily basis and will mainly consist of food waste and packaging waste and that will be collected in the bins provided QABP. On-source segregation will be encouraged. Secondary collection and disposal of waste will be the responsibility of QABP management.

8.8.5. Wastewater

Impacts

Wastewater, if disposed of without any treatment, can cause water pollution and soil contamination, if seeped through.

Mitigations

As the water used in the cooling tower is to be recycled completely, so wastewater generation will be 0 m3Jday. The wastewater generated during paint process will be 10-15 liters per day. It will be disposed of into septic tank after neutralizing in a separate tank of capacity 30-50 liters. Also, municipal wastewater will generate from the proposed unit. It will be disposed of into internal drain of QABP, after treating primarily through septic tank. For this, septic tank system shall be appropriately installed and maintained. The specifications of the septic tank are already provided under "Environmental Estimates". Additionally, water conservation strategy shall be adopted to minimize the wastewater generation.

8.8.6. Landscaping

Impacts

The impacts on natural vegetation and sensitive plant communities are largely restricted to the construction phase. Operational phase impacts are likely to be restricted to maintenance activities within the site such as vegetation clearing through brush cutting from the internal road network. As such these impacts are considered to have a low intensity, and au overall Moderate Minor significance.

Mitigation

Landscaping in the form of excessive plantation will be done at the site and the process of plantation will be kept continuous throughout project life. The massive tree rising along walls, rare end, vacant spaces available near the parking area and other places will act as a buffer zone_ The plantation process to be started at construction stage shall be kept continued during operation phase of the project too. This will also make the air cleaner due to the production of pure oxygen and by adsorbing particulates from the air.

8.8.7. Socio-economic. environment:

Impact

According to the social survey, the pressing needs of the area are provision of drinking water supply, health care facilities, education institutions and solid waste collection facilities along with development of road infrastructure.

Mitigations

A number of categories of employees will be required during the operation phase. This will include skilled and unskilled laborers, engineers, contractors and a small number of other professionals. These levels of employment will have a positive impact on the Local economy and regional unemployment

The development of the proposed project will cause high positive impacts on them and their communities.

8.9. Potential Environmental Enhancement Measures:

Following potential environment enhancement measures shall be taken by the Project Proponents:

- The pollutants generated in the factories can be discharged to reach standard after proper treatment measures and will not reduce existing environmental functions of this region. The company will meet the environmental assessment and approval rules, it should reduce the influence on environmental quality in this region to the minimum; the company should call on all staff to protect the region environment and put more fund into environment protection.
- All vehicles used in the installation of industrial unit will be regularly inspected and maintained.
- The proponent ensures that there will be a monitoring team under the direct supervision of project proponent which shall 'time and again' take necessary precautions and adopt mitigation measures to keep the environment clean.
- Raw materials and final product will be transported to and from the project site according to best management practices.
- Construction of boundary wall of the proposed site shall be done properly after demarcation of project area and construction and operational activities shall remain confined in this boundary wall.
- A well-integrated security system will be provided for the entire project site. All sensitive areas shall be covered by security cameras.
- All the roads shall be paved to minimize the dust emissions from the vehicles' movement on roads and other infrastructure.
- All workers and visitors shall wear protective clothing and rubber boots.
- Proper cross ventilation and proper height shall be provided to avoid suffocation. Similarly, proper lighting and spacing shall also be provided.
- Extensive plantation will be ensured in and around the project area to enhance the environmental quality.
- The labor force will be trained to use Personal Protective Equipment (PPEs) to avoid any accident at site.
- The vehicles used for transportation of material will be properly designed, covered and cleaned to avoid any risk while departing to and from the project site.
- No structural changes shall be made in the project after grant of relevant NOCs.

- Environmental Management and Monitoring Plan (EMMP) will be strictly operational throughout the project life. All monitored data will be reported to the EPA Punjab, Lahore for scrutiny at their end.

9. ENVIRONMENTAL MANAGEMENT & MONITORING PLAN(EMMP)

A comprehensive management plan is necessary to implement the recommendations and mitigation measures suggested after assessing and evaluating potential environmental impacts due to the development of the project.

The implementation of EMMP should be carefully coordinated with the design, construction and operation program of the project to ensure that relevant mitigation measures are implemented at the appropriate stage and that adequate resources are properly allocated to achieve the desired results. This EMMP has been prepared to satisfy the requirements of the Pakistan Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Review Procedures, 2000.

For effective environmental management, the management of the project should assign the necessary responsibilities to its Health, Safety and Environment team, which should be responsible for environmental monitoring of the project.

9.1. Objectives of EMMP

The EMMP provides a delivery mechanism to address potential impacts of the project activities, to enhance project benefits and to introduce standards of good practice to be adopted for all project works. The EMMP has been prepared with the objectives of:

- Defining roles and responsibilities of the project proponent for the implementation of EMMP and identifying areas where these roles and responsibilities can be shared with other parties involved in the execution and monitoring of the project.
- Outlining mitigation measures required for avoiding or minimizing potential impacts assessed in the EIA report.
- Developing a monitoring mechanism and identifying requisite monitoring parameters to confirm effectiveness of the mitigation measures recommended in the EIA report.
- Defining the requirements for communication, documentation, training and monitoring, management and implementation of the mitigation measures.

9.2. Institutional Capacity

Following functionaries will be involved in the implementation of EMMP:

- Project proponent as the executer of Environmental Management and Monitoring Plan
- Project contractor(s) as executors of the EMMP during construction phase of the project
- HSE/ Project Manager
- Environmental Protection Agency (EPA), Punjab as Government Department *to* review and monitor the implementation of remedial and mitigation measures as provided in EIA

Specific responsibilities of key role players are illustrated hereunder:

10.2.l. Responsibilities of Management of Project

Management of the project will be responsible for the environmental management and supervisory affairs during the project activities. Environmental personnel designated by the management of the project will look after the environmental related issues during the project activities. The responsibilities of Environmental personnel are as follows:

- Monitoring progress of the project as per planned schedule of activities.
- Exercising oversight over the implementation of environmental mitigation measures by the contractor.
- Documenting the experience in the implementation of the environmental process.
- Preparing training materials and implementing programs.
- Maintaining interfaces with the other lined departments/stakeholders and
- Reporting to the management of the projection the status of EMMP implementation.

10.2.2. Responsibilities of Project Contractor

Contractor appointed for the commissioning of the project including the auxiliary facilities is responsible for:

- Implementation of, or adherence to, all provisions of the EMMP and with any environmental and other codes of conduct required by the project.
- Provision of proper Personal Protective Equipment (PPE) to the workers and train them for their proper use.

10.2.3. Responsibilities of EPA

To review and monitor the implementation of remedial and mitigation measures as given in the EIA.

9.3. Environmental Trainings

One of the most important mechanisms for the enhancement of the project's overall environmental performance is to organize environmental trainings for the project personnel and the Contractor's team. Environmental training will form part of the ongoing environmental management of the project. Contractor's environmental awareness and appropriate knowledge of environmental protection is critical to the successful implementation of the EMP because without appropriate environmental awareness, knowledge and skills required for the implementation of the mitigation measures, it would be difficult for the Contractor(s) workforce to implement effective environmental protection measures. Adoption of these measures will help Proponent and the Contractor to achieve a high level of environmental awareness in the project team, which should, in tum, promote sound environmental management during project lifespan.

9.3.1. Training Schedule

A training schedule will be developed by the Health & Safety manager and organized and maintained by the management of the project and contractors. Following is the comprehensive form of the training schedule;

Table 10-1: Training Schedule

Provided by	Trainee	Contents	Duration	Responsible Authority
HSE Manager & Training Assistant	All working personnel	o Environmental laws and regulations, daily monitoring and supervision o Introduction to project EIA And EMMP o Importance of safety practices and usage of PPEs o Environmental sensitivities of the project area o Communication of environmental problems to corresponding officials o Waste disposal	Monthly	Project Management & Contractor

Consultants/ specializing in social management	Staff dealing III social matters	o Short seminars and courses on: Social awareness o Effective public speaking	Monthly	Project Manager
Drivers	As specified	o Road safety o Road restrictions o Vehicle/driving restrictions o Applicable rules & regulations o Defensive driving	Twice a month	Project Management & Contract or
Consultants/ organizations specializing in occupational, health and safety issue	As specified	o Short lectures relating to Occupational Safety and Health	Twice a year	Project CEO

9.4. Environmental Management and Monitoring Plan (EMMP)

The Environmental Management and Monitoring Plan (EMMP) will be used as a management and monitoring tool for implementation of the mitigation meas11res identified in the EIA report.

The EMMP matrix lists down:

- The required mitigation measures recommended in the EIA report.
- The person/organization directly responsible for adhering to or executing the required mitigation measures and monitoring adherence to the mitigation measures.
- The parameters, which will be monitored to ensure compliance with the mitigation measures.
- The timing at which the mitigation or monitoring has to be carried out.
- Project proponent will hold primary and overall responsibility for ensuring full implementation of the EMMP.

9.5. EMMP for Pre-construction, Construction & Decommissioning phase

The EMMP during construction phase includes following:

- Air quality management & monitoring plan
- Noise management & monitoring plan
- Waste management & monitoring plan
- Health and safety management & monitoring plan

- Energy management & monitoring plan
- Water management & monitoring plan

Table 10-2: Air Quality Management &Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	**Potential Impacts**	**Management & Monitoring Measures**	**Timeframe**	**Responsible Authority**	**(PKR)**
Reduce Dust Emissions					
l	**Dust Emissions**	Ensure strict enforcement of on-site speed limit regulations	Pre-construction, Construction & Decommissioning phase	HSE representative	0
		Avoid excavation works in extremely dry weathers	Pre-construction, Construction & Decommissioning phase	HSE representative	0
		Sprinkle water on graded access routes when necessary to reduce dust generation by construction vehicles	Pre-construction, Construction & Decommissioning phase	HSE representative	5,000/ month
		Personal Protective equipment to be worn by the workers	Pre-construction, Construction & Decommissioning phase	Proponent/ HSE representative	10,000
		Construction materials on site must be c0vered to prevent their blown off by wind	Pre-construction, Construction & Decommissioning phase	Contractor	5,000
Reduce Exhaust Emissions					

2	**Exhaust Emissions**	Vehicle idling time shall be minimize.cl	Pre-construction, Construction & Decommissioning phase	Proponent & Contractor	0
		Alternatively, fueled construction equipment shall be used where feasible equipment shall be properly tuned and maintained	Pre-construction, Construction & Decommissioning phase	Proponent& Contractor	0
		Sensitize truck drivers to avoid unnecessary racing of vehicle engines at loading/un-loading points and parking areas, and to switch off vehicle engines at these points	Pre-construction, Construction & Decommissioning phase	HSE representative	0

Table 10-3: Noise Management & Monitoring Plan

Management Plan			**Monitoring Plan**		**Cost**
Sr. No	**Potential Impacts**	**Management & Monitoring Measures**	**Schedule of Implementation**	**Responsible Party**	**(PKR)**
Minimization of Noise and Vibrations					
		Sensitize construction vehicle drivers and machinery operators to switch off engil1es of vehicles or machinery not being used	Pre-construction, Construction & Decommissioning phase	HSE representative	0

1	**Noise and Vibrations**	Sensitize construction drivers to avoid gunning of vehicle engines or unnecessary hooting especially when passing through sensitive areas such as churches, mosques, residential areas and schools	Pre-construction, Construction & Decommissioning phase	HSE representative	0
		Ensure that construction machinery is kept in good condition to reduce noise generation	Pre-construction, Construction & Decommissioning phase	Proponent & Contractor	**10,000**
		Ensure that all generators and heavy-duty equipment are insulated or placed in enclosures to minimize ambient noise levels	Pre-construction, Construction & Decommissioning phase	Proponent & Contractor	5,000
		The noisy construction works will entirely be planned to be during daytime when most of the neighbors will be at work	Pre-construction, Construction & Decommissioning phase	Proponent & all site foreman	1,000

Table 10-4: Waste Management & Monitoring Plan

Management Piao			**Monitoring Plan**		**Cost**
Sr. No.	**Potential Impacts**	**Management & Monitoring Measures**	**Schedule of Implementation**	**Responsible** Party	**(PKR)**
Minimization of solid waste generation and ensure efficient solid waste management					

1	**Increased solid waste generation**	Use of an integrated solid waste management system i.e. through a hierarchy of options: I. Source reduction 11. Recycling ... 111. Composting and reuse 1V. Combustion V. Sanitary land filling	Pre-construction, Construction & Decommissioning phase	Proponent/ Contractor/ HSE representative	5,000
		Though accurate estimation of the size-s and quantities of materials required, order materials in the sizes and quantities they will be needed, rather than cutting them to 'Size, or having large quantities of residual materials	Pre-construction, Construction & Decomrnissioning phase	Project manager/ Proponent/ HSE representative	0
		Ensure that construction materials left over at the end is used in other projects rather than being disposed of	Pre-construction, Construction & Decomrnissioning phase	Proponent/ Project manager	5,000
		Ensure that damaged or wasted construction materials including pipes, doors, plumbing and lighting fixtures, marbles will be	Pre-construction, Construction & Decommissioning phase	Proponent/ Project manager	1,000

		recovered for refurbishing and use in other projects			
		Donate recyclable/reusable or residual materials to local community groups, institutions	Pre-construction, Construction & Decomrnissioni ng phase	Proponent	0
		Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time	Construction Phase	Proponent & Contractor	2,000
		Provide facilities for proper handling and storage of constn1ction materials to reduce the Amount of waste caused by damage or exposure to the elements	Pre-construction, Construction & Decommissioni ng phase	Proponent & Contractor	5,000
		Use building materials that have minimal or no packaging to avoid the generation of excessive packaging waste	Construction Phase	Proponent & Contractor	0

Table 10-5: Health & Safety Management & Monitoring Plan

Management Plan **Monitoring Plan** **Cost**

Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
Minimization of occupational health and safety risks					
1	**Health and Safety Impacts**	Ensure the general safety and security at all times by providing day and night security guards and adequate lighting within and around the premises	Continuous	Proponent/ HSE representative	15,000
		Construction of a perimeter wall around the project area	On commencement	Contractor/ HSE representative	10,000
		Suitable overalls, safety footwear, dust masks, gas masks, respirators, gloves, ear protection equipment etc. should be made available and construction personnel must be trained to use the equipment	Once off	Proponent/ Contractor/ HSE representative	10,000
		Implement all necessary measures to ensure health and safety of workers and the general public during operation of the project	Continuous	Proponent/ Contractor/ HSE representative	5,000
2	**Health & Safety**	Well stocked first aid box which is easily available and accessible should be provided within the premises	Pre-construction, construction & Decommissioning-phase	Proponent & Contractor	5,000

		Provision must be made for persons to be trained in first aid, with a certificate issued by a recognized body	One-off	Proponent & Contractor	10,000
3	**Fire Protection**	Firefighting equipment such as fire extinguishers should be provided at strategic locations such as stores and construction areas	One-off	Proponent& Contractor	15,000
		Regular inspection and maintenance of the equipn1entmustbe undertaken by a reputable service provider and records of such inspections must be maintained.	Quarterly	Proponent/ Contractor/ HSE representative	10,000
		Fire escape routes and assembly point must be marked at the project site	Continuous	Proponent/ Contractor/ HSE representative	5,000
		Signs such as "NO SMOKING" must be prominently displayed within the premises, especially in parts where flammable materials are stored	One-off	Proponent & Contractor	10,000

Table 10-6: Energy management & monitoring plan

Management Plan	**Monitoring Plan**	**Cost**

Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
Minimization of Energy Consumption					
1	**Increased Energy Consumption**	Ensure electrical equipment, appliances and lights are switched off when not being used	Throughout constructi01i period	Proponent & Contractor	11,000
		Install energy saving fluorescent tubes at all lighting points instead of bulbs which consume higher electric energy	Pre-construction, construction & Decommissioni ng phase	Proponent& Contractor	15,000

Table 10-7: Water Management & Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	Potential Impacts	Management & Monitoring Measures	Schedule of Implementation	Responsible Party	(PKR)
Minimize water consumption and ensure more efficient and safe water use					
1	**High Water Demand**	Promptly detect and repair water pipelines and tank	Continuous	Proponent	5 000 /month
		Ensure taps are not running when not in use	Continuous	Proponent	1,000 /month
		Thstall a discharge meter at water outlets to determine and monitor total water usage	One-off	Proponent/ Construction manager	1,000

9.6. EMMP for Operational Phase

The EMMP during operational phase includes following:

- Air quality management & monitoring plan
- Noise management & monitoring plan
- Waste n1anagement & monitoring-plan
- Health and safety management & monitoring plan
- Energy management & monitoring plan
- Water management & monitoring plan

Table 10-8: Air Quality Management & Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	**Potential Impacts**	**Management & Monitoring Measures**	**Schedule of Implementation**	**Responsible Party**	**(PKR)**
Minimize the risks of air quality deterioration due to dust and gaseous emissions					
1	**Gaseous emissions**	The vehicles and generator are to be kept well maintained. Plantation wi,11 be done around the area.	Continuous	Proponent/ HSE representative	10,000/ month

Table 10-9: Noise Management & Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	**Potential Impacts**	**Management & Monitoring Measures**	**Schedule of Implementation**	**Responsible Party**	**(PKR)**
Minimization of Noise and Vibrations from machinery					
1	**Noise and Vibrations**	Properly design machinery ed will purchased. be	Once-off	HSE representative	Cost of machinery
		All operational machinery will be inspected and maintained for wear and tear	Throughout operation period	Proponent & Contractor	10,000 /month

		Ensure that all generators and heavy-duty equipment are insulated to minimize noise levels.	Throughout operation period	Proponent& Contractor	5,000 /month
		The noisy operational works will entirely be planned to be during daytime when most of the neighbors will be at work.	Throughout operation period	Proponent& all site foreman	1,000 /month
		Ensure simple engineering and administrative controls for the operation of machinery	Throughout operation period	HSE representative	5,000 /month

Table 10-10: Waste Management & Monitoring Plan.

Management Plan			Monitoring Plan		Cost
Sr. No.	**Potential Impacts**	**Management & Monitoring Measures**	**Schedule of Implementation**	**Responsible Party**	**(PKR)**
Minimization of solid waste generation and ensure efficient solid waste management					
I	**Solid waste generation**	Provide solid waste handling facilities such as waste bins and skips	One-off	Proponent	8,000 /month
		Ensure that solid waste generated at the offices and industry is collected	Continuous	Proponent	10,000 /month
		Ensure that staff at project site manages	Continuous	Proponent	0

		their waste efficiently through recycling, reuse and proper disposal procedures			
		Donate redundant but furniture to charities and institutions	Continuous	Proponent	0
Minimize risks of sewage release into environment					
2	**Sewage Disposal**	Ensure implementation of water conservation strategies to minimize the amount of sewage generated	Continuous	Proponent & HSE representative	5,000
		Conduct regular inspections for drainage pipe blockages or damages and fix appropriately	Continuous	Proponent & HSE representative	500 per i11spection
		Ensure time to time monitoring of the wastewater discharged from the project to ensure that the stipulated effluent discharge rules and standards are not violated	Continuous	Propoi1ent	10,000 per sample
		Ensure the installation of septic	Once-off	Proponent	50,000-100,000

Table 10-11: Health and Safety Management& Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	**Potential Impacts**	**Management & Monitoring l\1easures**	**Schedule of Implementation**	**Responsible Party**	**(PKR)**
Minimization of fire and health and safety risks					
	Health and Safety Impacts	Implement all necessary measures to ensure health and safety of the workers and the general public during operation of the project. Train all workers of fire safety procedures Ensure installation of firefighting equipment with the premises of industry. Install fire extinguishers fire alarms, smoke detectors, fire hydrants etc. to cope up with fire events	Continuous	Proponent	15,000

Table I0-12: Energy Management & Monitoring Plan

Management Plan			Monitoring Plan		Cost
Sr. No.	**Potential Impacts**	**Management & Monitoring Measures**	**Schedule of Implementation**	**Responsible Party**	**(PKR)**
Minimization of Energy Consumption					
I		Switch off electrical equipment, appliances and lights when not being used	Continuous	Proponent	0

	Energy Resource Utilization	Install occupation sensing lighting at various locations such as storage areas which are not in use all the time	One-off	Proponent	10-40% higher than ordinary lighting
		Install energy saving fluorescent tubes at all lighting points within the facility instead of bulbs which consume higher electric energy	One-off	Proponent	10-40% higher than ordinary lighting
		Monitor energy use during the operation of the project and set targets for efficient energy use	Continuous	Proponent	7,000 /month
		Sensitize workers to use energy efficiently	Continuous	Proponent	5,000

Table 10-13: Water Management & Monitoring Plan

Management Plan			**Monitoring Plan**		**Cost**
Sr. No.	**Potential Impacts**	**Management & Monitoring Measures**	**Schedule of Implementation**	**Responsible Party**	**(PKR)**
Minimize water consumption and ensure more efficient and safe water use					
1	**Water Demand**	Promptly detect and repair water pipelines and tank leaks.	Contin\1ous	Proponent	7,000/ month
		Ensure taps are not running when not in use.	Continuous	Proponent	0
		Users to conserve water e.g. by avoid water loss.	Continuous	Proponent	0

		Install water conserving taps that tum-off automatically	Once-off	Contractor/ Construction manager	10-40% higher

9.7. Schedule for Implementation and Environmental Budget

The cost required to effectively implement the mitigation measures is important for the sustainability of the Project. The proponent of the subject industrial unit has allocated the Environmental Cost or budget of Rs. 260,000/annum for recover any damages done by the project activities to environment which will include Environment, Health & Safety, for restoration, rehabilitation & landscaping of the area, for installing any pollution abating technology or equipment, for any maintenance and repair of safety devices, for the implementation of Environmental Management Plan and other environment related aspects.

Table I0-14: Environmental Budget for the Project

Environmental Component	Quantity (Number)	Amount .PKR	Schedule of Implementation
Landscaping	500-800	50,000	Once in project life
Implementation of EMMP	Lump sump	50,000	Throughout the project life
Environmental Trainings	Lump sump	50,000	Quarterly
Air Quality Monitoring	Lump sump	20,000	Twice a year
Water Quality Monitoring	Lump sump	20,000	Twice a year
Noise Level Monitoring	Lump sump	20,000	Twice a year
External Monitoring	Lump sump	50,000	Yearly
Total Environmental budget		**260,000**	

10.8. Environmental Management Team

Environmental management team will be made responsible for overseeing the environmental performance in the industry and develop, implement and monitor environmental strategies that promote sustainable production. The team will comprise Environmental Manager and Assistant Managers; their responsibilities are as follows;

Position of Team Member	Roles and Responsibilities
Environmental Manager	o Implementing environmental policies and practices o Devising strategies to meet targets and to encourage best practice o Devising the best tools and systems to monitor perfon11ance and to implement strategies o Ensuring compliance with environmental legislation o Assessing, analyzing and collating environmental performance data and reporting information to internal staff, clients and regulatory bodies o Confirming that materials, ingredients and so on are ethically or environmentally sourced o Managing environmental strategy budgets o Liaising with internal staff including senior managers and directors o Acting as a chan1pion or cheerleader for environmental issues within your organization o Providing environmental training to staff at all levels o Writing plans and reports o Keeping up to date with relevant changes in environmental legislation and initiatives including international legislation where applicable o Producing educational or information resources for internal staff, clients or the general public o Liaising with regulatory bodies such as the Environment Agency
Assistant Manager Compliance	o Develop and oversee control systems to prevent or deal with violations of legal guidelines and internal policies o Evaluate the efficiency of controls and improve them continuously o Revise procedures, reports etc. periodically to identify hidden risks or non-conf01mity issues o Draft, modify and implement company policies a Collaborate with corporate counsels and HR departments to monitor enforcement of standards and regulations a Assess the business's future ventures to identify possible compliance risks o Review tl1e work of colleagues when necessary to identify compliance issues and provide advice or training o Keep abreast of regulat01y developments within or outside of the company as well as evolving best practices in compliance control o Prepare reports for senior management and external regulatory bodies as appropriate
Assistant Manager EHS	a Research health and safety regulations, such as OSHA laws, and create company safety protocols. o Supervise safety and security staff.

	o Look into accident and injury claims company-wide, ensuring results consistent with company goals. o Educate all personnel on health and safety policies and company safety goals

10.9. Proposed Monitoring Program

Environmental monitoring can be categorized into two types:

- Compliance Monitoring
- Effects Monitoring

The environmental monitoring will. be conducted according to SMART rules and EPA regulation.

10.9.1. Compliance Monitoring

Compliance monitoring will be carried out to ensure compliance with the requirements of the EIA and EMMP. The project staff and contractors will carry out the inspections on a routine basis. This will also include the routine monitoring at the project site as specified in EMMP.

10.9.2. Effects Monitoring

Effects monitoring will be done to monitor actual impacts of the project on selected sensitive receptors so that impacts not anticipated .in the EIA report or impacts which exceed the levels anticipated in the EIA report can be identified and appropriate mitigation measures can be adopted on time.

10.9.3. Monitoring components

Time to time environmental monitoring will be carried out by the management of proposed unit for the following essential components of environment;

- Noise Levels
- Ambient air quality
- Water Quality
- Solid waste management
- Wastewater disposal
- Vehicular emissions
- Soil Contamination (if needed)
- Health& Safety

The monitoring can be performed through observation, in laboratory or by both means as per requirement, such as;

Table 10-15: Proposed Monitoring Program

Environmental Component	Monitoring Type		Timeframe
	Observation	Laboratory	
Noise Levels	✓	✓	Twice a year
Ambient air quality	✓	✓	Twice a year
Water Quality		✓	Twice a year
Solid waste management	✓		Weekly
Wastewater disposal	✓		Weekly
Vehicular emissions	✓		Monthly
Soil Contamination (if needed)		✓	Twice a year
Health & Safety	✓		Twice a week

10.10. Proposed EMP Reporting & Reviewing Procedures

EMP Reporting & Reviewing Procedures emphasize that the EMP shall set forth in sufficient detail all the design measures, monitoring programs, best management practices, and emergency and contingency plans to assure best that all the potential impacts are methodically controlled and suitably mitigated. ln addition to reviewing the EIA report recommendations, the management of the industry should compare these documents and plans to the guidelines for such Industrial units in its evaluation of what is applicable or otherwise should be included in the EMP. Employee educational and training materials to be submitted to best for their review 3 weeks prior to the beginning of staff training.

10.11. Equipment Maintenance Details

The proposed project is establishment of "National Automotive Components (Pvt.) Ltd," in QABP, Sheikhupura. The management of the industry will maintain the records for Health Safety & Environment and will hire HSE manager to check and deal with the HSE issues. All industrial tools, equipment and vehicles will be kept properly maintai11ed so that workers are not endangered. However; maintenance tasks themselves are potentially hazardous and c.an result in injury and a successful maintenance program is:

- Well organized and scheduled,

- Hazards controlling,
- Defining operational procedures, and
- Training key personnel

Preventive and regularly schedt1led maintenance is vital to the efficiency and life of large machinery.

10.11.1. Necessity of Maintenance

- Preventive maintenance preserves the value of the equipment. Keeping machines in good working order extends equipment life and keeps operators safe. It also ensures the availability of the machinery.
- Early detection of problems allows repairs to be made before the situation worsens. Machinery that does not need to be taken offline for extensive repairs will avoid production interruptions. Regular inspections and analysis can be used to predict and prevent component failures that may create safety hazards and machinery breakdowns.
- Good maintenance is important for worker safety. Large machinery maintenance can be dangerous. It is often conducted in close contact with running machinery. The conditions can be closely confined and unhealthy. The work is non-routine and subject to human error. There is often time pressure involved as well. The Occupational Safety and Health Administration (OSHA) reports that 15 to 20 percent of industrial accidents and 10 to 15 percent of all fatal industrial accidents are related to maintenance operations.
- Preventive maintenance and scheduled equipment overhauls can diminish the chances of large machinery breakdown and thus lessen the risks that technicians face in onsite repairs. Accidents in the workplace are also significantly reduced.

10. I1.2. Methodology of Equipment Maintenance

Following steps will be taken for machinery maintenance in the proposed industry;

Keep Daily Records of Use and Oversee Operation

- Large machinery wear and breakdown are often made worse by unskilled handling. Keeping records of machinery use and monitoring daily operations will help pinpoint when and where the machinery is being used by inadequately skilled operators.

- A new way to oversee the operations of large machinery is via GPS. The device tracks movement and records it in digital records, which are organized to be easily retrieved. Problems can be caught early, and breakdowns can be prevented.

Maintain a Schedule of Planned Maintenance

- Components break down, and wear is inevitable. Forecasts for the expected life of all components will be established and replaced on schedule. Part replacement must be done by knowledgeable technicians.
- Bearings are key components of heavy machinery equipment and can be easily damaged or worn. Bearing housings shall be regularly maintained, including inspection for corrosion and wear, and replaced when necessary. A maintenance log will also be kept to ensure regular checks are not missed and compliance is measured.

Lubricate and Clean Frequently

- Working heavy machinery requires daily maintenance. Some components, especially moving parts in engines and power trains, demand frequent lubrication. Other components, such as hydraulic Lifts and bearings, will be monitored and lubricated at the first sign of need.
- Contamination can lead to machinery breakdown. Water is a major source of corrosion. Lubrication prevents corrosion. Maintaining seals and replacing filters will help keep lubricants free of contaminants.

Inspect and Monitor Components for Wear and Damage

- A planned maintenance schedule can predict component wear. Visually inspect components on an ongoing basis to monitor wear and prevent equipment failure. Components that must be replaced ahead of schedule may signal a larger problem that needs to be diagnosed.
- Check belts, pulleys and chains for alignment and condition. Gears and sprockets for broken teeth, cracks and misalignment will be inspected regularly.
- Fluid analysis should also be part of a regular maintenance schedule. Analysis of used lubricants and other fluids is an excellent way to diagnose problems and prevent machinery wear and breakdown. Identifying contaminants in the fluids can lead analysts to the source of wear and damage.

Protect Equipment during Storage

- Large machinery will be stored under cover wJ1enever possible. Motors, turbines, mixers and other equipment will be rotated frequently. Idle machinery will be inspected for rust, condensation and contamination. Oil-mist lubrication is a good solution for the damaging effects of warm, humid environments; so, lubrication will also be checked.

10.12. Change Management Plan

The EIA report recognizes that changes in the operations or the EMMP may be required during the operation and therefore a Change Management Plan has been provided to manage such changes. The management of changes is discussed under two separate headings, changes to the EMMP and changes to the operation.

10.12.1 Change to the EMMP

The EIA report and the EMMP have been developed based on the best possible information available at the time of the EIA study. However, it is possible that during the construction and operational phase, some aspects 6f the EMMP need to be changed owing to their non-applicability in a certain area of operation or the need for additional mitigation measures based on the findings of environmental monitoring during the construction and operational phases. In such cases following actions shall be taken.

- A meeting will be held between management and the concerned contractor. During the meeting the proposed deviation from the EMMP, planning and designing will be discussed and agreed upon by all parties.
- Based on the discussion during the meeting, a change report will be produced collectively, which will include the original EMMP clause/plan or design, the change that has been agreed upon, and the reasons for the change.
- The report will be signed by all the patii.es and will be filled at the site office. A copy of the report will be sent to the management of the project and contractor head offices.

10.12.2. Changing in the Planning and Design

The change management system recognizes three orders of changes.

First Order Change

A first order change is one that leads to a significant departure from the project described or the impacts assessed in the EIA report and consequently require a reassessment of the

environmental impacts associated with the change. Examples of such change include change in location of the proposed project. ln such an instance, the environmental impacts of the proposed change will be reassessed, and the results sent to the Punjab EPA for approval.

Second Order Change

A second-order change is one that entails project activities not significantly different from those described in the EIA, and which may result in project impacts whose overall magnitude would be similar to the assessment made in this report. In case of such changes, the environmental impact of the activity will be reassessed, additional mitigation measures will be specified if necessary, and the changes will be reported to the Punjab EPA.

Third Order Change

A third-order change is one that is of little consequence to the EIA report findings. Th.is type of change does not result in impact levels exceeding those already assessed in the EIA; rather these may be made onsite to minimize the impact of an activity. The only action required in this case will be to record the change in the change record register.

10.12.3. Improved Monitoring and Management Practices

The EJA study and the EMP have been developed based on the best possible information available at the time of study. However, it is possible that during the operation of project some aspects of the EMP need to be changed owing to their non-applicability in a certain area of transportation or the need for additional mitigation measures based on the findings of environmental monitoring. 1n such cases following actions shall be taken:

1. A meeting will be held between management and the concerned contractor. During the meeting the proposed deviation from the EMP, planning and designing will be discussed and agreed upon by all parties.
2. Based on the discussion during the meeting, a change report will be produced collectively, which will include the original EMP clause/plan or design, the change that has been agreed upon, and the reasons for the change.
3. The report will be signed by all the parties and filled at the site office. A copy of the report will be sent to proponent and contractor head offices.
4. All relevant project personnel will be informed about the change.

10.13. Compensation in Terms of Money

Changes in the EMP can be done up to 5% of the total development cost in case the mitigation arid monitoring of the environment according to the prescribed plan does not render useful.

10.14. Replacement, Relocation and Rehabilitation Plan

The estimated life of the project is about 50 years. Much before the project approaches end of its first life cycle it will be completely renovated, refurbished and even new/latest art of the equipment will replace the older one. All civil structures and related infrastructures will be extensively renovated. All activities will be carried out in accordance with prevailing environmental management laws and controls so as to avoid any damage to any segment of environment or human health around the project site. Rehabilitation would not be required as such at current project site.

10. STAKEHOLDERS CONSULTATION

Public Consultation is a mandatory part of the EIA process for development projects. It is a tool used for communication with a diverse group of stakeholders having multifarious aims such as information dissemination, exchanging views., soliciting feedback and suggestions on issues pertaining to the project; plan future actions. The adequacy of the public consultation and information disclosure is one of the basic criteria used to determine the project compliance with the national / international safeguard policies.

The consultation process was carried out in accordance with the requirements of Pakistan Environmental Procedures. The objectives of this process were to:

- ✓ Inform the public about what is proposed project
- ✓ Identify and involve all stakeholders., especially local residents, in the consultative and participation process
- ✓ Share information with stakeholders on the design and construction of the proposed project and anticipated impacts on the physical, biological and socioeconomic environment of the project area
- ✓ Understand stakeholders' concerns regarding various aspects of the project, including the existing available facilities and problems, construction of the project and the likely impacts (positive & negative) of construction and operation related activities Understand the perceptions, assessment of social impacts and concerns of the communities in the vicinity of the proposed project
- ✓ Provide an opportunity to the public in the public consultation session to provide valuable suggestions for the project design in a positive manner
- ✓ Reduce the chances of conflict through the early identification of controversial issues, and consult them to find acceptable solutions.

This section describes the outcome of the public consultation sessions held with different stakeholders that may be directly or indirectly affected by the proposed project.

10.1. Methodology of Consultation

For ascertaining the perceptions of different stakeholders about the project (during construction/operation) consultation meetings were held with them in the vicinity of the proposed project. The meetings with stakeholders were carried out from 1st to 3rd July, 2024.

Consultation was carried out in order to establish stakeholder's opinion regarding project implementation. The methods used for public consultation with project stakeholders include Scoping Sessions, Formal Meetings, Informal Meetings and Individual Interview. All the stakeholders were briefed about the project verbally. Their feedback was noted, and all the concerns voiced in the discussion were relayed to the management team of the project.

10.2. Study Area and Identification of Stakeholders

The area of Quaid-e-Azam Business Park, Punjab Industrial Estate Development & Management Company as a whole was the part of our study area boundaries.

Stakeholders are those entities who have a direct or indirect interest in project development During the field survey, significant efforts were made to identify the possible categories of stakeholders and their stakes: The stakeholders identified during field survey were the management and working personnel in nearby industries, management of QABP, local residents around the project or in close vicinity of the industrial estate, environmental experts, customers, pedestrians and road users. All the stakeholders had different types of stakes according to their professions which were listed down along with their apprehensions. Informal group discussions were also held as an additional tool for the assessment of the perceptions of the stakeholders.

10.3. Categories of Stakeholders Consulted

The Stakeholders contacted during the survey belonged to different categories, as under;

10.3.1. Proponent's Environmental Management Team

Possible potential impacts and mitigation measures related to the proposed project during its construction and operational phases were discussed in detail with the project proponent. They assured to undertake all the suggested mitigation measures to control, eliminate or minimize the anticipated potential impacts and control any discrepancy arose by the project to make the project envirot1mental ·friendly. The environmental management team of the proponent was made aware of their responsibilities which include;

- Oversee daily activities of team members to maintain environmental management system (EMS)
- Ensure that industrial operations are in compliance with local, state and federal environmental regulations
- Follow and enforce environmental policies and procedures.

10.3.2. The responsible Authority

The management of the industry is the responsible authority to take all mitigation measures to protect the environment prior to commencement of the project.

10.3.3. Other departments and agencies

Scoping Sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area. The purpose of such consultation was to obtain feedback from relevant personnel.

For the analysis of anticipated potential impacts, detailed meetings were held with the management of the subject industrial unit, local community surrounding the project area and bearers/ members of Punjab industrial Estate. Issues were discussed that might affect the environment and implementation of proposed project. All the possible mitigation measures were considered and have been incorporated in the Environmental Management Plan (EMP) provided in this EIA report.

10.3.4. Environmental Practitioners and Experts

The expert team of AAA Environmental Advisers visited the proposed project site, had discussion with stakeholders and consulted the personnel working in neighboring industries and local community residing nearby the industrial estate. People of the area belonged to different professions such as doctors, lawyers, government employees, teachers, agriculture etc. and some had their own business. People provided massive information about the project and most of them showed positive remarks regarding the project development.

10.3.5. Affected Wider Community

There is no affected community present in the radius of the study area. The people showed optimistic attitude towards the development of subject unit. Stakeholders' participation Performa/ socio-economic questionnaire was also get filled to evaluate the projects impacts especially socio-economic impacts. Those Performa/ socio-economic questionnaires are attached as appendices with this EIA report. Categories of stakeholders consulted while survey/ public consolation sessions are under: -

10.4. Consultation Meetings and Formal & Informal Group Discussions

Among all stakeholders some major stakeholders were identified in the proposed project area. Consultation meetings regarding project impacts, their magnitude and mitigation measures were held with the Management of M/S. National Automotive Components (Pvt.) Ltd, environmental practitioners, local residents around the project or in close vicinity of the industrial estate, pedestrians, management of QABP, general public, customers and pedestrians

to know their concerns regarding proposed project. Scoping sessions and meeting were conducted with these stakeholders. Generally, it was found that people were already aware of the proposed project because the project is to be located in the Industrial Estate and various industries are being established their time to time. Majority of the stakeholders showed their full support for the proposed project.

Following are the other concerns/suggestions of the stakeholders;

- Exposure of noise and dust pollution will cause disturbance and health & safety issues to the local residents and other stakeholders throughout the construction stage due to the movement of construction machinery and transportation of construction materials, The effects of noise and dust pollution on the local residents should be minimized by making necessary arrangements. Dust pollution should be controlled by water sprinkling on regular basis.
- Due to the movement of loaded trucks during the construction period of proposed project, congestion on the access road will increase. Proper diversion route rather than access road should be clearly defined to avoid traffic blockage during the entire construction period.
- Local residents should be given priority for jobs during construction as well as operational phase of the project
- Public utilities should not be disturbed. Arrangements should be made to minimize the disruption of public utilities or should be rehabilitated on priority basis to reduce the impacts.
- A detailed health and safety plan must be developed to mitigate the construction and operational risks of the proposed project
- Solid waste and wastewater produced during construction and operational phases should be disposed of timely and appropriately.

Mitigation measures proposed by EIA consultants for addressing the stakeholder's concerns are as follows;

- Significant efforts including change in design should be adopted to minimize the physical and economical disturbance of the local residents.
- Local residents should be given priority while hiring manpower during construction and operational phases of the proposed project.
- Construction machinery should be placed at adequate locations away from the sensitive areas to minimize the impacts related to the noise.
- Project facilities should be located outside the existing residential areas. In order to avoid restricting the daily movement of the local stakeholders; construction vehicles

should remain confined within their designated areas of movement

- The utilities to be shifted due to the implementation of the proposed project should be rehabilitated on priority basis to minimize the impacts on the stakeholders. Landscaping must be done.
- Solid waste and wastewater generated during construction at site should be disposed of safely and in an appropriate manner to not impact the environment
- All necessary measures should be taken to ensure the safety of traffic during construction, including barricades (including signs boards, pavement markings, flags, and lights).
- Dust and noise levels should be kept to minimum employing the best suitable and effective mitigation measure
- The construction activities must be confined within the project site boundary

A List of individuals consulted and their written feedback is annexed with the report.

10.5. Site Visit Pictures

The environmental management team of the proponent, community personnel around the site, environmental practitioners and QABP & industry management was visited from 1st -3rd July 2024. The members of the consultant's team included:

The visits were carried out in the management offices and at project site. Site visit pictures are as follows;

Figure 11-1: Site Visit Pictures

11. CONCLUSION & RECOMMENDATIONS

This section presents conclusions of the EIA Report. This EIA study has been carried out as per requirements of EPA, Punjab. Based upon the findings of this environmental assessment, below are key study findings are summarized in the form of conclusion.

11.1. 1. Conclusion

The implementation of the proposed project will have many beneficial impacts such as;

- The subject industrial unit will contribute towards meeting growing demand of good quality automotive components locally.
- The establishment of this industrial unit will contribute towards industrial development in the country and country towards its GDP.
- local people *will* get employment opportunities and thus the industry will contribute towards better socio-economic condition of the area.

Apart from the beneficial impacts of the project, the proposed project has potential environmental impacts during all phases. Most of the adverse impacts during construction are of a temporary nature. These potential impacts can be avoided or mitigated by adopting suitable mitigation or remedial measures as mentioned in the EIA Report. Following conclusions are based on the findings of this EIA study.

- Various liquids like fuel, lubricant oil and other oily products, which are used during the construction phase may contaminate groundwater
- Construction camp location and mismanagement of construction camp activities may lead to various social and environmental impacts such as: Loss of vegetation, indiscriminate generation of solid waste, discharge of sanitary effluent, water pollution and social & cultural conflicts.
- Health risks and work safety problems may result at the workplace/camps if the working conditions provide unsafe and/or unfavorable working environment due to storage, handling and transport of construction materials and malfunctioning in operation of construction machinery and equipment
- Air quality will be affected by fugitive dust emissions from construction machinery; dust from the unpaved surface and construction vehicles. Emissions may be carried

over longer distances depending upon the wind speed, direction, temperature of surrounding air and atmospheric stability.

- Air quality will be deteriorated both during pre-construction (site clearing) and construction phase of the industry due to construction activities (operation of construction machinery, dust emissions, vehicular movement, etc.) which results 1n increase air and noise pollution along with associated health risks.
- Due to construction activities, waste will be generated at construction and contractors camp site. The construction waste will include wastewater, oil spillage from machinery, domestic waste and solid waste etc. This can result in unhygienic conditions, health risk to work force and public at the camp site.
- Durii1g construction and operational phase; increased vehicular movement will result into gaseous emissions and increased levels of noise/ vibrations.

12.1.2. Recommendations

Following recommendations must be incorporated prior to any of the decision about the proposed project:

- Health and safety plan for the workers must be followed during construction and operational phases of the project
- Tree plantation plan must be followed and implemented with fidelity
- Environmental Management and Monitoring Plans should be a part of contract document of Contractors. Proper implementation of EMMP should be ensured during all the phases of the proposed project.
- All personnel staff employees and contractors should undertake appropriate training prior to construction to ensure they are aware of the on-site responsibilities in respect of all environmental and social issues
- Drivers should be instructed to avoid using horns and playing loud music s in the proximity of the project
- Only tuned-up vehicles should be allowed at the project site so that there are no gaseous emissions
- Water conservation strategies should be adopted with an aim of resource conservation
- The wastewater generated should be disposed-off in after treating primarily through septic tank

- The solid waste should be managed properly, littering and open dumping should be avoided. On-source segregation should be encouraged.
- First aid facilities should be made readily available at construction site and inside the industrial unit during operational phase
- Continuous monitoring should be done and all environmental parameters (air, noise, water) should be kept within the permissible values of the PEQS.