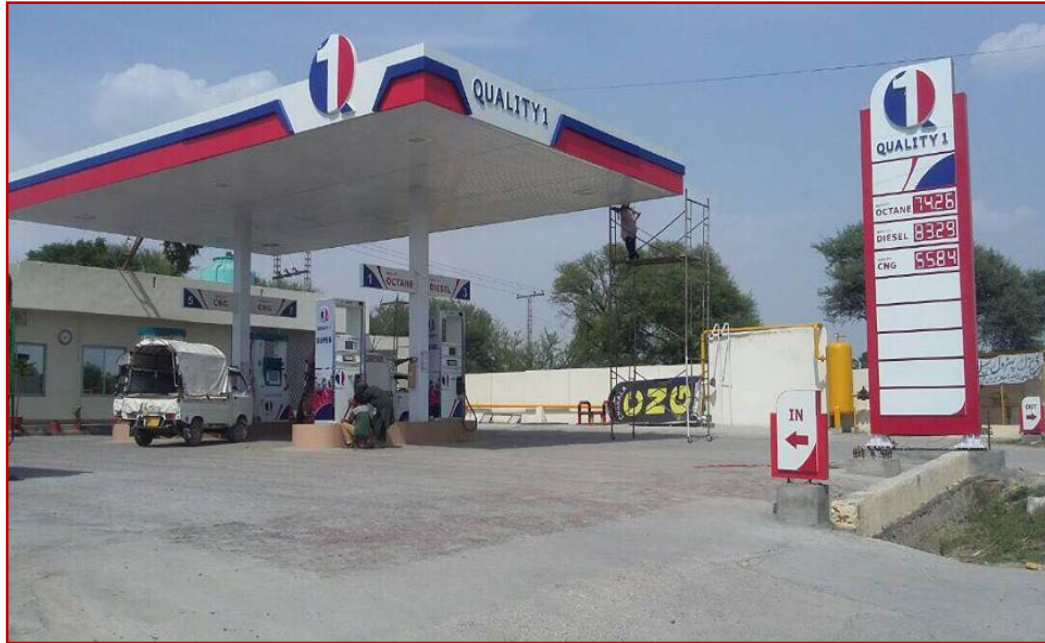


M/S Malik Filling Station, District Rawalpindi

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT,
FEBRUARY, 2021



Proponent: Mr. Aurangzeb Khan

Elite Environmental Solutions (EES) Pvt. Ltd

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EXECUTIVE SUMMARY

1. Introduction

This executive summary presents an overview of the main findings of the Environmental Impact Assessment (EIA) report of M/S Malik Filling Station located at Plot No. 03, at upper Jheka Gali Road, Tehsil Murree, District Rawalpindi. The project has been proposed for installation of the Petrol Pump in Tehsil Murree by utilizing environmentally friendly establishing methods. Environmental Impact Assessment (EIA) of the anticipated project has been conducted in accordance with the Punjab Environmental Protection Act, 1997 (as amended 2012). The process for conducting environmental assessment and the results of EIA are described in this document.

2. Salient Features of Project

Proponent Name:	Mr. Aurangzeb Khan S/O Mr. Shah Jehan Khan
Project Title:	M/S Malik Filling Station
Project Location:	Plot No. 03, at upper Jheka Gali Road, Tehsil Murree, District Rawalpindi
Consultant Name:	Elite Environmental Solutions (EES) Pvt. Limited
Total Area:	1 Kanal 10 Marla (30 Marla)
Source of Water:	Groundwater
Nature of Area:	Environmentally Sensitive Area
Source of Power:	WAPDA
Current Status of Project:	Proposed
Cost of the Project:	74.76 Million PKR

3. Project Objectives:

The main objectives of establishing of Project are as under:

- Maintain continuity in supply of petroleum to the domestic consumers through distributors and quality of services to the consumers.
- Ease in availability of Petroleum fuel in nearby vicinity.
- Help to overcome the scarcity of petroleum due to huge gap between demand and supply.
- Discourage deforestation with reduction in use of fire wood and fossil fuels.



4. Environmental Consultant:

An Environmental Impact Assessment (EIA) study report has been prepared to identify and assess the significant environmental impacts likely to occur due to proposed plant construction and operation along with environmental impact statement followed by delineation of appropriate Environmental Management Plan as well as the monitoring requirements. M/S Malik Filling Station has engaged M/S Elite Environmental Solutions Pvt. Ltd located at House No.12, Street No.06, V-Lane, Cavalry Ground, Lahore to conduct EIA of the proposed unit to meet the aforementioned targets, and to get Environmental Approval from Punjab Environmental Protection Agency.

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5. Description Of The Environment

The baseline secondary data of the Study and Project Area was collected from different sources including available literature, information by the proponent and the concerned government departments while the first-hand surveys (baseline primary data) and field information were known through investigations by the trained socio-environmental team of the consultants. The baseline environmental conditions of the project area are measured in terms of physical, ecological and socio-economic resources. The project area is open land. The study area has gentle and steep slopes. The climate is cold in winter and mild in summer. There is no any faunal and floral species present in the project area while there are number of floral and faunal species present in the study area.

6. Major Impacts And Recommended Mitigation Measures

Both positive and adverse environmental impacts of the proposed project has been identified by comparative analysis in all phases of the proposed project with respect to the baseline conditions of the study area, however very few or low adverse impacts are observed whereas no significant impacts and unsustainable situations are identified. The major impacts foreseen during construction and operation phase of the proposed project are as following:

**Table 1: Major Impacts and Recommended Mitigation Measures**

Sr. No.	Major Impacts	Mitigation Measures
Construction Phase		
1	Air pollution may occur be due to exhaust emissions during construction	Water suppression and covered transportation and storage of the construction materials.
2	Noise may be produced due to construction, transportation activities (transportation of raw materials).	Avoiding or reducing noisy activities or limiting the noise sources far away from the sensitive areas.
3	Land contamination may occur due to improper disposal of waste.	Proper waste management plan should be followed during construction phase
4	Water Pollution due to improper discharge of waste water.	Water treatment should be done before its final disposal into main drain.
5	Health and safety issues to workers during construction	Provision of Personal Protective equipment, good housekeeping and training of workers.
Operation Phase		
1	Improper disposal of solid waste	Waste will not be disposed off in the open and on-site burning of waste materials will be eliminated.
2	Noise may be produced due to operation & transportation activities	Generator and vehicles used during the operation will be properly tuned and maintained to minimize noise and air emission.
3	Contaminated water may be disposed off into municipal drains of nearest area.	Water treatment should be done before its final disposal into main drain.
4	Air pollution may occur be due to exhaust emissions	Well maintained closed operation will be done to ensure the minimum air emissions.
5	Health and safety issues to workers	Provision of Personal Protective equipment, good housekeeping and training of workers.

7. Environmental Management & Monitoring Plans

The development of the EMP is to make some person responsible for implementing the mitigation measures as identified so that smooth implementation of the mitigation measures can be assured hence enhancing the positive impacts of the proposed project and reducing the anticipated adverse environmental impacts of the project.

Monitoring plans have also been included to ensure the compliance of the EMP by contractors and other responsible authorities. The proposed monitoring for the project is:

**Table 2: Proposed Management and Monitoring Plan**

Sr. No.	Impact	Project Activity	Monitoring Mechanism	Frequency	Monitoring Authority
Construction and Operational Phase					
1	Air emissions and dust	Air quality will deteriorate due to transportation and construction activities	Monitoring for the air quality as per PEQS, 2016	Quarterly	EMC
2	Water pollution	Water quality will deteriorate due to construction and operational activities	Monitoring for waste water & drinking water quality as per EPA PEQS, 2016.	Quarterly	EMC
3	Noise pollution	Construction activities, utilities and transportation activities	Monitoring for noise level as per PEQS, 2016.	Quarterly	EMC
EMC: Environmental Management Committee					

8. Conclusion and Recommendation

Results of this EIA study shows that adverse environmental impacts of the construction as well as operation phases of the proposed project of “M/S Malik Filling Station” on the physical as well as biological environment will be of little or no eventual consequence because of their mitigable character. Almost all the identified adverse impacts are also reversible in nature and can be made good by implementing the mitigation measures and the environmental monitoring program as are suggested in this EIA report. As against the environmental impacts, the socioeconomic benefits of the project are of immense advantage and beneficial for the community and local industry of the area.

It is recommended that the proponent should obtain an environmental approval (No Objection Certificate) from the Punjab-EPA before proceeding further into the construction activities as per regulatory requirements.



TABLE OF CONTENT

CHAPTER 1: INTRODUCTION	6
1.1 GENERAL	6
1.2 OBJECTIVES OF EIA	6
1.3 IDENTIFICATION OF THE PROJECT AND PROPONENT	7
1.4 DETAILS OF CONSULTANTS.....	8
1.5 SCOPE OF STUDY	9
1.6 METHODOLOGY	10
1.6.1 SCOPING.....	10
1.6.2 BASELINE DATA COLLECTION.....	10
1.6.3 IMPACT ASSESSMENT	11
1.6.4 DOCUMENTATION.....	11
1.7 COMPONENTS OF THE REPORT	12
CHAPTER 2: DESCRIPTION OF THE PROJECT	13
2.1 GENERAL	13
2.2 TYPE AND CATEGORY OF PROJECT	13
2.3 PROJECT OBJECTIVES.....	13
2.4 PROJECT ALTERNATIVES	13
2.4.1 SITE ALTERNATIVES	13
2.4.2 TECHNOLOGY ALTERNATIVE.....	14
2.5 LOCATION AND SITE LAYOUT OF THE PROJECT	14
2.6 AREA DETAILS.....	14
2.7 LAND USE ON THE SITE.....	14
2.8 ROAD ACCESS.....	14
2.9 VEGETATION FEATURES OF THE SITE.....	14
2.10 COST AND MAGNITUDE OF OPERATION	14
2.11 PRODUCTION/ FILLING/ STORAGE CAPACITY.....	15
2.12 SCHEDULE OF IMPLEMENTATION.....	15
2.13 PROCESS DESCRIPTION.....	15
2.14 RAW MATERIAL AND PRODUCT	16
2.15 EQUIPMENT DETAILS	16
2.16 Manpower.....	16
2.17 Water and Wastewater Details	16
2.18 Solid Waste	18
2.19 Activities at the Decommissioning Phase	18
2.20 Restoration and Rehabilitation Plan	18
2.21 GOVERNMENT APPROVALS	19
CHAPTER 3: STATUTORY REQUIREMENT & STANDARDS.....	20
3.1 EXISTING LEGISLATION AND LEGAL FRAMEWORK	20
3.2 INSTITUTIONAL SETUP	20
3.3 Environmental Protection Councils.....	20
3.4 RELEVANT LEGAL / INSTITUTIONAL FRAMEWORK.....	20
3.5 Pakistan Environmental Protection Order (PEPO) 1983.....	20



3.6	<i>Punjab Environmental Protection (Amendment) Act, 2012</i>	21
3.7	<i>National Environmental Policy, 2005</i>	21
3.8	<i>Review of IEE / EIA Regulations, 2000</i>	21
3.9	<i>Guidelines for the Preparation of IEE/EIA Reports</i>	22
3.10	<i>Pakistan Penal Code, 1860</i>	22
3.11	<i>The Land Acquisition Act, 1894</i>	22
3.12	<i>Labor Laws</i>	22
CHAPTER 4: DESCRIPTION OF THE ENVIRONMENT		23
4.1	GENERAL	23
4.2 STUDY PARAMETERS		23
4.2.1	STUDY AREA	23
4.2.2	PROJECT AREA	23
4.3	PHYSICAL ENVIRONMENT	23
4.3.1	TOPOGRAPHY AND GEOGRAPHY	23
4.3.2	GEOLOGY AND SOILS	24
4.3.2	SEISMICITY OF THE PROJECT AREA	24
4.3.3	CLIMATE	24
4.3.5	AMBIENT AIR QUALITY	27
4.3.6	NOISE LEVEL	27
4.3.7	WATER QUALITY	28
4.4	ECOLOGICAL ENVIRONMENT	28
4.4.1	FLORA	28
4.4.2	FAUNA	29
4.5	SOCIO-ECONOMIC ENVIRONMENT	31
4.5.1	DEMOGRAPHIC PROFILE	31
4.5.2	INFRASTRUCTURE	32
4.5.3	EDUCATION	32
4.5.4	HEALTH	32
4.5.5	CIVIC FACILITIES	32
4.5.6	LANGUAGE	32
4.5.7	COMMON DISEASES	32
4.5.8	QUALITY OF LIFE VALUES	32
CHAPTER 5: STAKEHOLDER CONSULTATION		33
5.1	GENERAL	33
5.2	OBJECTIVE OF THE STAKEHOLDER CONSULTATION	33
5.3	PROPONENT	33
5.4	THE RESPONSIBLE AUTHORITY	34
5.5	OTHER DEPARTMENTS AND AGENCIES	34
5.6	ENVIRONMENTAL PRACTITIONERS AND EXPERTS	34
5.7	COMMUNITY CONCERNS	34
5.7.1.	PROJECT APPROVAL	34
5.7.2.	RESETTLEMENT/ RELOCATION	34
5.7.3.	LOCAL EMPLOYMENT	34
5.7.4.	INTERACTION WITH LOCAL COMMUNITY	34



5.8	CONSULTATION PROCESS	35
5.9	STAKEHOLDER CONSULTATION TECHNIQUES	35
5.10	STAKEHOLDERS CONSULTED	36
5.11	STAKEHOLDER CONCERNS AND RECOMMENDATIONS	36
CHAPTER 6: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES		38
6.1	GENERAL	38
6.2	IMPACT ASSESSMENT METHODOLOGY	38
6.4	IMPACT IDENTIFICATION	40
6.4.1	<i>Impact Screening Checklist</i>	<i>41</i>
6.5	IMPACTS ANALYSIS AND PREDICTION	43
6.7	PURPOSE OF MITIGATION MEASURES	44
6.8	WAYS OF ACHIEVING MITIGATION MEASURES.....	44
6.9	IMPACTS ASSOCIATED WITH PROJECT LOCATION	45
6.10	IMPACTS ASSOCIATED WITH DESIGN	45
6.11	IMPACTS ASSOCIATED WITH THE CONSTRUCTION PHASE	45
6.11.1	<i>Construction Noise</i>	<i>45</i>
6.11.2	<i>Air Emissions.....</i>	<i>47</i>
6.11.3	<i>Water Resources.....</i>	<i>49</i>
6.11.4	<i>Soil Contamination.....</i>	<i>50</i>
6.11.5	<i>Safety.....</i>	<i>51</i>
6.11.6	<i>Employment Conflicts.....</i>	<i>53</i>
6.12	ENVIRONMENTAL IMPACTS ASSOCIATED WITH OPERATIONAL ACTIVITIES	54
6.12.1	<i>Noise.....</i>	<i>54</i>
6.12.2	<i>Wastewater</i>	<i>55</i>
6.12.3	<i>Air Emissions.....</i>	<i>56</i>
6.12.4	<i>Solid Waste</i>	<i>56</i>
6.12.5	<i>Soil Contamination due to spillage during Storage/ Refueling/ Dispensing</i>	<i>58</i>
6.12.6	<i>Safety Hazards, Public Health and Nuisances</i>	<i>59</i>
6.12.7	<i>Job Opportunities</i>	<i>60</i>
6.12.8	<i>Emergency Response</i>	<i>60</i>
6.12.8.1	<i>Fire Hazard.....</i>	<i>60</i>
6.13	<i>Impacts Associated with Decommissioning Phase</i>	<i>61</i>
6.13.1	<i>Soil Disturbance</i>	<i>61</i>
6.13.2	<i>Solid Waste Generation.....</i>	<i>61</i>
6.13.3	<i>Health and Safety Impacts.....</i>	<i>61</i>
6.14	POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES	62
6.14.1	<i>Green Belt Development.....</i>	<i>62</i>
6.14.2	<i>Tree Plantation.....</i>	<i>62</i>
CHAPTER 7: ENVIRONMENTAL MANAGEMENT & MONITORING PLAN.....		63
7.1	GENERAL	63
7.2	PURPOSE AND OBJECTIVES OF THE EMP.....	63
7.3	MANAGEMENT APPROACH.....	63
7.4	ENVIRONMENT MANAGEMENT PLAN.....	64
7.4.1	<i>Environmental Monitoring Plan</i>	<i>68</i>
7.5	<i>Communications and Documentation.....</i>	<i>71</i>
INSTITUTIONAL RESPONSIBILITIES		72



7.5.2	Monitoring Plan	72
7.6	SUMMARY OF IMPACTS AND THEIR MITIGATION MEASURES.....	75
7.7	EQUIPMENT MAINTENANCE DETAILS	76
CHAPTER 8:	CONCLUSIONS AND RECOMMENDATIONS.....	78
8.1	CONCLUSION	78
8.2	RECOMMENDATIONS.....	79



LIST OF ANNEXURES

Annexure A	Annexure A1: Google Earth Map
	Annexure A2: Site Layout Map
Annexure B	CNIC of Proponent
Annexure C	Agreement for Land Purchase
Annexure D	List of Abbreviations
Annexure E	Glossary
Annexure F	References
Annexure G	Project Team
Annexure H	Term of References
Annexure I	Undertaking
Annexure J	OGRA License
Annexure K	Lab Reports
Annexure L	Letter of Deputy Commissioner



CHAPTER 1: INTRODUCTION

1.1 General

Pakistan meets its more than 80 % POL demand through import, therefore the prices of petroleum products in Pakistan are driven by the fluctuation in the prices in the International Market which are determined by the Demand Supply Balance by the large fuel consuming economies. Any increase in the prices adversely affects Pakistan's balance of payment and energy scene in terms of inflation and dampens demand of petroleum products in the country.

M/S Malik Filling Station retails refined petroleum products and lubricants across individual and commercial market segments.

M/S Malik Filling Station is the new emerging company for delivering qualitative & quantitative products & services to its valued customers. The company has completed the development of its 1st oil storage facility at District Sahiwal meeting standards fixed by OGRA to facilitate the customer in the area. NOCs have been secured and completed. Further other oil storage facility at District Rawalpindi & Doulatpur is under construction.

This Report presents the Environmental Impact Assessment (EIA) of M/S Malik Filling Station, Rawalpindi. For this purpose, the proponent has decided to engage Environmental Consultants, **M/S Elite Environmental Solutions Pvt. Ltd** (Environmental Consultancy Division). The purpose of this study is to identify the environmental baseline i.e. physical, biological and socio-economic/cultural conditions and assess all possible impacts arising during the construction and operation phases of the project along with the proposal of adequate mitigation measures and formulation of Environmental Management Plan (EMP) for implementation of the project in environment friendly manner.

The report provides relevant information, as required under the officially approved format to help the decision makers; i.e. EPA, understand the environmental feasibility of the project before issuing the Environmental Approval.

1.2 Objectives of EIA

The primary objectives of the EIA are:

- To determine and document the state of the environment of the project area to establish a baseline in order to assess the suitability of the Project in that area.



- To identify pre-construction, construction and operation activities and to assess their impacts on environment.
- To provide assistance to the proponent for planning, designing and implementing the project in a way that would eliminate or minimize the negative impact on the biophysical and socio-economic environment and maximizing the benefits to all parties in cost effective manner.
- To present mitigation and monitoring Plan to smoothly implement the suggested mitigation measures and supervise their efficiency and effectiveness.
- To provide opportunity to the public for understanding the project and its impacts on the community and their environment in the context of sustainable development.

1.3 Identification of the Project and Proponent

Name	Address
Mr. Aurangzeb Khan S/O Mr. Shah Jehan Khan	R/O, Charsadda Road, Khadra Khail, Post Office Bakshi Pul, Peshawar.

• Nature & Size of Project

The proposed project under study is titled as M/S Malik Filling Station that will involve the establishment of Petrol filling /station integrating in its construction and operation environmental friendly techniques. Total area of project site is 1 Kanal 10 Marla (30 Marla).

• Location of Project

The proposed project site is located at Plot No. 03, at upper Jheka Gali Road, Tehsil Murree, District Rawalpindi.

• Cost of the Project

The Cost of the proposed project has been estimated at 74.76 Million PKR approx. including land, infrastructure and machinery cost.

Table 1.1: Cost Details

Sr. No		(Rs. In Million)
1.	Land Cost	Rs. 45.36 M
2.	Building and Civil Work	Rs. 7.500 M
3.	Plant and Machinery	Rs. 8.600 M
4.	Canopy, Canopy Fascia (ACM) and Spreader etc	Rs. 7.300 M
5.	Underground tanks	Rs. 2.00 M
6.	Others	Rs. 2.354 M
7.	Working Capital Finance	Rs. 4.00 M
Total Cost of Project		Rs. 74.76 Million



1.4 Details of Consultants

For the preparation of the EIA Report of the proposed project, the proponent has hired the services of the environmental consultants; M/S Elite Environmental Solutions (Pvt.) Limited Team comprising of Environmental Engineers, Chemical Engineers and Environmental Experts has worked on this report. Elite Environmental Solutions (Pvt.) Limited is one of the pioneers Environmental Consultancy Companies in Pakistan with an unrivalled reputation for providing expert, tailored services and solutions. Elite Environmental Solutions (Pvt.) Limited provides the environmental services, litigation and consultancy to clients both industry and government.

Elite Environmental Solutions (Pvt.) Limited is providing quality services in various environmental sectors i.e.

- Environmental Assessment Reports i.e. IEE/EIA
- Baseline Studies
- Environment Management Plans (EMP)
- Designing of Emission Control Equipment
- Waste Water Treatment Plant (WWTP) Designing
- WWTP Construction Supervision, Commissioning and Operations
- Establishing Bottled Water Plant based on RO or UF
- Lab testing (Drinking Water & Waste Water Analysis, Soil Analysis, Sludge Testing, Petroleum/ Lube Oil Testing, Fertilizer Analysis, Pesticides in Water, Soil, Fertilizer, Coal, Coke Analysis)
- Monitoring and inspection
- Environmental modelling

➤ Contact Details

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Contact No.	+92 300 6509353
Manager Operations (EPA Visiting Person)	Engr. Farwa Batool
Contact No.	+92 300 4580827

Study team:

The following table lists the names of experts involved in the making of EIA report:

**Table 1.3: Study Team**

Name	Profession	Qualification	Professional Experience	Roles
Mr. Muhammad Nawaz	Operational Manager	BE Chemical Engineering	7 Years	<ul style="list-style-type: none"> • CEO • IEE report Review • Assessment of physical and socioeconomic baseline conditions at the Project Site.
Mr. M Iqbal	Senior Environmentalist	M.Phil. Env. Sci.	5 Years	<ul style="list-style-type: none"> • Capacity building & training • Conducting and monitoring of health assessment surveys • Environment health risk assessment and management
Mr. Qaiser	Senior Environmentalist	B.S Env. Sci. and M.Phil. Sociology	5 Years	<ul style="list-style-type: none"> • Collection of baseline data. • Public consultation. • Preparation of survey tools including socio-economic survey tool and environmental checklist.
Ms. Farwa Batool	Environmental Engineer	MS Environmental Engineering	3 Year	<ul style="list-style-type: none"> • IEE report writing • EIA report writing • Assessment of physical and socioeconomic baseline conditions at the Project Site.
Mr. M Hafiz Tahir	Environmental	BS. Environmental Sciences	2 Year	<ul style="list-style-type: none"> • IEE report writing • EIA report writing • Impacts assessment and proposed their mitigation measures.
Ms. Iram Shahzadi	Environmental Engineer	MSc Environmental Engineering	2 Year	<ul style="list-style-type: none"> • IEE/EMP report writing • EIA report writing • Assessment of physical and socioeconomic baseline conditions at the Project Site. • Impacts assessment and proposed their mitigation measures

1.5 Scope of Study

For the EIA study, the scope of work is as under:

- Description of physical, ecological and socio-economic conditions in and around the facility.



- Project impact identification, prediction and significance at all stages of the project including planning, implementation and operation.
- Identification and assessment of the workability of mitigation measures to offset or minimize negative project impacts on environment.
- Identification of occupational hazards during all stages of the project and laying down suggestions for improvement in the conditions.

1.6 Methodology

Methodology of preparing EIA report follows:

1.6.1 Scoping

The key activities of this phase include:

Project Data Compilation: A generic description of the activities relevant to environmental assessment is compiled with the help of the proponent.

Published Literature Review: Secondary data on weather, water resources and vegetation, and other relevant environmental features of the project area and the similar projects, is reviewed and compiled.

Legislative Review: Information on relevant legislations, regulations, guidelines, and standards is reviewed and compiled.

Identification of Potential Impacts: The information collected is reviewed and potential environmental issues are identified.

Identification of Mitigation Measures: Mitigation measures are identified for all the likely impacts in order of preference for avoiding the impacts altogether, minimizing their frequency or extent and compensating or rectifying the losses; as may be found practicable in the project.

Selection of Alternatives: Based on the potential impacts and the cost required to mitigate them, most crucial project employing the best available technology at the most feasible site is selected.

Scoping Meeting: A scoping meeting was held to share this basic level of project information with all the project stakeholders before the information is incorporated into the report, so that some improvement can be sought out in the data as may be necessary, better or more friendly alternatives can be selected, and better and more practicable mitigation measures can be suggested.

1.6.2 Baseline Data Collection

A considerable amount of baseline information on the project area was available from the environmental studies previously conducted in the region of other projects. A field visit was conducted to collect primary data on the water quality, ambient air quality, noise level, and



ecological species surviving in the area and the ecosystems prevalent, and the lifestyle, socio-cultural setup, income and sources of income and the facilities available for the residents in the areas around the unit. For ambient air and water quality, tests were conducted by an EPA-certified laboratory, noise level was measured using noise meter, and for socioeconomic profile, people around the site were interviewed.

1.6.3 Impact Assessment

The environmental and socio-economic features and other project information collected, is used to assess the potential impacts of the activities. The issues studied include potential project impacts on:

- Geomorphology
- Meteorology
- Groundwater and surface water quality
- Ambient air quality & noise level
- Ecological Resources, including flora and fauna
- Local communities

Wherever possible and applicable, the discussion covers the following aspects:

- The potential change(s) in environmental parameters likely to be effected by project related activities
- The identification of potential impacts
- The evaluation of the likelihood and significance of potential impacts
- The defining of mitigation measures to reduce impacts to as low as practicable
- The prediction of any residual impacts, including all long-term and short-term, direct and indirect, and beneficial and adverse impacts
- The drafting of monitoring arrangements of residual impacts

1.6.4 Documentation

This EIA Report is prepared according to the relevant guidelines prescribed by the Punjab Environmental Protection Agency. It includes findings of all the phases of the assessment process. Before preparation of the final report for submittal to the EPA Punjab, draft report was presented to the Proponent for review and comments.



1.7 COMPONENTS OF THE REPORT

This EIA Report presents the screening of potential environmental impacts of the induction furnace and discusses the necessary mitigation measures to eliminate or reduce the negative impacts to an acceptable level. It also describes the institutional requirements for smooth and easy implementation of the project and provides an Environmental Management Plan (EMP).

EIA report comprises of following chapters.

Chapter 1: Introduction (A description of the project including the need for the project and how the project will be undertaken).

Chapter 2: Project Description (Full description of the relevant parts of the project and summary of project inputs and outputs).

Chapter 3: Policy, statutory, and institutional Framework (A description of the pertinent national & provincial legislations, regulations and policies that are relevant and applicable to the project and a demonstration of how the project conforms to these aspects).

Chapter 4: Description of the Environment (Description of project area's existing physical, biological and socio-economic condition, including geomorphology and soils, water resources, air quality, flora, fauna and demography).

Chapter 5: Stakeholder Consultation (Presents details about stakeholder consultation regarding the project)

Chapter 6: Project Impacts and mitigations (Presents an assessment of the project's impacts and their required mitigation measures on the Physical, Biological and Socioeconomic environment).

Chapter 7: Environmental Management Plan (Provides the complete outline of the project and Environmental Management Plan).

Chapter 8: Conclusions & Recommendations (Conclusion of the EIA report with a few recommendations to conduct the project in environment-friendly manner)



CHAPTER 2: DESCRIPTION OF THE PROJECT

2.1 General

This section of the study renders a detailed account of the project and its salient features; such as location and various phases. Inputs and discharges relevant to different phases of the project, such as electricity & materials etc. have also been examined as a response to possible environmental concerns.

2.2 Type and Category of Project

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2000 the proposed project; i.e. M/S Malik Filling Station falls Schedule II under the category I (Environmentally Sensitive Areas) stating “All projects situated in environmentally sensitive areas”.

2.3 Project Objectives

The main objectives for the establishment of this unit as M/S Malik Filling Station are as under:

- Maintain continuity in supply of petroleum to the domestic consumers through distributors and quality of services to the consumers.
- Ease in availability of Petrol/ Diesel fuel in nearby vicinity.
- Help to overcome the scarcity of petroleum due to huge gap between demand and supply.
- Discourage deforestation with reduction in use of fire wood and fossil fuels.

2.4 Project Alternatives

2.4.1 Site Alternatives

Site alternative cannot be considered because the proposed project site criterion is based on several evaluations which determines its best suitability including that the proposed project site is located on main road, providing the direct access to all surrounding areas. The administrative control on proposed project site is also feasible. The geographical location of the proposed selected project site also makes it ideal by connecting it to transportation infrastructure of country. So, the proposed selected project site possesses a broad spectrum of commercial, industrial and management benefits.



2.4.2 Technology Alternative

Keeping in view all the environmental consideration, best suited technology has been proposed for the said project including no air emissions. Water mitigation techniques will also be considered at their best.

2.5 Location and Site Layout of the Project

The site of Project “M/S Malik Filling Station” is located at Plot No. 03, at upper Jheka Gali Road, Tehsil Murree, District Rawalpindi.

The location map of the project is given as Annex-A. The site layout of the M/S Malik Filling Station is also provided as Annex-A.

2.6 Area Details

Total area of project site is 1 Kanal 10 Marla (30 Marla). The Agreement for Land Purchase documents is attached hereby as Annex-C.

2.7 Land Use on the Site

The proposed project of M/S Malik Filling Station is planned in an open land having access to all main roads of the area which will transformed the open plot into industrial use which is positive.

2.8 Road Access

The project site is connected to other areas with metaled roads. The major road connecting the project site to other areas. The map showing the road network of area is annexed as Annex-A.

2.9 Vegetation Features of the Site

The proposed project will be established on the clear open land having no significant vegetation.

2.10 Cost and Magnitude of Operation

Total estimated cost of the Proposed Project is 74.76 Million PKR including cost of land, infrastructure and machinery.

The total area of Project site is 1 Kanal 10 Marla (30 Marla). Project building will have following facilities:

- Steel Structure Canopy
- Manager Room
- Sale Office
- Toilets
- Switch Room
- Store



2.11 Production/ Filling/ Storage Capacity

The capacity of M/S Malik Filling Station will be:

Table 2.2: Capacity of storage tanks

PRODUCT STORAGE TANKS	STORAGE CAPACITY
TANKS NO. 1. 9'-3" DIA X 6'-6" LONG STEEL TANK	CAPACITY 15,000 (LTRS) (HOBC) = -5%=14,250 (LTRS) (HOBC)
TANKS NO. 2. 9'-3" DIA X 18'-6" LONG STEEL TANK	CAPACITY 35,000 (LTRS) (DP) = -5%=33,250 (LTRS) (DP)
TANKS NO. 3. 7'-6" DIA X 12'-10" LONG STEEL TANK	CAPACITY 15,000 (LTRS) H.S.D

2.12 Schedule of Implementation

The time required for the construction of M/S Malik Filling Station is approximately 03 Months.

Breakdown of the time for the construction phase is given below in Table 2.2:

Table 2.2: Timeline for Construction of Project

Sr. #	Activities	3 Months		
		4W	4W	4W
1	Designing			
2	Mobilization of Contractors			
3	Construction Period			
4	Restoration of Site			

2.13 Process Description

The proposed project will involve the establishment of Petrol Pump station. The unit is very conscious about the product quality and environmental protection so the establishment and operation will use the best available technology.

Petrol Stations typically include provisions for dispensing of motor petroleum fuel (petrol and diesel). The petroleum fuel will be stored in underground tanks and will be pumped out into the vehicles via the dispenser that will also meter the flow.

A car lubricating oil change facility, tyre shop and a convenience shop will variously available at these facilities.

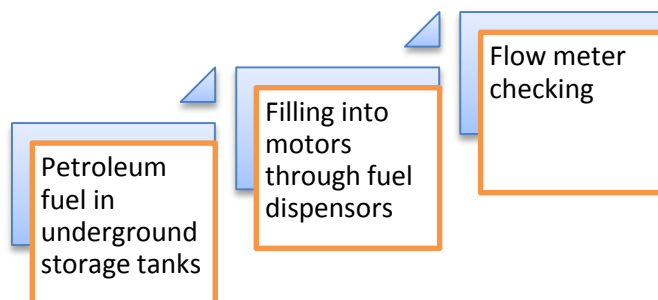


Figure 2.1: Process Flow

2.14 Raw Material and Product

The raw materials and final product is the petrol and diesel for dispensing it into motor vehicles.

2.15 Equipment Details

The equipment detail that will be used in proposed project facility is:

- Storage Tanks
- Petrol Pump fuel dispenser

2.16 Manpower

The manpower in construction phase will be 10 persons while in operational phase of proposed project will be 12 persons.

2.17 Water and Wastewater Details

a. Sources of water

In proposed project the water requirement in the construction and operation phase will be fulfilled by extraction of groundwater through installation of pumps.

b. Water Requirement and Wastewater Generation

The Breakup of water requirement and wastewater generation during construction phase of project are given in Table 2.3:

**Table 2.3: Water Requirement and Wastewater Generation during construction**

Sr. No.	Description	Water Consumption (gallons/day)	Wastewater Generation (gallons/day)	Mode of Disposal
1	Domestic	845	676	Will be disposed off in Main Drain after its proper collection and primary treatment in septic tank.
2	Construction and sprinkling	500	-	-

Breakup of water requirement and wastewater generation during operational phase of project are given in Table 2.4:

Table 2.4: Water Requirement and Wastewater Generation during operational phase

Sr.	Description	Water Consumption (gallons/day)	Wastewater Generation (gallons/day)	Mode of Disposal
1	Domestic	1014	811	Will be disposed off in Main Drain after its proper collection and primary treatment in septic tank.

c. Waste Water

- Construction Phase**

During Construction phase of proposed project, the domestic wastewater will be generated which will be Will be disposed off in Main Drain after its proper collection and primary treatment in septic tank.

- Operation Phase**

In the proposed project, no process water will be generated, the generated domestic waste water and wash-off of equipment waste water will be collected through a network of pipeline and will be disposed off in Main Drain after its proper collection and primary treatment in septic tank.



2.18 Solid Waste

- **Construction Phase**

The domestic solid waste during construction phase at the project site will be handled properly by its proper collection, reusing of reusable material and then its final disposal. The excavated material from the proposed project site will be used for backfilling of the areas and other construction purposes. For proper waste management, waste bins will be placed in the unit. From these bins the waste will be collected for the proper disposal.

- **Operation Phase**

During operational phase, domestic waste will be generated due to the workers activity. All the generated waste will be collected separately in the designated solid waste collection area. This identified, collected and separated solid waste will be handed over to the relevant contractor. The collection by contractor will be done on daily basis. Although the rejected raw material will be returned to the supplier.

2.19 Activities at the Decommissioning Phase

The activities at the decommissioning phase of the factory include; isolating (cordonning off) the site and the necessary communication, demolition of superstructures, careful removal of the machinery, backfilling of the excavations with suitable material such as pebbles or construction dug out soil, proper disposal of decommissioned facilities and other wastes using a licensed waste collector and landscaping at the project site planting of grass and trees (or shrubs). The major emphasis here will be restoration of the affected environment, proper disposal of dismantled material and protection of public health and safety.

2.20 Restoration and Rehabilitation Plan

Following Restoration and Rehabilitation Plan will be followed in its full accordance.

- After completion of the construction work all the disturbed sites will be changed into conditions as they were prior to the commencement of the project or even far better than that.
- The area will be planted with indigenous vegetation.
- All the concrete will be broken and disposed of according to the rehabilitation plan.



-
- For improving the environmental and aesthetic value or visual quality of the site, the proponent will carry out landscaping and tree planting with in premises of factory for which the Tree Plantation Plan has been provided in Chapter 7 of this report.

2.21 Government Approvals

At this Stage, the Management has applied for Environmental Approval and after getting Environmental Approval, they will apply for other required approvals.



CHAPTER 3: STATUTORY REQUIREMENT & STANDARDS

3.1 Existing Legislation and Legal Framework

The Federal Ministry of Environment was responsible authority for policy making on environmental protection in Pakistan but after 18th Amendment in the Constitution, the Provincial Governments have taken over the subject of Environment. This EIA study has been carried out in the light of the policy guidelines of the Preparation of IEE/EIA Reports under the procedures and practices formulated by the Pak EPA and adopted by the Punjab Environmental Protection Agency (EPA).

3.2 Institutional Setup

3.3 Environmental Protection Councils

The Punjab Environmental Protection Council (PEPC) is the apex decision-making body of Punjab. It has been developed under the provision of Punjab Environmental Protection (Amendment) Act 2012. It is headed by Chief Minister of Punjab with other members.

3.4 Relevant Legal / Institutional Framework

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) that was replaced by the PEPA, 1997, through an Act of Parliament. According to the 18th Amendment in Constitution, the PEPA 1997 has been confined to Federal Area and provinces have been allowed to formulate their own environmental legislation in the subject of environment.

Provincial Environment Protection Departments are also working on the formulation and enforcement of environmental statutes and by-laws. The Pak EPA has issued several policies guidelines and adopted measures for streamlining the environmental assessment. Though, the need for environmental screening and assessment has received some weight during the recent past, strict implementation of the NEQS is still a dream to be realized. The applicable laws for the environmental study of the Project are briefly described below:

3.5 Pakistan Environmental Protection Order (PEPO) 1983

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) 1983. It was the first legislation promulgated for the protection of environment. According to PEPO,



1983 it was necessary to carry out IEE / EIA for all development projects, but there were no IEE / EIA regulations under that ordinance.

3.6 Punjab Environmental Protection (Amendment) Act, 2012

Under section 12 (4) of PEPA, (Amended) 2012 *“The Provincial Agency shall communicate its approval or otherwise within a period of four months from the date the initial environmental examination or environmental impact assessment is filed complete in all respects in accordance with the prescribed procedure, failing which the Initial Environmental Examination or, as the case may be, the Environmental Impact Assessment shall be deemed to have been approved, to the extent to which it does not contravene the provisions of this Act and the rules and regulations”.*

As per definition given in the Punjab Environmental Protection (Amendment) Act 2012, Environmental Impact Assessment (EIA) means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory, and compensatory measures, formulation of environmental management & training plans & monitoring arrangements, and framing of recommendations and such other components as may be prescribed. The provision of Section 12 has been incorporated “as it is” in the new Punjab Environmental Protection (Amendment) Act, 2012.

3.7 National Environmental Policy, 2005

The National Environmental Policy (2005) provides a framework for addressing the environmental issues (particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of bio diversity, desertification etc.) confronting Pakistan.

3.8 Review of IEE / EIA Regulations, 2000

The Pak EPA has issued Review of the Initial Environmental Examination and Environmental Impact Assessment Regulations 2000, to review the Initial Environmental Examination (IEE) / Environment Impact Assessment (EIA) reports. Categorization of the projects for IEE and EIA is one of the main components of the Regulations. As these regulations, the Projects have been classified based on expected degree of adverse environmental impacts. Projects type listed in Schedule I are designated as potentially less adverse effect, schedule I projects require an IEE and projects given in schedule II require EIA to be conducted.



3.9 Guidelines for the Preparation of IEE/EIA Reports

The Pak EPA has also framed Guidelines for the Preparation of IEE / EIA of projects in various developmental sectors. These Guidelines are ideal for preparing the IEE or EIA report but line-to-line preparation not necessary because Guidelines are not part of PEPA and EPA Punjab has not any notification for adoption or follow these Guidelines.

However, this EIA report has been prepared in following the Guidelines.

3.10 Pakistan Penal Code, 1860

Noise pollution has been covered in section 268, which defines and recognizes noise as a public nuisance. "A person is guilty of a public nuisance who does any act or is guilty of an illegal omission which causes any common injury, danger or annoyance to the public or the people in general who dwell or occupy property in the vicinity, or which must necessarily cause injury, obstruction, danger or annoyance to persons who may have occasion to use any public right".

3.11 The Land Acquisition Act, 1894

The Land Acquisition Act (1894) deals with the acquisition of private properties for public purposes. There are 55 sections in this Act mainly dealing with area notification, surveys, acquisition, compensation, apportionment awards, disputes resolution, penalties and exemptions.

3.12 Labor Laws

Construction and operational activities during the course of construction may affect occupational health of workers. Employers are required to abide by labor laws in respect of their own employees and to ensure that contractors to follow the relevant labor laws and rules relating to safety of the workforce and creating a healthy working environment.



CHAPTER 4: DESCRIPTION OF THE ENVIRONMENT

4.1 General

This section describes the existing environmental conditions around the project area. The existing environment around the proposed project site has been studied with respect to Physical, Biological/Ecological and Socio-Economic resources.

4.2 Study Parameters

The existing information to establish a database for the EIA of the project was collected from different government departments; review of previous studies and through the site visits carried out in the project area.

The Social Assessment of the project area was conducted through consultation with the community by interviewing them. Assessment of the area has been carried out distinguishing it into:

4.2.1 Study Area

An area about half a kilometer radius around the project has been considered as influence zone and hence it has been taken as Study Area (SA) to collect the primary data related to physical, ecological and socio-economic environment.

4.2.2 Project Area

The boundary of that specific area where the project has been established is taken as Project Area.

4.3 Physical Environment

The physical environment of the area is described with respect the air shed, watershed, geology, soil characteristics and seismicity. The air shed describe the climatic conditions and quality of air in the microenvironment and macro environment and characterized it in term of level of pollution, viz. watershed describe the hydrology and quality of surface and groundwater as well as water availability. The terrestrial environment is described by its geology, geomorphology, and soil characteristics in term of stability and seismicity.

4.3.1 Topography and Geography

The study area has generally gentle and steep slopes. The study area is situated at an average elevation of 682 meters above mean sea level.



4.3.2 Geology and Soils

The geology of the project area is composed of consists of limestone, shale, sandstone and clay-stone. The soils of study area are mostly gravely and sandy.

4.3.2 Seismicity of the Project Area

According to Building Code of Pakistan, study area has been placed in Zone 3. Therefore, location lies in Moderate Damage Risk Zone in on account of seismic sensitivity.

4.3.3 Climate

The climate here is mild, and generally warm and temperate. The summers here have a good deal of rainfall, while the winters have very little. The average annual temperature in Kotli is 21.9 °C. The average annual rainfall is 976 mm.

a. Temperature and Precipitation

At an average temperature of 31.8 °C, June is the hottest month of the year. January is the coldest month, with temperatures averaging 10.6 °C. Between the driest and wettest months, the difference in precipitation is 182 mm. Throughout the year, temperatures vary by 21.2 °C.

Precipitation is the lowest in November, with an average of 19 mm. Most of the precipitation here falls in July, averaging 201 mm.

Average, minimum, maximum temperatures and precipitation for study area are given in following Table 4.1¹:

Table 4.1: Temperature and Precipitation

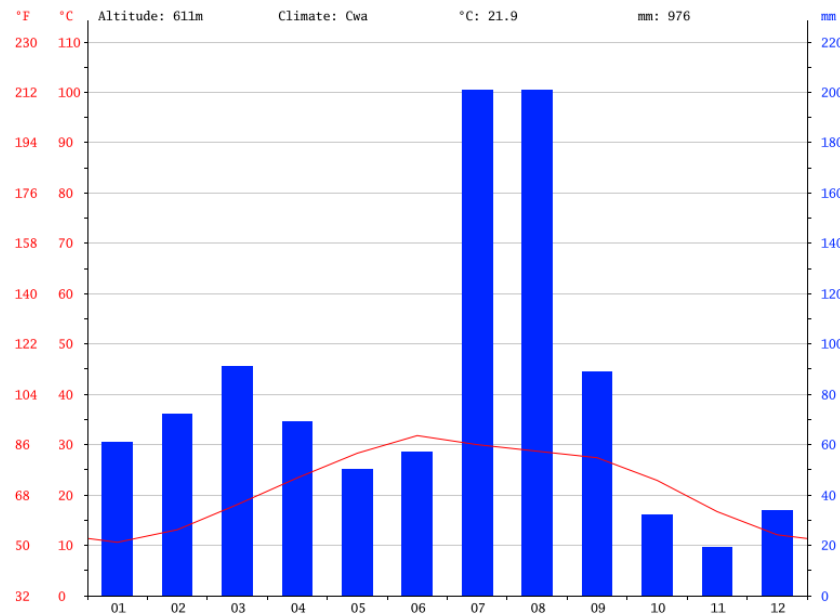
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Avg. Temp(°C)	10.6	13.1	18.1	23.4	28.3	31.8	30	28.7	27.4	22.9	16.7	12.1
Min. Temp(°C)	4.5	6.8	11.6	16.4	21	24.8	24.9	24	21.4	15.2	8.6	4.9
Max. Temp(°C)	16.7	19.5	24.6	30.4	35.6	38.8	35.2	33.4	33.5	30.7	24.8	19.3

¹ Cited on December 16, 2019 Available on: <https://en.climate-data.org/asia/pakistan/azad-kashmir/kotli-768493/>



Prec. (mm)	61	72	91	69	50	57	201	201	89	32	19	34
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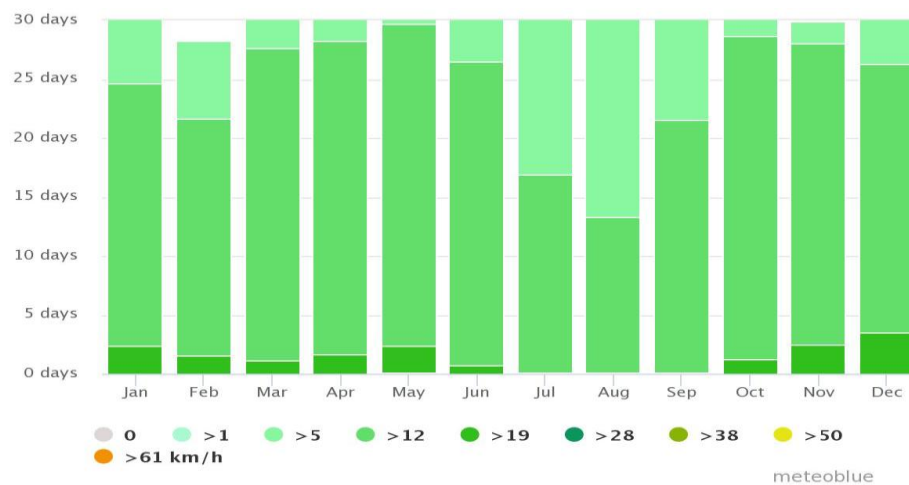
The trends of average minimum and maximum temperature are shown below (Graph 4.1).



Graph 4.1: Maximum and Minimum Temperature

b. Wind Speed

Wind speed of Study Area varies throughout the year. The graphical representation of maximum, average and minimum wind speed for each month is shown below (Graph 4.3²).



Graph 4.3: Wind Speed

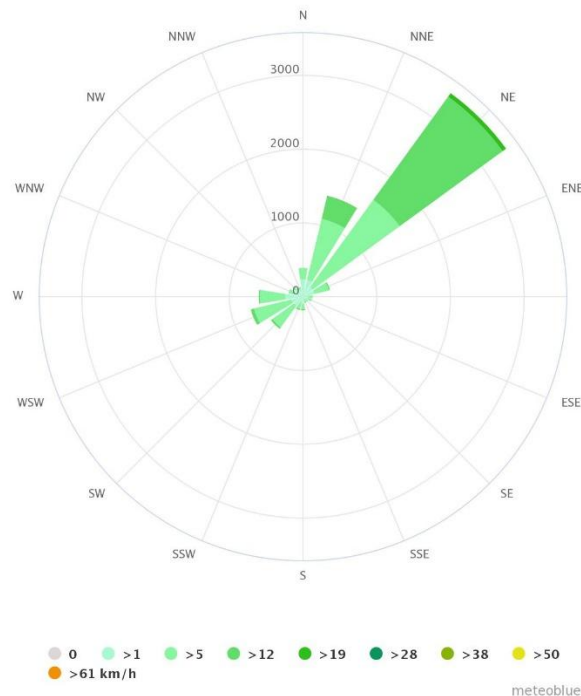
² Cited on December 16, 2019 Available on:

https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/kotli_pakistan_1173055



c. Wind Direction

Wind direction of any area shows that from which direction the wind is blowing. For this purpose wind rose diagram is formulated which shows that for how many hours the direction of wind blow from specific direction i.e. from SW to NE etc. the prominent wind direction of district is NS. Wind rose of study area is shown below (Graph 4.4³).



Graph 4.4: Wind Rose Diagram

d. Sunshine

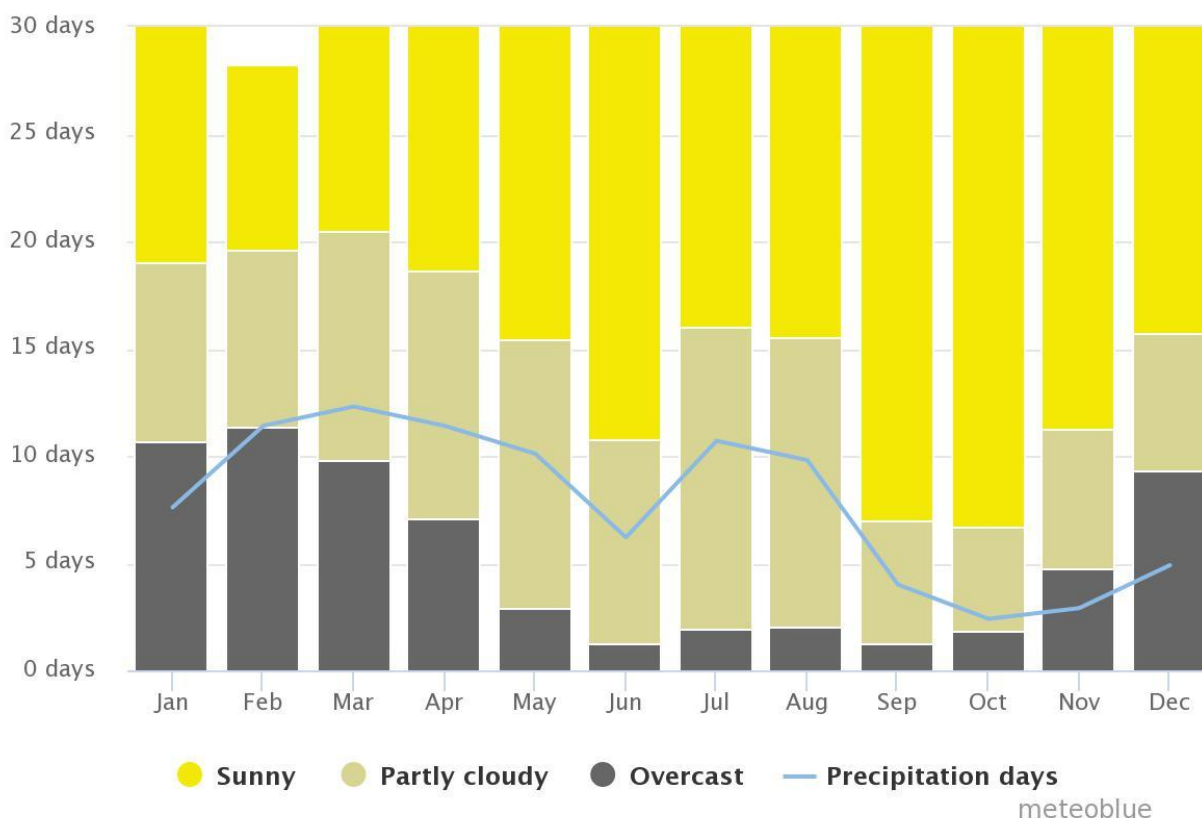
Sunshine of any area shows that how many days are sunny in a month. The sunshine patterns for a specific area vary accordingly. For each month, the number of sunny and cloudy days for study area is shown below (Graph 4.5⁴):

³Cited on December 16, 2019 Available on:

https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/kotli_pakistan_1173055

⁴Cited on December 16, 2019 Available on:

https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/kotli_pakistan_1173055



Graph 4.5: Sunshine Patterns

The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

4.3.5 Ambient Air Quality

The monitoring of air has been conducted to analyze the ambient air quality of the project area. Equipment used for monitoring was Haz Scanner HIM 6000 Air Quality Monitoring Station. The results of monitoring shows that the major air pollutants i.e. carbon monoxide, sulphur dioxide, nitrogen dioxide and particulate matter are within PEQS.

4.3.6 Noise Level

Noise level was also measured on project site, the noise level recorded at project site was 53 dB which is within PEQS.



4.3.7 Water Quality

Ground water quality testing was carried out to determine its suitability for use. Testing data shows that ground water is suitable for drinking. The results of ground water analysis shows, almost all the parameters are within safe limits of PEQS.

4.4 Ecological Environment

The ecological environment of an area is generally considered sensitive to large-scale developments. Disturbances and imbalances in the ecological environment can adversely affect biodiversity features of an area. The biodiversity of an area generally reflects the abundance and richness of the biological and the ecological resources.

4.4.1 Flora

a. Forest and Trees

As there is no significant flora present site project site. While the study area is rich in variety of its flora The detail of the trees is given below in Table 4.2.

Table 4.2: Common Trees & Plants of Study Area

Sr.#	Scientific Name	Local Name
1	Olia Europeaa	Kao
2	Acacia Modesta	Phulai
3	Deodonia Viscose	Sanatha
4	Dalbergia Sissoo	Sheesham
5	Carissa Spinarium	Granda
6	Pinus Logifolia	Cheel
7	Bombax Cieba	Simal

b. Grasses

The names of common grasses that are found in study area are given in Table 4.3

**Table 4.3: Common Grasses of Study Area**

Sr.#	Scientific Name	Common Name
1	Desmostachya bipinnata	Dab
2	Bothriochloa Perfuse	Palwar
3	Eualiopsis binata	Bhablar
4	Sachharum bengalensis	Saroot

c. Shrubs and Herbs

The shrubs and herbs provide nutritious supplemental feed to livestock during lean period because they are perennial and have depth root systems. Some of the common shrubs and herbs present in study and project area are Karer, Jand, Aak, Kana and Lana; Botanical names of which are shown below in Table 4.4:

Table 4.4: Major Shrubs and Herbs of Study Area

Sr. No.	Local Name	Botanical Name
1	Karer	Capparis Decidua
2	Jand	Prosopis Cineraria
3	Aak	Calotropis Procera
4	Kana	Sueda Fruiticosa
5	Lana	Saccharum Munja

d. Endangered Floral Species

No such plant species is encountered at study area that is endangered or declared protected under national, provincial or local government definitions as well as international agreements/protocols ratified by Government of Pakistan.

4.4.2 Fauna

The study on terrestrial fauna in the study area is based upon the field investigation and reports of Forest Department. A variety of animals found in study area which are categorized as Mammals, Birds, Reptiles and Amphibians.



a. Mammals

Some of the common Mammals found in study area are leopard, monkey, sheep and deer. Following table gives the Common and Zoological names of Mammals:

Table 4.5: Mammals present in Study Area

Sr. No.	Common Name	Zoological Name
1	Leopard	Panthera pardus
2	Deer	Cervidae
3	Monkey	Rhesus macaque
4.	Sheep	Ovis aries

b. Birds

Native species of birds present in study area are pigeon, sparrow, crow, golden orioles, woodpeckers and black partridges. Common and Zoological names of birds are given in Table 4.6:

Table 4.6: Major Birds present in Study Area

Sr. No.	Common Name	Zoological Name
1	Pigeon	Columbidae
2	Sparrow	Passeridae
3	Crow	Corvus
4	Golden orioles	Oriolus oriolus
5	Woodpeckers	Picidae
6	Black partridges	Melanoperdix niger

c. Reptiles and Amphibians

The native species of reptiles and amphibians observed in Study Area are Snake, Lizard and Frog.

Table 4.7: Reptiles and Amphibians of Study Area

Sr. No.	Common Name	Zoological Name
1	Snake	Serpentes
2	Lizard	Lacertilia



3	Frog	Anura
---	------	-------

d. Endangered Faunal Species

The endangered species present in study area is Barking deer which has been declared protected under national, provincial or local government definitions as well as international agreements/protocols ratified by Government of Pakistan.

4.5 Socio-Economic Environment

This section provides an overview of the baseline information relating to the socio-economic environment of the study area. The information collected from the respondents comprised their occupation, civic facilities, educational and health facilities, agricultural status including livestock population.

4.5.1 Demographic Profile

According to the 2017 population census the district has a population of 5,405,633. From 1998 to 2017, the population grew with an estimated average annual growth rate of 1.84 %. Population Statistics of district Lahore is given below in Table 4.8⁵:

Table 4.8: Population Statistics of District

District/Tehsil	Population	
	2017	1998
Rawalpindi Tehsil	3,258,547	1,927,612
Gujar Khan Tehsil	678,503	494,010
Kahuta Tehsil	220,576	155,080
Taxila Tehsil	677,951	371,140
Murree Tehsil	233,471	176,426
Kotli Sattian Tehsil	119,312	81,523
Kallar Sayyedan Tehsil	217,273	158,120

⁵ Cited on December 16, 2019; Available on Pakistan Bureau of Statistics



4.5.2 Infrastructure

There is a network of metalled and unmetalled road in the study area. Project area can be accessed through road Lehtrat-Kotli Sattian Road. Most of the families live there in houses made up of cement and bricks.

4.5.3 Education

There are number of government and private schools, colleges and universities are being functional in the study area which are imparting education to the locals.

4.5.4 Health

The health facilities including various health care centers, hospitals, dispensaries, basic health units, dental clinics and city medical centers are present in the study area.

4.5.5 Civic Facilities

PTCL telephone exchanges are being operating in the study area. Cellular phone service and Electricity is available in the study area. Natural gas is also available in study area.

4.5.6 Language

In study area most people speak Punjabi including Pothohari, Majhi, Pahari, shahpuri, Dhani and Kashmiri. Although Urdu is also the mother tongue of few people but Urdu being a national language is spoken and understood

4.5.7 Common Diseases

In this area, common diseases are Buri-Zahmat Wah, Mokhur, Pharoon, Dhakh, Chang-Pilchi-Tah-Titli, Pa-Un, Ghoto, Tainki and Taku.

4.5.8 Quality of Life Values

People of the area have non-nomadic life style and are living here from times of their ancestors. In the project area the main sources of income are trade and industries. The overall literacy rate of study area is 68.4% and it has been observed by available data. People of the study area get facilitated by necessary facilities of fresh drinking water, education, hospitalization, transportation, telecommunication, electricity and cooking gas as well.



CHAPTER 5: STAKEHOLDER CONSULTATION

5.1 General

Any person, group or organization with an interest in the project or who can be affected directly or indirectly, negatively or positively by the project activities is a project stakeholder. Because of their interests and concerns, it is very important to take stakeholders into confidence regarding the project need and impacts, and their management. Stakeholder consultation is a mean of involving the entire primary and secondary stakeholders in the project decision making process in order to address their concern, improve project design and give the project legitimacy. Stakeholder consultation, if conducted in a participatory and objective manner, is a mean of enhancing the project stability.

Community input (both of knowledge and values) on socioeconomic and environmental issues can greatly enhance the quality of decision making. Stakeholder consultation was therefore conducted in the project area, not only to satisfy legal requirement of EIA in Punjab but also to improve and enhance the social and environmental design of the project.

5.2 Objective of the Stakeholder Consultation

Role of the public participation is very important in the design making process to achieve the goal of sustainable development. The major objectives of public consultation are as follows:

- Promote better understanding of the project, its objectives and its likely impacts and their management.
- Identify and address the concerns of all interested and affected parties of the project.
- Provide a mean to Identify and resolve issues before plans are finalized and development commences, thus avoiding public anger, resentment and potentially costly delays.
- Encourage transparency, and inculcate trust among various stakeholders to promote cooperation and partnership with the communities and local leadership.

5.3 Proponent

All possible impacts and mitigation measure related to the project were discussed with the proponent and management. They assured to take all suggested mitigation measures to control any discrepancy arose by the project and to make the project environment friendly.



5.4 The Responsible Authority

The M/S Malik Filling Station will be the responsible authority to take all measures prior to start the project and during operation.

5.5 Other Departments and Agencies

For the impact analysis detailed with the management, local community, educational institutes, health institutes, hospitals and NGOs. All issues were discussed related to implementation of the project. Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area.

5.6 Environmental Practitioners and Experts

Team of Elite Environmental Solutions visited the project site, had discussion with stakeholders and consulted with the local people of nearby and other villages to evaluate the project socio-economic impacts. People of the area belong to different professions like mostly belong to employment, own businesses, doctors, some of them communicated but according to social value of the area they mostly hesitate to communicate comfortably and get pictured. People provide the massive information about the project and have positive remarks regarding the project development.

5.7 Community Concerns

5.7.1. Project Approval

The community consultations demonstrated that goodwill towards the project proponents indeed exists; approval for project activities by the communities was evident. The consultations were considered a good gesture and appreciated, especially by the men and women. This project will provide employments to the local as well as non-local poor community in its construction as well as in operational stages.

5.7.2. Resettlement/ Relocation

The proposed site is located on the land already owned by proponents of the project. Therefore, no issue of the resettlements is there.

5.7.3. Local Employment

Communities in the project area emphasized that local poor community should be given priority when employing people for various project-related works and activities according to their skills.

5.7.4. Interaction with Local Community

Non-Local work force coming in the project area that will not be aware of the local customs and norms, may result in conflicts with the local community, keeping in mind the sensitive law and order situation and culture of the area.



5.8 Consultation Process

Primary stakeholders were consulted during informal and formal meetings held in the project area. The consultation process was carried out in Urdu and native language. During these meetings, a simple, non-technical, description of the project was given, with the overview of the project's likely human and environmental impacts. This was followed by an open discussion allowing participants to voice their concerns and opinion. In addition to providing communities with information on the project, their feedback was documented during the primary stakeholder consultation. The issues and the suggestions raised were recorded in field notes for analysis and interpretation.

By reaching out a wider segment of population and using various communication tools such as participatory needs assessment, community consultation meetings, focus group discussions, in-depth interviews and participatory rural appraisal. EIA involved the community in important decision making. This process will continue even after the EIA has been submitted, as well as during future EIAs in which similar tools will be used to create consensus among the stakeholders on specific environmental and social issues in context of the project.

Secondary stakeholder consultations were more formal as they involved government representatives and local welfare organization, NGOs consulted during face to face meetings and through telephonic conversations. They were briefed in the EIA process about the potential negative and positive impacts of the project on the area's environment and communities.

It is important not to raise community expectation unnecessarily or unrealistically during the stakeholder consultation meetings in order to avoid undue conflicts with tribal leaders or local administrators. The issues recorded in the consultation were examined, validated, and addressed in EIA report.

5.9 Stakeholder Consultation Techniques

In recognition of diversity of views within any community, it is very important to obtain a clear understanding of the different stakeholders' views and concerns regarding the project and to analyze their capacity and willingness to be involved in some or all of the project and its planning process. It is important to be aware of how different power relations can distort the participation. It is also important to know that how community skills, resources and knowledge can be applied to improve the project implementation. All of this can be achieved by careful use of various tools of stakeholder consultation. Therefore the following participatory techniques were employed during stakeholders' consultation:



- Informal meeting with the communities in neighborhood areas; men and elders attended these meetings.
- Focus group with women participants in surrounding areas.

5.10 Stakeholders Consulted

In consultation process for EIA, the following stakeholders were consulted.

- Local communities, men, women and elders attended the meetings
- Local Government representatives
- Meeting with stakeholders comprised of community consultation meeting, focus group discussion and in-depth interviews with men and limited focus discussion with women. The location of meeting, the process followed and the outcome are discussed here.

5.11 Stakeholder Concerns and Recommendations

The finding of the community consultation has been addressed in various sections of EIA. Mitigation plan has been incorporated into EMP. The community consultations demonstrated that goodwill towards the project proponent indeed exists. Approval for project activities by communities was evident. The consultations were considered a good gesture and were appreciated; especially by men and women. The summary of consultation with various stakeholders is given below:

Table 5.1: Detail of Public Consultation with Community

Sr. No.	Name of Respondent	Department	Comments
1	Abbas	Community	He was in favor of the Project and showed no negative concern about the Project. He said that the local availability of petrol for driving of vehicles will meet the need of the locals.
2	Farooq	Community	He was fully encouraging the establishment of petrol pump by saying that the fuel filling distance will be minimized by the local establishment of petrol pump.
3	Tahir	Community	He overall favored the project by saying that the establishment of proposed project will not affect any residential community so it is



			a positive step to establish a petrol pump by getting dual benefits of fuel and economy.
4	Jalaluddin	Community	He showed positive response towards industrial development of the country by increasing its economic growth to cater the current economic crisis of the country.
5	Abdul Ghani	Community	By showing concern towards generating employment opportunities, he fully supported the project.
6	Ghulam Mohammed	Community	He favored the project by focusing on its positive impacts meanwhile on its mitigable temporary environmental impacts.
7	Mohd. Khaleel	Community	By focusing at the generation of local employment opportunities to skilled unemployed labors he overall favor the project.



CHAPTER 6: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1 General

This chapter discourses the potential environmental and social impacts of the project activities separately during both construction and operation phases, predicts the magnitude of the impacts, assesses their significance, identifies the mitigation measures to minimize to a tolerable level, if impossible to completely eliminate the adverse environmental impacts and evaluates the residual impact of the project. Environmental impacts of a project are driven out using numerous factors and parameters, due to which it is necessary in the study area to carry out comparative analysis with that area where there is no activity to be commenced yet.

6.2 Impact Assessment Methodology

Once potential impacts have been identified, the assessment of these potential impacts will follow these steps:

➤ **Definition of criteria for determining the significance**

The consequences of the project activity are evaluated by weighing them against recognized significance criteria. The criteria are of following types:

- Institutional recognition- law, standards, government policies and plans
- Technical recognition- guidelines, scientific or technical knowledge.
- Public recognition- social and cultural values and opinions of a segment of the public; especially the community directly affected by the project.
- Professional interpretation of evaluator.
- Prediction of magnitude of the potential impacts
- This step refers to the description, quantitatively (where possible) or qualitatively, of the anticipated impacts of the project.

➤ **Identification of mitigation measures**

It is determined that the predicted impact is significant when compared with the criteria for determining the significance, suitable mitigation measures are identified. These measures can be classified into following categories:

- Avoiding the impacts altogether by not taking certain project activity or part of an activity or by changing the way the activity is being performed or by modifying the equipment being used for the purpose. For example, using CFC free equipment to avoid the impacts



on the ozone layer and using cooling tower (if required) running on phosphate base instead of chromate base to avoid chromium impurities in effluent water.

- Minimizing impacts by limiting the degree or magnitude of the activities or by exchanging the process, raw materials, products, other accessories or equipment with one that can reduce the impact. For example, minimizing dust emission by reducing the vehicular traffic and minimizing noise by operating noisy machinery in sound-proof rooms.
- Rectifying the impacts by repairing, rehabilitating, or restoring the affected environment.
- Compensating for the impacts by replacing or providing the substitute resources or environment of at least similar value. For example, shifting the trees to similar ecosystem instead of cutting them down and giving similar shelters and job opportunities for inhabitants to be displaced.

➤ **Evaluation of the residual impacts**

Even though incorporation of suggested mitigation measures reduces the environmental impacts of the project and brings them within the acceptable limits, this step refers to the identification of the anticipated remaining impacts after mitigation measures have been applied.

➤ **Identification of monitoring requirements**

The last step in the assessment process is the identification of minimum monitoring requirements. The scope and frequency of monitoring depends on the residual impacts. The purpose of the monitoring is to confirm that the impact is within the prescribed limits and to provide timely information, if there is breach of the standards.

6.3 Impact Evaluation and Characteristics

During the Environmental Impact Assessment of Project, the predictable environmental impacts (positive and adverse) were carefully analyzed and characterized by using Impact Screening Checklist and Project Impact Evaluation Matrix. Subsequent to the characterization, appropriate mitigation measures were identified, in order to minimize, if not completely eliminate, the adverse impacts associated with Project activities. Finally, residual impacts were also identified. The parameters used for the impact characterization are listed below:

Categories

Characteristics

Nature

Direct: The environmental parameters are directly affected by the Project construction or operation.

Indirect: The environmental parameter changes as a result of alteration in another parameter.



Duration of Impact	<p>Short-term: The impacts that last only during the construction of the proposed Project e.g., noise from the construction activities.</p> <p>Medium-term: Lasting for a period of few months or a year. The Project before naturally reverting to the original condition such as loss of vegetation due to clearing of campsite, contamination of soil or water by fuels or oil.</p> <p>Long term: Lasting for period greater than medium term impact before naturally reverting to the original condition such as loss of soil due to soil erosion.</p>
Geographical Extent	The geographical extent may be local or regional (spatial dimension)
Project Phases	<ul style="list-style-type: none"> • Pre-Construction/Designing • Construction • Operational • Decommissioning
Reversibility of Impact	<p>Temporary: The impacts that don't exceed ecosystem threshold value of resilience.</p> <p>Permanent: The impacts that exceed ecosystem threshold value of resilience i.e., community that cannot come back to its original stage without external aid.</p>
Likelihood of the Impact	<p>Certain: Impact anticipated occurring under most circumstances.</p> <p>Likely: Impact will probably occur under most circumstances.</p> <p>Possibly: Impact may possibly occur during different stages of the Project.</p> <p>Unlikely: Impact could occur during most stages of the project.</p> <p>Rare: Impact may occur but only under exceptional circumstances.</p>
Impact Consequence Severity	<p>Major: When an activity causes irreversible damage to a unique environmental feature; 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-term effects (period of years) on Socio-Economic activities of significance or regional level.</p> <p>Moderate: 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.</p> <p>Minor: When an activity causes short-term (period of few months) 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 (period of months) effects on Socio-Economic activities of local significance.</p> <p>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.</p>
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.

6.4 Impact Identification

In order to identify the significance of an impact, it is important to distinguish between two concepts: sensitivity and magnitude. As far as possible, the sensitivity and magnitude of the



impacts are described with reference to legal requirements, accepted scientific standards or impact assessment practice and/or social acceptability. Where no known or published “*standard criteria*” exists for determining the magnitude of effects, already established professional criteria and best practices or techniques are used and clearly described. Identification and evaluation of impacts has been undertaken through number of techniques; for instance,

- Checklists
- Matrices
- Networks
- Overlays and
- GIS and Computer expert systems, etc.

An impact evaluation checklist has been used to screen out the significant potential impacts from insignificant impacts.

6.4.1 Impact Screening Checklist

The Impact Screening Checklist is developed to screen out the potentially insignificant environmental and social impacts from the potentially significant adverse environmental and social impacts during the operational phase of the Project. The objective of the Impact Screening process is to assess the significance of the issues related to the air, water, noise, soil, the hazards and external constraints of the Project. The beneficial and adverse impacts of the Project during operational phases are identified and given in the Environmental Checklist which is given below:

Table 6.1: EIA Checklist

Sr. No.	Environmental Components	Environmental Issues	Impact	Minor	Moderate	Major
			Yes/ No	Adverse /Positive	Adverse /Positive	Adverse /Positive
Operational Phase						
1	Water Resources	Alteration in groundwater table?	Yes	A		
		Are there any water resources including surface waters, e.g. rivers, lakes/ponds, coastal or underground	Yes	A		



Sr. No.	Environmental Components	Environmental Issues	Impact	Minor	Moderate	Major
			Yes/ No	Adverse /Positive	Adverse /Positive	Adverse /Positive
		waters on or around the location which could be affected by the project, particularly in terms of their volume and flood risk?				
2	Air Quality /Noise Level	Flue gas emissions	Yes	A		
		Fugitive gas emissions	Yes	A		
		Increased levels of NOx & Sox	No			
3	Wastewater Generation	Contains any hazardous chemicals?	No			
		Cause pollution burden on receiving stream if discharged untreated?	Yes	A		
4	Solid Waste	Generation of solid waste	Yes		A	
5	Energy	Use substantial amounts of fuel or energy?	Yes		A	
		Substantially increase the demand on existing sources of energy?	Yes	A		
6	Fauna	Harm or Reduce the habitat or numbers of any provincial or federally designated unique, rare, or endangered species of animals?	No			
7	Accident Risk	Involve the risk of release of potentially hazardous substances including oil, chemicals, radiation, or other toxic substances in the event of an accident or “upset” conditions?	Yes	A		
8	Human Health & Safety	Create any health hazard or potential health hazards?	Yes	A		
		Accidental risks	Yes	A		



Sr. No.	Environmental Components	Environmental Issues	Impact	Minor	Moderate	Major
			Yes/ No	Adverse /Positive	Adverse /Positive	Adverse /Positive
9	Socio-Economic	Have any effect on local or regional economic conditions e.g., local income levels, land values, or employment?	Yes	P		
10	Archaeological, Cultural and Historical	Alter archaeological, cultural, or historical sites, structures, objects or buildings, either in or eligible for inclusion in the National Register	No			
A= Adverse, P= Positive						

6.5 Impacts Analysis and Prediction

Impacts analysis and prediction can be done by following techniques:

- Meetings
- Workshops
- Consultation / Case Studies

Impacts of the Project are predicted by consultation and case studies.

6.6 Impact Significance and Mitigation Management

Purpose of mitigation is to evade, reduce or balance the expected antagonistic effects in suitable way, to integrate these into environmental managing strategy or plan. At every stage of the project, mitigation plan for all the adverse impacts should be predictable and coasted to find out the best alternatives. The objectives of mitigation are to:

- Invent best substitution, means of better alternatives and ways of doing things
- Improve the environmental and societal payback of the project
- Prevaricate, remedying or reduce, provocative impacts
- Certify that remaining adverse influences are kept within permissible limits



6.7 Purpose of Mitigation Measures

Purpose of mitigation measures includes that what is the problem, when the problem will occur, when, where and how the problem should be addressed. The answers to these questions are given below:

a. What is the Problem?

As the project is the establishment of petrol filling station so the problem can be the impacts that could likely to cause from the activities involved in construction and operation phase of the project i.e. air pollution, noise pollution, solid waste, wastewater generation etc.

b. When Problem will occur and when it should be addressed?

Problem can occur during different phases when different activities are done through machinery or manual work. These problems may include noise, solid waste, liquid waste etc. These all problems should be addressed on the spot to avoid the adverse impacts.

c. Where Problem should be addressed?

As the problem is generating from the construction and operational of the project so it should be addressed on source i.e. site of the project.

d. How the Problem should be addressed?

Proper mitigations measures are being provided according to the nature of the impacts/ problems. Details of mitigation measures are further discussed in this chapter.

6.8 Ways of Achieving Mitigation Measures

a. Changing in Planning and Design

Since the Project will be constructed as it is planned as per feasibility assessment so there is no need of changing in planning and design of the Project.

b. Improved Management & Monitoring Practices

Improving activities will be carried out for betterment while monitoring will also be conducted to keep environment friendly throughout the operation of the project.

c. Compensation in Money Terms

There is no damage of fauna, flora or any other resource. So, compensation in money is not needed.

d. Replacement/ Relocation/ Rehabilitation

Project is located in an open area where the need of the proposed project is well enough. No population will be disturbed due to establishment of this project. So, replacement, relocation and rehabilitation are not required.



6.9 Impacts Associated with Project Location

The proposed project area is located in an area where no resettlement or relocation issues will be arisen due to proposed project. The minimal disturbance to the natural environment due to the construction activities will be short term and mitigable i.e. the excavated material and the removed top soil during construction will be used for backfilling of the areas, tree plantation and green belt development will be done as potential environmental enhancement measures. Thus, there will be no long-term, high and adverse impacts on the surrounding area due to the construction of the unit.

6.10 Impacts Associated with Design

In design, best available technologies will be utilized to prevent or minimize the potential environmental impacts associated with the project as well as to ensure high environmental and business performance. Design of building will adhere to all standard technical requirements in order to avoid impacts on environment and human health.

6.11 Impacts Associated with the Construction Phase

As project area is far from the community and biological life, there are rare impacts on the environmental and socioeconomic conditions. Moreover, likely impacts associated with the construction activities of the project are discussed in this section. The impacts that are discussed are as following:

6.11.1 Construction Noise

Depending upon the formation of the area, the equipment used and its distance from the receptor, the community may typically be exposed to intermittent and variable noise level. During the day, such noise results in general annoyance and can interfere with the sleeping during night. But in case of the instant plant there is no residential activity within 1 km around the project area.

Potential Issues

The potential noise issues during the construction may cause disturbance to the surrounding communities of the project due to construction machinery and vehicle operation on or near the project site but as such there is no community residing within high-noise region (50 m from construction site) around the project area so, the impacts regarding noise will be on minimal / negligible level on the community. The workers will however be exposed to high noise during ground clearing, excavation, foundation and paving works.

Impact Analysis

The potential sources of significant noise during the construction period include the construction machinery and construction related traffic. Precise prediction of noise due to construction activities



at given location at given time requires the list of all equipment that is operational at the time and the following information regarding each piece of equipment:

- The maximum and minimum noise level, measured at reference distance from the equipment, during a work cycle
- Fraction of time it operates at maximum level during a work cycle
- The usage factor, i.e. the number of hours during the day when the equipment is operational
- Distance of equipment from the receptor
- Potential noise barrier and other topographical features that attenuate the sound
- Atmospheric condition, the wind speed and direction, humidity and barometric pressure, also affect the propagation of sound. However for short distances the effect of these is ignorable as compared to other variables.

Mitigation Measures

Construction noise is unavoidable. The strategy to minimize the noise in the community within acceptable limits should be based on the following:

Reduce Noise at source

Based on the site survey conducted by the proponent or his his designate daily, equipment emitting excessive noise in comparison with other similar equipment should not be allowed to operate. Equipment under use should be regularly maintained, tuned and provided with mufflers in good running order to effectively minimize noise level. Equipment in poor state of maintenance; particularly without noise control devices should be checked to determine if it can be improved, replaced with less noisy equipment as soon as practicable.

Traffic noise

- The construction related traffic would enter into the plant site through construction gate
- Either the vehicles will use paved access roads or will drive at speed around 20 km/h on unpaved roads.
- Blowing of horns will be prohibited on the access road to the plant site and inside the site to only emergency use.
- Drivers will follow traffic regulations, protocols and road courtesies
- It will be ensured that all the vehicles are properly tuned, are in good running order and have quality mufflers installed in order to reduce vehicular noise.



Use of PPEs by Workers

Contractor will provide the workers deployed in noisy operations with PPEs such as ear plugs, ear muffs, etc. and will ensure their use by them, so that any damage to their hearing can be avoided.

Residual Impacts

No irreversible noise impact is expected from the construction activities at the plant site; construction noise impacts are all temporary in nature. It is possible that occasionally there will be accidents of the significance criteria during the construction. This may happen if for example, a number of construction machineries is deployed close to community. This will cause a nuisance to the community, although it is likely to last for short period.

Monitoring Requirements

Although the supposed project of M/S Malik Filling Station is away from the residential area but the issue related to the noise will not be taken for granted. To assure mitigation of the impacts that can arise due to noise, a complete monitoring plan will be developed. Monitoring of sound levels will be carried out regularly.

6.11.2 Air Emissions

Different exhaust gases may release from construction equipment and vehicles depending upon the fuel used and the maintenance and tuning condition of vehicles. Dust emission from construction sites is however a major concern with regards to air quality; particularly for the settlement that is found near the construction site. Dust generated during the construction activities can be substantial, since construction activities mean earthwork, which involves dealing with or handling dust or other similar materials.

Dust or the equivalent technical term particulate matter (PM) is generally defined as any airborne finely divided solid and liquid material up to the size of about 100 microns. Large particles also tend to settle rapidly and often do not reach the receptor. In case where they reach the receptor, the dust is considered as nuisance as it may disturb soil property and affect the visibility besides causing breathing difficulties.

Potential Issues

Particulate matter emitted during construction activities can result in deterioration of ambient air quality in the vicinity, and be a nuisance for the community and workers.



Impact Analysis

Potential sources of particulate matter emission during construction activities include earthwork, exposed surfaces, exposed storage piles, truck dumping, halting vehicle movement on unpaved road, combination of liquid fuel in equipment and vehicles, and concrete mixing and batching. Other exhaust gases are emitted only by machinery and vehicles not maintained and tuned regularly or running on sulfur-rich or outdated fuels; which will be ensured not to be operated at the proposed plant site by the construction contractor.

The quality of dust that will be generated on a particular day will depend on the magnitude and nature of activity and the atmospheric conditions prevailing on the day. A wide variety of options exist to control emissions from the construction site. The most effective means of reducing the dust emission is wet suppression. Watering exposed surface and the soil with adequate frequency can help keep soil moist at all times and reduce the total dust emission from the project by as much as 75 %.

Mitigation Measures

The following mitigation measures will be implemented at the proposed unit construction site during construction to control the emission of particulate matter and other exhaust gases:

- Water will be sprinkled daily or when there is obvious dust problem on all exposed surfaces, to suppress emission of dust. Frequency of sprinkling will be kept such that the dust remains under control; particularly when wind is blowing towards the community.
- Dust emission from soil piles and aggregate storage stockpiles will be reduced by covering the piles, for example with tarpaulin or thick plastic sheet.
- All roads within the project site that are to be paved or appropriately sealed, will be paved as early as possible (before commencement of construction work).
- Project traffic will maintain at the maximum speed limit of 30 km/h on all unsealed roads.
- Construction material that is susceptible to dust formation will be transported only in securely covered trucks to prevent dust emission.
- Construction machinery and vehicles will be provided with good quality mufflers.
- Preventive maintenance and regular tuning of the vehicles and machinery will be conducted.



Residual Impacts

The dust emission during the construction activities will affect the ambient air quality. Dust is likely to be nuisance to the community. The effects of the dust trouble with lasting impact are not however expected after the completion of construction.

Monitoring Requirement

In the view of the residual impacts, the following monitoring measures will be undertaken:

- Dust emission from the construction activities will be visually monitored, particularly when the activity is undertaken close to community, to check visible dust.
- The community in the residential area will be actively consulted. Their feedback will form a key mean for monitoring the impacts of dust emission.
- Exhaust of the construction machinery and vehicles will be monitored for the level of exhaust gases.

6.11.3 Water Resources

Water is to be used during construction for operations like footing excavations for pier formation, dredging and dewatering, concrete pouring and washout and some other construction activities as well as for municipal purposes by the workers. This water, after use may be discharged directly and may reach fresh water surface and ground reservoirs; thereby polluting them.

Potential Issues

The extraction of water for the construction activities and municipal works can affect the groundwater availability for the project area communities. Moreover, the wastewater of these operations can potentially contaminate the water resources.

Impact Analysis

Common aquifer yield in the area is quite good. The extraction of water during construction period will not affect the availability of the underground water for community. Moreover, there is no fresh surface water body in the vicinity of the project site. However, little impact on the groundwater quality is likely.

Mitigation

Based on discussion above, the following mitigation measures are proposed:



➤ **Conservation**

- Project management will bore deep groundwater well designated for its construction requirements
- Efforts will be made to ensure that water is conserved and that is frugally used avoiding wastages.

➤ **Pollution Control**

- Proper waste water treatment will be done for the municipal wastewater.
- Efforts will be made to recycle water where possible.
- A plan for responding to accidental spills will be in place duly practiced.

Residual Impacts

No residual impact will envisage due to extraction of water owing to the sufficient recharging of the aquifer in planted region of the project area. Moreover, the implementation of the proposed mitigation measures for water pollution control will ensure that there is no residual impact on the water quality.

6.11.4 Soil Contamination

Spills during refueling, discharges during vehicle and equipment maintenance, traffic accidents and leakage from the equipment, and vehicles often results in the contamination of soil at the construction site.

Impact Analysis

During the construction of the project, spills of fuels, lubricants and chemicals can take place:

- During transfer from one container to another
- During maintenance of equipment and vehicles
- During refueling
- Due to leakage from containers and equipment
- As a result of traffic accidents

Depending on nature of material, location of spill and quantity of spill, soil can get contaminated.

Mitigation Measures

The following control measures are proposed to mitigate the impact on the soil resources:



- Spills prevention trays should be provided and used at refueling locations
- During on the site maintenance of vehicles and equipment, tarpaulin or other impermeable material should be spread on the ground to prevent the contamination of the soil.
- Regular inspection should be carried out to detect the leakage in construction vehicles and equipment so that preventive maintenance can be carried out
- Fuels, lubricants and chemicals should be stored in covered banded areas
- Appropriate arrangement; including shovels, plastic bags and absorbent material should be available near the fuel or oil storage area
- Contaminated soil should be collected and disposed off safely

Residual Impacts

Implementation of proposed mitigation measures is not likely to leave any long-term residual impacts on the soil.

Monitoring Requirements

To ensure compliance:

- Regular inspection of soil of the project area should be undertaken
- Incident record of all moderate and major spills should be maintained.

6.11.5 Safety

Safety is always an issue in any occupational work (construction being one) and needs to be given due consideration in EIA when mitigation measures of other negative impacts are being proposed. Both workers at site and the surrounding community are at stake of safety issues in construction work except that the construction activities are performed in line with set safe work procedures carefully at work site.

Potential Impacts

The construction activity can potentially be a safety hazard for the workers at construction site and the nearby community; particularly owing to the increase in the construction related traffic on the project access road.

Impact Analysis

Project related traffic; particularly on the section of the access road that is adjacent to the nearest residential area will be major source of concern for the community. The construction activities near the residential areas will also create several potential safety hazards. Moreover, workers will



themselves be creating safety issues for themselves if they do not observe safe work practices or owe careless attitudes.

Mitigation

Following are the mitigation measures for safety issues:

➤ **Community Safety**

- A public safety plan should be developed
- Community complaints register and other mean should be adopted for the community to complain.
- Fence surrounding the site should be put in on during the construction to prevent access to construction site.
- All entry points into the construction site should be staffed 24 hours a day. People who are not related to the project should not be allowed inside.
- No machinery should be left unattended, particularly in the running condition.
- Road signage relevant to the project should be displayed, where necessary.
- Nighttime driving of project vehicles should be limited.
- Drivers will be trained to observe traffic rules.

➤ **Workers' Safety**

- Safe Operation Procedures (SOPs) for all construction works will be established and displayed at site, and contractor will ensure all the workers follow them.
- Contractor will ensure no careless attitude is shown by any worker.
- Contractor will either hire skilled labor or will train them before deploying them into construction work.
- It should be ensured that no unsafe act or condition prolongs at site.
- Workers should be provided with PPEs whenever and wherever necessary.

Residual Impacts

With the implementation of mitigation measures proposed above, the residual impact on the safety of the workers and community due to construction will be insignificant.



Monitoring Requirement

As the project is well away from the community interruption but still to avoid any health safety issue from community and the construction workers, a Specific monitoring requirement should be part of community safety plan and may include inspection for road signage, safety marks, fencing, SOPs and their implementation, provision of PPEs and observation of other measures. Besides this, separate registers maintaining records of all accidents, injuries and complaints, with the nature and the corrective measures taken or compensation paid together with the loss must be made.

6.11.6 Employment Conflicts

Potential Issues

Potential employment related issues include dissatisfaction among the local communities over the number of jobs offered to them.

Impact Analysis

The project is likely to create significant job opportunities. Even unskilled and semi-skilled employment opportunities, likely to be created will be for a significant period. For these jobs, locals will be given a preference.

The key issue is related to provision of job. This issue particularly becomes problematic if it is perceived by the local community that a significant number of construction-related job opportunities are not given to people from the local community. This could be result in friction between local residents and construction workers.

Mitigation

The following mitigation measures will be implemented:

- Maximum number of unskilled and semiskilled jobs should be provided to the locals
- A local labor selection criterion should be developed in consultation with the community.

Residual Impacts

Due to its economic implementation, it is possible that employment may remain a contentious issue throughout the project.



Monitoring Requirements

The following data should be recorded and maintained on the employment:

- Total number of unskilled and semiskilled, and skilled jobs offered during construction.
- Name and place of residence of the employed staff.

6.12 Environmental Impacts Associated with Operational Activities

The environmental and socio-economic impacts related with the operation phase of the project are discussed in this section. The impacts that are discussed are related to:

6.12.1 Noise

Unwanted sound or sound level beyond safe or tolerance level is termed as noise. Whenever and wherever machines are operated, noise is generated. Its level depends upon the life of machine, its maintenance condition and its distance from the receptor as the primary factors, and nature of the building housing it and the atmospheric conditions as the secondary factors.

Potential Issues

The noise may affect the community but is definitely the area of utmost concern for the employees. In the operation phase of any industry, noise is an issue of high significance, as it can cast stressful effect on the ears, nervous system and heart; especially to workers exposed to above 85 dB(A) noise for long period of time.

Impact Analysis

Noise, if emitted during the project operation, can potentially be a nuisance for the nearby community apart from the workers at site. In this project noise shall be emitted from the vehicles coming for fuel filling, running generators.

Mitigation

- Proper muffling of operating equipment/ generators will control noise at its source.
- Preventive maintenance and regular servicing and tuning of the equipment will be assured.
- Noise can also be controlled with barriers by enclosing the source of the noise, by placing sound-reducing barriers between the worker and the source, or by increasing



the distance between the worker and the source. For example tree plantation helps block the propagation of sound and construction with sound-proof materials aids limiting the noise to a certain boundary. Both the measures will be taken.

Residual Impacts

No significant increase in noise level in the community is envisaged under normal operation. Moreover, implementation of the above-stated mitigation techniques will also keep the noise impacts at minimum to the workers.

Monitoring Requirements

During project operation, it should be ensured that the noise level at the project site does not exceed the prescribed limits. Monitoring the noise level within and around the project site, periodically is therefore a requirement.

6.12.2 Wastewater

Water left after use that can't be brought into the same use again in the form it has been generated is termed as 'wastewater' of that process or industry. Since it may contain a number of impurities, it is likely to pose various threats to the receiving water body and the life it inhabits.

Potential Issues

The discharge effluent from the project can potentially affect the water resources if it is discharged into fresh water channel, canal, pond etc. But neither process nor municipal wastewater from the proposed project site will be discharged into a fresh water body. Process wastewater will rather be disposed off into the nearby drain after treating it through a wastewater treatment plant to comply with the PEQS limits, and municipal wastewater after treatment in Septic Tanks will be used for irrigation owing to its nutritional value and lack of any hazardous chemical.

Impact Analysis

Since no water is to be discharged into any a water body without adequate treatment, and since PEQS limits are to be observed, wastewater will not be an issue.

Mitigation

- The generated domestic waste water will be collected through a network of pipeline into septic tank for its primary treatment before its final disposal into main drain through a proper drainage channel.
- Any leakage system detected will be repaired at its priority.



Monitoring Requirements

Wastewater discharge from the proposed project site, will need monitoring to affirm whether or not the PEQS limits are complied, and to track if any improvement in the existing system is required.

6.12.3 Air Emissions

Whenever there is a gaseous item (raw material, product, intermittent product or by-product or in any other form) in the system, there lies a probability of release of some gaseous emission from the system. Moreover, dust and other fine particles can also get suspended in air with wind.

Potential Impacts

In the proposed project operation, no gaseous item is involved and hence no gaseous emission is likely. Particulate matter emission is however expected to result from various operations, which can impact breathing and hinder vision.

Impact Analysis

Exhaust emissions from vehicles and generators are the expected air pollutants.

Mitigation:

- Workers should wear dust masks and other respiratory PPEs at the project site.
- Well maintained generators in an enclosure should be present.
- Regular monitoring
- No waste should be burnt at the premises.

Residual Impacts

Dust and PM level will remain within the limits described by PEQS, and the workers away from its impacts, provided the recommended mitigation measures are practiced.

Monitoring Requirements

To ensure PM emissions are within the prescribed ranges, PM levels will be monitored at the project site.

6.12.4 Solid Waste

Solid waste can be a problem if raw material(s) or product(s) or by-product(s) or any are in solid form during the processing; otherwise solid waste is generated from packaging and un-packing,



storing, transporting activities and from machinery and equipment or some steel or glass works and from canteens, cafeterias and gardens is to be managed.

Potential issues

Waste minimization is very important part in waste management practices of any industry. By focusing on the waste avoidance and reduction through use of cleaner production processes and practices, pollution control and waste disposal cost can be lowered. Preference will be given to waste avoidance and reduction and next to recycling and reuse. The unit administration will make a comprehensive plan to mitigate all the issues regarding the waste generation to its disposal.

Impact Analysis

The proposed project is likely to yield some quantity of domestic waste water will also be generated. All of this waste will either be recycled at the plant or sold to a waste management contractor for environment friendly management; hence, solid waste management is also not a significant issue.

Mitigation

A useful approach to waste minimization involves the preparation of proper waste minimization plan. The starting point for the waste minimization will be waste audit. The mitigation techniques that will be applied include:

- Identification of all waste streams.
- Quantify and characterize the waste streams.
- Recyclable materials should be separated at source.
- No waste should be dumped at any location outside the boundary.
- Separate, labeled dust bins should be placed within the premises to collect different nature of waste separately
- Recycling at plant will be practiced
- Before disposal or sale, entire solid waste will be collected for sorting operations in an area designated for the purpose.
- Audit of waste management should be undertaken on regular basis
- Record of all waste generated should be maintained. Quantities of waste, disposed, recycled or reused should be logged on.
- Training should be provided to personnel for identification, segregation and management of waste.



Residual Impact

Proper Management will reduce the probability of any residual impact of solid waste to almost zero.

Monitoring Requirements

Monitoring measures will include:

- Record of all waste generated should be maintained.
- Quantities of waste disposed, recycled or sold should be logged on the waste tracking register.
- Audit of waste management should be undertaken on regular basis.
- The areas around the project boundary and access roads should be periodically inspected to verify that no project related waste is scattered in these areas.

6.12.5 Soil Contamination due to spillage during Storage/ Refueling/ Dispensing

Spills during refueling, discharges during vehicle and equipment maintenance, traffic accidents and leakage from the equipment, and vehicles often results in the contamination of soil at the project.

Impact Analysis

During the operation of the project, spills of fuels, lubricants and chemicals can take place:

- During transfer from one container to another
- During maintenance of equipment and vehicles
- During refueling
- Due to leakage from containers and equipment
- As a result of traffic accidents

Depending on nature of material, location of spill and quantity of spill, soil can get contaminated.

Mitigation Measures

The following control measures are proposed to mitigate the impact on the soil resources:

- Prepare proper pad for bowzer parking while unloading.
- Ensure the pipe and couplings for the fuel transfer are secured tight and drip pans are put in all likely places where leakage can occur to avoid loss to ground.



- Schedule deliveries at times of light traffic load to avoid congestion.
- Underground fuel storage tanks are constructed to modern specifications with secondary containment, impervious linings and leakage monitoring wells in place
- Piping from tanks to the dispensers to be above ground to the extent possible. All buried piping routes to be clearly marked on the ground and on drawings available at the station.
- Effective monitoring program for tank integrity checking and leak detection to be in place.
- Station should have enough spacing between dispensers for vehicles to queue up without effecting flow of traffic

Monitoring Requirements

To ensure compliance:

- Regular inspection of soil of the project area should be undertaken
- Incident record of all moderate and major spills should be maintained.

6.12.6 Safety Hazards, Public Health and Nuisances

Health and safety are gradually gaining high worth for all the persons involved with some business in any way since any occupational activity can pose various health and safety risks for the workers and general public. This is the reason why nowadays, standard procedures are established for all the tasks to be performed in any project keeping in mind that no health and safety issue may arise from the performance of that task, termed as “Safe Operation Procedures”.

Impact Analysis

Operation of the project may cause some concerns for safety, public health and nuisances within the project area if the activities involved are not performed in a safe way; i.e. following SOPs.

Mitigation:

- SOPs will be established for all the project activities and will also be revised whenever required.
- Safety audits should be conducted.
- All accidents and incidents should be recorded, reported and reclaimed.
- Various safety tools should be brought into use.
- Preventive approach will be preferred to corrective approach.



- Standardized Personal Protection Equipment (PPEs) such as Gloves, Masks and Gum Shoes will be provided to the employees to ensure their safety at work place.
- Workers' awareness and safety wall chart showing safety symbols will be displayed.
- First Aid Box will be kept in every department which will be within easy approach of all in case of any injury or mishap.
- To avoid any chance of fire, a comprehensive firefighting system will be developed that includes all types of fire Extinguishers, fire hydrants, sand Buckets and fire fighting Vehicles.
- Basic medical and safety training will be held from time to time to minimize the risk of health and safety issues in the project site premises.
- Employees will also be provided with free medical facilities and services.

6.12.7 Job Opportunities

The project is creating skilled and unskilled labor opportunities during operation. Proponent is willing to hire most of the laborers (around 90%) from the local communities, which will reduce unemployment in the area and improve living conditions of the local population. This is a moderate positive impact.

6.12.8 Emergency Response

Incidents and accidents may occur unexpectedly during project operations. These may include;

- Fire hazard

6.12.8.1 Fire Hazard

During operational phase of the project, fire hazard poses a serious threat.

Mitigation:

- Fire extinguishers should be properly maintained and checked periodically.
- Adequate fire hydrant system should be installed.
- Flammable materials should be prohibited in the premises.
- Maintaining fire alarm systems for detection and warning of fire.
- Pressure gauges should be checked monthly.
- Adequate training of workers on use of firefighting system to deal with the situation.
- Administration of the unit will develop the proper evacuation plans from all processing unit halls.



6.13 Impacts Associated with Decommissioning Phase

6.13.1 Soil Disturbance

Soil erosion may be caused by exposure of soil surfaces during site clearing, earth moving, and excavation activities. Soil disturbance will loosen the soil and make it exposed to the agents of erosion i.e. wind and water.

Mitigation Measures

Following mitigation measures can be adopted:

- Scheduling to avoid heavy rainfall periods (i.e. during the dry season) to the extent practical.
- Mulching to stabilize exposed areas.

6.13.2 Solid Waste Generation

Solid waste will be generated in form of spoil soil, obsolete pumps, pipes, machinery etc.

Mitigation Measures

Following mitigation measures can be adopted:

- Timely collection and disposal of solid waste.
- Recyclable waste should be sell out to the recycle market or any relevant customer.

6.13.3 Health and Safety Impacts

Health and safety risks may occur during decommissioning of infrastructure i.e. open pits hazard, fire hazard, fall hazard, noise and vibrations due to machinery used for dismantling of equipment.

Mitigation Measures

Following mitigation measures can be adopted:

- Employees should be provided with personal protective equipment and required to use impervious clothing, gloves, face shields and other appropriate protective equipment.
- Work permits to carry out dangerous works i.e. permit to work in confined spaces, work at heights and work with dangerous chemicals etc.
- Increased demand on healthcare services.
- Contact with local health service and cooperation established between both parties.
- Emergency preparedness plan in place.



6.14 Potential Environmental Enhancement Measures

Several measures have been proposed for enhancing the environment and social aspects including planting of trees, green belt development, construction of retaining walls and guardrails, providing sign boards, preserving and landscaping cultural properties etc.

6.14.1 Green Belt Development

Adequate number of saplings will be planted all along the periphery of the plant, roadways and available open spaces. Apart from functioning as a pollutant sink, green belts provide other benefits like:

- Green belt helps in noise abatement for the surrounding area.
- Green belt increases the aesthetic value of the site.

6.14.2 Tree Plantation

Tree plantation and cropping within the premises have been planned by the proponent for environmental enhancement. The Proponent will also make arrangements for protection and maintenance of trees. More than 500 trees will be planted including having height of 6-7 ft.

Table: 6.2: Trees to be planted

Sr.#	Scientific Name	Local Name
1	Olia Europea	Kao
2	Acacia Modesta	Phulai
3	Deodonia Viscose	Sanatha
4	Dalbergia Sissoo	Sheesham
5	Pinus Logifolia	Cheel
6	Bombax Cieba	Simal



CHAPTER 7: ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

7.1 General

This chapter of the EIA provides the Environmental Management Plan (EMP) of the project for its construction and operation phases separately to keep its environment benign as well as the monitoring plan to ensure the compliance of the established EMP.

As per the environmental legislation in Pakistan, the EMP for the operation phase, along with other documents, is to be submitted to the concerned Environmental Protection Agency to obtain confirmation for compliance and Environmental Approval for project operation.

7.2 Purpose and Objectives of the EMP

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the EIA.
- Define the responsibilities of the project proponent, contractors and other staff and stakeholders.
- Provide means of effective communication of environmental issues between all the persons associated with the project.
- Identify monitoring parameters in order to ensure the effectiveness of the mitigation measures.
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

7.3 Management Approach

The organizational roles and responsibilities of the key players are summarized below:

Proponent: The project proponent will take overall responsibility for compliance with the EMP in his hand. Proponent will carry out verification checks to ensure that the contractors are effectively fulfilling their environmental and social responsibilities as mentioned in EIA.

Contractors: The contractors will implement the majority of environmental and social mitigation measures. The contractors are subject to certain liabilities under the environmental laws of the country, and under contract with the proponent.



7.4 Environment Management Plan

It lists all the mitigation measures identified in the EIA and the associated environmental or social aspects in line with the administrative framework involving all the responsible implementing authorities who are required to take the planned actions/measures.

Table 7.1: Environment Management Plan (EMP)

Environmental and social aspects	Mitigation Measures	Responsibility
Construction noise	<ul style="list-style-type: none"> Periodic surveys will be conducted for the control of noise level from the construction equipment, operational machinery and vehicles. Machines and vehicles will be provided with mufflers. Proper maintenance, oiling and greasing of machines at regular intervals to reduce generation of noise. Provision of PPEs (ear plugs, ear muffs) to the workers working in high noise areas. 	Construction Contractor
Dust emission	<ul style="list-style-type: none"> Sprinkling of water on all the exposed sites to suppress the emission of dust. Covering all the soil piles and construction materials will be transported in closed containers. 	Construction Contractor
Vehicle and equipment exhaust	<ul style="list-style-type: none"> Maintenance of all vehicles and other equipment used during the construction in order to minimize the emission of pollutants. 	Construction Contractor
Water conservation plan	<ul style="list-style-type: none"> Recording of amount of groundwater that will be extracted for construction activities Strict monitoring will be in place to have an eye on all water uses so that no wastage of water takes place and where possible, water would be recycled. 	Construction Contractor
Wastewater management	<ul style="list-style-type: none"> Wastewater generated during the construction activities will be collected properly and routed towards septic tank for primary treatment before disposal. 	Construction Contractor



Solid Waste	<ul style="list-style-type: none"> • Identification and quantification of all waste streams • Provision of separate waste bins at various locations for proper collection of different waste streams • Onsite Separation of recyclable waste • Hiring of waste collection contractor for its regularly collection • Recording of all waste generation activities and its management 	
Health and safety	<ul style="list-style-type: none"> • Establishment of SOPs for all the project activities. • Safety audits should be conducted. • All accidents and incidents should be recorded, reported and reclaimed. • Provision of Standardized Personal Protection Equipment (PPEs) such as ear plugs, safety Helmets, Gloves, Goggles, Masks and Gum Shoes to the employees to ensure their safety at work. • Displaying Workers' awareness and safety wall chart showing safety symbols. • Provision of First Aid Box in all departments. • Development of comprehensive firefighting system to avoid any chance of fire that will includes all types of fire Extinguishers, fire hydrants, sand Buckets and fire fighting Vehicles. • Basic medical and safety training will be held from time to time to minimize the risk of health and safety issues in the project site premises. • Provision of free medical facilities and services to the employees. 	Construction Contractor
Soil contamination	<ul style="list-style-type: none"> • Spills trays will be provided and used at refueling locations. Emergency plan for the spill management will be prepared and inducted to the staff for any incident of spill. Fuels, lubricants and chemicals will be stored in the covered bounded area. 	Construction Contractor



Hazardous and non-hazardous solid waste management	<ul style="list-style-type: none"> • Reuse of construction and demolition waste (bricks, cement, etc.) for flooring. • All hazardous waste will be separately collected and managed from the other waste. • Proper labelling of all containers of hazardous waste. • Municipal waste will be managed using standard procedures. • Record of all waste generated during the construction phase will be recorded. 	Construction Contractor & Waste Contractor
Operation Phase		
Noise	<ul style="list-style-type: none"> • Silencing and proper muffling of operating equipment • Preventive maintenance and regular servicing and tuning of the equipment will be assured. • Workers should be told and encouraged to use PPEs (ear plugs or ear muffs) at all times. • Tree plantation will be done to reduce noise level. 	Operation and Maintenance staff
Exhaust and Dust emission	<ul style="list-style-type: none"> • Provision of PPEs to the workers before entering into the working vicinity. • Practicing water spraying where required. • Regular monitoring of air emission sources. • No open burning of waste within the premises of project site. 	Operation and Maintenance staff
Water conservation plan	<ul style="list-style-type: none"> • Recording the amount of groundwater that will be extracted for operation activities. • Strict monitoring will be in place to have an eye on all water uses so that no wastage of water takes place and where possible, water would be recycled. 	Operation and Maintenance staff
Wastewater management	<ul style="list-style-type: none"> • The generated domestic waste water will be collected through a network of pipeline into septic tank for its primary treatment before 	Operation and Maintenance staff



	its final disposal into main drain through a proper drainage channel.	
Soil contamination	<ul style="list-style-type: none"> • Provision of dense greenbelt within the premises of factory. • Prepare proper pad for bowzer parking while unloading. • Ensure the pipe and couplings for the fuel transfer are secured tight and drip pans are put in all likely places where leakage can occur to avoid loss to ground. • Schedule deliveries at times of light traffic load to avoid congestion. • Underground fuel storage tanks should be constructed to modern specifications with secondary containment, impervious linings and leakage monitoring wells in place • Piping from tanks to the dispensers to be above ground to the extent possible. All buried piping routes to be clearly marked on the ground and on drawings available at the station. • Effective monitoring program for tank integrity checking and leak detection to be in place. • Station should have enough spacing between dispensers for vehicles to queue up without effecting flow of traffic • Maintenance of impervious flooring and roof covers in order to avoid land contamination due to accidental spills. 	Operation and Maintenance staff
Health and safety	<ul style="list-style-type: none"> • Establishment of SOPs for all the project activities. • Conducting Safety audits. • Recording and Reporting of all accidents and incidents. • Preventive approach will be preferred to corrective approach. • Provision of Standardized Personal Protection Equipment (PPEs) such as Gloves, Masks and Gum Shoes to the employees to ensure their safety at work place. 	Operation and Maintenance staff



	<ul style="list-style-type: none"> Workers' awareness and safety wall chart showing safety symbols will be displayed. Availability of First Aid Box in every department which will be within easy approach of all in case of any injury or mishap. Development of a comprehensive firefighting system including all types of fire Extinguishers, fire hydrants, sand Buckets and fire fighting vehicles to avoid any chance of fire Basic medical and safety training will be held from time to time to minimize the risk of health and safety issues in the project site premises. Provision of free medical facilities and services to the employees. 	
Decommissioning Phase		
Soil Disturbance	<ul style="list-style-type: none"> Scheduling to avoid heavy rainfall periods to the extent practical. Mulching to stabilize exposed areas. 	Operation and Maintenance staff
Solid Waste Generation	<ul style="list-style-type: none"> Timely collection and disposal of solid waste. Recyclable waste should be sell out to the recycle market or any relevant customer. 	Operation and Maintenance staff
Health and Safety Issues	<ul style="list-style-type: none"> Employees should be provided with personal protective equipment. 	Operation and Maintenance staff

7.4.1 Environmental Monitoring Plan

Environmental monitoring is a vital component of the Environmental Management Plan. It is the mechanism through which the effectiveness of the Environmental Management Plan in protecting the environment is measured and assured. The feedback provided by the environmental monitoring is instrumental in identifying any problem or lapse in the system under implementation, and in planning corrective actions. The main objectives of the environmental monitoring during the construction phase of the said textile industry will be:

- To provide a mechanism to determine whether or not the project construction contractors are carrying out the project in conformity with the EMP.
- To identify areas where the impacts of the project are exceeding the criteria of significance



and therefore, require corrective actions.

- To document the actual project impacts on physical, biological and socioeconomic receptors, quantitatively where possible, in order to design better and more effective mitigation measures.

Following environmental record should be maintained:

- Periodic inspection reports of the site
- Audit reports
- Incident record of all moderate and major spills. The record will include:
 - ✓ Location of spill
 - ✓ Estimated quantity
 - ✓ Spilled material
 - ✓ Restoration measures
 - ✓ Photographs
- Description of any damage to vegetation, water resource or community asset.
- Corrective measures taken, if any
- Waste Tracking Register that will record entire waste generated during the construction period. This will include quantities of waste disposed, recycled and reused.
- Records of water consumption with use-wise breakdown
- Survey reports; in particular, the following:
 - ✓ Vehicle and equipment noise.
 - ✓ Ambient noise survey reports.
 - ✓ Ambient level of PM
 - ✓ Vendor data—all vendors disturbed by the project and compensation paid
 - ✓ Public infrastructure: Record of all damages and repair work undertaken.
 - ✓ Employment
 - ✓ Total number of unskilled, semi-skilled and skilled jobs offered during Construction.
 - ✓ Name and domicile of the employed staff.
 - ✓ Archeological resources—Record of any findings with photographs.
 - ✓ Project and Community Interface



- ✓ Record of community complaints and the measures taken to address them.
- ✓ Number of meetings held in various communities and persons who attended
- ✓ Environmental and social training records

Table 7.2: Roles and Responsibilities for Environmental Monitoring

Aspects	Proponent Responsibilities	Contractors Responsibility	Relevant Documentation
Contracting	Ensure that the monitoring, rehabilitation and rebuilding requirements are included in the contract between the proponent and the construction contractor.	Understand the environmental requirements of the contract.	Contract between the proponent and the contractor
Monitoring plan	Finalize the monitoring plan prior to the commencement of the construction.		Revised monitoring plan
Resources	Ensure the availability of resources for environmental responsibilities; monitoring, rehabilitation and rebuilding.	Ensure the availability of resources for environmental monitoring, rehabilitation and rebuilding and their efficient use without wastage.	Project budget
Environmental staff	Designate an environmental manager for the project.	Appoint officer dedicated to environment.	Job description
Monitoring survey	Undertake the periodic (pre-planned and unplanned) inspection and carry out the field measurement or assign this duty to a concerned person or organization.	Systematically observe and collect the data on the environmental performance.	Inspection and survey reports
Environmental	Conduct periodic audits of	Conduct audits.	Audit reports



Audit	the construction site and commence third party audit.		
Reporting	Ensure that periodic environmental monitoring reports are received.		Periodic reports
Corrective action	Verify that activities are carried out complying with EIA/EMP.	Carry out the corrective actions where required.	Corrective action record
Maintenance of record	Maintain monitoring data and record of all incidents of environmental significance.	Maintain monitoring data and record of all incidents of environmental significance.	Environmental data base

7.5 Communications and Documentation

An effective mechanism to store and communicate environmental information during the project is an essential requirement of an EMP.

Meetings

Two kinds of environmental meetings will take place during the project:

- Kick-off meetings
- Weekly meetings

The purpose of the kick-off meetings will be to present the EMP to project staff and discuss its implementation strategy and policy.

A weekly meeting will be held during operation. The purpose of this meeting will be to discuss the conduct of the operation and environmental issues and their management. The proceedings of the meeting will be recorded in the form of a weekly environmental report.

Changes-Record Register

A change-record register will be maintained at the site, in order to document any change in project/system design; especially those which have direct impact on the industry's emissions, effluents, wastes and resource management. These changes will be handled through the change management mechanism.



Environmental Training

Environmental training will help ensure that the requirements of the EIA and EMP are clearly understood and followed by all project personnel in the course of the project.

Table 7.5: Training Program

Target audience	Trainers	Contents	Schedule
Selected management staff	Contractors	Key finding of mitigation measure	After every five months
All personnel	Contractors	Mitigation measures	Monthly
Technical Staff	Contractors	Waste disposal, vehicle movement restriction and other mitigation measures	After every three month
Other staff	Contractors	Waste disposal, resource conservation and other mitigation workers	Monthly

Institutional Responsibilities

Following functionaries will be involved in the implementation of EMP:

1. S as the project proponent and owners of the EMP
2. Project construction contractor(s) as executors of the EMP during construction phase of the project.
3. Operational & Maintenance (O&M) and the Health, Safety and Environment team of the proposed project as an executor of the EMP during the operational phase of the project.

7.5.2 Monitoring Plan

The monitoring of the EMP and the communication and documentation mechanism that will be employed during the operation phase will be based on the Environmental Management System (EMS) of the project proponent. The management system of the project proponent will be the same as the certified EMS in place at the company.

Table 7.3: Environment Monitoring Plan for Construction Phase

Potential activity and potential impact	Objective of monitoring	Parameter to be monitored	Measurements	Location	Frequency	Responsibility
Disturbance due to noise	To determine	Noise level near the	Reading will be taken.	At least three locations on	On three typical	Environment Officer



from construction activity	the effectiveness of the noise abatement measures on the sound level	receptor		the plant boundary and three locations at the receptor end	working days and one weekend	
Soil contamination due to leakage of oil and chemicals on the ground	To determine the effectiveness of the control measures taken to minimize the spillage of oil and chemicals	Procedure in place to handle the liquids and availability of procedure and equipment for emergency response	Visual inspection and availability checks	Construction site	Weekly inspection	Environment Officer
Waste collection, storage and disposal	To check the availability of waste management system and implementation on	Inspection of waste generation, collection, storage and disposal will be undertaken	Visual inspection	Construction sites and camp sites	Once daily	Environment Officer
Water and other resources' conservation	To determine the effectiveness of the conservation techniques in practice	Leakages, spillages and wastages	Visual inspection and record tracking	At all points of use	On monthly basis	Environment Officer
Workers'	To check and	Injuries and	Injuries will be	Construction	Daily	Environment



safety	evaluate the effectiveness of the workers' safety plan	LWI or LTI	recorded	site		Officer
Vehicle and equipment exhaust	To confirm the availability of exhaust control devices with the construction vehicles and equipment	Air quality at different points around the vehicles and equipment	Readings will be taken	At least three points around the source and three points at some distance downwind	On three word days	Environment Officer

Table 7.4: Environment Monitoring Plan for Operational Phase

Potential activity and potential impact	Objective of monitoring	Parameter to be monitored	Measurement	Location	Frequency	Responsibility
Disturbance due to noise from operational activity	To determine the effectiveness of the noise abatement measures on the sound level	Noise level near the receptor	Noise Measurement	At least three locations on the plant boundary and three locations at the receptor level	Quarterly	Environment Officer
PM concentration in air	To determine if the PM concentration	Ambient Air parameters	PM	Processing halls and	Monthly	Environment Officer



	exceeds the prescribed limits.			project boundaries.		
Procedure for waste collection, storage, sorting and sale	To check if the solid waste can be reduced, reused or recycled at plant before sale	Inspection of waste generation, collection, storage, sorting and sale will be undertaken at entire unit and record will be maintained. Waste Audit	Visual inspection	Entire unit	Once daily	Administration Officer/Waste Manager
Health and safety of the employees and the neighboring community	To determine the effectiveness of the Health & Safety management system in place	All the major and minor incidents and accidents, and injuries or losses will be recorded. Safety Audit	Periodic medical check-up of all the employees and Visual Inspection	All the employee / Entire unit	Monthly or earlier if required	Environmental Officer/ SHE Manager
Energy management and conservation	To check the effectiveness of the energy management and conservation system in place	Energy audit	Energy audit	Entire unit	Bi-annually	Environmental Officer

7.6 Summary of Impacts and their Mitigation Measures

Environmental monitoring is a vital component of the Environmental Management Plan. It is the mechanism through which the effectiveness of the Environmental Management Plan in protecting the environment is measured. The feedback provided by the environmental monitoring is



instrumental in identifying any problem or lapse in the system under implementation and planning corrective actions. The main objectives of the environmental monitoring are:

- To provide a mechanism to determine whether the project construction contractors are carrying out the project in conformity with the EMP.
- To identify areas where the impacts of the project are exceeding the criteria of significance and, therefore, require corrective actions.

7.7 Equipment Maintenance Details

- PPE's and other required machinery of latest technology with high efficiency will be purchased by the proponent
- Good technical practice should be implemented during operations.
- Maintenance of equipment will be done twice a year for the smooth operation.
- All the equipment must be kept clean.
- Proper lubrication of moving parts of machines should be according to schedule.
- Make maintenance and inspection schedule.
- Prepare and keep the record of equipment maintenance log.
- Training workshops to staff about SOPs of equipment should be planned and implementation of such practices must be ensured.

7.8 Environmental Budget

The environmental cost has been worked out in Table 7.6:

Table 7.6: Environmental Budget

Sr. #	EMP Parameters	Unit Cost	Before Construction		During Construction		After Construction		Total (m PKR)
			Times	Cost	Times	Cost	Times	Cost	
1	Environmental Monitoring	0.040	1	0.040	0	0	2	0.040	0.12
2	Social Cost (meeting, visit, tour etc.)	0.02	1	0.02	1	0.02	1	0.02	0.06
3	Environmental Training	0.03	1	0.03	0	0	1	0.03	0.06
4	Tree Plantation Plan	0.0010	0	0	0	0	500	0.0010	0.5
5	Environmental reporting & review	0.2	1	0.2	0	0	1	0.2	0.4



Total	1.14
Contingencies (10%)	0.114
Grand Total	1.254



CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusion

The report presents Environment Impact Assessment of the project M/S Malik Filling Station, Rawalpindi. The main objective for the establishment of petrol pump station by using environmental friendly technology.

The performed EIA showed all the possible impacts (both positive and negative) associated with the construction and operation of the project. Appropriate mitigation measures as explained in the environmental study shall reduce, if not eliminate, these impacts so that these can be brought within acceptable, safe limits. The study also shows that there will be no exploitation and consequential depletion of the local natural resources. Based on overall assessment of the environmental impacts of the project, it is concluded that the project is not likely to cause any significant adverse impact on the social, physical and biological environment of the area, provided that suitable mitigation measures as identified in this study are implemented. Moreover, the identified impacts have been found to be of temporary nature; leaving no long-term, residual impacts behind.

This Environmental Impact Assessment has been conducted, to the extent possible, in line with the relevant guidelines provided by the Environmental Protection Agency. The objective of such a study is to identify and assess potential environmental and socio-cultural impacts of the project. The Environmental Impact Assessment contains description of the project, description of the environmental baseline, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is also included in the study, developed separately for construction and operation phases. For compliance checks of the EMPs, Environmental Monitoring Plans have also been developed.

On the basis of all the above conclusions and the fact that the project is going to have a benefit/cost ratio above one for both environmental and socioeconomic concerns, this project is found to be environmentally feasible. Since, conservation, reduction, reuse, recycling, treatment and recovery techniques have all been planned to be practiced for both material and energy resources with the aim to reduce footprint of the industrial processing, the project can also be declared to be sustainable.

It is further concluded that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context. It is accordingly



recommended that environmental approval for the project may be issued by the Environmental Protection Agency, subject to the payment of the requisite scrutiny fee by the proponent of the project.

8.2 Recommendations

Following are some recommendations to improve the environmental status of the project:

- All the parameters of discharges and emissions of the project shall be within prescribed limits.
- No activity should be undertaken at the project site which may cause leakage and spillage of oils, chemicals and fuels into adjoining grounds;
- No activity should be undertaken at the site which could pose any sort of a threat to public health.
- Workers should be provided with adequate and standardized PPEs like ear muffs, goggles, gloves and shoes etc.
- Workers should be told and encouraged to use PPEs.
- Training schedules should be strictly followed;
- Separate parking spaces should be demarcated at the project site for parking of vehicles;
- Trained drivers should be hired for transportation and they should be told and encouraged to observe traffic rules;
- Establishments shall be regularly advised to keep noise levels within acceptable limits.
- Waste minimization practices should be employed and workers should be encouraged to adopt such methods;
- Small waste storage bins should be installed at different corners for proper waste collection of solid waste.
- An area designated for sorting of the solid waste must be constructed;
- Wages should be distributed on time;
- Wages should not be below minimum wages as prescribed;
- Proper ventilation must be in place;
- Proper tree plantation plan will also be developed in order to make the unit environment friendly.
- The use of air filters can trap most of the air pollutants, so it should be encouraged;
- Obligatory insurance should be provided to work laborers against accidents.



-
- Basic medical training should be provided to the specified work staff and basic medical service and supplies to workers.
 - Flammable materials should be prohibited in the warehouse premises.
 - Stop the source of the spill or any other accident immediately;
 - Track and root out the causes of any accident or spill;
 - The Security Guards shall also be trained to act in case of all possible emergency situations. The fire alarms can be activated to signal evacuation. At the same time, communication shall be made with hospitals, emergency services and police for urgent support.
 - The proposed Environmental Management & Monitoring Plan should be implemented.