GUIDELINES ON POLLUTION PREVENTION IN INDUSTRIAL SITING

DEPARTMENT OF ENVIRONMENT, MALAYSIA

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PREFACE

The new *"Guidelines on Pollution Prevention in Industrial Siting"* was developed by the Department of Environment. The first document was published in 1976 to provide guidance to industries when selecting a site for the setting up of manufacturing or industrial facility. A revised edition of the related guidelines was introduced in 1994, and later in 2012, the guidelines were updated and reintroduced as *"Guidelines for the Siting and Zoning of Industries and Residential Areas* (SZIRA)*"* with the aim of reinforcing site selection while considering the latest process technologies and environmental pollution control technologies.

Revised further in 2017 to include the latest provisions on internal pollution systems, Environmental Mainstreaming Tools (EMT), and other updates, it was renamed "Environmental Essentials for Siting of Industries in Malaysia (EESIM)," marking the fourth edition in this series developed by the Department of Environment. The long-term sustainability of a project is best assured by incorporating the latest developments in process and pollution control technology to ensure cleaner production systems throughout the life cycle of the industrial facility.

As project planning spans various aspects and legal jurisdictions, and with the introduction of new provisions under the EQA 1974 and the latest DOE guidelines related to industry siting, the new "Guidelines on Pollution Prevention in Industrial Siting" is introduced as the latest document. It integrates elements from both SZIRA and EESIM where applicable and relevant; streamlines and complements siting, zoning, and buffer requirements by the State and other technical agencies, e.g., PLANMalaysia and State Planning requirements; classifies and categorizes each industry based on polluting potential (LPI, MPI, HPI, HRI, and Special Industry); includes overall improvements on criteria for the siting of each industry; provides recommendations for buffers based on industry clusters/groups or individuals; outlines the pollution control policy in Malaysia and promotes eco-friendly industries through Eco-Industrial Park & Managed Industrial Park. This guideline aims to assist relevant planning agencies and Local Authorities in evaluating planning applications from Project Developers for such industrial projects and/or activities as part of pollution prevention efforts.

When selecting a suitable site for the setting up of manufacturing or industrial facility, the proposed industrial activity should be sited within an industrial estate and developed and managed with environmentally sound control measures. In assessing the suitability of the proposed site, the site of interest is evaluated based on its compatibility with the gazetted Structure and Local Plans, surrounding land use, provision of setbacks or buffer zones, and the industrial facility's adoption of the best available technologies for pollution control.

DATO' WAN ABDUL LATIFF BIN WAN JAFFAR
DIRECTOR GENERAL OF ENVIRONMENTAL
QUALITY MALAYSIA

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LIST OF ABBREVIATIONS

BATs	Best Available Technology
BNM	Bank Negara Malaysia (Central Bank of Malaysia)
CP	Cleaner Production
DID	Department of Irrigation and Drainage (Jabatan Pengairan dan Saliran)
DOE	Department of Environment
DOSH	Jabatan Keselamatan dan Kesihatan Pekerjaan / Department of Occupational Safety and Health
EIA	Environmental Impact Assessment
EIP	Eco-Industrial Park
EGIM 2016	Environmental Impact Assessment Guidelines in Malaysia 2016
EQA 1974	Environmental Quality Act 1974
EESIM	Environmental Essentials for Siting of Industries in Malaysia
GOM	Government of Malaysia
HAZOP	Hazard and Operability Study
HRI	High Risk Industry
HPI	High Polluting Industry
ICT	Information and Communications Technology
IETS	Industrial Effluent Treatment System
IPIan	Integrated Planning and Land Use System, PLANMalaysia
KM	Kebenaran Merancang
LA	Local Authority
LPI	Low Polluting Industry
M	Meter
MIDA	Malaysian Industrial Development Authority
MIP	Managed Industrial Park
MOH	Ministry of Health
MPI	Medium Polluting Industry
MRF	Material Recovery Facility
NAHRIM	National Hydraulic Research Institute of Malaysia
n.e.c.	Not elsewhere classified
NPP-4	National Physical Plan-3
NPP-4	National Physical Plan-4
NSDC	National SME Development Council
OSC	One Stop Centre
PLANMalaysia	PLANMalaysia (Jabatan Perancang Bandar dan Desa / Department of Town and Country Planning)
P2M2	Pollution Prevention and Mitigation Measures
QRA	Quantitative Risk Assessment
R&D	Research and Development
RM	Ringgit Malaysia
SI	Special Industry
SME	Small and Medium Enterprises
SSP	State Structure Plans
TOR	Terms of Reference
WQI	Water Quality Index

1. INTRODUCTION

Kuala Lumpur, Malaysia
Photo by Patrick Langwallner on Unsplash

1.1 INTRODUCTION

The Guidelines on Pollution Prevention in Industrial Siting serve as a primary guidance document for Project Proponents, Project Owners, and their consultants, as well as the Federal and State Governments and Local Authorities to determine the suitability of a site for industrial or polluting activities that have the potential to negatively impact the environment. Assessing site suitability is a crucial pollution prevention measure, as selecting an appropriate location can minimize environmental harm and reduce the risk of pollution affecting sensitive receptors.

Avoidance of conflict(s) through proper siting is an important element of pollution prevention and environmental planning for achieving long-term sustainability of a project and helps reduce the cost of unnecessary investment into pollution control and improves public perception of the project.

Objectives of Guidelines

To guide stakeholders during the selection of site for the proposed industrial or polluting activity to avoid or minimize environmental conflicts, of which would otherwise arise due to incompatibility of land uses between the proposed project or activity and its neighbor(s) and receptor(s).

Guidelines Is Applicable for Selection of Sites for the Following Activities:

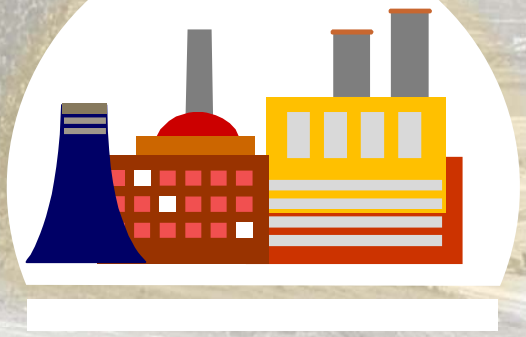
- New manufacturing or processing industry, within designated industrial estate
- Any premise or facility used for industrial or trade purposes that is discharging or capable of discharging air pollutant or effluent (or both) into the environment
- Expansion of existing manufacturing or processing industries which are located adjacent or close to environmentally sensitive areas or receptors
- Premises and facilities for waste management including waste recycling, recovery, treatment and disposal
- Mining and quarrying activities involving the extraction and production (processing) of natural resources such as minerals and rocks
- Power generation facilities utilizing fossil fuel, renewable energy
- Activities with high-risk potential causing significant loss of life or damage due to fire and explosion (e.g. manufacturing of explosive materials) and / or to emit toxic radiation or utilized radioactive materials

This guideline does not apply to facilities such as nuclear power plants, highly hazardous chemical sites, airports, outer space facilities, or husbandry activities. These activities must seek approval from other relevant agencies.

1.2 USE AND COVERAGE OF GUIDELINES

This Guideline is to provide guidance in the selection and determining the siting and buffer requirements of an industrial or a polluting activity based on the polluting potential of the activities. This is particularly important since these activities have potentially causing environmental impacts and nuisance towards the surroundings if proper planning and controls are not in place. Surrounding developments within the proximity of an industrial or polluting activity also needs to consider its siting suitability, zoning planned and buffer requirements against the existing industrial or polluting activity.

Applicability of Guidelines for siting and buffer planning for industry and all types of developments, considering aspects of "who came first, and who comes later".



Ensure the proposed development within the proximity of an industrial or polluting activity will not cause any conflict or incompatibility concerns, and safety distances are provided for during the planning stage of that development This is particularly important for development(s) that will be developed later than the existing industrial or polluting activity.

1.3 STRUCTURE OF THE GUIDELINES

The Guideline is divided into Seven (7) main sections. In addition to this introductory section, the Guideline contains the following sections:

Section 1 – Introduction	Outline the applicability of the guideline
Section 2 – Classifying Industries Based on Polluting Potential	Outline the definitions of industrial terminologies based on various legislations. Classify industries according to their pollution potential, and highlight associated environmental concerns with typical examples.
Section 3 – Site Selection and Site Suitability Assessment	Outline criteria and requirements to be considered in site selection and site suitability and zoning for an industry or activity – Confirmation on Zoning, Sensitive Receptors, Buffer Zone
Section 4 – Sensitive Receptors of Concerns	Outline sensitive receptors (human) and environmentally sensitive areas.
Section 5 – Setting of Buffer Zone	Describes the principle for defining “buffer zone” or buffer area”
Section 6 – Pollution Control Policy Instruments for Industries in Malaysia	Outlines the policy that need to be adhered to by the industries
Section 7 – Eco-Industrial Park & Managed Industrial Park	Promote sustainable development and eco-friendly industries

2. CLASSIFYING INDUSTRIES BASED ON POLLUTING POTENTIAL

YTL Cement

2.1 DEFINITION AND DESCRIPTIONS

Industrial and polluting activity under this Guidelines covers industries and industrial plants for manufacturing of goods and services, 'prescribed premises' and 'prescribed activities' under the EQA 1974. There are various polluting activities that are non-industrial and non-manufacturing but have a propensity for high levels of risk such mining, quarrying, waste management facilities and oil & gas industry. The commonly used terminologies in various legislations used for these types of activities are shown in the following **Figure 2.1** and **Figure 2.2** but they do not represent 'legal definitions' but rather than to assist those who use the Guidelines.

Figure 2.1: Terminology for Industrial and Manufacturing Related Activities

INDUSTRY

Any land alienated to the category of "industry" shall be used only for industrial purposes; that is for the purpose of the erection or maintenance of factories, workshops, foundries, warehouses, docks, jetties, railways or other buildings or installations for use for on in connection with one or more of the following purposes:

(i) manufacture;
(ii) smelting;
(iii) the production or distribution of power;

the assembling, processing, storage, transport or distribution of goods, or other commodities; and such other purposes as the State Authority may prescribe for the purposes of this section by rules under section 14 of the Act.

Legislation **The National Land Code Section Code, 1965 (Act 56) Section 117**

MANUFACTURING ACTIVITY

The making, altering, blending, ornamenting, finishing or otherwise treating or adapting any article or substance with a view to its use, sale, transport, delivery or disposal and includes the assembly of parts and ship repairing but shall not include any activity normally associated with retail or wholesale trade Act.

Legislation **The Industrial Coordination Act, 1975 (Act 156)**

MANUFACTURING

Refers to physical or chemical transformation of materials or components into new products.

Legislation **Bank Negara**

PRESCRIBED PREMISE

Refer to any premises prescribed by the Minister under Section 18. Currently applied to:
(i) The processing of raw natural rubber into technically specified form or latex form,
(ii) The processing of oil palm fruit or oil-palm fresh fruit bunches into crude palm oil
(iii) Scheduled waste treatment and disposal facilities

- Off-site Storage Facilities
- Off-site Treatment Facilities
- Off-site Recovery Facilities
- Scheduled Waste Incinerators
- Land Treatment
- Facilities Secure Landfills

Legislation **The Environmental Quality Act, 1974 (Act 127)**

PRESCRIBED ACTIVITIES

The activities specified in the First and the Second Schedule of the Environmental Quality (Prescribed Activities) (EIA) Order 2015

Legislation **The Environmental Quality Act, 1974 (Act 127)**

INDUSTRIAL PLANT

Industrial plant means any plant used for the generation of power or for any industrial use or for the operation of ships, dredges, locomotives, cranes or other machines.

Legislation **The Environmental Quality Act, 1974 (Act 127)**

Figure 2.2: Terminology for High Polluting/ High Risk Activities

WASTE MANAGEMENT FACILITIES

- Landfill – sanitary landfills, inert landfills, secured landfills
- Compositing facility
- Transfer stations
- Waste recycling facilities
- Waste recovery facility, including material recovery facility (MRF)
- Thermal treatment plant and Waste-to-Energy plant

Legislation **Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations, 2009**

MINING AND QUARRYING

Mining of Minerals and quarrying of rock material

- Mining for ore and minerals
- Sand mining or sand dredging
- Quarry for aggregates, limestones, silica, quartzite, sandstone, marble and decorative building stone

Legislation **Environmental Quality (Prescribed Activities) (EIA) Order 2015**

QUARRYING *(noun)*

Any open or underground excavation, other than that which is controlled under any written law, made for extracting and removing rock material from any land and includes the crushing or other treatment works on the site or elsewhere in the State'

Legislation
Selangor Quarry Rules 2003

QUARRYING *(verb)*

To break or excavate ground for the purpose of extracting and removing rock material from any land and includes the processes of crushing, grinding, dressing or other treatment of such material on the site or elsewhere in the State'

Legislation
Selangor Quarry Rules 2003

ROCK MATERIAL

Any rock, stone, marble, gravel, sand, earth, laterite, loam, clay, soil, mud, turf, peat, coral, shell or guano within or upon any land, and includes any bricks, lime, cement or other commodity manufactured there from

Legislation
National Land Code, 1965

MINE

Any place, excavation or working wherein, whereon or whereby any operation connected with mining is carried on together with all buildings, premises, erections, water reservoirs, tailing ponds, waste, other dumps and appliances belonging or appertaining there to above or below the ground or in or below the sea for the purpose of winning, obtaining or extracting any mineral by any mode or method or for the purpose of dressing, treating or preparing mineral ores'

Legislation
Mineral Development Act (Act 525) 1994

TO MINE

Intentionally to win minerals and includes any operation directly or indirectly and necessary therefore or incidental thereto, and "mining" shall be construed accordingly'

Legislation
Mineral Development Act (Act 525) 1994

MINERAL

Any substance whether in solid, liquid or gaseous form occurring -
(a) naturally;
(b) as a result of mining in or on the earth; or
(c) as a result of mining in or under the sea or sea-bed,

Legislation
Mineral Development Act (Act 525) 1994

2.2 CLASSIFYING INDUSTRIES BASED ON POLLUTING POTENTIAL

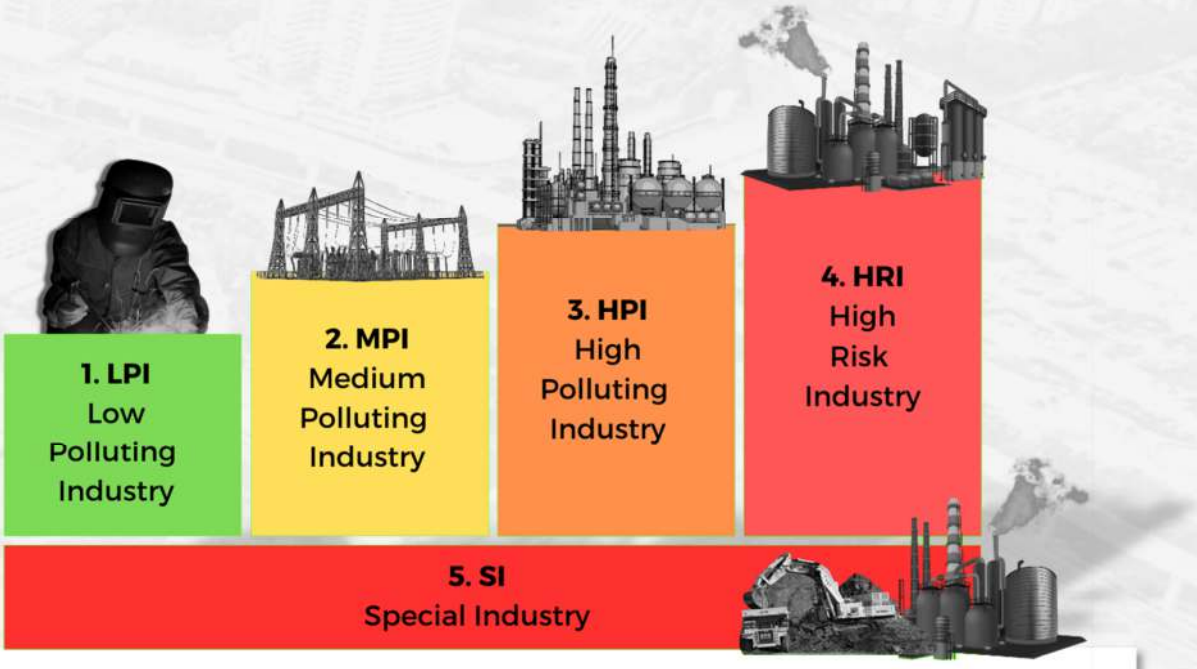
Manufacturing industry is taken to constitute the sector of human activity which makes use of machines, tools and labor to produce goods for use or sale. It constitutes industrial production in which raw materials are transformed into finished goods on a mass scale and such finished goods may be used for manufacturing other more complex products, such as aircraft, household appliances or automobiles, or sold as a product itself. These manufacturing industries presently may be categorized as small-scale to those of medium-scale, as well as very large-scale operations based on sales turnover and number of employees (Bank Negara, BNM, refer to Appendix A).

However, these manufacturing industries which may be recognized as prescribed premises, prescribed activities as well as resource based industrial activities can cause environmental concerns ranging from air pollution to noise, fumes, smoke, vibration, odor, water pollution, risk of death or injury due to fire and explosion, or risk to health due to toxic and hazardous chemical wastes release. The environmental concerns are often more severe for heavy industries when compared to medium-scale and light scale industries. This is the case as the bigger the scale of the operations is usually involving the use of larger quantities of raw materials including water, intensive use of heat and energy sources, production of larger quantities of pollutants and wastes, need for large scale transportation, need for significant labor and associated facilities for housing workers, and need for large area for the processing facilities, storage, and other manufacturing units. The scale of the environmental impacts depends on various factors including: -

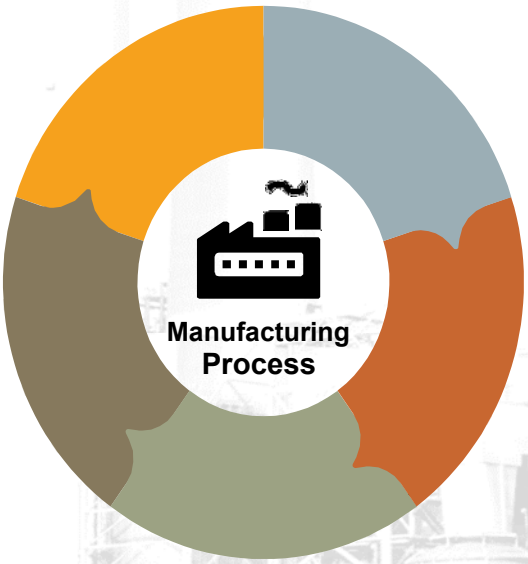
1. The type of raw materials used in the process,
2. The type of process technology that is adopted,
3. The type of equipment or machinery that is used in the production process,
4. The type of control system that is applied,
5. The operational and management practices that are adopted for the plant, and
6. The level of skills of workers and the type of training provided.

Based on aspects such as process operations and activities, technologies and hazardous nature of raw materials, products produced and/or chemicals utilized, type / quantities of emission and discharges the industrial activities are category and classification based on polluting potential as follow:

1. Low Polluting Industry/Activity (LPI)
2. Medium Polluting Industry/Activity (MPI)
3. Heavy Polluting Industry/Activity (HPI)
4. High Risk Industry/Activity (HRI)
5. Special Industry (SI)



In choosing a suitable siting location for an industrial activity or an activity that are potentially cause environmental concerns, the key consideration is to understand the process operation activity that will be carried out. Industrial pollution largely depends on the proposed operation, its raw materials utilization, products developed and pollution control. As such, to determine suitable siting for an industrial activity that likely to generate environmental pollutions should be classified based on its polluting potential and arising magnitude of environmental concerns.



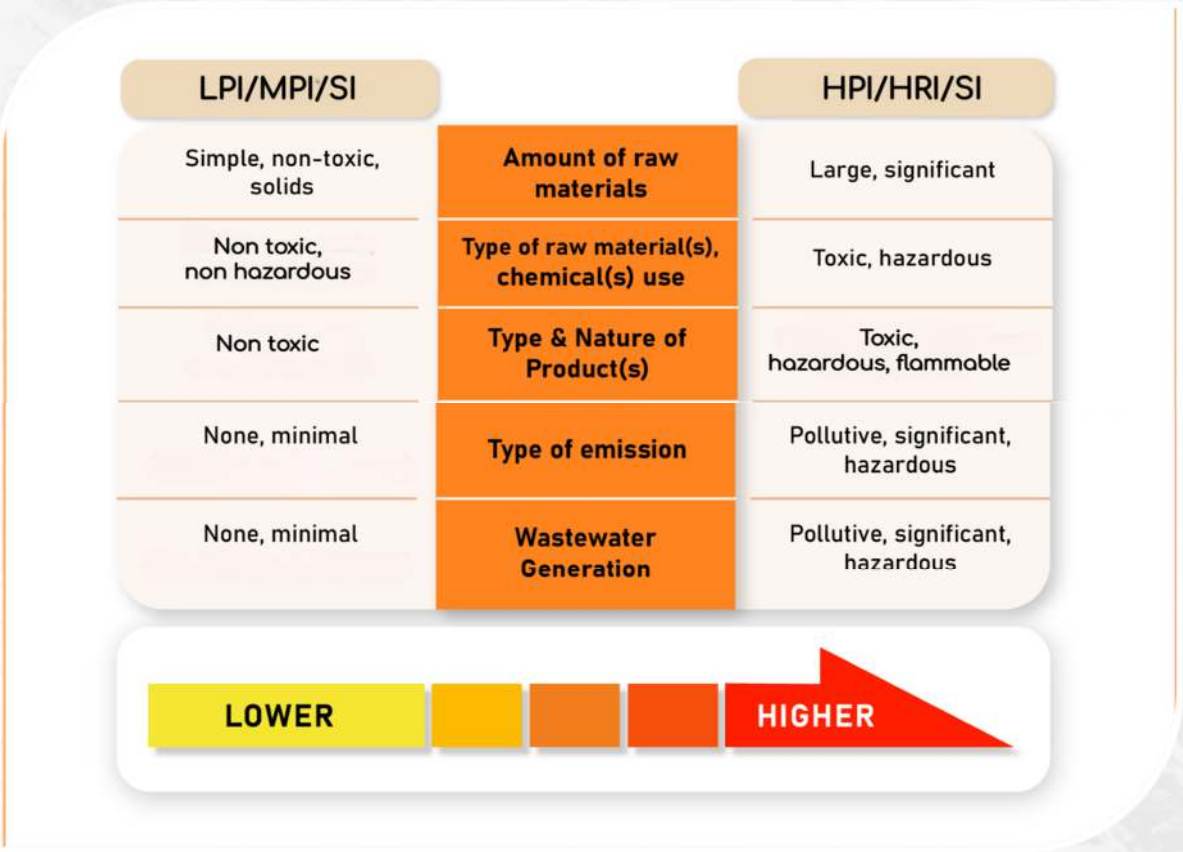
Project Proponent is reminded to obtain the necessary information such as:

- ☑ Raw materials type and quantities,
- ☑ Chemical(s) type and quantities,
- ☑ Nature, type and quantities of products,
- ☑ Nature of raw material and product storage,
- ☑ Overall land size requirement
- ☑ Nature, type and quantities of emission generation,
- ☑ Nature, type and quantities of wastewater generation
- ☑ Nature, type and quantities of waste generation
- ☑ Manpower
- ☑ Utility requirements

Among the information needed are process flow diagram (PFD), pollution generation information, raw materials utilized, chemical usage, waste generation and cooling requirement.

Each industry is unique and environmental impacts and concerns likely to differ due to varying conditions, and the corresponding receivable impacts is based on the magnitude pollution generated. During the planning stage, it is recommended that these factors to be studied and confirmed in order it can properly guide the industrial activity on the determination of its classification so that a suitable site selection can be done.

Figure 2.3: Magnitude of Polluting Potential of an Industrial Activity

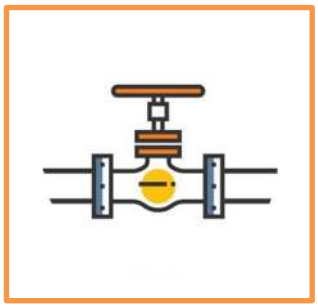


Based on the information gathered, one should be able to determine if the activity can be classified as HRI, HPI, MPI, LPI or "SI". "Line of delineation" for "upstream operations", "midstream operations" and "downstream operations" of typical industrial activities" is generally described below and following sections assist to explain further on each classification.

UPSTREAM OPERATIONS

Upstream operation refers basic industrial activities or processing of raw material(s) or mineral(s) in their raw form to produce semi- finished products or midstream products, or extractive activities (for example extraction of raw minerals from earth).

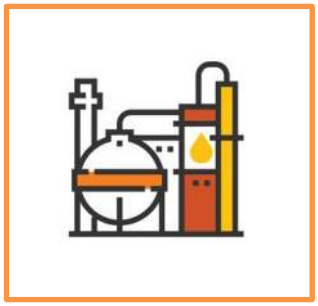
TYPICALLY: HPI and HRI



MIDSTREAM OPERATIONS

Midstream operation is mainly focus on further processing of the semi-finished product(s) / raw material(s) after processing by the upstream industry into finished goods. Output will be a morerefined semi-finished product.

TYPICALLY:
MPI (HPI → MPI) and (HRI →HPI)



DOWNSTREAM OPERATIONS

Downstream operation is mainly focus on further processing of the mid-stream products / semi-finished product(s) / raw material(s) after processing by the upstream industry into finished goods. Normally, semi-finished products or finished products, consumable goods.

TYPICALLY:
HPI/ MPI → LPI

2.2.1 LOW POLLUTING INDUSTRY

Low Polluting Industry is defined as:

Basically, non-polluting thus producing minimal noise, air and gaseous emission, effluent discharges or scheduled and toxic wastes.

LOW POLLUTING INDUSTRY (LPI)

Environmental Concerns

- No industrial process
- Shall not use any raw materials which are toxic and hazardous and therefore will not produce any scheduled wastes
- Shall not use any radioactive materials and scheduled wastes in their operation/activity
- Minimal air emission
- Minimal effluent generation
- Only generates sewage, surface runoffs (rainwater)
- No noise or offensive odors
- Generates mainly solid industrial wastes, easily recycle or disposed

Examples of Low Polluting Industry:

- Packing and/or repacking of dried foodstuff, food ingredients, bottling, and packing of drinks / health food products
- Production of ice, dry-ice, water bottling, etc
- Tailoring, knitting, weaving of textile goods and wearing apparel without dyeing, bleaching and/or other finishing operations
- Printing, publishing, and allied industries that does not use significant chemicals, printing ink, etc
- Storage or warehousing merchandise good, food, frozen food
- Handicrafts
- Repair workshops

If an industry is not included in these examples, please refer to the outlined Environmental Concerns to determine its classification.




2.2.2 MEDIUM POLLUTING INDUSTRY

Medium polluting industry is defined as:

Those that will produce gaseous emissions, noise, smell, some scheduled wastes and also industrial effluent upon processing.

Essentially these industries will:

- Have more possibility of pollutants being discharged than those categorized as Low Polluting Industries
- May use raw material which are classified as toxic and hazardous in their production

MEDIUM POLLUTING INDUSTRY (MPI)

Environmental Concerns

- Industrial processes involving chemicals and hazardous as raw materials
- Could produce scheduled wastes but which can be treated onsite or disposed offsite from their premises
- Could produce fumes and odour that can possibly affect the workers health and the sensitive receptors
- Could generates air emission from main process
- Could generates effluent and caused water pollution
- May produce offensive odours from utilization of raw materials, process operation
- Could contribute higher than average ambient noise level
- Shall not use any radioactive materials and scheduled wastes in their operation/ activity

Examples:

- Manufacture of food products which generate effluent
- Manufacture of electrical apparatus and parts
- Manufacture of cutlery, hand tools and general hardware
- Manufacture of emergency lighting and power supply systems
- Manufacture of detergents and cleaning preparations, perfumes, hair-care products, cosmetics and other toilet preparations
- Manufacture, knitting or weaving textile goods, with dyeing, bleaching and/or other finishing operations
- Knitting mills with dyeing, bleaching and/or other finishing operations
- Cutting, grinding and polishing of marble and ceramic tiles
- Filling/bottling of inert industrial gases such as nitrogen, helium and argon
- Storage of chemicals, detergents, oils, solvents, pesticides and related products
- Storage of rubber products and other odorous products
- Recycling solid waste (depending on technology/ pollution control)
- Offsite storage scheduled waste
- Recycling of scheduled wastes (depending on technology/ pollution control)

- If an industry is not included in these examples, please refer to the outlined Environmental Concerns to determine its classification.






2.2.3 HIGH POLLUTING INDUSTRY

High polluting industry is defined as:

Those, due to their operational process, nature of raw material used, nature of production and material handling will give rise to air, water pollution, extensive noise and vibration, solid as well as hazardous wastes.

High polluting industry is defined in terms of its impacts on the environment. It's can be either related to the production of products which are heavy in weight or in the processes leading to their production. High polluting industry can also be generalized as more capital intensive or as requiring greater or more advanced resources, facilities or management.

HIGH POLLUTING INDUSTRY (HPI)

Environmental Concerns

- High pollution load of air emission and generates odours
- Extensive noise and vibration concerns
- High volume and/or high pollution load of effluent generation from operation
- Significant generation scheduled wastes
- Night-time activity - typically 24 hours operation
- Use radioactive materials and/or generate radioactive wastes
- Storage of flammable, explosive materials
  potential health risks

Examples:

- ☑ Mineral extraction industries - mining and quarrying
- ☑ Cement plants
- ☑ Chemical plants producing hazardous and volatile materials
- ☑ Chemical Plants
- ☑ Smelters
- ☑ Pulp and paper making plants
- ☑ Waste management facilities - Sanitary Landfill
- ☑ Power generation facilities
- ☑ Tank farm
- ☑ Incinerator Municipal Waste (Waste to energy (WTE))

- If an industry is not included in these examples, please refer to the outlined Environmental Concerns to determine its classification.






2.2.4 HIGH RISK INDUSTRY

Definition for High-Risk Industry is:

Those, due to their operational process, nature of raw material used, nature of production and material handling will give rise to air, water and noise pollution and will generate solid wastes as well as toxic and hazardous wastes.

High Risk Industry is often defined in terms of its impacts on the environment especially those with high probability of fire, explosion, bio-exposure and all other environmental risks.

HIGH RISK INDUSTRY (HRI)

Environmental Concerns

- Very high risk due to fire, explosion, radiation, and highly hazardous chemicals
- Raw material used in production or products may include those classified as 'highly hazardous'
- Could generate nuisance such as excessive noise and odor from its operations
- Could produce gaseous emissions at significant rates, volume and concentration.
- Could produce industrial effluent at significant rates, volume and concentration
- Could use radioactive materials and scheduled waste which are toxic and hazardous
- Could generate scheduled wastes and radioactive wastes

Examples:

- Extraction of crude petroleum - Onshore extraction of crude petroleum oils, bituminous or oil shale and tar sand production of crude petroleum from bituminous shale and sand
- Manufacture of refined petroleum product - Extraction of crude petroleum-On-site processes to obtain crude oils: decantation, desalting, dehydration, stabilization, storage, etc. at onshore extraction site
- Manufacture of liquid or gaseous fuels or other products from crude petroleum, bituminous minerals or their fractionation products
- Incinerator of scheduled wastes
- Petrochemical Plants

- If an industry is not included in these examples, please refer to the outlined Environmental Concerns to determine its classification.

2.2.5 SPECIAL INDUSTRY

Special Industry is intentionally meant to classify industrial activities that in actual operation are depending on the resources available and activities related to infrastructure at its facilities. Hence, proximity to the resource to which they depend is the main consideration for selecting a site for their location.

Depending on their operational process and the nature of raw material used, nature of production and material handling may or may not give rise to air, water and noise pollution and generate of wastes.

SPECIAL INDUSTRY (SI)

Common characteristics of Special industries are:

Site Characteristics

- Allowable with conditions to be located within an area where the resources are found as such in the case of agro-based and mining and mineral based.
- In the Local Plan (*Rancangan Tempatan*) this type of industry may not be specifically identified under industrial land use zoning but the activity is permittable/allowable with specific conditions under other land use zoning such as agriculture or infrastructure. activity as shown in the ***Jilid II, Kelas Kegunaan Tanah*** of the Local Plan. An example of how agro-based industry (Rice Factory) is permitted (with conditions) in the land use zoned as agriculture is as shown in **Appendix B**.

Environmental Concerns

- May be classified as Low Polluting Industry (LPI), Medium Polluting Industry (MPI), High Polluting Industry (HPI), High Risk Industry (HRI) or Special Industry (SI) depending on the activity of processes involved.

Classification	Example
LPI/ MPI	▪ Cottage industries ▪ Traditional – batik, *kerepek, keropok*
HPI	▪ Resource-based industry/activities involve in mining and mineral extraction and/or processing - iron, bauxite, gold, oil and gas, and others ▪ Quarrying or mining for raw materials - stone, rock, sand, clay and other materials ▪ Infrastructure and facilities development – (disposal of municipal solid waste)
HRI	▪ Infrastructure and facilities development – (disposal of scheduled wastes)
Cottage Industry	▪ None or very low pollution potential for air pollution, odour, noise, vibration, fire or explosion ▪ Home-based or located mostly within residential areas or associated with local communities ▪ Involves mostly the production of goods using natural resources and products are in the form of food items, souvenirs, household items and other items ▪ No mass production of goods which are mostly hand-made using basic tools and requires low energy inputs ▪ Mostly dry processes but some may generate significant amounts of wastewater for washing, cleaning and soaking processes but with low potential to contribute to water pollution ▪ Generate mostly non-hazardous solid waste and no significant amount of scheduled wastes.

3. SITE SELECTION AND SITE SUITABILITY ASSESSMENT

Palm Oil Plantation, Negeri Sembilan
Photo by Nazarizal Mohammad on Unsplash

3.1 PROJECT SITING AND SITE SUITABILITY

Selection of a suitable site should be conducted at the earliest project planning phase, normally during the conception of a project as part of its project planning and must be carried out for project or process improvements. This is an important aspect in determining the site suitability and zoning compatibility as well as safety distance for the project. Screening on site suitability must be carried out at early project planning to avoid or at least reduce any impact from potential environmental concerns to a certain acceptable level. The requirement for environmental compliance must be carried out by incorporating internal controls for the pollutants generated, and hence allowing for any industry enabling it to be sited at the desired location.

By virtue, under spatial planning policies in place, the proposed development of industry and polluting activity must be sited within industrial area or area that gazetted and/or identified specific for its purpose in the spatial plans. Provisional exceptions are for special industry or resource-based industrial projects such as quarry, mining, palm oil mill and rubber factory (both palm oil mill and natural rubber processing factory are regulated by its respective regulations). Nonetheless, suitability of siting will still need to be assessed. Upon confirmation of the type of industry or activity classification, the suitability and compatibility analysis is done through the following screening process: -

Conformance To Land Use Zoning.
All industrial activities projects must be located/sited within appropriate area allowable for industry as shown in land use zoning plan of the gazetted in the Statutory Local Plans (Rancangan Tempatan). The details of the permitted/not permitted landuse development activities, as well as the types of development with conditions can be checked based on the Use Class Order (Kelas Kegunaan Tanah) in the Local Plan. Should the Project be located outside the designated zone or in an inappropriate zone, conversion of the land use zoning must be carried out prior to application for Planning Permission (Kebenaran Merancang, KM). It can be located in Special Industrial Zones, such as hi-tech parks. These plans are available at all Local Authority and can be accessed from IPLAN web portal (https://iplan.planmalaysia.gov.my/). Various geospatial initiatives have been developed to help users to use the geospatial information effectively or as reference in the development of geospatial data or sharing geospatial information.

Avoidance of Sensitive Receptors.
Refer to Section 4.0 for details on Sensitive Receptors.

When selecting a site for industrial development, it is crucial to identify nearby sensitive receptors to reduce potential adverse effects on human health, the environment, and overall quality of life. These receptors are more susceptible to the impacts of industrial activities, such as air pollution, noise, and water contamination. Maintaining a safe distance from them enables better risk management, stronger environmental protection, and enhanced well-being for surrounding communities.

Provision of Sufficient Buffer Distance
*Refer to **Chapter 5** and specific on **Table 5.2** recommended buffer.*

The compatibility of the site must also be evaluated by ensuring that the project does not pose environmental concerns to adjacent and surrounding activities and land uses, and vice versa. Once a suitable site is determined, checks must be conducted to confirm the land zoning. The provision of setbacks or buffer zones is essential for safeguarding public safety.

With initial adhering to the first rule for industrial activity siting, it can reduce the environmental concerns and impacts to a certain level. Focus for the industrial activity is to design for internal control of pollution(s) generated and compliance with statutory standards and limits.

3.2 REQUIREMENTS FOR SITE SUITABILITY ACCEPTABILITY

Site suitability acceptability shall take account of the following considerations:

- The proposed industrial project is suitable and compatible without in conflict with the future development as per shown in land use zoning that was designated or proposed as detailed out in the gazetted Local Plan or Structure plan, or such other approved development plans prescribed by the relevant local and state authority;

- The site generally meets the buffer zone distances prescribed for the activity in the *Guidelines for the Siting of Industry*;

- The impact of the added pollutant load on the environment and its capacity to receive it without compromising on national ambient air and water quality goals; and

- Appropriateness of process technology and pollution control prevention and control measures proposed to be adopted.

- Overall, any industrial project(s) must take account of all the requirements set in forth by the related technical agencies in the project planning and implementation. The environmental criteria for siting of manufacturing industries are governed to a large extent by the type of industry and the likely environmental concerns expected from the industry. Nevertheless, there are common concerns and criteria in the selection of site for industrial and polluting activities as shown as the following: -

Overview for Determining Siting

1

Investor to Engage with MITI, MIDA, State Government (UPEN), State Agencies, DOE, Relevant Technical Agencies on Project Proposal

Review of Government Policy & Legislations and Check Project Compliance with Governing Policies and Legislations.

- Environmental Quality Act 1974
- Malaysia Plan
- National Physical Plan
- National Policy on The Environment (DASN)
- Environmental Sustainability in Malaysia, 2020-2030 (SDGs)
- New Industrial Master Plan (NIMP) 2030
- Industry Policy
- National Recycling Program
- Tax Incentives

May refer to related policy and guidelines including Environmental Requirements: A Guide for Investors

2

Determine Project Siting in the State Structure Plan, District Local Plan (RT), Regional Development Plan or Area Action Plan (RKK), if any.

- Check project siting and compatibility with current policies, guidelines and requirements
- Do site selection (site options)
- Confirm with State Government, State and Regional Agencies on land matters – location and suitability (if applicable)

Land Use Zoning

- Determine the land use zoning as identified in the gazetted Local Plan, Structure Plan, or other approved development plans.
- Check for the types of industrial activities allowable, permitted with conditions and activities that are restricted based on (Use Class Order).

Suitability and Compatibility Analysis of Project

- Confirmation compatibility with surrounding areas of Project Site
- Identify and avoid environmental sensitive receptors *(Refer to Section 4.0 for details)*
- Identify Recommended Buffer Requirements and undertake assessment/modelling to determine compliance, where required (*Refer to Section 5.0 for details)*

Information Required

- Land Use Zoning
- Environmental Sensitive Area (ESA)
- Hydrology
- Geology
- Topography &Slope
- Accessibility
- Others

Zone of Environmental Impact (ZOI)

5km radius from the Project Site (**depending on project activity)

FINALISED SITE LOCATION

Environmental Criteria Site Selection for Industrial and Polluting Activities

Manufacturing Industry

a. Preference is for siting within designated and approved industrial estates or areas designated for industrial use,

b. Adjacent industry types are to be generally compatible with one another,

c. Avoid areas where an operation has a strong likelihood to impact, either directly or indirectly, environmentally sensitive areas located downstream or in adjacent areas

d. Area is served with good road infrastructure which allows easy access to the site and avoids directly passing through residential areas or sensitive receptors such as hospitals and schools,

e. Area is served with adequate and appropriate utility supplies and proper waste management services and facilities, and proper drainage for storm water conveyance, and

f. Area has adequate recommended buffer to mitigate those environmental concerns best managed by an adequate separating buffer from sensitive receptors (such as residual noise)

Resource Based Industry

Resource based industries are locational dependent requiring them to generally close to their resource, the siting of such industry or activity shall take into consideration the following:

a. Avoidance of ecologically sensitive areas or sites

b. Avoidance of water pollution affecting downstream uses of water for public water supply, irrigation, power generation and conservation of sensitive aquatic ecological resources,

c. Avoidance as far as possible human related activities, structures and systems constituted as environmentally sensitive areas

d. Conform to the landscape of the area without affecting the scenic features of that place or causing major ecological damage such as soil and ground water contamination.

Industries of High-Water Pollution Potential

An Industry or activity with potential to cause significant water pollution is to give preference for a location downstream of any of the following sensitive receptors:

a. Public water supply intakes as prescribed under the Sixth Schedule of the Environmental Quality (Industrial Effluents) Regulations 2009, or as prescribed by such public utility authorities from time to time;

b. Where public water supply system is not available, points of abstraction of water by a community (more often rural) wholly dependent on the river for water supply;

c. Important public recreational areas used for contact recreational activities or sports; or

d. Locations along the river which are critical or known to be critical for conservation of endangered aquatic species and habits (including fish breeding, maturation and feeding grounds).

For Siting Upstream of Sensitive Receptor, the following conditions are to be fulfilled before a site is considered accepted:

a. No significant hazardous material with potential to cause acute toxicity is used in its process or is generated in the course of its operations; and

b. The industry or the activity has to show that it is capable of adopting on or more of the following measures:

- It has the technology and capability to adopt a complete recycle and/or reuse process for wastewater that is generated and no effluent is to be directly discharged into any watercourse, or
- Treated effluent that meets prescribed limits can be conveyed and discharged downstream of the sensitive receptor(s), or

c. Treated effluent that meets prescribed limits can be diverted to another river catchment which has no sensitive receptor.

Siting Criteria For Worker Housing

The main purpose of the worker quarters is to provide housing for the industrial workers to be located at the nearest location available for ease of access to their work place. To ensure suitability and compatibility of the worker quarters, its design criteria was based on the requirements stipulated under the:

a. **Workers Minimum Standards of Housing and Amenities (Amendment) Act 2019** – being the governing Act for development and operation of worker's housing in Malaysia. Project Proponent is required to obtain the Certificate of Accommodation from the Director General of Labour, as stipulated under Section 24(D) of the Act.

b. *"Garis Panduan Perancangan Penginapan Pekerja Berpusat dan Prosedur Penyediaan Penginapan Pekerja Secara Jangka Pendek (2021) by PLANMalaysia.*

Further to the above, the design for the housing units and facilities are in line with the Guidance Document entitled "**Workers" Accommodation: Processes And Standards" (2009)**, by the International Finance Corporation (IFC) [member of the World Bank Group] and European Bank for Reconstruction and Development (EBRD)

4. SENSITIVE RECEPTORS OF CONCERNS

Taman Negara, Pahang, Malaysia

4.1 SENSITIVE RECEPTORS OF CONCERNS

When determining an industrial siting, it is essential to identify nearby sensitive receptors to minimize potential negative impacts on human health, the environment, and overall quality of life. Sensitive receptors are more vulnerable to the harmful effects of industrial activities, including air emissions, noise, and water pollution. Avoiding proximity to these receptors allows for better risk management, enhanced environmental protection, and improved well-being for local communities.

Sensitive receptors are defined as components that could be adversely affected by pollution or accidental releases from industrial processes, including air, water, noise, and odor pollution. This chapter will explore the classification of sensitive receptors into two primary categories: human and environmentally sensitive areas.

4.2 HUMAN

Human sensitive receptors refer to components directly involving human populations. The sensitivity of these components is typically classified based on the distance between industrial sites and the receptor locations. Examples include:

a) Residential Areas:
   landed housing, high-rise housing, urban residentials, sub-urban residentials.
b) Public Facilites:
   Hospitals, medical facilities, schools, institutions and other educational centers.
c) ‘Orang asli’ traditional or ‘reserved’ land and ‘Native Customary Land’.
d) Worker’s housing (on-site and off-site), centralised labour quarters (CLQ).
e) Sites gazetted or dedicated to be of national, historical, cultural, religious, and tourism value.
f) Areas gazetted or dedicated for recreation and sports including parks and green areas


Residential Area


School/Public Facilities


Native Customary Land

4.3 ENVIRONMENTALLY SENSITIVE AREA

These '*environmentally sensitive areas*' are often classified as 'environmental receptors' referring to those component(s) that will be affected due to pollution and/or accidental release from industrial activities or processes that liberates air and water pollution. The 'receptor' may be represented by different components

- Natural system; include animals, plants, soil, water and physical elements.
- Man-made; include areas, structures and institutional facilities dedicated for human well-being and for social, cultural and religious activities

The natural system is highly sensitive to environmental changes caused by human activities. These changes can directly affect plant and animal species or indirectly impact them through alterations to their habitats and life support systems. Some examples of such areas include:

a) **Protected Areas** (PA), such as gazetted national and state parks, wildlife reserves/sanctuaries, marine parks, protection forest estates, biosphere reserves, and other areas designated for statutory protection.

b) **Land above the 1000m** contour, excluding Special Management Areas like Cameron Highlands - Kinta - Lojing, Fraser's Hill - Genting Highlands - Bukit Tinggi - Janda Baik, and Fraser's Hill (refer to Figure 4-1).

c) Additionally, there are **ecologically sensitive areas** that require protection. Some of these are not currently gazetted or protected by law but are vital due to their ecological importance for the conservation of species or habitats.

d) **Forests**, which serve as habitats for diverse flora and fauna.

e) **Lakes**, which provide critical water sources for ecological balance.

f) Surface **water supply rivers** and **reservoirs** used for public water supply

g) **Groundwater Supply** aquifers and their recharge zones.

h) The area within 100m of a site, not necessarily gazetted, which is known for **migratory birds** to congregate for feeding, roosting, breeding or nesting.

i) **River Reserves**, which are protected areas aimed at maintaining river water quality.

j) A defined beach or area known for turtle and terrapin landing and nesting

k) A defined wetland and the catchment area within 50m of the wetland

l) Land reserved or dedicated for conservation of geological formations and scenic areas

m) Riparian reserve defined or proposed to be a 'river or riparian reserve' by a relevant authority (such as the Department of Irrigation and Drainage)

n) Land, places, buildings or structures listed or gazetted as being of national or international heritage value

The list is not exhaustive, and other areas may also be of ecological importance and require protection

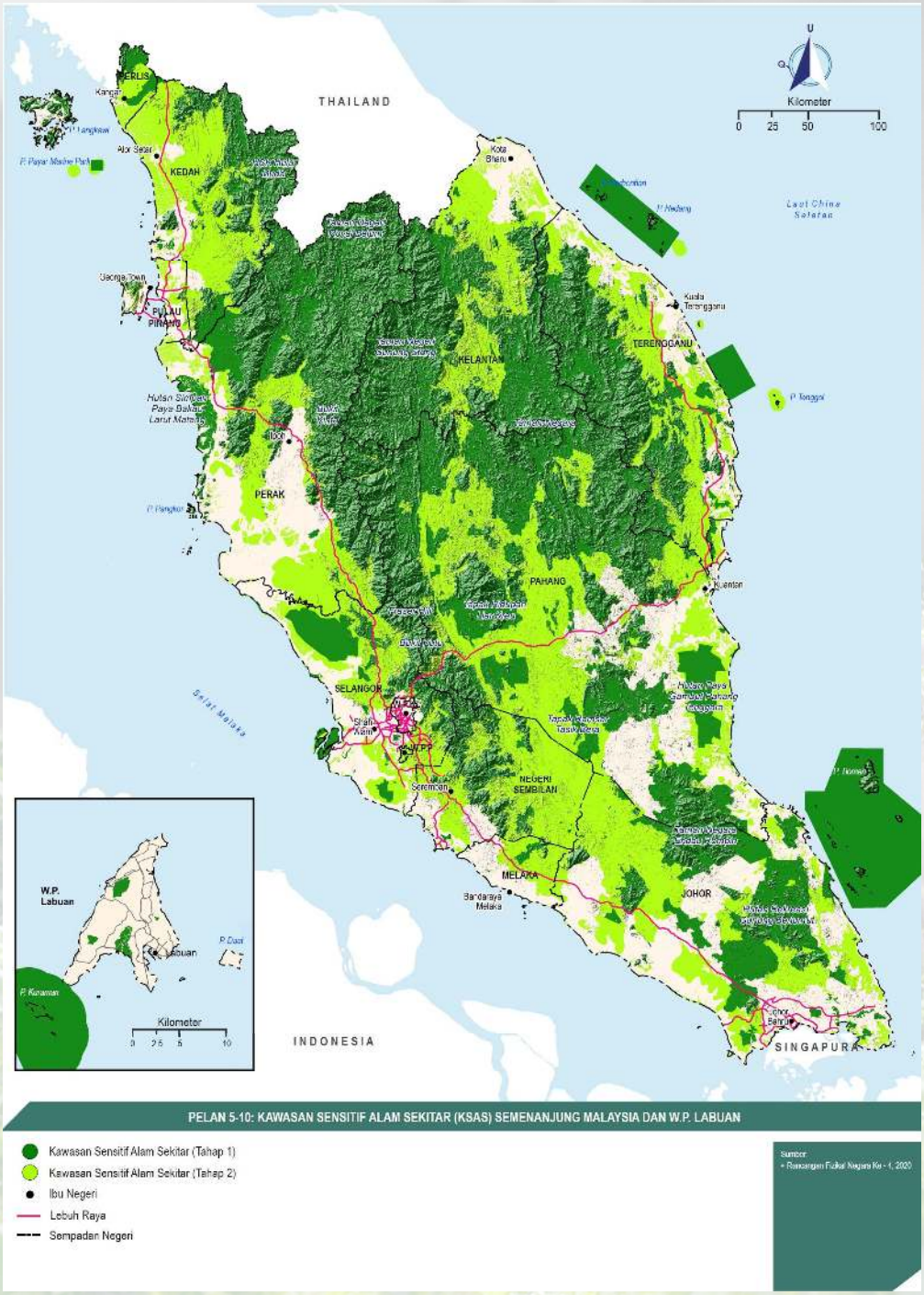
.

Some ESAs have been identified in the National Physical Plan and other State conservation strategies and plans. In such cases, the National Physical Plan (NPP) and other related guidelines must be referred to ensure compliance with existing policies and regulations.

Further information and details on ESAs can be obtained from PlanMalaysia, which is accessible via https://myplan.planmalaysia.gov.my/.

ESA for the States of Sabah and Sarawak are presently taken to include gazetted State Parks, Wildlife Reserves/Sanctuaries, Marine Parks, Protection Forests identified within Permanent Forest Estates, UNESCO Biosphere Reserve and Heritage Site, and may include those that have been declared to be State historical, cultural or religious sites by the respective States. For more information, please refer to relevant authorities

Figure 4.1: National Physical Plan 4 – Environmentally Sensitive Areas (ESA)



5. SETTING OF BUFFER ZONE

Bayan Lepas, Pulau Pinang
Photo by Kai on Unsplash

5.1 DEFINITION OF BUFFER ZONE

Buffer zone or 'Buffer Area' is the 'separation area' or 'separation distance' that lies between two or more other areas or activities for the purposes of mitigation of potential conflicts and for protection of the environment. Buffer zones are intended to safeguard and protect human lives, property, comfort and well-being, and sensitive ecological resources from the pollution sources, such as:

a) Fire and/or explosion,
b) Noise and vibration,
c) Air pollution due to emissions of particulates and gaseous pollutants,
d) Smoke and fume; or
e) Odorous emissions,

A buffer zone is a designated area around industrial or potentially hazardous activities where sensitive or incompatible land uses are restricted or require special protective measures. Its primary purpose is to minimize environmental harm and reduce the risk of pollution affecting sensitive receptors. This protective space acts as a crucial pollution prevention measure by providing a separation that reduces the exposure of vulnerable areas to industrial impacts.

Buffer areas are not an alternative to prevention and control at source and the adoption of high standards of environmental management by those engaged in activities which have potential to impact the environment. But rather, buffer zone should be considered as an added measure to assist in minimizing off- site impacts due to residues which remain even with the adoption of preventive and mitigation measures.

The ideal solution to minimize impacts to the environment is for activities which have potential to cause environmental pollution to contain their impacts and risks on-site (meaning, within its property boundary). However, some industries by their nature generate a range of emissions that cannot be fully mitigated or contained on-site and their residual emissions are likely to impact areas that are adjacent to or surrounding it. In general, the degree of impact reduces with increasing distance from the source and the imposition of a buffer between such activities and sensitive receptors is to take account of such potential residual impacts.

The guidelines identify **two (2) types** of buffer zones, each serving a distinct purpose in minimizing the impact of industrial activities on surrounding areas:

a. **Recommended Buffer (as in Local Plan)**: This refers to the suggested **minimum distance between the boundary of an industrial area and the nearest residential area.** It functions as a general planning guideline intended to provide a basic level of separation between industrial operations and the community, thereby reducing potential exposure to air emissions, noise, and other impacts. For certain types of industries classified under the LPI, particularly those located within light industrial area, such as handicrafts, and warehousing; the recommended buffer zone may be applied as an appropriate buffer.

b. **Actual Buffer**: The actual buffer refers to the **separation distance required for pollution sources**, as determined through detailed environmental modeling and/or risk assessment. The actual buffer distance accounts for the nature of the industrial activity, potential environmental hazards, and the proximity of sensitive receptors such as residential areas, schools, and healthcare facilities. Its purpose is to ensure

an adequate level of protection by preventing direct or unsafe exposure to pollutants and other associated risks.

When determining the appropriate buffer zone, it is essential to consider the specific risks associated with industrial activities, especially those involving hazardous materials. A comprehensive risk assessment is a fundamental part of this process, ensuring that the buffer zone effectively mitigates potential hazards and protects surrounding communities and the environment.

Risk assessment is particularly crucial for projects involving large quantities of hazardous materials. It evaluates the potential impacts on nearby communities and the environment while ensuring that safety measures are in place to prevent incidents such as fires, explosions, or toxic releases. The assessment also includes risk management strategies, emergency response plans, and risk communication protocols to mitigate adverse effects and enhance overall project safety.

Integration of Recommended and Actual Buffers

In determining the appropriate siting for a new industry, both the Recommended Buffer and the Actual Buffer shall be taken into consideration. To ensure adequate protection of nearby sensitive receptors, **the buffer distance that is greater between the two shall be applied.**

Example 1 (MPI)

For example, consider a food products manufacturing facility located within a medium industrial area. The Recommended Buffer, as may be stipulated in the Local Plan, is 150 meters. However, environmental modeling indicates that an Actual Buffer of only 100 meters is sufficient to mitigate the associated environmental impacts. In this case, since the Actual Buffer is less than the Recommended Buffer, the Recommended Buffer of 150 meters shall be applied to ensure adequate separation.

Actual Buffer < Recommended Buffer

→ Apply the Recommended Buffer (i.e., the greater distance)

Example 2 (HPI)

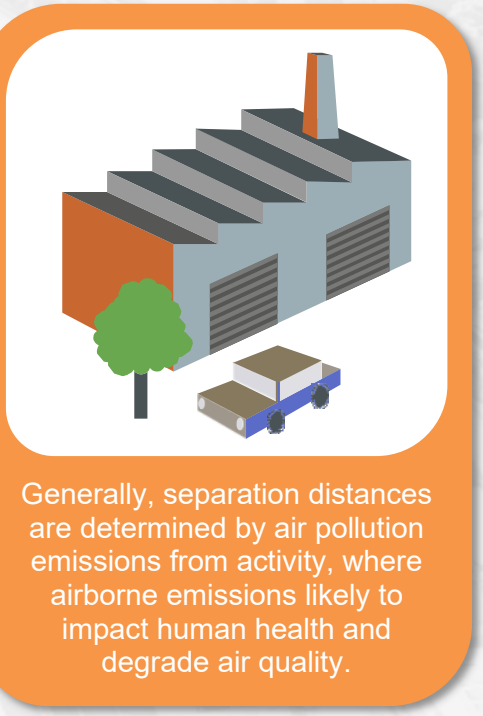
For example, consider a chemical manufacturing plant proposed within a designated heavy industrial area. The Recommended Buffer, as outlined in the Local Plan, is 300 meters. However, due to the nature of the industrial processes involved, including the handling of hazardous chemicals and the potential for toxic emissions, risk assessment and dispersion modeling indicate that a minimum separation distance of 800 meters is required to protect nearby sensitive receptors such as residential areas and a hospital. In this case, since the Actual Buffer is greater than the Recommended Buffer, the Actual Buffer shall be applied to ensure adequate protection from pollution sources (tank farm/ stack/ chimney).

Actual Buffer > Recommended Buffer

→ Apply the Actual Buffer (the greater distance)

5.2 BUFFER THROUGH MODELLING

For setting of buffer, it is **best to be determined by assessment method or detailed evaluation, where possible via modelling**, and this is when potential impacts from the industrial or polluting activity have been evaluated thoroughly. For note, buffer setting will be more conservative and is specific mainly for separation distances related to air pollution emission concerns, odour issues, noise concerns and visual aesthetics from the activity.



Generally, separation distances are determined by air pollution emissions from activity, where airborne emissions likely to impact human health and degrade air quality.

Buffer distances are recommended on the basis of the type of industry or activity taking account of the following considerations:

a) Their potential to impact the environment and the significance of the impacts to human health and environmental conservation

b) The industry standard normal applied for pollution control and the relative efficiency of the control system(s)

c) Fugitive dust emission potential from the industry or activity

d) The potential for odour generation/release

e) The risk posed to human health and safety due to exposure to pollutant, fire and explosion, and

f) The significance of the residual impact taking account of the industry standard for pollution control.

Best method to assess buffer is to undertake modelling of the potential impacts from the industrial activity or polluting activity, since the proposed site location has major bearing on the emission dispersion patterns. Land forms and topography is important aspect to review when deciding suitable location, especially for activity that is likely to release significant emissions. Emission screening methods can be used to assist decision makers as initial evaluation. For some activity which may have existing plants elsewhere, information from that operation can be useful and use as screening basis for site selections.

The screening process can be effectively carried out using modelling tools such as SCREEN3. Information and data to be inputted into the modelling tools varies by software used, however the most common required data includes emission parameters and site location. These data are already at project proponent's disposal, obtained during earlier steps of the screening process. Output of the modelling tools usually entails the relationship between the concentrations of emission vs the distance from emission source. By assessing the output, project proponent can make a decision on suitability of proposed site. The most common modelling tools are SCREEN3 (or SCREEN View), AERMOD View, AERSCREEN View, TSCREEN and CTSCREEN. For accidental releases involving hazardous chemicals, ALOHA is also widely used to estimate threat zones and assess potential health and safety risks to surrounding areas. Table 5-1 compares the respective tools on their features, input and output provided by the tools.

TABLE 5-1: Common Modelling Tools

TYPES	DESCRIPTION	INPUT REQUIRED	OUTPUT
SCREEN View	• User friendly interface for SCREEN3. • Preliminary modelling with SCREEN View can remove the need for more complicated modelling, saving time and resources.	• Source type • Source parameters (emission rate, stack height and diameter, stack gas exit velocity and temperature, ambient air temperature dispersion coefficient) • Receptor data (height above ground)	• Distance vs concentration graph
AERMOD View	• Complete and powerful air dispersion modelling package used extensively to assess pollution concentration and deposition from a wide variety of sources. • Incorporates building downwash algorithms, advanced depositional parameters, local terrain effects, and advanced meteorological calculations.	• Source type • Source parameters (GPS coordinate, emission rate, stack height and diameter, stack gas exit velocity and temperature	• Maximum concentration by distances • 3D visualization of emission concentration
AERSCREEN View	• User friendly interface for AERSCREEN screening-level air quality model and associated modelling programs. • Estimate worst case impacts of ground level concentrations for a single source by interfacing with the screening mode of the AERMOD model	• Source type • Source parameters (emission rate, stack height and diameter, stack gas exit velocity and temperature, air temperature) • Building data • Meteorological data • Terrain data • Receptors' distances	• Final maximum concentration and maximum concentration at the minimum ambient distance • Fumigation results • Maximum concentrations by distance • Meteorology associated with the maximum concentration
TSCREEN	• Toxics Screening Model (TSCREEN) is a Gaussian model that implements the procedures to correctly analyze toxic emissions and their subsequent dispersion from one of many different types of possible releases for superfund sites	• Particulate matter emission type • Source parameters (emission rate, stack height and diameter, stack gas exit velocity and temperature) • Building parameters • Terrain type • Averaging time	• Maximum concentration and the distance to the maximum • Dispersion characteristics and pollutant • Concentrations of the resulting plume
CTSCREEN	• CTSCREEN is a Gaussian plume dispersion model designed as a screening technique for regulatory application to plume impaction assessments in complex terrain. CTSCREEN is a screening version of the CTDMPLUS model.	• Maximum concentration and the distance to the maximum • Dispersion characteristics and pollutant • Concentrations of the resulting plume	• Worst-case 1 hour concentration
ALOHA	• Chemical dispersion model for accidental hazardous releases. • Suitable for emergency response and planning. • Simulates toxic gas clouds, fire, and explosion scenarios.	• Chemical type and quantity • Release scenario (e.g. tank leak, pipe rupture) • Weather conditions (wind speed/direction, temperature, humidity) • Source location	• Threat zones by toxic concentration • Impact distance for health effects • Dispersion footprint map • Fire/explosion hazard zones (if applicable)

5.3 RISK ASSESSMENT

Risk assessment is a systematic process used to evaluate potential risks associated with hazardous installations and materials. It involves hazard identification, probability or frequency analysis, and consequence analysis.

Qualitative Risk Assessment uses descriptive scales to evaluate potential consequences and their likelihood based on experience and fundamental principles. It serves as an initial screening tool, providing a subjective assessment of the risk posed by a proposed installation. If the assessment deems the risk insignificant or acceptable with appropriate control measures, further analysis is not required.

In contrast, **Quantitative Risk Assessment** uses numerical data to estimate probabilities and consequences, offering a more objective and analytical evaluation of risks. Risk is classified into two categories:

a. Individual risk refers to the probability of a fatal injury occurring to a person at a specific location near a hazardous installation; and

b. Societal risk considers the likelihood of multiple fatalities within a group exposed to hazards in the same vicinity. This indicator is particularly useful when evaluating the suitability of a proposed major hazardous installation in areas that could affect a large number of people.

Recommended Risk Assessment Procedure

The risk assessment procedure for a proposed major hazard installation should include:

a. Hazard identification;
b. Qualitative risk assessment;
c. Quantitative risk assessment, including frequency/probability analysis, consequence analysis, and risk estimation.

Risk Tolerability

Risk assessment outcomes are typically evaluated against established criteria to determine whether the risk is broadly acceptable, tolerable, or unacceptable. In Malaysia, the recommended risk tolerability criteria are as follows:

(a) The 1×10^{-6} fatalities/person per year individual risk contour must not encompass involuntary recipients of industrial risks, such as residential areas, schools, hospitals, and other locations with continuous occupancy.

(b) The 1×10^{-5} fatalities/person per year individual risk contour must remain within industrial developments.

The minimum buffer zone distance should be defined by the extent of the 1×10^{-6} individual risk contour, ensuring a safe separation between industrial risks and surrounding areas.

For further details, please refer to the Environmental Impact Assessment Guidelines for Risk Assessment issued by the DOE (2004) or the most recent applicable edition.

Risk assessments are required to be prepared for High Polluting Industries and High-Risk Polluting Industries.

5.4 THE RECOMMENDED BUFFER DISTANCES AND ACTUAL BUFFER DISTANCE ACCORDING TO INDUSTRY CLASSIFICATION

The guidelines define two types of buffer zones to minimize the impact of industrial activities on surrounding areas. The **Recommended Buffer Zone** is a general distance between industrial areas boundary and residential zones, providing a safe separation to reduce residents' exposure to pollution, noise, and other impacts. In contrast, the **Actual Buffer Distance** is industry-specific and determined through detailed modeling (from pollution source) and risk assessment to evaluate environmental hazards and calculate a safe distance for sensitive receptors like homes, schools, and hospitals.

Table 5-2: Indicative Recommended Buffer and Actual Buffer Based on the Classification of Industries

CLASSIFICATION OF INDUSTRY	Recommended Buffer (as in Local Plan) (Minimum Distance from Industrial Area Boundary to Residential Area)	Actual Buffer (Individual Industry Distance from Pollution Source to Sensitive Receptors)
Low Polluting Industries (LPI)	Minimum of 50 m	Actual buffer to be established from modelling study. (depends on the activity)
Medium Polluting Industries (MPI)	Minimum of 150 m	Actual buffer to be established from modelling study
High Polluting Industries (HPI)	Minimum of 300 m	Actual buffer to be established from modelling study and risk assessment.
High Risk Industries (HRI)	Minimum of 1000 m	Actual buffer to be established from modelling study and risk assessment.
Special Industries (SI)	• The actual buffer for these processes or sources are to be established from modelling studies and/ or risk assessment. • For cottage industries, there is no specific minimum recommended buffer. However, where significant noise or heat is generated, a buffer of 10 metres or more is suggested. • Refer to local authority and relevant agency	

The recommended buffer applicable to manage situations such as the following:

a) Process areas which are significant sources of residual air pollutants or odor;
b) Process areas which have potential for significant fire and explosion;
c) Process areas which have potential to release hazardous chemical or fumes[1];
d) Raw material handling, transfer and storage during which significant fugitive emission(s) is likely to occur, for materials such as, coal, coke, mineral ores, scrap metal, rocks and their products, clay, and other materials;
e) Storage areas for hazardous chemicals or materials which have potential to result in fire or explosion;
f) Product handling, transfer and storage which may result in significant fugitive emission(s),
g) Stacks and other point sources of air emissions; and
h) Areas from which residual noise is expected to be significant.

For facilities identified above, the appropriate buffer distance for such facilities is recommended to be established from modelling studies.

However, the recommended buffer is not applicable to the following facilities:

a) Nuclear power plant and facilities which use hazardous radioactive materials or have potential to generate radioactive wastes[2] which contain long-lived radionuclides;
b) Aerodrome or airport facilities;
c) Outer space facilities such as rocket launcher;
d) Husbandry, including animal husbandry and crop cultivation[3]; and
e) Facilities not limited to the list above..

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1 Reference may also be made to: Occupational Safety & Health (Use and Standards of Exposure of Chemical Hazardous to Health) Regulations, 2000

2 International Atomic Energy Agency, Classification of Radioactive Waste, IAEA Safety Standard Series, No GSG-1, 2009

3 Garis Panduan Perancangan Ladang Penternakan Ayam

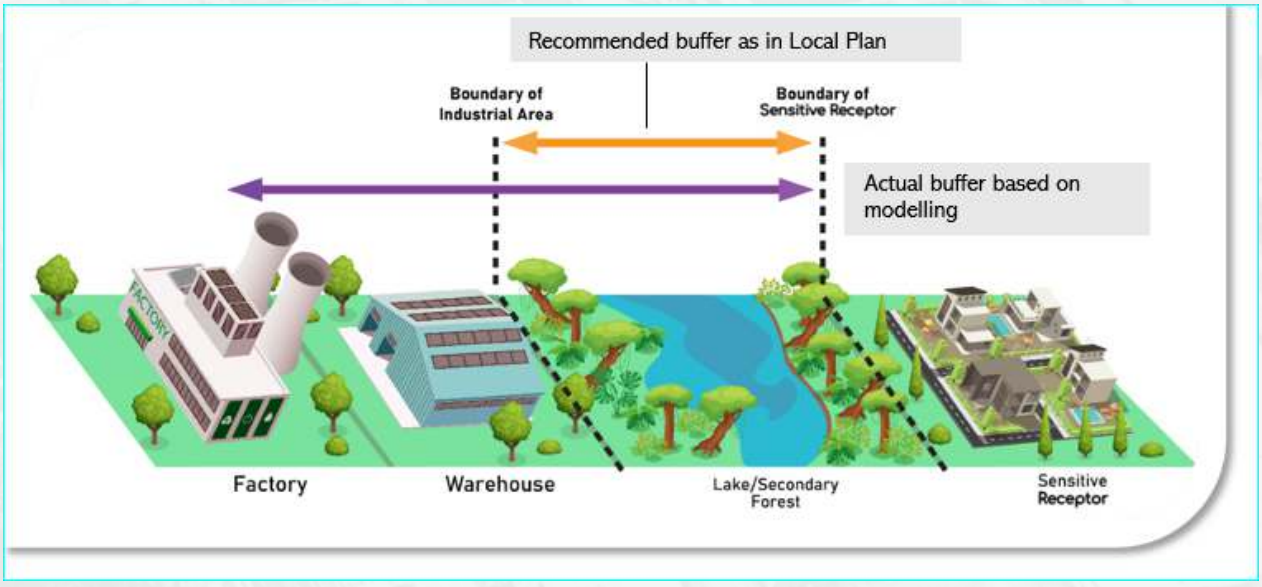
5.5 ACTIVITY & DEVELOPMENTS ALLOWED IN BUFFER ZONE

Buffer zones are not zones of zero-use, to be left as green areas or 'neutral' areas not to be developed. Rather, they are zones where use restrictions apply. Land uses and activities which are acceptable to be within the buffer zone depend on their compatibility with the sensitive receptor in the neighboring or adjacent areas as outlined in the following:

a) Roads and road reserves,
b) Car parks,
c) Drains and drain reserves,
d) Rivers and riparian reserves,
e) Areas designated for soil conservation and slope protection,
f) Lakes and other natural open water systems,
g) Forests (whether primary, secondary or disturbed,
h) Parks and open spaces, and building setbacks,
i) Golf courses and other sporting facilities,
j) Agriculture involving the planting of permanent crops such as rubber, oil palm, cocoa, coffee and commercial crops and flowers
k) Commercial activities,
l) Warehouses not involved in the storage of hazardous or dangerous goods,
m) Light or service industries including workshops which do not generate significant air emissions or noise and vibration, and
n) Other downstream activities (which may include packing, packaging, or other preparation processes) which do not generate significant noise, vibration, odor or air emissions which cannot be contained within the project boundary,
o) Acceptable amenities or facilities such as Office and associated staff facilities and amenities (including canteen, gym, rest rooms, etc)
p) Cemetery, grave yard

An idealized situation may be seen in **Figure 5.1**.

Figure 5.1: Recommended Buffer and Actual Buffer Adjacent to Sensitive Receptors



5.7 APPLICATION AND CHARACTERISTICS OF BUFFER

In the buffer setting for an activity, the objective is to meet the required buffer distance, and this is achieved considering all available distances and activity in between the pollution source and its receptor. This flexibility allows one to locate the main sources of pollution well away from the sensitive receptor, to achieve the required buffer distance, by effective overall layout planning of the project. This flexibility is also a means to manage residual impacts which may still be significant even with the adoption of the best available or most practical control technology.

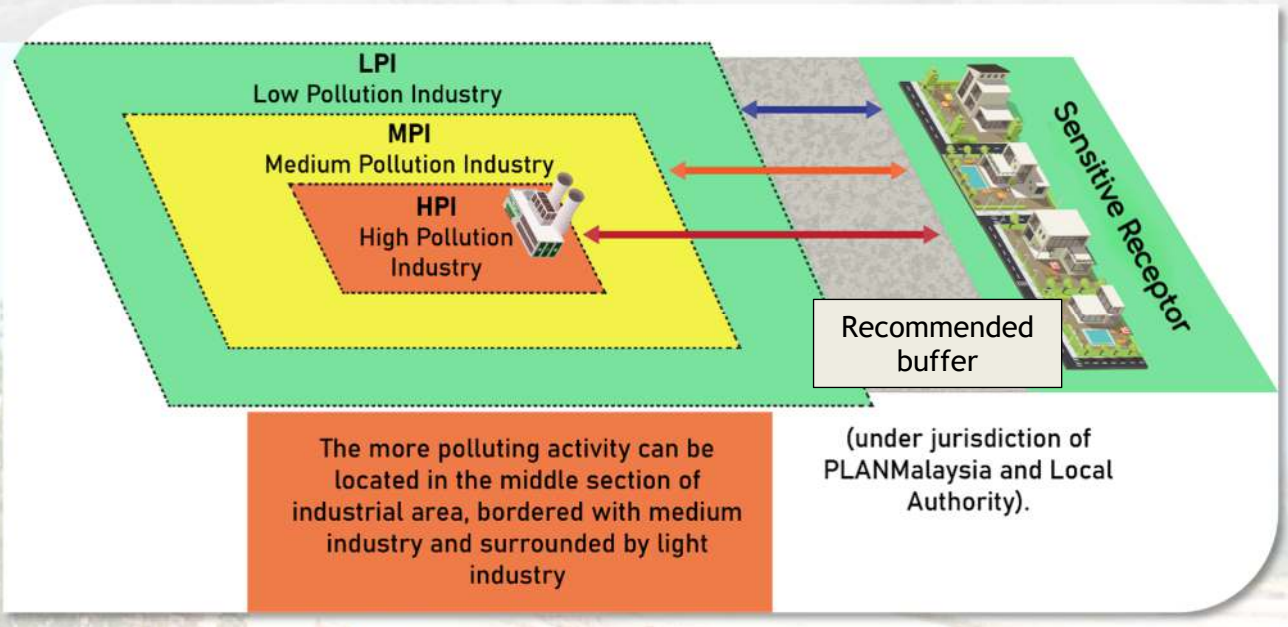
In the Local Plan, provisions have been allowed for buffers between the industrial land and adjacent developments. This buffer is to ensure that safety distance is in place as minimum protection for the receptors. In some industrial area planning where further allocation is planned for “light polluting industry”, “medium polluting industry” and “high polluting industry”, the in between industrial activity enable to provide as “buffer” to the more polluting activities. With such planning, one can easily determine where they should be located in the industrial area (**Figure 5.2**).

In situation where an activity requires more distance and should this be a constraint, review of the layout planning can be done to move away the pollution source to achieve the buffer distance. Examples is given in **Figure 5.3** and **Figure 5.4** respectively.

Ways to achieve required or more buffer distance:

a) Revision to the project layout to achieve an 'extended' buffer zone,
b) Relocation of polluting facilities or activities away from sensitive receptors,
c) Introduction of 'barriers or physical measures to reduce impacts to the receptor (generally applicable to impacts due to noise, fire, visual & aesthetics), and
d) Other improvement measures, such as adoption of better process technology to reduce or ameliorate emissions or reduce pollutant generation.

Figure 5.2: Well-Planned Industrial Area with Activity Classifications



Sectional View

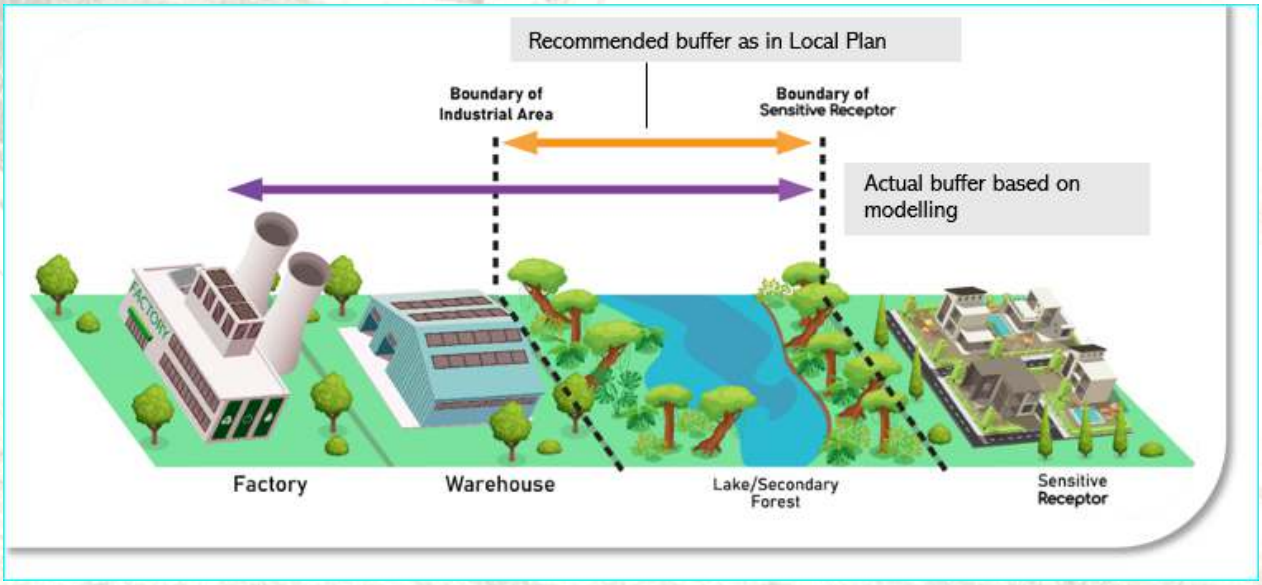
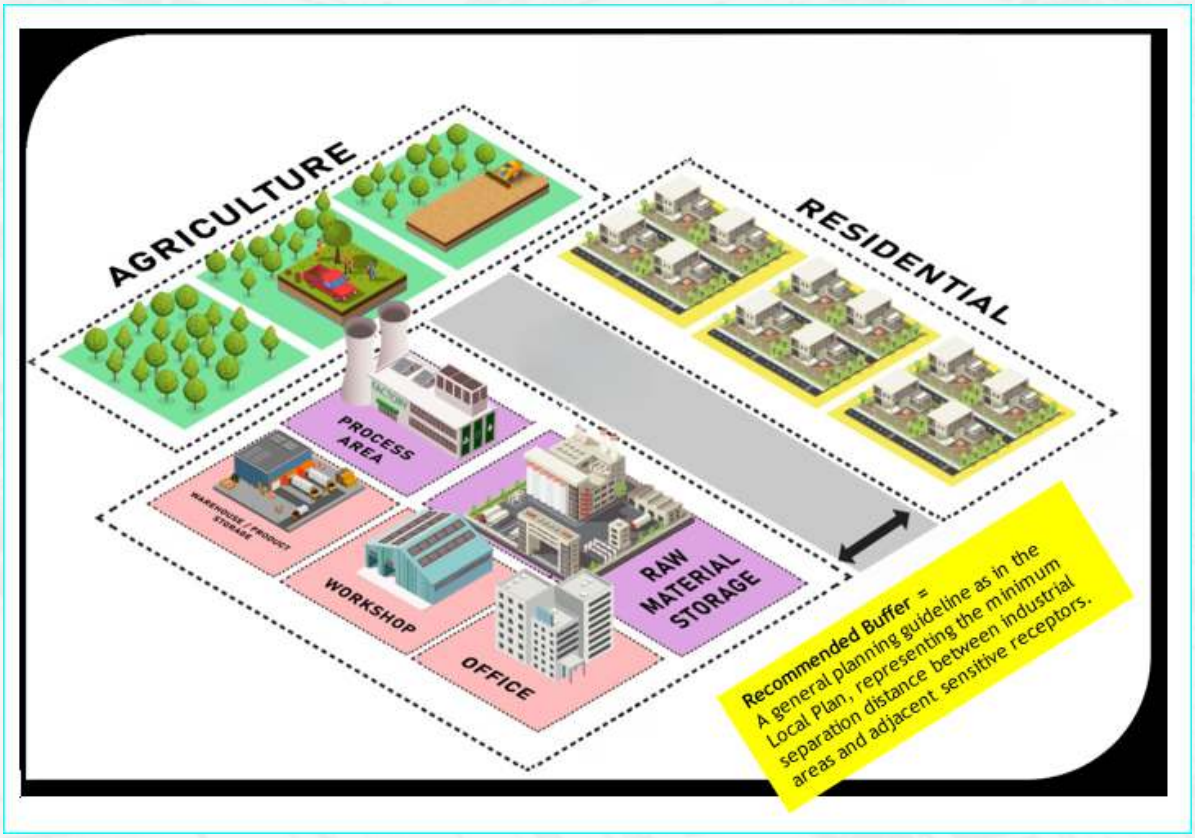


Figure 5.3: Initial Layout Development for Industrial Area



Revised Layout Optimizing Use of Actual Buffer

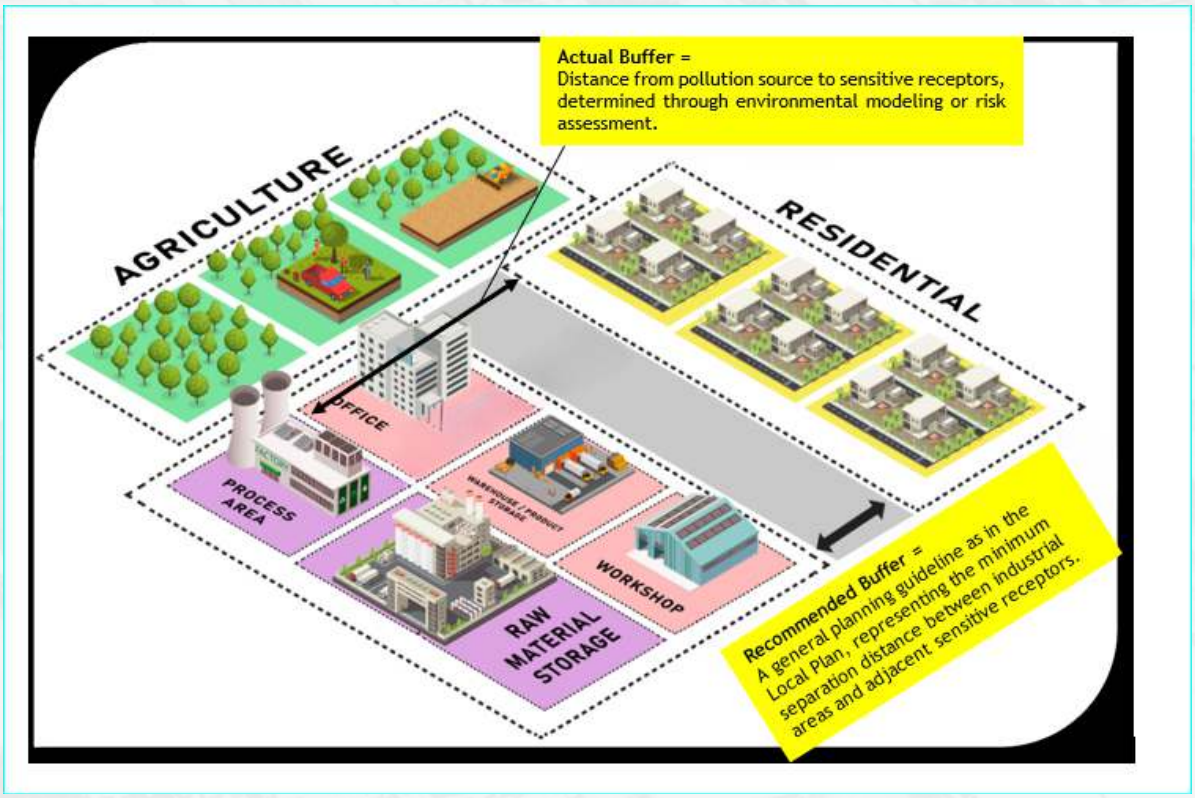
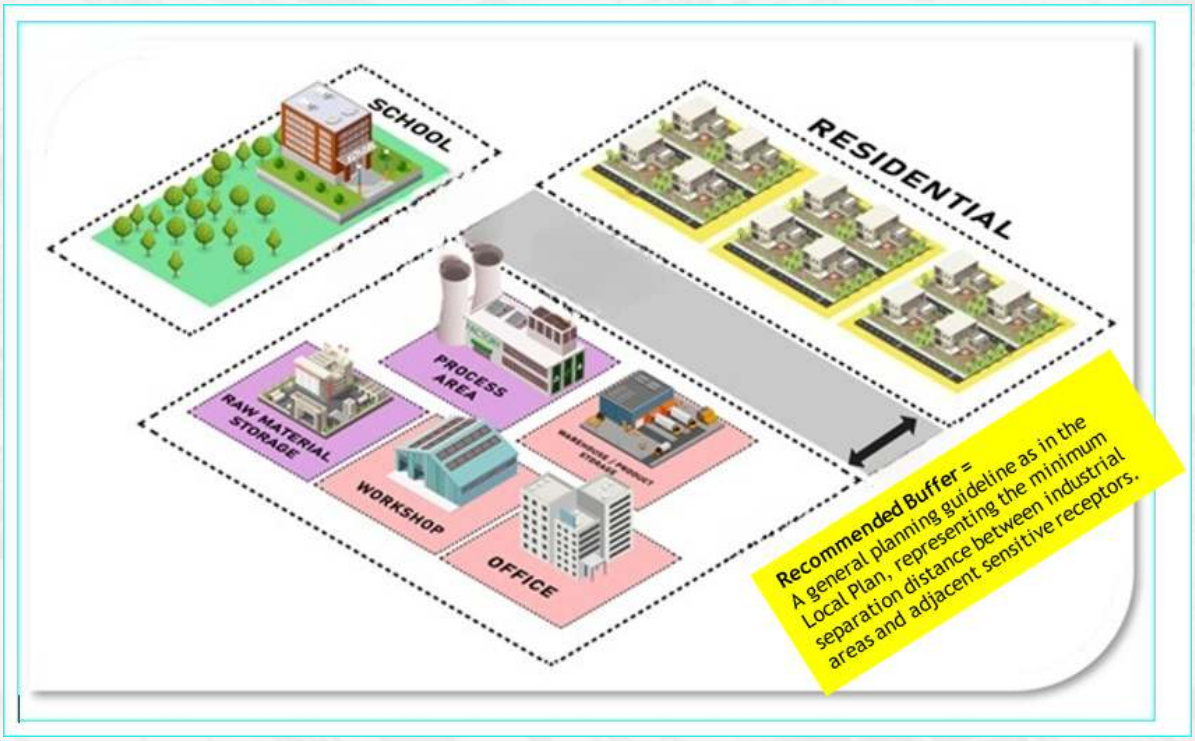
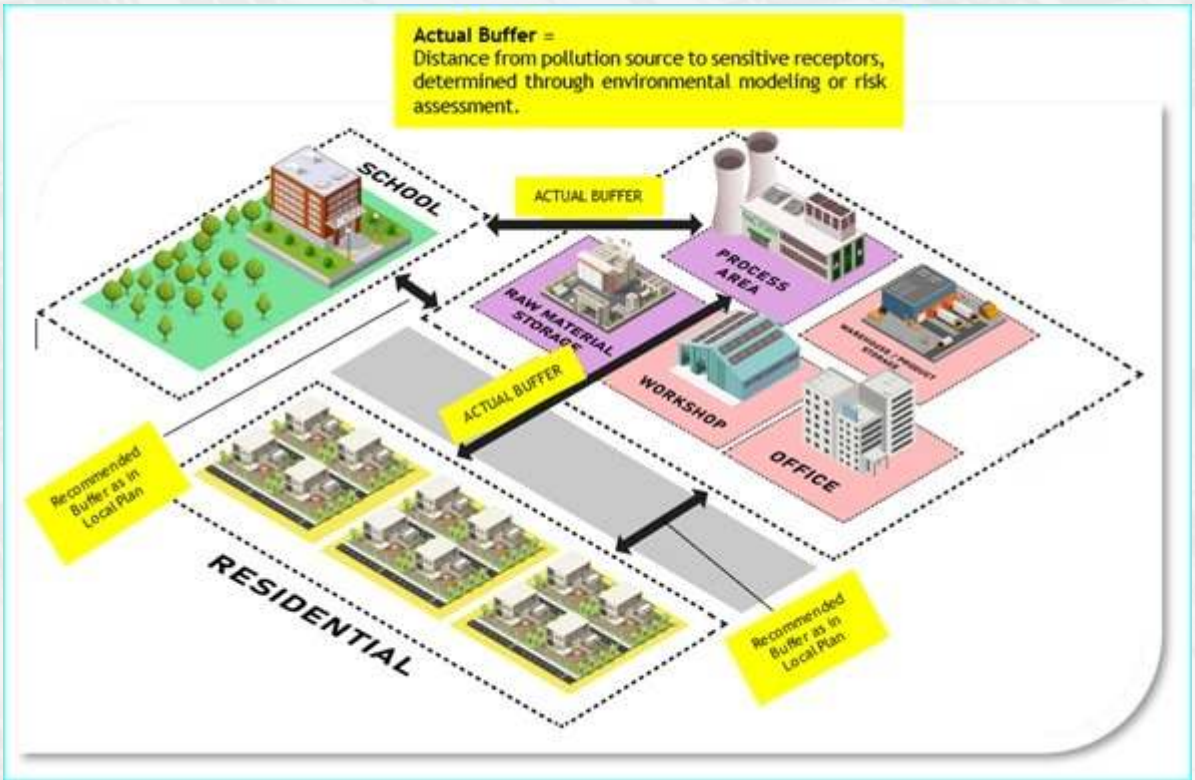


Figure 5.4: Initial Layout Development of Residential Adjacent to Existing Industrial



Revised Layout Optimising Use of Recommended Buffer



5.8 BUFFER ZONE UNDER OTHER AGENCIES

Various authorities and agencies have issued recommended buffer guidelines to be adopted in the planning and development of various types of buildings, facilities, and structures. The guidelines include the following:

a) Garis Panduan Perancangan Perindustrian published by PLANMalaysia Headquarters or PLANMalaysia@Negeri. This Guidelines are not intended to override these guidelines and at all times are to complement them as far as possible. For example, setback distances for industrial buildings required by the Department of Town and Country Planning will continue to apply and may be included as part of the overall recommended buffer distance (previously known as Secondary Buffer distance) in these Guidelines.

b) Malaysian Sewerage Industry Guidelines – Volume IV, Sewage Treatment Plants, 3rd Edition, National Water Services Commission (SPAN). Jan 2009. Sewerage Industry Guidelines issued by SPAN on buffer distances for sewage treatment plants will continue to be used for those plants which are constructed to serve approved residential or mixed developments. For regional or municipal-wide sewage or sludge treatment plants, the buffer distances specified in these Guidelines are recommended to be adopted.

c) Department of Occupational Safety and Health Malaysia. Regulations for the control of industrial major accident hazards have also been issued by the Department of Occupational Safety and Health Malaysia which relate to the control of industrial activities having potential to cause major accident hazards [Occupational Safety and Health (Control of Industrial Major Accident Hazards) Regulations 1996]

d) State Planning Authority

.

6. POLLUTION CONTROL POLICY INSTRUMENTS FOR INDUSTRIES IN MALAYSIA

Northport, Port Klang
Photo by Esmonde Yong on Unsplash

6.1 OVERVIEW OF POLLUTION CONTROL FOR INDUSTRY AND RELATED ACTIVITIES IN MALAYSIA

The federal government of Malaysia adheres to and is created by the Federal Constitution of Malaysia, the supreme law of the land. The federal government adopts the principle of separation of powers under Article 127 of the Federal Constitution of Malaysia, and has three branches: executive, legislature and judiciary. The state governments in Malaysia also have their respective executive and legislative bodies. The governing environment law is the Environmental Quality Act 1974, latest being the amendments under incorporated as the Environmental Quality (Amendment) Act 2012 (incorporating amended up to 2024).

The Environmental Quality Act (EQA), 1974 and its accompanying legislations, enforced by the DOE, stipulates the prevention, abatement, control of pollution and enhancement of the environment in Malaysia and prohibits the emission, discharge or deposit of environmentally hazardous substances, pollutants or wastes into any area, segment or element of the environment. Any discharges produced must be rendered to safe levels meeting the standards or limits set by the EQA 1974. Specific Regulations and Orders were also formulated under the various Sections of the EQA 1974 to specify the standards and limits for compliance of identified pollutants and for management of various environmental aspects. The EQA 1974 also specifies controls for activities, including industrial activity, that are likely to result in the release or discharge emission of pollutant that would cause detrimental impacts to the environment. As such, any activity that is deemed prescribed under the EIA Order 2015, shall comply with the requirements of Section 34A of EQA 1974, and mandatory to obtain approval from the Director General of Environmental Quality of the Department of Environment (DOE) prior to its development. Alongside this requirement, prescribed premises specified under the respective Regulations must also obtain Written Permission and Licenses prior to start of its operation

6.2 EIA REQUIREMENT FOR INDUSTRIAL ACTIVITY

“Prescribed activity” refers to an activity that is prescribed by order made under Section 34A of EQA 1974. To determine if the project requires an EIA study, the first review should be made with the prescribed activities listed in the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 2015. Procedures for preparation of an EIA study can be referred to Environmental Impact Assessment Guideline in Malaysia 2016 (EGIM 2016) or the latest guideline published by the DOE. List of prescribed activity can be referred to EIA Order 2015 and details on undertaking an EIA study can be referred to EGIM 2016.

In essence, the EIA study is an instrument used by the Project Proponent to identify and evaluate the potential environmental impacts of a proposed project, evaluate alternatives and design appropriate mitigation, management and monitoring measures. The main objective of the EIA is to ensure that decisionmakers consider environmental impacts before deciding whether to proceed with the project. While it is within the DOE’s jurisdiction for approving the EIA study, the outcome of the study is key input for the overall project approval. For undertaken the EIA study, some of the key components mandatory are required where reference to be made to the EGIM 2016 for the full details.

For industrial activities that are not subject to the EIA requirements (i.e. non-prescribed activity), it is mandatory for submitting the pollution control system upon introduction of new pollutions source(s), or modification of existing pollutants discharge or release that will be installed for the Project as per above via the Written Notification. Reference must be made for compliance with the statutory standards and limits under the respective Regulations under the EQA 1974 especially on the emission release, discharges and waste management. Submission for the Written Notification (WN) to the DOE shall be made at the initial stages of project planning and preferably before or alongside the submission for planning approval to the project approving authority. The Project Proponent may consult DOE for advice on the compliance requirements need to obtain for the project.

Similar to proper siting identification and selection, planning and design for pollution control system must be incorporated at earliest possible phase of the project to ensure the compliance to the set standards and limits are addressed early and incorporated into the design.. Project must have sufficient details include detailed design information on the pollution control system for decision-making.

6.3 OVERVIEW OF PROJECT APPROVAL PROCESS

For all projects, **strategic and early planning** should be encouraged in order to decide on an optimal location of project site while ensuring that key environmental concerns are protected. The laws, procedures and guidelines pertaining to a project development process in Malaysia can be quite extensive, depending on the project siting location, components and design. It also involves various Government agencies, ranging from the planning departments and technical agencies, that imposes their own respective requirements for mandatory compliance for the project to be implemented. Some of the more pertinent laws to be complied with, include the National Land Code (NLC) 1965 (NLC, 2008), the Town and Country Planning Act, 1976 (Act 172), the Local Government Act 1976 (Act 171), Uniform Building By Law 1984 (UBBL), the Street, Drainage and Building Act 1974 (Act 133) and the Environmental Quality Act 1974.

Land development by planning control is referred to Part IV of the Town and Country Planning Act (TCPA), 1976 and planning guidelines. In Section 19, the TCPA states that “no person, other than the local authorities, shall, commence, undertake, or carry out any development unless planning permission in respect of the development has been granted to him under Section 22 (treatment of application or extended under Subsection 24 (3) (lapse of planning permission)” (LOM, 2006). Thus, it is mandatory for a planning approval to be obtained prior to project development, including industrial activity.

The approval for a project lies within the jurisdiction of the **Project Approving Authority**, which is either the federal agency, state agency or local authorities. The project approving authority shall call upon for support from various technical agencies that has been entrusted with respective legislations and powers of enforcement. To facilitate the planning approval process, One-Stop Centre (OSC) which is normally at the Local Authority level, acts as a central agency for receiving, processing and approval of Planning Permission. **Figure 6.1** presents a typical set-up of the environmental requirements in planning permission (KM) process, of which may differ according to respective Local Authority.

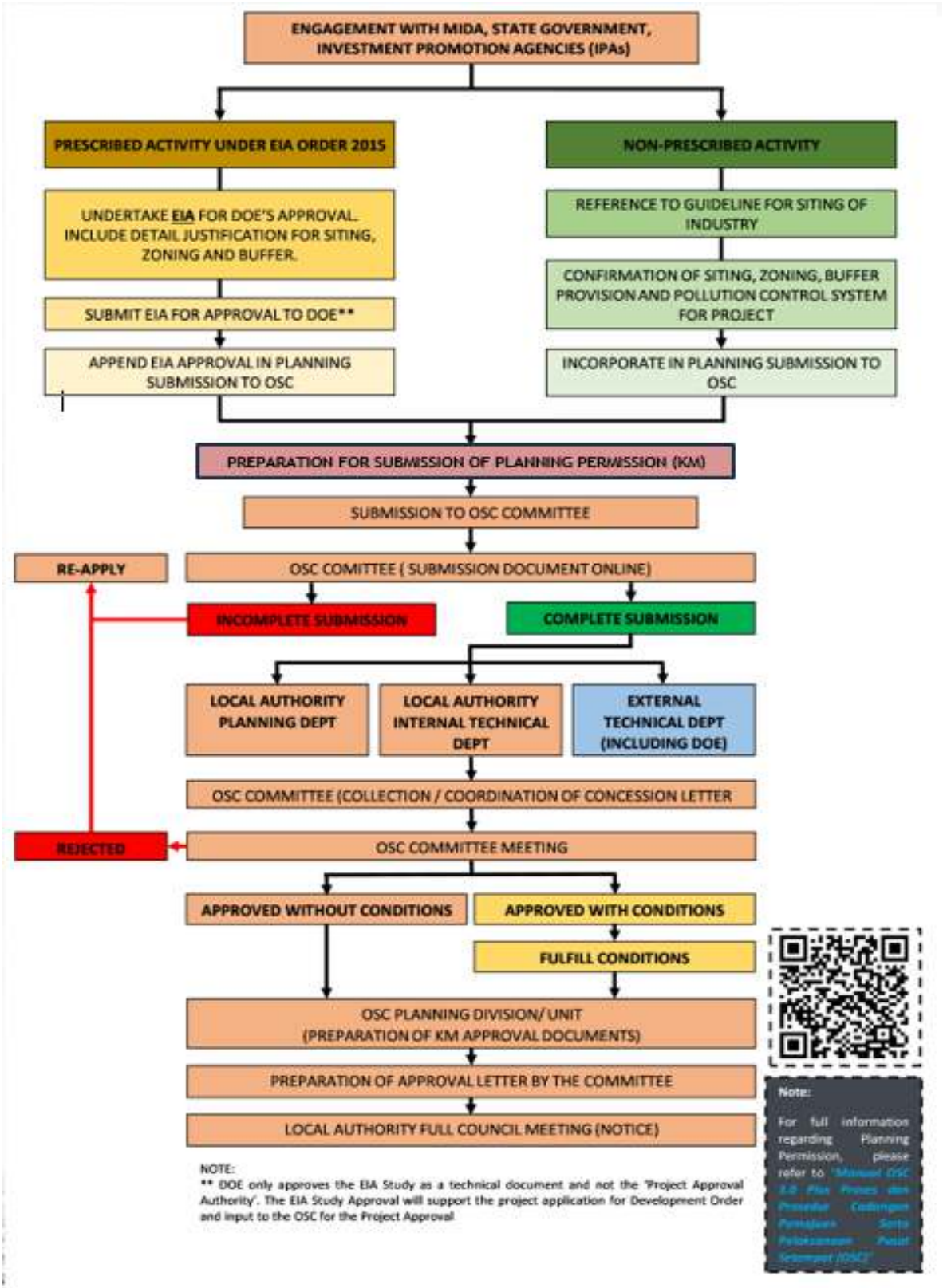


Figure 6.1: Environmental Requirements in Planning Permission and Approval

6.4 ROLE OF PLANNING AUTHORITY IN PROJECT SITING AND PROVISION OF BUFFER

Under the current legislative setup, spatial planning in Malaysia is governed by the Town and Country Planning Act 1976 (Act 172) (incorporating amendments up to 16th January 2017) which is enforced by PLANMalaysia. The National Development Planning Framework comprises of three (3) levels of planning, namely the National Physical Planning at the Federal level, the State Planning at the State level and the local planning at the Local Authority level (**Table 6-1**).

The National Physical Plan (NPP) sets the overall guidelines and strategies for Federal and State Governments to control development and land administration. The NPP includes measures to tackle climate change and conserve natural resources and biological resources in the country, including establishing carbon sinks for sequestration, establishing sustainable forest and water management, and a Central Forest Spine to link key ecological areas in Peninsular Malaysia. With the establishment of the broad framework of the NPP, these policies and plans from the NPP are developed into the State Structure Plan (SSP) so as to provide policies on development and use of land at the State level. The Local Plan is drafted at the local district level, outlining detailed and site specified development facilitation and control. Another form of local level plan is the Special Area Plan, which provides detailed plan of areas, needing special attention.

These planning guidelines, namely the NPP, State Structure Plan and Local Plans establishes the land use gazettement at each of these levels. This includes areas that has been identified and/or gazetted for industrial activities, based on the NPP strategies and main conurbation areas within the Peninsula Malaysia. The NPP also identifies the industrial clusters based on its physical existence and State's economic planning needs. Further detailing and specifications for each industrial area are then carried out at the State and Local levels under the purview of the State government, Local Authority and PLANMalaysia.

PLANMalaysia being the main authority in the spatial planning, has produced specific guidelines for various types of developments, including industrial estates, to detail out requirements of the land use design as well as zoning and buffer specifications. While the primary focus of PLANMalaysia is on the spatial design, the buffer establishment takes into consideration safety distances between industries and receptors. PLANMalaysia is the lead agency, entrusted to undertake all land use planning by following set criteria as per their guidelines, to ensure proper infrastructures and provisions are accounted for. PLANMalaysia has produced specific guidelines for various types of developments, including industrial estate, to detail out the requirement of the permitted, permitted with the conditions and prohibited uses within specific land uses and also require buffer zone to ensure land use compatibility. While the primary focus of PLANMalaysia is on the spatial design, however, the buffer requirements in the local plans / special area plans are defined without any description of the industry or information on the scale of the industry or the environment surrounding the industry. In general, the recommended buffer zone is set in the absence of a detailed, site-specific assessment for a proposed industrial. For case-by- case assessment that may not meet the minimum requirement of the project approving authority, the best buffer zone requirement should be determined to the satisfaction of the Department of Environment (DOE).

Apart from PLANMalaysia, there are various authority of concerns may impose respective requirements for siting and zoning of project locations. Project Proponent are required to engaged with the relevant authority to understand the specific compliance requirements, basedon the scope and nature of the project and incorporate into the project planning and design. Engagement must be carried out as early possible in project planning stage.

TABLE 6-1: PROVISION OF SITING OF INDUSTRY IN SPATIAL PLANS

SPATIAL PLANNING DOCUMENT	PROVISION ALLOWED FOR
PENINSULAR MALAYSIA (EXCLUDING FEDERAL TERRITORY OF KUALA LUMPUR)	
National Physical Plan (presently NPP-4 gazetted in 2021)	Industrial estate / area clusters based on the economic viability and growth potential. Key points from NPP: • The industrial areas are more likely to be built near urban areas and ports. • Industrial sites near urban areas will further strengthen growth over time and promote the development of industry clusters Strategies recommended: • Upgrading physical environment in terms of landscaping, images and relevant facilities • Upgrading infrastructures and utilities to provide services capable of matching the need of modern industries including ICT and communication • Improving environmental standard for waste management and effluent emission • Expanding the managed industrial park mechanism for all industrial areas
State Structure Plans(at each State level)	Structure planning by the State itself based NPP strategies and the State's economic policies. Focus on area or district of interest and avoiding the creation of "grey areas" for industrial development by provision of "mixed industrial areas" that allow for a variety of industries to be placed within one area which has the tendency to create incompatibility issues. SSP is to assist the Local Authority in their detailed planning by identifying zoning of the areas and to some extend specify the provision for specific areas allocation for heavy industry, medium industries and light industries.
Local Plans (at district level by Local Authority)	Detailed planning by the respective Local Authority and requiring to zoom in to the details and tailored to the area or district of interest. Care is to be taken and observed to prevent creation of "grey areas" for industrial development by provision of "mixed industrial areas" that allows for a variety of industries to be placed within one area which has the tendency to create incompatibility issues. Planning should take care the specifics by identifying proper zoning of the areas and this include provision of specific areas allocation for heavy industry, medium industries and light industries.
Spatial Planning Document	**Provision Allowed For**
	In the Local Plans, the Local authority with PLANMalaysia must provide the necessary buffer between the industrial estates or areas to receptors, and to account for future "encroachment" of receptors. The buffer provision must account for sufficient safety distances in event of fire or emergencies. Most time the buffer areas are utilised in various forms, such as access roads, pipeline reserves, commercial areas, utilities areas, etc.

SABAH	SARAWAK	FEDERAL TERRITORY OF KUALA LUMPUR
Town and Country Planning Ordinance	Land Code, Chapter 81, Laws of Sarawak	Kuala Lumpur Structure Plan as in accordance with Section 7 of the Federal Territory (Planning) Act 1982 (Act 267)

All information is subject to the latest legislative provisions.

7 ECO-INDUSTRIAL PARK & MANAGED INDUSTRIAL PARK

Pengerang Eco-Industrial Park Concept
PeIP MasterPlan

In Malaysia, Eco-Industrial Park (EIP) is a new way forward as promoted for eco-friendly industries under the NPP-3. At present, there is no proper EIP being set-up or planned. Nonetheless, there are limited "Industrial symbiosis", which is a related but more limited concept in which companies in a region collaborate to utilize each other's by-products and otherwise share resources, does exist among the industries and within the existing industrial areas/ complexes. The drivers for such practice is mainly the economics.

The National Physical Plan 3 (NPP-3)

Under **The Action PD1.4C - Promoting the Planning of New Integrated Industrial Areas** promotes the establishment of Eco-Industrial Park (EIP) as a new way forward to promote sustainable development. While it is stated that the EIP to be promoted for new industrial areas, the existing industrial areas can be planned to integrate this concept with proper planning.

Waste generators are always implementing measures to reduce costs and find means to resell, instead of disposal, financially benefits their operation. As such it is encouraged that such established to be planned for and considered by among the industries as to enable for sustainable development.

There are various design and concepts that can be considered for the EIP. Some of which can be conceptualised on resource-based and more commonly are the waste-based as illustrated in **Figure 7-1**. The concept will be mainly for ensuring the key or anchor industry/industrial activities and integration of other related or downstream activities.

Action PD1.4C: Promoting the Planning of New Integrated Industrial Areas

Under this Action plan, planning for new industrial area should take into account new technology resulting from innovation and research as well as to look at world market demand. These shifts in planning considerations will alter the processing method and operations of many industries, especially in manufacturing. Therefore, addition of sustainable, high-tech and eco-friendly infrastructures, utilities and facilities must be prepared in new industrial area to cater to the global transformation trends. Such additions include:

- Shifting of complex manufacturing towards fast engineering and advanced manufacturing techniques
- Innovations and new technologies
- Sustainable manufacturing and circular economy
- Human-centric manufacturing processes

Development of Eco-Industrial Park (EIP), an industrial park which promotes business cooperation between industries and local public for efforts involving pollution reduction and improvement of resource-sharing efficiency, shall be promoted for new industrial areas.
These efforts will lead towards sustainable development, stimulate economic growth while improving environmental quality. When planning the Eco-industrial parks, importance is given to prioritising environmental management, promoting high value-chain industries and developing technology for green and clean industries.

The National Physical Plan 4 (NPP-4)

Under **Action PD 2.3B: Prioritising the Planning of New Integrated Industrial Areas**, the **Managed Industrial Park (MIP) concept serves as a strategic approach to promote sustainable industrial development by integrating economic, social, and environmental goals within an efficient and inclusive framework.** It was introduced as a solution to challenges faced by traditional industrial development, which is often uncoordinated, scattered, and inefficient—leading to inconsistent utility supply, inadequate infrastructure, and difficulty in complying with complex regulations. Environmental issues such as pollution and public health risks also tend to arise due to the lack of a holistic management system. To address these concerns, MIP features a **centralised management entity** that oversees and coordinates all operations systematically, ensuring a balance between economic growth, environmental sustainability, and social well-being.

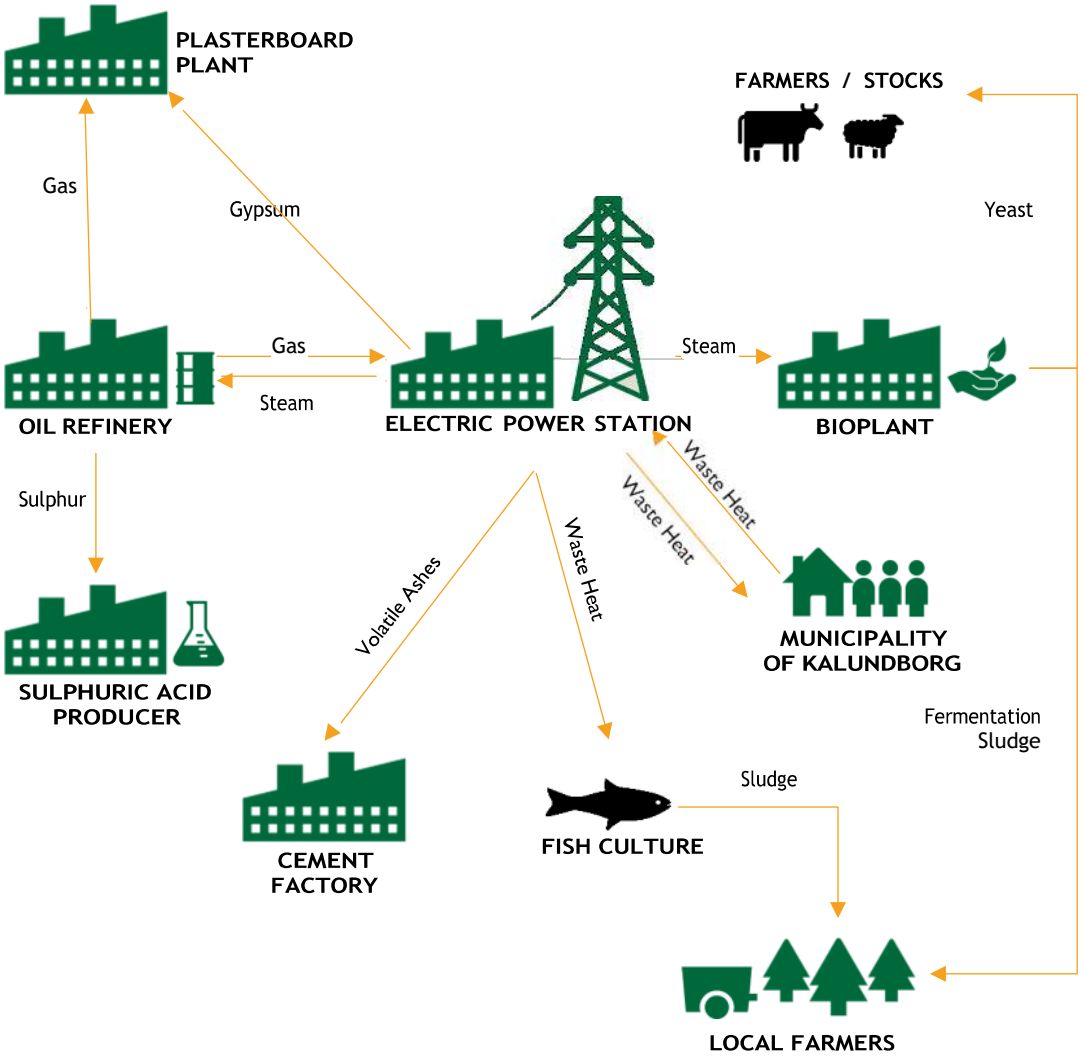
MIPs differ from traditional industrial zones by offering:

- **Comprehensive services** that enhance efficiency, productivity, and compliance
- **Centralised infrastructure management** including utilities, transportation, security, and waste systems
- **Support ecosystems** such as research centers, skill development hubs, and logistics services

Examples of MIPs include technology parks, export processing zones, and Special Economic Zones (SEZs), all of which act as catalysts for innovation and economic growth.

For further information on EIP and MIP, please refer to the NPP and Garis Panduan Perancangan Perindustrian, published by Jabatan Perancangan Bandar dan Desa (PLANMalaysia).

Figure 7.1: Illustration of Waste Based Recovery Practiced in Kalundborg EIP, Denmark



Source: Adapted from Kalundborg EIP, Denmark

APPENDICES

APPENDIX A: INDUSTRY CATEGORISATION BY BANK NEGARA MALAYSIA (BNM)

Small and Medium Enterprises (SME) are classified as either "Manufacturing" or "Services and other sectors". These categories for SME industries were endorsed by the National SME Development Council (NSDC), which is chaired by the Prime Minister with members from key Ministries and Agencies in July 2013 (circular no BNM/RH/CIR 028-1, sourced from www.bnm.gov.my).

Broad definition for SME :

MANUFACTURING Refers to physical or chemical transformation of materials or components into new products	Sales turnover not exceeding RM50 million OR Full-time employees not exceeding 200 workers

SERVICES AND OTHER SECTORS
 	
SERVICE:
Where "services" refer to refer to all services including distributive trade; hotels and restaurants; business, professional and ICT services; private education and health; entertainment; financial intermediation; and manufacturing-related services such as research and development (R&D), logistics, warehouse, engineering etc.
 	
OTHER SECTOR:
Where "other sectors" refers to the remaining 3 key economic activities, namely:
• Primary Agriculture
  • Perennial crops (e.g. rubber, oil palm, cocoa, pepper etc.) and cash crops (e.g. vegetables, fruits etc.)
  • Livestock
  • Forestry & logging
  • Marine fishing
  • Aquaculture
 	
• Construction
  • Infrastructure
  • Residential & non-residential
  • Special trade
 	
• Mining & quarrying
	Sales turnover not exceeding RM20 million
	OR
	Full-time employees not exceeding 75 workers

Infrastructure if the industry exceeds the above capacity, it is defined as a large industry.

The Categorisation based on **size of operation** are as follows:

CATEGORY	MICRO	SMALL	MEDIUM
Manufacturing	Sales turnover of **less than RM300,000**	Sales turnover from **RM300,000 to less than RM15 million**	Sales turnover from **RM15 million to not exceeding RM50 million**
	OR	OR	OR
	full-time employees **less than 5**	full-time employees from **5 to less than 75**	full-time employees from **75 to not exceeding 200**
Services and Other Sector		Sales turnover from **RM300,000 to less than RM3 million**	Sales turnover from **RM3 million to not exceeding RM20 million**
		OR	OR
		full-time employees from **5 to less than 30**	full-time employees from **30 to not exceeding 75**

IF THE INDUSTRY EXCEEDS THE ABOVE CAPACITY, IT IS DEFINED AS LARGE INDUSTRIES.

APPENDIX B – Extract from Volume 2 *Kelas Kegunaan Tanah*

BPK		TAHAP INTENSITI	DENSITI (UNIT/EKAR)	PLINTH	NISBAH PLOT	KETINGGIAN (MAK.)
3.5A	KLUSTER PERTANIAN_JELAPANG PADI MADA	Amat Rendah	1 - 4	40%	1 : 2	3 Tingkat

KOLUM I KELAS /AKTIVITI UTAMA	KOLUM II AKTIVITI YANG DIBENARKAN	KOLUM III AKTIVITI YANG DIBENARKAN DENGAN SYARAT		KOLUM IV AKTIVITI YANG TIDAK DIBENARKAN	KOLUM V LAIN-LAIN SYARAT
		AKTIVITI	SYARAT		
G_PERTANIAN & PENTERNAKAN	G1_Pertanian Komersial_Padi G3_Akuakultur Aktiviti Sedia Ada • Rujuk **Jadual II(B)**	**A_Perdagangan** A1_Perkedaian A1.1_Runcit A1.4_Perkhidmatan A1.5_Perkhidmatan Khusus A3_Institusi Swasta A3.1_Pendidikan A3.2_Kesihatan A5_Bangunan Penginapan A5.4_Rumah Inap Desa A5.7_Chalet A7_Bangunan Sementara A8_Gerai & Pasar A9_Makanan & Minuman A11_Kegunaan Khas (Burung Walit)	*1) Aktiviti Perkedaian :* • Aktiviti perkedaian untuk keperluan tempatan dan penjualan hasil pertanian sahaja dibenarkan, dengan syarat tidak menimbulkan kacau ganggu kepada penduduk tempatan. • Juga tertakluk kepada kelulusan dan ketetapan PBT dan agensi teknikal yang berkaitan. • Ketinggian Maksimum Kedai = 2 tingkat. *2) Aktiviti Institusi Swasta* Pembangunan untuk tujuan **A3 (Institusi Swasta : A3.1 (Pendidikan), A3.2 (Kesihatan) dan A5.4/5.7 (Resort/Inap Desa)** dibenarkan bagi mana-mana kawasan yang berpotensi dibangunkan dengan syarat memenuhi *performance criteria* berikut: 1. Memperolehi kelulusan tukar syarat tanah kepada komersial atau institusi awam/kegunaan awam daripada PBN; 2. Memperolehi Kebenaran Merancang daripada PBT; 3. Densiti Rendah : < 8 unit/ekar atau 30 unit bilik/ekar; 4. Kawasan Plinth : 40%; 5. Ketinggian Maksima : 3 tingkat; 6. Penyediaan akses keluar masuk, infrastruktur, utiliti, kemudahan masyarakat, kawasan lapang dan rekreasi yang secukupnya seperti yang ditetapkan oleh garis panduan semasa dan piawaian yang diguna pakai oleh PBT dan agensi teknikal yang berkaitan.	Selain Aktiviti Yang Dinyatakan Di Kolum I, II & III.	• Sebarang aktiviti yang bercanggah dengan Kolum I, II dan III perlu mendapat kelulusan khas daripada PBN dan agensi teknikal yang berkaitan. • Pembangunan mana-mana kawasan yang berpotensi untuk tujuan pertanian komersial berskala sederhana dan besar dibenarkan dengan syarat: 1) Mendapat kelulusan dan penentuan syarat-syarat dan persetujuan agensi teknikal yang berkaitan seperti Jabatan Pertanian, Jabatan Alam Sekitar dan agensi teknikal yang berkaitan. 2) Mendapat kelulusan Kebenaran Merancang (KM) bagi pendirian bangunan. • Zon penampan bagi kawasan pertanian/penternakan serta industri sokongan adalah mengikut jenis aktiviti pertanian/penternakan yang dibenarkan, dengan merujuk kepada ***Guidelines for Siting and Zoning of Industry and Residential Areas, Department of Environment (Okt 2012).*** • Pembangunan mana-mana kawasan yang berpotensi untuk tujuan mineral hendaklah dibenarkan dengan syarat: 1. Mendapat kelulusan dan penentuan syarat-syarat dan persetujuan daripada Kerajaan Negeri dan agensi teknikal yang berkaitan. 2. Mendapat kelulusan Kebenaran Merancang (KM) perlombongan sebelum kerja-kerja perlombongan dijalankan. 3. Mendapat kelulusan daripada Jabatan Alam Sekitar dengan penyediaan Penilaian Awalan Tapak (AS-PATI-12) dan Laporan Impak Alam Sekitar (EIA). • Semua pemajuan/pembangunan perlu mengikut ketetapan akta dan garis panduan/piawaian semasa yang diguna pakai oleh PBN, PBT dan agensi teknikal yang berkaitan. • Zon Penampan tertakluk kepada syarat-syarat JPS.
		B_Perindustrian B1(A)_Industri Ringan Jenis A B1(B)_Industri Ringan Jenis B B2_Industri Sederhana B3_Industri Berat (Kilang padi)	• Dibenarkan Industri yang berkaitan dengan aktiviti pertanian dan penternakan serta berasaskan sumberjaya tempatan. • Perlu memperolehi kelulusan dan penentuan syarat-syarat dan persetujuan PBT dan agensi teknikal yang berkaitan.		
		C_Perumahan C1_Rumah Sesebuah C2_Rumah Berkembar C7_Rumah Kampung	**Perumahan dibenarkan untuk kegunaan pemilik:** • Kawasan liputan kediaman tidak boleh lebih daripada satu perlima (1/5) keseluruhan luas tanah atau 2.0 hektar mengikut mana yang lebih kecil [Kanun Tanah Negara, S115(4)].		

Gazzetted on 31/03/2022 @Warta No. 13 Jilid 65

Extract from Volume 2 *Kelas Kegunaan Tanah*, RT MP Kangar 2035

APPENDIX C

BORANG INPUT PEMBANGUNAN/ BORANG PEMBERITAHUAN MAKLUMAT ASAS PREMIS

Nota/ *Note*:

a. Borang ini diberi secara percuma/ *This form is provided free of charge.*
b. Sila tandakan "√" di dalam petak yang mana berkenaan/ *Please tick "√" in the box where appropriate.*
c. Salinan dokumen yang disertakan hendaklah disahkan benar/ *Attached copy of documents must be certified true copy.*
d. Sila gunakan lampiran jika ruang tidak mencukupi/ *Please use attachment if space insufficient.*
e. Sila lengkapkan borang permohonan ini dan kemukakan kepada Jabatan Alam Sekitar Negeri yang berkenaan bersama-sama maklumat dalam senarai semak seperti berikut:/ *Please complete this application form and submit to the relevant Department of Environment State Office together with the information in the following check list:*

SENARAI SEMAK/ *CHECK LIST*

BIL./ NO.	PERKARA/ ITEM	SILA TANDA "√" JIKA LENGKAP/ *PLEASE TICK "√" IF COMPLETE*
1.	Surat rasmi daripada pemohon bagi menjelaskan maksud permohonan. *Formal letter explaining the purpose of application.*	
2.	Salinan surat ulasan/pengesahan daripada Pihak Berkuasa Tempatan atau agensi berkenaan/ *Cover letter and letter from the relevant Local Authority or government agency* (jika berkaitan).	
3.	Salinan Sijil Pendaftaran Syarikat/ *Copy of Registration of Company (ROC).*	
4.	Salinan dokumen tanah Syarat Nyata Tanah/ *Copy of the Land Title document*	
5.	Salinan dokumen *Power of Attorney* yang berkenaan/ *Copy of the Power of Attorney document.*	
6.	Pengesahan zon guna tanah perancangan daripada Pihak Berkuasa Tempatan berkenaan/ *Confirmation of land use zoning from relevant Local Authority.*	
7.	Salinan laporan pemodelan dan/atau laporan kajian risiko untuk penetapan jarak penampan/ *Copy of the modeling report and/or risk assessment report for the determination of buffer distance.*	
8.	Pelan/peta lokasi lot tapak projek/ *Location plan/map of the project site.*	
9.	Pelan susun atur premis/ *Layout plan.*	
10.	Pelan guna tanah sekeliling dalam radius 500 meter dari tapak projek/ *Land use plan within 500 meter radius from project site.*	
11.	Carta alir proses pengeluaran yang menunjukkan dengan jelas unit proses dan tempat pencemar dihasilkan/ *Process flow chart showing the process unit and the point where pollutants are generated*	
12.	Gambar/foto bagi tujuan penjelasan dan pemahaman berkaitan/ *Pictures/photo for relevant explaination and comprehension.*	
13.	Semua dokumen dijilid/ *All documents are bounds.*	

A. TUJUAN PERMOHONAN ULASAN
PROPOSED OF THE APPLICATION FOR COMMENT

1. Sila pilih tujuan permohonan ulasan:
   Please select the purpose of the application for comment:

BIL./ NO.	TUJUAN PERMOHONAN ULASAN/ *PURPOSE OF THE APPLICATION FOR COMMENT*	SILA TANDA "√" / *PLEASE TICK* "√"
i)	Kebenaran Merancang/ *Development Order*	
ii)	Lesen Perniagaan*/ Business License*	
iii)	Lesen Pendudukan Sementara*/ Temporary Occupation Licence*	
iv)	Ubah syarat tanah*/ Land use change*	
v)	Lain-lain (Sila nyatakan)*/ Others (Please specify):*	

B. CADANGAN PEMBANGUNAN
PROPOSED DEVELOPMENT

2. **Tajuk Cadangan Projek/Aktiviti:**
   Proposed Project/ Activity Title:

_____
_____
_____
_____
_____
_____

3. **Pihak Berkuasa Tempatan yang meluluskan**:
   Approving Local Authority:

_____

Nota/ *Note*:

Tajuk cadangan projek hendaklah selaras dengan cadangan permohonan ke Pihak Berkuasa Tempatan atau Pihak Berkuasa Melulus Projek
The title of the proposed project should be in accordance with the proposal for the Local Authority or Project Approval Authority

C. MAKLUMAT PEMOHON
INFORMATION ON APPLICANT

4. **Maklumat Pemohon:**
***Information on Applicant*:**

a) Nama Pemohon/Syarikat:
Name of Applicant/Company:

_____

_____

b) Alamat Pejabat:
Office Address:

_____

_____

_____

_____

c) Telefon: Faks:
Telephone: _____ *Fax:* _____

d) Alamat e-mel:
E-mail address: _____

Nota/ *Note*:

Sila kemukakan salinan Sijil Pendaftaran Syarikat
Please attach a copy of Registration of Company (ROC)

5. **Maklumat pegawai yang boleh dihubungi:**
Information on contact person:

a. Nama: _____
Name:

b. Jawatan: _____
Position:

c. No. Telefon bimbit: _____
Handphone No:

d. E-mel: _____
E-mail

D. MAKLUMAT TAPAK CADANGAN PROJEK
INFORMATION ON THE PROPOSED PROJECT SITE

6. **Lokasi Tapak: *Site Location*:**

a) Nombor Lot/ PT:
Lot number/PT: _____

b) Mukim/Daerah/Negeri:
Territory/District/State: _____

c) Koordinat tapak:
Site coordinate:

Longitud (xx.xxxxxx°) ***Longitude*(xx.xxxxxx°)**	**Latitud (xx.xxxxxx°)** ***Latitude*(xx.xxxxxx°)**

d) Pelan kunci dan lokasi tapak (Lampirkan). ☐
Key and site location plan (Please attach).

e) Pelan Susunatur Projek (Jika berkaitan) (Lampirkan). ☐
Project Layout Plan (If related) (Please attach).

f) Pelan Konsep (Jika berkaitan) (Lampirkan): ☐
Conceptual Plan (If applicable) (Please attach):

i. Teknologi Hijau (*Green Technology)*
ii. *Best Available Technology (BAT)*

g) Peta Analisa Kecerunan (Sekiranya tapak projek melibatkan kawasan cerun) (Lampirkan) ☐
Slope Analysis Map (If project site involved slope area) (Please attach)

Nota/ *Note*:

Peta ini perlu mendapat pengesahan Juruukur Berlesen
This map needs to be endorsed by a Licensed Surveyor

7. **Status dan Hakmilik Tanah:**
Land Status and Entitlement:

a. Syarat Nyata Tanah: _____ ☐
(Lampirkan salinan dokumen Syarat Nyata Tanah)
Land Title: *(Please attach a copy of the Land Title document)*

b. *Power of Attorney (PA)* (Lampirkan salinan dokumen PA yang berkenaan) ☐
Power of Attorney (PA) (Kindly attach a copy of the PA document)

8. **Keluasan Keseluruhan Tapak Cadangan Projek & Setiap Lot Yang Terlibat:**
The total area for the Proposed Project Site & of each lot involved:

_____

9. **Guna Tanah Berdasarkan Zon Perancangan:**
Land Use in accordance with the Planning Zone:

a) Rancangan Fizikal Negara/Struktur/Tempatan/ Rancangan Kawasan Khas (RKK) atau apa-apa rancangan pemajuan di bawah Akta 172 atau berkaitan:

Physical/Structure/Local Plan/Special Planning Area or any development planning under the Act 172 or related:

_____

b) No. Blok Perancangan:
Planning Block No: _____

c) Zon perancangan guna tanah mengikut rancangan pemajuan:
Landuse planning zone according to development planning:

i) Perumahan (*Housing*) ☐

ii) Perindustrian (*Industrial*) ☐

iii) Pertanian (*Agriculture*) ☐

iv) Lain-lain (Nyatakan): ☐
Others (*Please specify*):

_____

_____

d) Gunatanah semasa tapak projek:
Current project site landuse: _____

e) Guna tanah sekeliling dalam lingkungan sekurang-kurangnya 500 meter jejari dari sempadan cadangan projek berdasarkan Zon Perancangan termasuk penerima sensitif (Lampirkan salinan pelan guna tanah):

Surrounding land use at least 500 meter radius from the boundary of the proposed project in accordance to the Planning Zone including sensitive receptor (Please attach land use plan):

☐

_____

Nota:

Rujukan berdasarkan Pelan Perancangan oleh PLANMalaysia atau Pihak Berkuasa Tempatan yang berkenaan
Reference made to the Planning document by the PLANMalaysia or the relevant Local Municipal Council.

f) Keperluan jarak penampan yang ditentukan melalui kaedah pemodelan berdasarkan potensi kesan pencemaran dan/atau kajian risiko.

The required buffer distance determined using modeling methods based on potential pollution impacts and/or risk assessment.

_____

g) Berdasarkan Zon Perancangan dan persekitaran sekitar, sila nyatakan jarak terdekat antara sempadan projek dengan penerima seperti berikut:

Based on the Planning Zone and surrounding environment, please state the nearest distance between the project boundary and the following receptors:

Penerima/ *Receptors*	**Jarak/ *Distance***
Petempatan penduduk (taman perumahan/kampung etc.): *Residentials*:	
Institusi (sekolah/klinik/hospital etc): *Institution (School/clinic/hospital etc):*	
Hutan simpan/Paya bakau: *Forest reserve/Mangrove*:	
Taman Negara/Taman Negeri/Taman Laut/Rizab Marin yang diwartakan: *Gazetted National Park/State Park/Marine Park/Marine Reserve:*	
Tapak RAMSAR/*Man and Biosphere*/Tapak warisan/Geopark: *RAMSAR site/Man and biosphere/heritage/Geopark site*:	
Badan air (lembangan sungai/loji rawatan air/empangan/tasik): *Water body (river basin/water treatment plant/dam/lake):*	
Kawasan sensitif ekosistem marine (contoh: rumput laut, karang, tuntung dan sebagainya): *Sensitive marine ecosystem (eg: sea grass, corals, terrapin etc.):*	
Kawasan industri: *Industrial area:*	
Lain-lain (nyatakan): *Others (Please specify)*:	

Nota/ *Note*:

Sila teruskan ke Bahagian E sekiranya projek pembangunan adalah **berasaskan industri**.
Sila teruskan ke Bahagian F sekiranya projek pembangunan **tidak melibatkan pembangunan industri.**

*For **industrial-based** development projects, kindly proceed to Part E.*
*For **non-industrial** development projects, kindly proceed to Part F.*

E. MAKLUMAT CADANGAN PROJEK BAGI INDUSTRI
INFORMATION ON PROPOSED INDUSTRIAL PROJECT

10. **Jenis dan jarak industri yang bersebelahan dengan cadangan pembangunan**
Types and distances of industries adjacent to proposed development

Jenis industri bersebelahan ***Type of adjacent industries***	**Jarak** ***Distance***

11. **Maklumat Operasi**
Information on Operation

a) Senarai bahan-bahan mentah yang digunakan:
List of raw materials used:

Bahan Mentah ***Raw materials***	**Kuantiti/hari** ***Quantity/day***

b) Senarai bahan-bahan kimia yang digunakan:
List of chemicals used

Bahan Kimia ***Chemicals***	**Kuantiti/hari** ***Quantity/day***

c) Senarai produk pengeluaran:
List of products:

Produk ***Products***	**Kuantiti/hari** ***Quantity/day***

d) Produk sampingan/sekunder (Jika ada):
By-product/secondary product (If any):

Produk sampingan/sekunder ***Secondary/ By-Products***	**Kuantiti/hari** ***Quantity/day***

e) Senarai barang yang disimpan (Bagi cadangan permohonan gudang sahaja)
List of goods stored (Only for proposed warehouse application)

Barangan ***Goods***	**Kuantiti/bulan** ***Quantity/bulan***

12. **Jadual Operasi**
Schedule of Operation

Jadual operasi ***Schedule of operation***	**Purata** ***Average***	**Maksimum** ***Maximum***
Masa Operasi *Hours of Operation*		
Bilangan Hari Operasi *Days of Operation*		

13. **Jumlah bilangan pekerja:**
Total number of workers: _____

14. **Huraian Proses Pengeluaran**
Description of Production Processes

Terangkan secara terperinci proses pengeluaran. Lampirkan carta alir proses yang gambar berkaitan.
Describe in detail production processes. Please attach the relevant process flow diagrams and pictures.

15. **Maklumat Mengenai Bekalan Bahanapi**
Fuel Supply and Energy Information

Alat pembakaran bahan api ***Fuel burning equipment***	**Bilangan** ***Number***	**Jenis bahan api** ***Type of fuels***	**Kuantiti (kg/jam)** ***Quantity (kg/hour)***
Dandang / *Boiler*			
Relau / *Furnace*			
Insinerator / *Incinerator*			
Set janakuasa / *Generator set*			
Lain-lain (Nyatakan) / *Others (Please specify)*:			

16. **Maklumat Mengenai Penggunaan Air Proses**
Process Water usage Information

Punca ***Source***	**Kuantiti (m^3/hari)** ***Quantity (m^3/day***

17. **Maklumat Mengenai Pencemaran**
Information on Pollution

a) Daripada carta alir proses pengeluaran, tunjukkan tempat penghasilan pencemar dan jenisnya.

From the process flow diagrams attached, show the points where pollutants are generated and their type.

Tempat Pelepasan ***Points of emmission/discharge***	**Jenis Pencemar** ***Type of pollutants***	**Kuantiti** ***Quantity***
	Udara / *Air*	
	Efluen / *Effluent*	
	Kumbahan / *Sewage*	
	Bau / *Odour*	
	Bunyi bising / *Noise*	

b) Alat-alat yang mengeluarkan bunyi bising (Sekiranya berkenaan):
Noise emitting equipment used in the factory (If relevant)

Alat/ *Equipment*:
_____
_____
_____
_____
_____

c) Buangan terjadual/ sisa pepejal:
Scheduled wastes/ solid wastes:

Adakah pembangunan projek menghasilkan: ***Does the project generate:***	*Jika ya, sila nyatakan makluamt beriktu:* *If yes, please specify the following information:*		
	Kuantiti/ Quantity	Kaedah pelupusan/ *Method of disposal*	Tempat Pelupusan/ *Disposal location*
Buangan terjadual/ S*cheduled waste:* Ya/ *Yes*: ☐ Tidak/ *No:* ☐			
Sisa pepejal/ *solid waste*: Ya/ *Yes*: ☐ Tidak/ *No*: ☐			

18. **Maklumat Mengenai Alat Kawalan Pencemaran Udara dan Air**
Information on Air and Water Pollution Control Equipment

Jenis Pencemar/ ***Type of pollutants***	**Jenis alat kawalan/** ***Type of equipment***	**Kuantiti/ Kapasiti** ***Quantity/ Capacity***	**Tempat Pemasangan/** ***Point of Installation***
Udara/ *Air*			
Efluen/ *Effluent*			
Kumbahan/ *Sewage*			
Bau/ *Odour*			
Bunyi bising/ *Noise*			

F. RUMUSAN PERMOHONAN
SUMMARY OF APPLICATION

19. **Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan Kepada Alam Sekeliling), 2015, Akta Kualiti Alam Sekeliling, 1974**

Environmental Quality Order (Prescribed Activity) (Environmental Impact Assessment), 2015, Environmental Quality Act, 1974

a) Adakah cadangan projek/ pembangunan merupakan Aktiviti Yang Ditetapkan bawah Perintah Kualiti Alam Sekeliling (Aktiviti Yang Ditetapkan) (Penilaian Kesan Kepada Alam Sekeliling), 2015 (EIA)?

Is the proposed project/ development a Prescribed Activity under Environmental Quality Order (Prescribed Activity) (Environmental Impact Assessment), 2015 (EIA)?

Ya*/ Yes:* ☐ Nyatakan Aktiviti Yang Ditetapkan:
Please specify the Prescribed Activity:

_____
_____
_____
_____

Tidak*/ No:* ☐ Nyatakan jenis pembangunan:
Please specify the type of development:

_____
_____
_____
_____

20. **Cadangan projek tertakluk kepada Akta Kualiti Alam Sekeliling 1974 bawah Peraturan berkaitan:**

Proposed project is subject to the Environmental Quality Act 1974 under the Regulations related to:

- Udara Bersih/ *Clean Air* ☐
- Buangan Terjadual/ *Scheduled Waste* ☐
- Kumbahan/ *Sewage* ☐
- Effluen Perindustrian/ *Industrial Effluent* ☐
- Larut Resap/ *Leachate* ☐
- Kilang Kelapa Sawit *Palm Oil Mill* ☐
- Kilang Getah *Rubber Mill* ☐

Nota/ *Note:*
Bagi perkara 18 & 19, pihak Jabatan Alam Sekitar akan membuat semakan bagi pengesahan selanjutnya.
For item 18 & 19, the Department of Environment will counter check for further confirmation.

G. PENGAKUAN OLEH PEMOHON
DECLARATION BY APPLICANT

21. Saya yang bertandatangan di bawah ini mengaku bahawa segala maklumat yang diberi dalam borang ini adalah benar dan betul sepanjang pengetahuan saya.

I, the undersigned, certify that the information given in this application form is to the best of my knowledge is true and correct.

Tandatangan:
Signature: …….

Nama Pemohon:
Name of Applicant: _____

Jawatan:
Designation: _____

Tarikh:
Date: _____

Cop syarikat:
Company stamp: