

GUIDELINES FOR SITING AND ZONING OF INDUSTRY AND RESIDENTIAL AREAS



**DEPARTMENT OF ENVIRONMENT
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LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|--------|---|
| AELB | Atomic Energy Licencing Board |
| DOE | Department of Environment |
| EIA | Environmental Impact Assessment |
| ESA | Environmentally Sensitive Area |
| NRE | Ministry of Natural Resources and Environment |
| NMC | National Mineral Council |
| PPHRA | Potentially Polluting and/or High Risk Activities |
| SMIDEC | Small and Medium Industries Development Corporation |
| n.e.c. | Not elsewhere classified |

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PREAMBLE

The first edition of the '*Guidelines for Siting and Zoning of Industries*' was developed by the Department of Environment in 1976 for purposes of providing guidance to industries when selecting a site for the setting up of a manufacturing or industrial facility. The Guidelines were also used to assist the Department of Environment and other relevant planning agencies and Local Authorities in evaluating applications from project proponents for such projects. A revised edition of the guidelines was introduced in 1994 and this has been in use since.

The overall objective of the Guidelines is to ensure that appropriate considerations be given when selecting a site so as to avoid or minimize environmental conflicts arising from land use incompatibility. The long-term sustainability of a project is best assured by avoiding conflicts which may otherwise necessitate additional investment into mitigation measures which unnecessarily burden the project. Proper siting can be used to effectively avoid conflicts arising from residual impacts left after the adoption of pollution control measures.

The present revision to the Guidelines entitled, '*Guidelines for Siting and Zoning of Industry and Residential Areas*' is intended to replace the existing guidelines to take account of changes that have taken place over the past two decades since it was first introduced. New industries have been introduced into the country since, which previously were not recognized or known, and improvements in process technology and environmental pollution control have led to cleaner production systems that are more acceptable. In addition, changes in land use patterns and human responses to environmental impacts necessitate that the new guidelines take into consideration such changes. It is with these considerations in mind that the new guidelines have been formulated.

As always, guidelines are not intended to be rigid documents to be applied without consideration of other factors which cannot be all stated in the guidelines. For example, while the guidelines may specify certain buffer distances to be applied to a group of industrial activity, a specific activity within the grouping may be less sensitive in terms of its impacts, due either to the nature of the process that it adopts or the nature of the raw material or fuel that it uses, hence a lesser buffer may be considered. In other instances, a specific buffer distance may not be completely fulfilled (it could be short by say 20 meters), and a decision on the application should not be made in haste in the absence of further consideration of the likely nature and extent of its environmental impacts which could be established from a simple modelling exercise which may show that the buffer distance is still acceptable.

The new Guidelines uses a class identification system for the industrial groupings which follow those prescribed in the Malaysia Standard Industrial Classification of 2008 (MSIC 2008), which is based on the International Standard Industrial Classification (ISIC Rev.4). It is hoped that such a system will avoid the difficulties associated with the older approach to classify industries as either heavy, medium, light, or as special industries.

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SECTION 1 : INTRODUCTION

1.1 INTRODUCTION

The 'Guidelines for the Siting and Zoning of Industry and Residential Areas', is intended as a primary guidance document to assist project owners and relevant Federal, State and Local authorities in deciding on the suitability of a site for a particular industrial or non-industrial activity which has potential to negatively impact the environment. The primary objective of the guidelines is to ensure that appropriate attention be given during the selection of a site to avoid or minimise environmental conflicts which would otherwise arise as a result of incompatibility in land use between the proposed project or activity and its neighbour(s). Avoidance of conflict(s) through proper siting is an important element of environmental planning for achieving long-term sustainability of a project, as this helps reduce the cost of unnecessary investment into pollution control and improves public perception of the project.

1.2 APPLICABILITY OF THE GUIDELINES

The Guidelines are applicable for use in the selection of sites for such activities as:

- a. New manufacturing or processing industries located within designated industrial estates or in greenfield areas;
- b. Expansion of existing manufacturing or processing industries which are located adjacent or close to environmentally sensitive areas or receptors;
- c. Facilities for waste management including waste recovery, recycle, treatment and disposal;
- d. Extraction and production of natural resources such as minerals and rocks; and
- e. Facilities for animal husbandry in feedlots or concentrated animal feeding operations.

The guidelines may also be adapted for special activities such as:

- a. Cottage industries traditionally associated with and operated by members of a local community, where such industries are conserved as traditional practices which are unique and promoted as a tourist or cultural attraction; and
- b. Industries which have very high potential to cause significant loss of life or damage due to fire and explosion (such as, plants manufacturing highly explosive materials or chemicals including ammunition) and the release of chemicals which are known to be highly toxic or known carcinogens.

However, in applying the guidelines to the above (special) activities, care has to be given to take account of the unique circumstances associated with them. For example, cottage industries are generally located within or adjacent to the residential premises of a local community and buffer distances generally do not apply. However, in the case of nuclear power plants, very large buffer distances are required due to the damaging character of radioactive releases which

have immediate and long-term impacts to human health. While the former group of industries are generally accepted by the public, the latter activity often draws significant negative public reaction and even violent protest. This sort of public reaction may also be seen when selecting a site for a waste landfill and waste incinerator. Special consideration, therefore, has to be taken in applying the guidelines when dealing with such projects.

[Note: Activities which have potential to release highly toxic radiation or radioactive materials such as, nuclear power plants and nuclear reactors, are not covered by these guidelines. Such activities are to be referred to the Atomic Energy Licensing Board (AELB) for their approval].

1.3 USE OF GUIDELINES IN APPLYING FOR ENVIRONMENTAL CONSENT

The Environmental Quality Act, 1974 (EQA), and various regulations made under it, require that the carrying out of any activity which is likely to result in the release or discharge or emission of any pollutant which is likely to have an impact to the environment, is required to obtain the relevant comment, consent or approval of the Director General of Environmental Quality of the Department of Environment (DOE). These consent or approvals are in respect of:

- a. **Site suitability assessment** or '*Penilaian Awal Tapak*' (for an industrial plant or prescribed activity);
- b. **Environmental Impact Assessment (EIA)** report (for prescribed activities under Section 34A of the EQA);
- c. **Written permission** (to construct a prescribed premise under Section 19 of the EQA);
- d. **Written approval** (for installation of incinerator, fuel burning equipment and chimney under the Environmental Quality (Clean Air) Regulations, 1978); and
- e. **License** (to use and occupy prescribed premises and prescribed conveyances under Section 18 of the EQA, or for contravention of the acceptable conditions specified under Section 21 of the EQA).

The present guidelines are to be used in conjunction with a submission to the DOE under item (a) for Site Suitability Assessment or in short 'AS PAT'. Such an application is made when an industrial plant, 'prescribed premise' or a 'prescribed activity' is proposed at a selected site, and the consent of the DOE is first sought prior to confirmation of the site. The application is to be made using the form, '*AS PAT 1-12 FORM: Preliminary Site Assessment for Development Project*', also known in Bahasa Malaysia as '*Borang AS PAT 1-12: Penilaian Awal Tapak Bagi Projek Pembangunan*'.

Submission of the application is to be made to the respective State DOE office where the project is proposed to be located. The general procedures for submission of the application and the procedures related to those environmental requirements that need to be fulfilled is described in Section 6 of the Guidelines.

1.4 STRUCTURE OF THE GUIDELINES

The Guideline is divided into six (6) main sections. In addition to this introductory section, the Guideline contains the following sections:

- Section 2: Definition and Description** – which contain definitions and descriptions for terms applied, such as ‘industry’, ‘manufacturing industry’, ‘prescribed premise’, ‘prescribed activity’, and others.
- Section 3: Siting Criteria for Industries and Prescribed Activities** – which outlines criteria to be considered in site selection for an industry or activity.
- Section 4: Buffer Zone Principle** – which describes the principle for defining ‘buffer zone’ or ‘buffer area’.
- Section 5: Buffer Distances** – outlines buffer zones or buffer distances for various categories of industry or activity.
- Section 6: Administrative Procedures for Site Suitability Assessment** – outlines guidelines for site suitability assessment application.

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SECTION 2: DEFINITIONS AND DESCRIPTIONS

2.1 INTRODUCTION

The scope of the Guidelines covers industries and industrial plants used for manufacturing of goods and services, 'prescribed premises' declared under Section 18 of the EQA and 'prescribed activities' which are declared under Section 34A of the EQA. Various terms and definitions are to be found in the Guidelines and the following provides clarification on the definition and meaning of the terms used. The definitions provided in these guidelines follow largely those that have been used within various laws but do not represent 'legal definitions' other than their use to assist those who use the Guidelines.

2.2 INDUSTRY, INDUSTRIAL PLANT & MANUFACTURING ACTIVITY

The terms 'Industry', 'Industrial Plant' and 'Manufacturing Activity' are interpreted under various legislations as described in the following.

2.2.1 The National Land Code, 1965 (Act 56)

The National Land Code, 1965 categorises land based on its intended type of use. Section 117 of the Act makes reference to land that is used for the purposes of 'Industry', which is interpreted in the following.

The category of land as 'Industry' shall apply thereto –

- a) *That it 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; (iv) the assembling, processing, storage, transport or distribution of goods, or other commodities; and (v) such other purposes as the State Authority may prescribe for the purposes of this section by rules under section 14 of the Act.*

2.2.2 The Industrial Coordination Act, 1975 (Act 156)

The Act provides for the coordination and orderly development of manufacturing activities in the country and defines 'manufacturing activity' with its grammatical variations and cognate expressions to mean;

'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'.

2.2.3 The Environmental Quality Act, 1974 (Act 127)

The Act relates to the prevention, abatement, control of pollution and enhancement of the environment which is likely to arise from various industrial and non-industrial activities which may give rise to waste or pollutants which affect environmental quality. The Act provides a definition of such terms as '**industrial plant**' and '**prescribed premises**' as follows;

'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; and

'prescribed premise' means any premise, which includes messuages, buildings, lands, and hereditaments of every tenure and any machinery or plant, prescribed by the Minister under Section 18 of the Act'.

'Prescribed premise' is currently applied to:

- a) the processing of raw natural rubber into technically specified form or latex form,
- b) the processing of oil palm fruit or oil-palm fresh fruit bunches into crude palm oil, and
- c) off-site scheduled waste treatment and disposal facilities.

2.3 PRESCRIBED ACTIVITIES OTHER THAN MANUFACTURING

Mining, quarrying and waste management constitute a varied group of activities which defer from the manufacturing industry. This group of activities have been identified to have potentially significant impacts to the environment and are prescribed to be '**prescribed activities**' under the *Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987*. These activities are further elaborated in the following.

2.3.1 Waste Management Activities

Waste management activities which are 'prescribed activities' include off-site facilities such as, incineration plants, recovery/recycling plants or facilities, composting plants, landfills and transfer stations. Under the *Solid Waste and Public Cleansing Management Act 2007 (Act 672)*, '**solid waste management facilities**' is taken to mean;

'any land, fixed or mobile plant and systems incorporating structures, equipment used or intended to be used for the handling, storage, separation, transport, transfer, processing, recycling, treatment and disposal of controlled solid waste and includes transfer stations, disposal sites, sanitary landfill, incinerators and other thermal treatment plants, recycling plants and composting plants'.

Definitions which are applied to the each of the group of activities identified above are given in the following.

a. Landfill

The term “**Landfill**” is interpreted in the *Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations, 2009*, as;

a 'waste disposal site for the deposit of solid waste onto or into land'.

According to the *Technical Guidelines for Sanitary Landfill Design and Operation* currently in use by the National Solid Waste Management Department, a 'landfill site' is defined as;

'the site where municipal wastes are disposed off by land filling. Such sites may be provided with various landfill facilities'.

Landfill can be classified into four (4) levels according to the *Technical Guidelines for Sanitary Landfill Design and Operation* adopted by the National Solid Waste Management Department (**Table 2-1**). Level 1 is the lowest level of any landfill system where basically waste is just dumped onto land in a controlled manner and levelled. Soil cover is laid periodically. Nevertheless, the Department will only recognize the site as 'sanitary landfill' if Level 4 facilities can be established.

Table 2-1: Level of Sanitary Landfill System

| Facilities | Level 1 | Level 2 | Level 3 | Level 4 |
|-------------------------|---------|---------|--------------|---------|
| Soil Cover | + | ++ | ++ | ++ |
| Embankment | | ++ | ++ | ++ |
| Drainage facility | | ++ | ++ | ++ |
| Gas venting | | ++ | ++ | ++ |
| Leachate collection | | | ++ | ++ |
| Leachate re-circulation | | | ++ | ++ |
| Leachate treatment | | | | ++ |
| Linings | | | | ++ |
| | | | Semi-aerobic | |

Note: + / to be provided periodically

++ / Level 2, 3 and 4:

b. Solid Waste Transfer Station

The term “**Solid Waste Transfer Station**” is interpreted in the *Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations, 2009* to mean;

'a facility where solid waste is received for the purpose of subsequent transfer to another facility for further processing, treatment, transfer or disposal'.

c. Incinerator

The term 'Incinerator' is defined within the *Environmental Quality (Clean Air) Regulations, 1978* to mean;

'any device, apparatus, equipment or structure used for destroying, reducing or salvaging or waste heat recovery by fire or by burning any material or substance including refuse, rubbish, garbage, trade waste, debris or scrap or a facility for cremating human or animal remains'.

In the context of the *Environmental Quality (Prescribed Premises) (Environmental Impact Assessment) Order 1987*, such facilities are applied in the management of toxic and hazardous wastes and municipal solid waste.

d. Composting Plant or Facility

The term '**Composting Plant**' or '**Composting Facility**' is not defined within any existing legislation but is taken to mean;

'a facility for treating solid waste in which waste organic material is broken down by microorganisms in the presence of oxygen to a point where it can be safely stored, handled and applied to the environment'.

e. Recovery/Recycling Plant or Facility

Recovery or recycling plant or facility is those that are associated with waste management. '**Material recovery plant**', or MRF, is one of such type of facility which is used in municipal solid waste management for the recovery of useful materials which would otherwise be disposed either in an incinerator or in a landfill. It is defined as;

'a specialized plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers'.

f. Municipal Wastewater Treatment Plant

'**Municipal wastewater treatment plants**' are commonly referred to as 'sewage treatment works', which is interpreted in the *Water Service Industry Act 2006 (Act 655)* as;

'a facility designed to accept and process sewage and sewage sludge before disposal to a receiving medium but does not include septic tanks'.

The Act provides the legal framework for regulation of the water and sewerage service industries in the country.

2.3.2 Quarrying

'Quarrying' as defined under the *Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987*, includes;

'the quarrying of aggregate, limestone, silica, quartzite, sand-stone, marble and decorative building stone', and the activity is a prescribed activity if 'undertaken within 3 kilometers of any existing residential, commercial or industrial areas, or any area for which a license, permit or approval has been granted for residential, commercial or industrial development'.

The term "Quarry" is interpreted under the Selangor Quarry Rules 2003, made under the National Land Code, 1965, when used as a noun, means;

'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'; and

"Quarry" when used as a verb, means;

'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'.

Quarries may be classified by hard rock, medium hard rock and soft rock type as tabulated in **Table 2-2**, which also indicates the type of operations needed for their extraction.

Table 2-2: Classification of Quarries

| Rock Hardness | Material | Operating Equipment |
|---------------|--|---|
| Hard | Hard, tough rocks like granite, felsites, gabbro, diorite, basalt, quartzite, and some sandstone, limestone, and dolomite | Rock drill, blasting materials and machine, power shovel, front loader, dump trucks, and crushing, screening (and washing) plant. |
| Medium | Moderately hard, tough rocks like most sandstones, limestone, solomite, and marbles. | Rock drill, blasting materials and machine, power shovel, front loader, dump trucks, and crushing, screening (and washing) plant. |
| Soft | Cementaceous materials like limerock, coral, caliche, tuff, and laterite, disintegrated granite and some sandstones or conglomerates | Rooter, power shovel, front loader, and earth moving equipment. |

sensitive characteristic elements of disaster risk function, the value of life support and the

2.3.3 Mining

The term '**Mine**' and '**Mining**' is interpreted in the *Mineral Development Act 1994* (Act 525) as follows:

"mine", when used as a noun, means; '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', and

"to mine" means; 'intentionally to win minerals and includes any operation directly or indirectly and necessary therefor or incidental thereto, and "mining" shall be construed accordingly'.

The term '*mineral*' is taken as '*a naturally occurring element or chemical compound that is formed as a result of geologic processes*'.

Mining as an activity is regulated as a 'prescribed activity' under the *Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987*, and is taken to include;

- a) *Mining of minerals in new areas where the mining lease covers a total area in excess of 250 hectares,*
- b) *Ore processing, including concentrating for aluminium, copper, gold or tantalum, and*
- c) *Sand dredging involving an area of 50 hectares or more.*

Mining is to be seen as '*a process that begins with the exploration and discovery of mineral deposits and continues through ore extraction and processing to the closure and remediation of worked-out sites*'.

2.4 DEFINITION OF RESIDENTIAL & COMMERCIAL

2.4.1 Residential

A '**residential area**' is a land use in which housing or residences predominate, as opposed to industrial and commercial areas. However, it is to be noted that under the *National Land Code 1965*, '*residential*' is a category of land use that is identified for land alienated under the category of '**building**' which may be used for purposes of the following:

- a) residential purposes,
- b) administrative or commercial purposes,

- c) the purposes of exhibiting, selling by retail, repairing or otherwise dealing with good and for providing any service,
- d) the purposes of providing educational, medical, sanitary or other welfare purposes,
- e) the purposes of entertainment, refreshment or recreation, or
- f) any purpose which the State Authority may think fit to authorise.

For purposes of the Guidelines, the following interpretation will be adopted as guidance in determining if an area is a residential area:

- a) the term '*residential*' or '*residential area*' shall be taken to constitute the category of land use for land that is alienated under the title of '*building*';
- b) a '*residential area*' is defined as a planned community or cluster of separate or independent structures planned on land that is alienated for '*building*' and occupied primarily by private residences or used as places of abode.
- c) for land that is alienated for purposes of '*agriculture*' and where a dwelling-house has been erected for use by the owner of the land, the '*land use*' remains as '*agriculture*'; and
- d) a cluster of houses, each of which is sited on an individual lot of land that is categorized as '*agriculture*', will be considered as '*residential area*' if there is formal recognition of the cluster as constituting '*a village*' or '*kampong*', or as a '*community*' with a given name.

2.4.2 Commercial

A '**commercial area**' is category of land use where land is alienated under the category of '*building*' but used for purposes of office, retail, leisure, healthcare and for associated industrial purposes (mainly warehousing, garage, distribution centres and other non-manufacturing activities). A commercial area include, hotels, restaurants and eating places, sports facilities, shopping malls, retail shops, office buildings, service offices, medical centres, nursing homes, warehouses and distribution and service centres.

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SECTION 3: SITE SELECTION CRITERIA

3.1 INTRODUCTION

The selection of a site that is suitable for an industry or any other activity is based on the primary concern of availability of suitable land that matches all or most of its needs which are likely to include such aspects as:

- a) accessibility to customers, suppliers (of raw materials and supporting services), & workers;
- b) transportation infrastructure (roads, rail, port and/or other transit facilities) and utilities (water, power and energy supplies);
- c) affordability of land, rent and other costs associated with the use of the land and its services; and
- d) compatibility with surrounding land uses and activities and absence of restrictions for future expansion.

Compatibility of land use and adequacy of buffer between the proposed industry and activity with that of its neighbours are important criteria in site selection as they provide opportunities for selecting options for environmental management that avoids unnecessary investment into pollution control over and above what is generally needed.

The following information is intended as guidance for site selection taking account of the sensitive receptor that is likely to be impacted by the development or the activity. The types of sensitive receptors and the principal criteria for site selection are described here to provide a backdrop to the recommended buffer for different industries or activities that is described in Section 5 of the Guidelines. The nature, character and response of the sensitive receptor to an impact are important considerations in determining the appropriate buffer between the source and the receptor.

3.2 SENSITIVE RECEPTORS OF CONCERN

The primary environmental concern from any development or activity is the negative impact it will exert on a receptor. The 'receptor' may be represented by different components of a natural system which include animals (including humans), plants, soil, water and physical elements. The receptor could also be man-made and include areas, structures and institutional facilities dedicated for human well-being and for social, cultural and religious activities. These are often classified as '*environmentally sensitive areas*' or 'receptors'.

An '*Environmentally Sensitive Area*' or ESA, may be defined as '*a special area that is very sensitive to any form of changes to the ecosystem due to natural processes or activities in or around it, either directly or indirectly, at any level is determined based on the integration*

sensitive characteristic elements of disaster risk function, the value of life support and the heritage and legacy of the area'

(LESTARI-JPBD 2009)

3.2.1 Environmentally Sensitive Area (Natural Systems)

Natural life systems or ecological systems are among the most sensitive to environmental changes brought about by human activities. Such changes may impact directly species of plants and animals or indirectly through alteration to their habitat(s) and life support system. Natural systems which have been classified as '*environmentally sensitive areas*' or '*ESA*' include those that have been identified in the *National Physical Plan 2 (2010)* or NPP-2 and other State conservation strategies and plans. ESA identified as being of Rank 1 sensitivity for Peninsular Malaysia under the NPP-2 include the following:

- a) Protected Areas (PA) which include gazetted National and State parks, Wildlife Reserves/ Sanctuaries, Marine Parks, Protection Forests identified within Permanent Forest Estates, Biosphere reserve, and other areas designated for statutory protection,
- b) catchments of existing and proposed dams and reservoirs for water supply, irrigation and hydro-power generation, and
- c) land above 1000 m contour (except for Special Management Areas such as Cameron Highlands-Kinta-Lojing, Fraser's Hill-Genting Highlands-Bukit Tinggi-Janda Baik, and Fraser's Hill (refer to **Figure 3-1**).

In NPP2, there are '*ecologically sensitive areas*' which require protection in view of their important ecological contribution for conservation of species or habitats. Some of the areas identified under in the NPP2 are highlighted in **Table 3-1**.

Table 3-1: Areas Gazetted for as Protected Areas in NPP2

| Area | State |
|---|-----------------|
| Ulu Muda | Kedah |
| Gunung Jerai | Kedah |
| Sungai Merbok mangroves | Kedah |
| Bintang Range | Kedah and Perak |
| Temengor | Perak |
| Pondok Tanjung freshwater swamp forest | Perak |
| Fraser's Hill | Pahang |
| South-East Pahang peat swamp forest | Pahang |
| Gunung Pantl | Johor |
| Sg Sedili Kecil & Sedili Besar wetlands | Johor |
| Setiu wetlands | Terengganu |

| Area | State |
|------------------------------------|------------|
| Kenyir and Tembat | Terengganu |
| Terengganu Hills | Terengganu |
| Upper Nenggiri/ Perias basin | Kelantan |
| Pergau and Gunung Basor | Kelantan |
| Gunung Chamah | Kelantan |
| Gunung Jaya, Gua Panjang | Kelantan |
| Serdam, Gelanggi, Jebak Puyoh | Pahang |
| Gunung Datuk, Rapat, Lanno, Kantan | Perak |
| Batu Caves | Selangor |
| Segari Melintang, Teluk Muroh | Perak |
| Bukit Labohan | Terengganu |

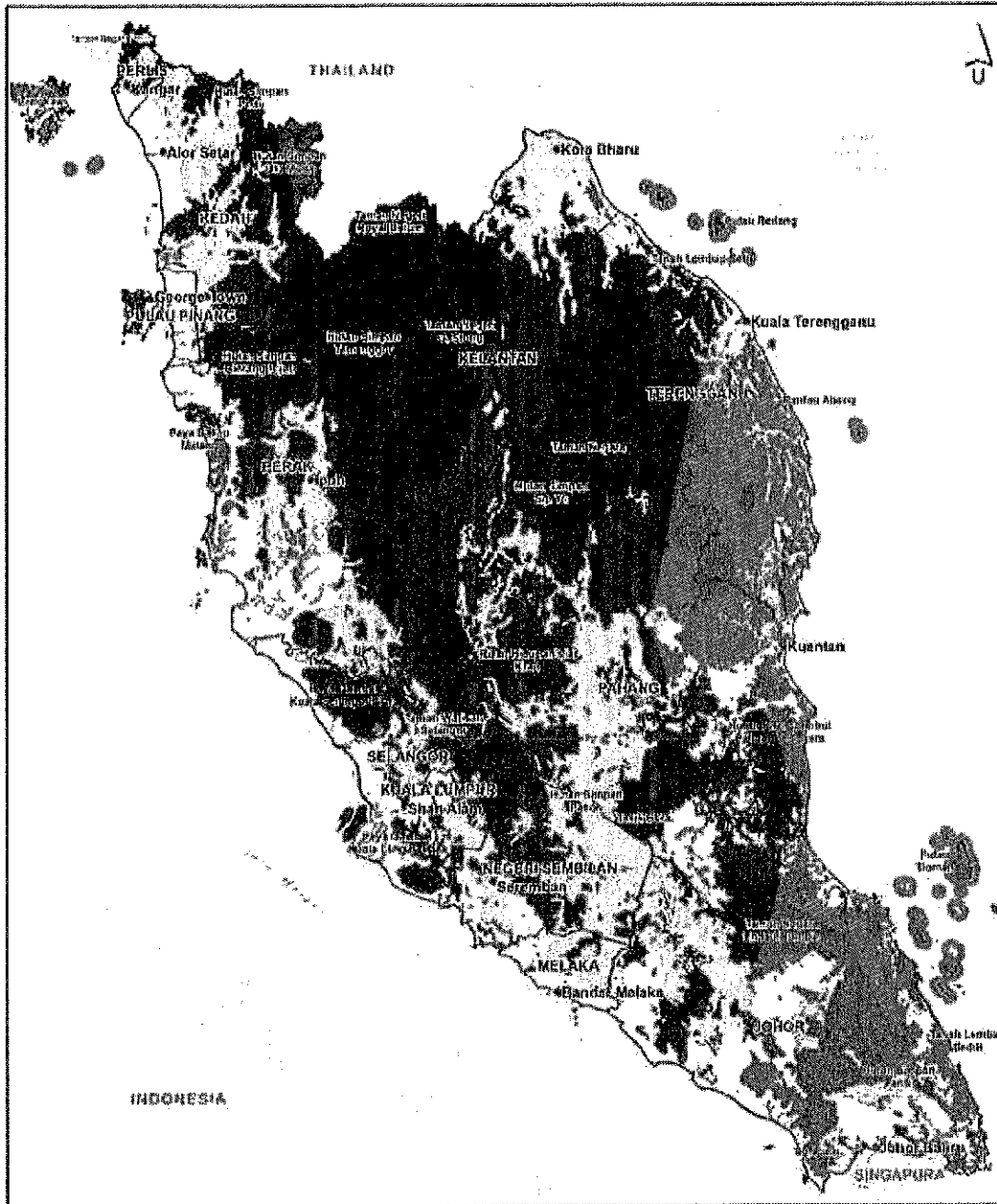
ESA for the States of Sabah and Sarawak are presently taken to include gazetted State Parks, Wildlife Reserves/Sanctuaries, Marine Parks, Protection Forests identified within Permanent Forest Estates, UNESCO Biosphere Reserve and Heritage Site, and may include those that have been declared to be State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

Apart from the above, other areas which may not be protected by current law but may require protection and include the following:







- a) groundwater supply aquifers and their recharge zones,
- b) surface water supply rivers and reservoirs used for public water supply,
- c) natural springs, wells, and small surface water sources traditionally used as sources of water supply for local and rural communities,
- d) land reserved or dedicated for conservation of geological formations and scenic areas,
- e) a defined beach or area known for turtle and terrapin landing and nesting,
- f) the area within 100 m of a site, not necessarily gazetted, which is known for migratory birds to congregate for feeding, roosting, breeding or nesting,
- g) a defined wetland and the catchment area within 50 m of the wetland,
- h) the area covered by vegetation within 50 m of rare flora,
- i) the area covered by a threatened ecological community, and
- j) riparian reserve defined or proposed to be a 'river or riparian reserve' by a relevant authority (such as the Department of Irrigation and Drainage).

Areas identified as important or potentially important sources of groundwater supply by the *Department of Minerals and Geo-science* represent ecologically sensitive areas which should be avoided by those developments or activities which have high potential to contaminate groundwater or reduce its capacity for recharge. This is because once contaminated, groundwater is difficult to be remediated. Similarly, turtle landings during the breeding season are affected by noise and light which is likely to cause them to move elsewhere.

Figure 3-1 National Physical Plan 2 – Environmentally Sensitive Areas



PI 15 : ENVIRONMENTALLY SENSITIVE AREAS

- Petunjuk.
-  ESA Rank 1
 -  ESA Rank 2
 -  ESA Rank 3
 -  State Boundary
 -  State Capital
 -  Marine Park

Source: National Physical Plan 2 (2010)

3.2.2 Environmentally Sensitive Area (Human Systems)

Human related activities, structures and systems may be constituted as 'environmentally sensitive areas' if they contribute to human well-being and health, enhance social or human understanding, and assist in education and development. ESA associated with such human systems include the following:

- a) land, places, buildings or structures listed or gazetted as being of national or international heritage value,
- b) sites gazetted or dedicated to be of national, historical, cultural, religious, social, and tourism value,
- c) 'Orang asli' traditional or 'reserved' land and 'Native Customary Land',
- d) cemeteries, burial grounds, traditional religious, cultural and heritage sites (other than those which are gazetted),
- e) hospitals, schools and other educational centres,
- f) residential areas, and
- g) areas gazetted or dedicated for recreation and sports including parks and green areas.

3.2.3 Criteria for Assessing Site Suitability

An environmental impact is considered to be significant if the change or the effect on the receptor, whether directly or indirectly, causes it to react adversely, alter or change in a manner which is detrimental to its life function or purpose. Knowing what the sensitive receptor(s) is and whether it is likely to be impacted upon by a proposed development is one good measure to know if a site is suitable for the development.

For development(s) which are proposed to be adjacent to such sensitive areas, the main criteria for determining site suitability is whether the development or activity has the potential to impact, either directly or indirectly, the integrity and/or the ecological function of the ESA concerned, taking account of the buffer zone available between the development or activity and the ESA.

In relation to ecologically sensitive resources, the overarching objective for protection and conservation of these resources is to ensure their sustainability in view of their importance in terms of the goods, services and life-support systems they provide. These include attributes such as, protection of biodiversity and habitats, soil stability, water retention or recharge, and other vital ecological functions. Hence, protection of the above ecologically sensitive areas necessitates that no development of any kind that is damaging to the ecological system be allowed within such areas, including agriculture and logging. Only low-impact activities such as nature tourism, research and education are to be allowed.

The two main criteria for determining if a development or activity is appropriately located close to or adjacent to such ESA are:

- its impact as to its effect on the value of the ESA for the purpose to which it is conserved for (example for conservation, tourism, culture, religious purposes, education, recreation, human well-being and others), and
- its impact on the quality of life for human well-being and human health and safety.

The impact is considered acceptable if the impact is not significant.

Other criteria that has to be considered in terms of siting is the geographical or landscape features of the chosen location. Good landscape features plays an important role for allowing dispersion that is emitted in form of emission, heat, odour, noise, etc. By taking advantage natural site features such as flat topography with good prevailing wind; siting in an appropriate location will minimise potential impacts on the surrounding. Landform such as valleys in another hand, are prone to trap pollutants due to poor air ventilation and movements, thus may not be suitable for many of industry and activities.

3.3 SITING CONSIDERATIONS FOR COTTAGE INDUSTRIES

A cottage industry refers to an industry where the creation of products and services is home-based, rather than factory-based. Products and services created by cottage industry are often unique and distinctive given the fact that they are usually not mass-produced and more often than not are hand-made. Products of cottage industry include food products, jewellery, pottery, handicraft, household utensils and various other types of art and craft.

Current planning practice in the country does not recognise home-based activities for the production of goods as 'industry', hence no requirement for alienation of the land to be 'industrial land'. However, they may be acknowledged as 'industrial establishment' if the floor space for industrial use is bigger and dominates the residential use. For purposes of these guidelines, cottage industry refers to those that bear the following characteristics:

- a) production of goods and services is home-based rather than factory-based,
- b) production is hand-made using tools and other means of production individually owned,
- c) no mass production process is adopted, and
- d) run by members of a family or by a loosely and informally organised group with each member working out of their own home.

3.3.1 Environmental Concerns of Cottage Industries

Due to the multitude of products that are generated by cottage industries, the environmental concerns associated with each of them differ one from another. The general environmental characteristics of cottage industries include:

- a) Low noise and vibration except those engaged in the production of metal ware products, use generator sets, pumps and blowers;
- b) Low air pollution except those operating small foundries, ovens, dryers, and kilns;
- c) Are dry or generate low volumes of wastewater except those engaged in activities which require significant amount of water for washing and cleaning such as in the production of food products, natural textile material, paper and natural fibre material; and
- d) Do not generate significant amounts of toxic or hazardous wastes except for those engaged in activities requiring acid or alkaline etching, electroplating, and the use of chemicals for cleaning and washing.

3.3.2 Environmental Criteria for Site Selection

Site selection is not normally an option for cottage industries as the products and the location in which they are produced are often synonymous with each other and they are home-based. Hence, the siting of a cottage industry is naturally linked or associated with a household or community or village and is site specific. Nevertheless, the following considerations are recommended to be taken into account for cottage industries:

1. Not to be sited in environmentally sensitive areas except if it is operated by native groups recognised as traditionally associated with the area concerned;
2. Operate within normal daytime hours if significant noise and vibration is expected from the activity;
3. Fire safety measures to be taken into account where fire and heating is needed for the production process (use of fire breaks, fire protection wall, etc);
4. Ability to treat wastewater generated independently or through a centralised system for collection and treatment; and
5. Facilities to collect toxic and hazardous wastes for treatment and disposal at proper facilities (expected to be off-site).

3.4 SITING CONSIDERATIONS FOR MANUFACTURING INDUSTRY

The 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 material 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.

Manufacturing industries range from those that are small-scale to those of medium-scale, as well as very large-scale operations. These may be classified as belonging to the 'light', 'medium' or 'heavy' industry category depending on the scale of their operations and/or pollution potential. The general characteristics of these industries are described later in Section 5 of the Guidelines.

3.4.1 Environmental Concerns of Manufacturing Industries

Manufacturing industries can cause a range of environmental concerns ranging from air pollution to noise, fumes, smoke, vibration, odour, 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 scale of the problem depends on various factors including:

- a) the type of raw materials used in the process,
- b) the type of process technology that is adopted,
- c) the type of equipment or machinery that is used in the production process,
- d) the type of control system that is applied,
- e) the operational and management practices that are adopted for the plant, and
- f) the level of skills of workers and the type of training provided.

Nevertheless, the environmental concerns are often more severe for large and heavy industries when compared to medium-scale and light industries. This is the case as the scale of the operations are usually big, involve the use of large quantities of raw materials including water, intensive use of heat and energy sources, production of large quantities of pollutants and wastes, need for large scale transportation, need for significant labour and associated facilities for housing workers, and need for large area for the processing facilities, storage, and other manufacturing units.

3.4.2 Environmental Criteria for Site Selection

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 in the selection of a site and these are outlined in the following:

- 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 primary buffer to mitigate those environmental concerns best managed by an adequate separating buffer from sensitive receptor (such as residual noise).

3.5 SITING CONSIDERATIONS FOR RESOURCE-BASED INDUSTRY

Resource-based industries refer to “industries that are based on primarily using resources (natural or ‘man-made’) for their operations”. Hence, proximity to the resource to which they depend is the main consideration for selecting a site for their location. Such locational dependent industries and activities include:

- a) those engaged in mineral extraction and/or processing such as, iron, bauxite, gold, oil and gas, and others,
- b) those engaged in the quarrying or mining for raw materials such as, stone, rock, sand, clay and other materials,
- c) those that are associated with harvesting and processing the produce of agriculture such as, rubber, oil palm, cocoa and others,
- d) those that are associated with harvesting and processing of coastal and marine products such as, fish, prawns, seaweed, and other marine produce,
- e) those supporting industries or activities described in (a) and (d), such as, facilities for the construction, repair and maintenance of vessels, crafts and other marine facilities, and
- f) those that use water to convert to energy or abstract water to supply to various beneficial uses such as, hydro-power generation, water supply, irrigation and others.

3.5.1 Environmental Concerns of Resource-based Industries

Environmental impacts due to resource-based industries and activities are generally significant and irreversible as many of their operations are based on the removal of non-renewable resources. In general, extractive industries such as, mineral extraction, surface mining and quarrying are ‘non-sustainable’ since they deplete the resources on which they depend and incur significant damage to the natural environment of the area concerned. Often the ecological integrity of the area is damaged beyond its ability to support normal life systems or revert to its original state without human intervention.

However, there are those that are based on sustainable practices which exploit the resources but maintain the natural environment for resource regeneration and sustainable harvesting such as, resource exploitation of coastal and marine resources, and run-of-river schemes for water supply and power generation. To some extent this may be true for agro-based industries (for long-term crops) which follow sustainable agricultural practices.

3.5.2 Environmental Criteria for Site Selection

While extractive industries are locational dependent requiring them to be 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 described in Section 3.2.1 and 3.2.2,
- 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 described in Section 3.2.2, and
- 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 groundwater contamination.

3.6 SITING OF INDUSTRIES OF HIGH WATER POLLUTION POTENTIAL

There are two major concerns associated with the location of an industry or activity which has potential to cause water pollution and these relate to:

- a. The presence of residue contaminants in treated wastewater which have potential long term impacts to water quality or natural resources within the aquatic ecosystem (example, pollutants which have tendency to accumulate such as heavy metals and some persistent organic compounds), and
- b. Accidental discharges which have an immediate impact to water quality or natural resources (example, chemicals which cause acute toxicity such as, cyanide and arsenic, or which exert an immediate oxygen demand on the receiving river causing asphyxiation of aquatic life).

A pollutant which is found in wastewater or effluent that is discharged, either accidentally or after treatment, takes the path of the watercourse to which it flows into. As the watercourse is the conduit for the pollutant, the impact that the pollutant exerts is along its course. The intensity of impact is likely to be generally less as it travels downstream since dilution and natural self-purification takes place along its path downstream.

However, not all pollutants behave symmetrically as various transformations may take place along the way and these can result in different effects on the environment. For example, nitrogen can transform from one form to another, such as NH_3 , NH_4^+ , NO_2^- , NO_3^- or N_2 depending on chemical conditions and nature of microbial activity. The zone of impact due to a pollutant depends on the nature of its transformation and its effects. Hence the applicability of 'buffer zone' to water pollution impacts has to be considered differently and the following procedure is to be adopted.

3.6.1 Siting Preference for Industry with Significant 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;
- d. Locations along the river which are critical or known to be critical for conservation of endangered aquatic species and habitats (including fish breeding, maturation and feeding grounds).

3.6.2 Conditions to Be Fulfilled For Siting Upstream of Sensitive Receptor

Where an industry or activity which has potential to cause significant water pollution and wishes to be located upstream of a sensitive receptor (as described in Section 4.5.1), the following conditions are to be fulfilled before a site is considered acceptable:

- 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 one 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
 - treated effluent that meets prescribed limits can be diverted to another river catchment which has no sensitive receptor.

3.7 SITING CONSIDERATION FOR WASTE MANAGEMENT FACILITIES

Waste management facilities, in the context of the present guidelines, include those facilities applied for the treatment and disposal of solid and liquid wastes generated from domestic, commercial, institutional and industrial activities. The two main categories of wastes generated may be classified as either 'hazardous' or 'non-hazardous'. The former refers to those generated from industrial processes and from medical facilities, while the latter is taken to mean '*municipal solid waste*'.

Waste management facilities include:

- a) sanitary and secure landfills,
- b) incinerators,
- c) solid waste transfer stations,
- d) material recovery & recycling plants,
- e) composting plants, and
- f) regional and municipal sewage and sludge treatment plants.

These facilities may be owned and/or operated by an authority or by private operators. Nevertheless, it is pertinent to note that most of such facilities are necessary to meet public needs and critical for the protection of public health and environmental quality.

3.7.1 Environmental Concerns of Waste Management Facilities

The common and foremost concern of municipal solid waste is their potential to impact public health due to the presence of microbes and contaminants which can cause diseases, often as a result of contamination of food, water and soil. As such, the primary focus of management of such waste is to adequately treat them to remove or reduce significantly their potential to affect public health. Other concerns include the potential to emit foul odours due to natural breakdown or fermentation of the organic fractions of the waste by bacteria and other microbes, and the visual and aesthetic impact of waste when it is not properly managed or disposed.

Industrial and medical wastes pose other concerns as they may possess toxic and hazardous characteristics which can potentially harm human health and environmental quality. Management of such wastes is aimed therefore at treatment and proper disposal to render such wastes innocuous or harmless. This may be by way of incineration, physical, chemical and biological treatment, and disposal in secure landfills.

3.7.2 Primary Environmental Criteria for Site Selection

Waste management facilities are intended to treat waste generated by human activities which are concentrated within urban areas and centres of industrial activity. For practical reasons, such facilities are best located close to the source of the waste to minimise logistic problems for conveying or transporting the waste to the treatment facilities. This indirectly helps to reduce operational costs and the social burden that public or the government has to bear.

However, finding an appropriate site close to the source of the waste may not be practical or acceptable by the public due to perceived concerns that waste management facilities have potential to harm human health, cause odours, allow pest proliferation, and reduce the property value of the area near where it is located. These public concerns may or may not be important depending on various factors including site physical conditions, prevailing winds, atmospheric conditions, treatment and management practices, operations, and environmental control measures that are taken. The environmental criteria for each of the waste management facilities may differ and are highlighted in the following.

The primary criteria which are to be applied strictly in the selection of a site for waste management facilities shall comprise the following;

- a) Totally avoid designated Protected Areas and avoid as far as possible other environmentally sensitive areas identified in Section 3.2.1;
- b) Avoid as far as possible environmentally sensitive areas identified in Section 3.2.2,
- c) Totally avoid native reserve areas such as, 'Orang Asli Reserves' and 'Native Customary Land',

- d) Select sites which provide natural screening, isolated settings, or existing natural features which minimize visual impacts of the facility, and
- e) other secondary criteria which are specific for each category of waste management facility that is proposed.

3.7.3 Secondary Criteria for Site Selection

The secondary criteria that applies is specific to the particular waste management facility or activity as described in the following.

3.7.3.1 Siting Criteria for Landfill

The location of a landfill and the types of waste received are the primary determinant of the extent to which the landfill will pose an environmental risk. The aim of choosing a suitable site is to avoid the need to take action to reduce environmental impacts where site features already help to minimise such risks. Landfill sites must be carefully screened to ensure that the chosen site fulfils most, if not all, engineering, geological, and regulatory specifications.

The environmental criteria for siting of landfills shall take account the primary criteria outline in Section 3.7.2 and the following:

- a) Site is to be well away from main river systems, lakes, and other natural bodies of water used for nature conservation, body contact swimming and public water supply,
- b) Site is readily accessible and is served with good road infrastructure which allows easy access to the site and avoids directly passing through or sensitive receptors such as residential housing, hospitals and schools,
- c) Avoid as far as possible areas of agricultural importance for food production such as designated granary areas (such as MADA, MUDA, KEMUBU, Kuala Selangor, etc) and food crops,
- d) Avoid locating within or using wetlands, swamps, mangrove areas, intertidal areas, natural and old mining lakes, areas subject to potential flooding, and those that have high groundwater table,
- e) Avoid airport exclusionary areas to minimise bird congregation,
- f) Avoid areas of regionally important groundwater supply aquifer (more so if they are unprotected) and their recharge zones, and
- g) Avoid geologically unstable areas which pose a substantial risk to the integrity of the landfill structure including areas underlain by karstified limestone, recently mined areas, areas with weak or unstable sub-soil, and those prone to landslip or slope failure.

3.7.3.2 Siting Criteria for Incinerators

Incinerators may be applied for treatment of either municipal and toxic and hazardous wastes. While their design specifications are likely to differ, the general requirements for their siting

are comparable. The main difference would be the buffer requirements between such facilities and sensitive receptors, which is discussed in the next section.

In general, the environmental criteria recommended to be applied in site selection shall include the primary criteria outline in Section 3.7.2 and the following:

- a) Avoid sites close to tall structures or hills which have potential to cause downwash and restrict effective dispersion of stack emissions,
- b) Site is readily accessible and is served with good road infrastructure which allows easy access to the site and avoids directly passing through sensitive receptors such as residential housing, hospitals and schools,
- c) Site shall not be subject to flooding nor prone to landslip or slope failure, and
- d) Site is served with adequate and appropriate utility supplies and proper drainage for storm water conveyance.

3.7.3.3 Siting Criteria for Waste Transfer Stations & Material Recovery Facilities

Waste transfer stations are facilities where municipal solid waste is unloaded from collection vehicles and briefly held while it is reloaded onto larger long-distance transport vehicles for shipment to landfills or other treatment or disposal facilities. A Material Recovery Facility (MRF) may also be associated with a transfer station to provide support in recovery of useful material and to reduce the volume of material that needs to be transported out for disposal or treatment.

Although transfer stations have the overall purpose to reduce the total number of vehicular trips traveling to and from the disposal site, they can cause an increase in traffic in the immediate area where they are located. Similarly, MRFs can also be the focus of traffic concentration. In addition, both of these facilities have the potential to cause odour and noise during operation and are a subject of social concern due to health and visual or aesthetics.

The general environmental criteria for selection of a suitable site for either a transfer station or an MRF takes into account the primary criteria outline in Section 3.7.2 and the following:

- a) Site is located well away from residential or populated areas and other sensitive receptors such as hospitals and schools,
- b) Site is readily accessible and is served with good road infrastructure which allows easy access to the site and avoids directly passing through sensitive receptors such as residential housing, hospitals and schools,
- c) Site shall not be subject to flooding nor prone to landslip or slope failure, and
- d) Site is served with adequate and appropriate utility supplies and proper drainage for storm water conveyance

3.7.3.4 Siting Criteria for Composting Facilities

Composting of organic waste involves natural biological processes carried out under controlled aerobic conditions, with the aid of various microorganisms, including bacteria and fungi. Odorous gases represent an issue of concern from such facilities. Aside from the environmental criteria which are to be strictly adhered, other criteria to be adopted include the following:

- a) Site is located well away from residential or populated areas and other sensitive receptors such as hospitals and schools,
- b) Site is to be well away from main river systems, lakes, and other natural bodies of water used for nature conservation, body contact swimming and public water supply
- c) Site shall not be subject to flooding,
- d) Site is readily accessible and is served with good road infrastructure which allows easy access to the site and avoids directly passing through sensitive receptors such as residential housing, hospitals and schools, and
- e) Site is served with proper drainage for storm water conveyance and control.

3.7.3.5 Siting Criteria for Centralised Sewage and Sludge Treatment Plants

Centralised municipal or regional sludge and sewage treatment plants are intended to treat the waste that is generated from large urban centres and are ideally best sited close to the source of the waste. The basic site requirements for such facilities should consider the following:

- a) Site is located well away from residential or populated areas and sensitive receptors such as hospitals and schools,
- b) Site provides possibility to reduce concerns of visual or aesthetics impacts through natural buffers or topographic features,
- c) Site is readily accessible and 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,
- d) Site shall not be subject to flooding nor prone to landslip or slope failure, and
- e) Site is served with adequate and appropriate utility supplies and proper drainage for storm water conveyance

It is to be noted that there are those sewage treatment plants (STP) which are constructed to serve as 'temporary' treatment plants pending the consolidation of such plants with the construction of regional or municipal treatment plants. The siting of these temporary STPs is presently governed by the guidelines¹ issued by the National Water Services Commission (SPAN). Such plants will continue to be guided by the SPAN guidelines.

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SECTION 4 : BUFFER ZONE PRINCIPLE

4.1 INTRODUCTION

Buffer zone or 'Buffer Area', in the context of the guidelines, represents 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:

- a) fire and/or explosion,
- b) noise and vibration,
- c) air pollution due to emissions of particulates and gaseous pollutants,
- d) water pollution due to waste discharges,
- e) smoke and fume,
- f) odorous emissions,
- g) obtrusive artificial light, or
- h) aesthetic concerns².

The presence of an adequate buffer zone represents the primary means to determine if a site is appropriate for the particular industry or activity taking account of the immediate and adjacent land use and characteristics of the receptor around the selected site. However, the new guidelines make provision of other considerations to be given due attention where a decision based purely on adequacy of the primary buffer zone is not feasible or appropriate.

The ideal solution to minimise 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 emissions³ 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.

A buffer zone is the area within which sensitive or incompatible land uses are prohibited or special measures are necessary to ameliorate the impacts due to an activity. 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. Buffer zone should be considered as an added measure to assist in minimising off-site impacts due to residues which remain even with the adoption of preventive and mitigation measures.

4.2 BUFFER ZONE TYPES

The Guidelines provide for the application of two types of buffer namely, the '**Primary Buffer Zone**' and the '**Secondary Buffer Zone**'. The sum of these two buffer zones constitute the '**Overall Buffer Zone**' that is to be met between an industry or an activity with the receptor or recipient of the environmental impact. This is to overcome some of the constraints that were faced in applying the older set of guidelines. The characteristics of the two forms of buffer are described in the following.

4.2.1 Overall Buffer Zone

The '**Overall Buffer Zone**' is defined as that buffer area or distance, which may be made up by the Primary Buffer Zone and/or the Secondary Buffer Zone, separating the industry or activity from residential area or other sensitive receptors.

4.2.2 Primary Buffer Zone

The '**Primary Buffer Zone**' is defined as *'that part of the buffer area or distance that lies between the property boundary of the intended project or activity with the property boundary of the adjacent sensitive receptor (which is taken to include designated residential zones, sensitive public amenities, and ecologically sensitive receptors), and shall be met at all times'*.

4.2.3 Secondary Buffer Zone

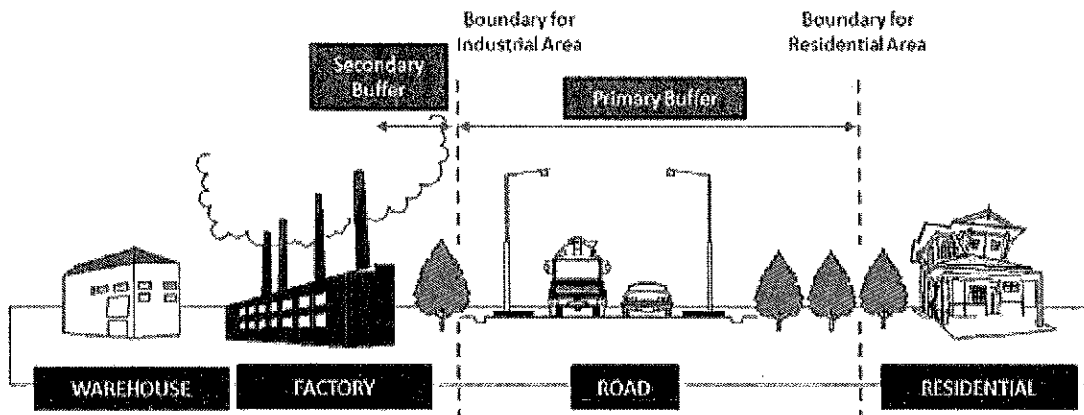
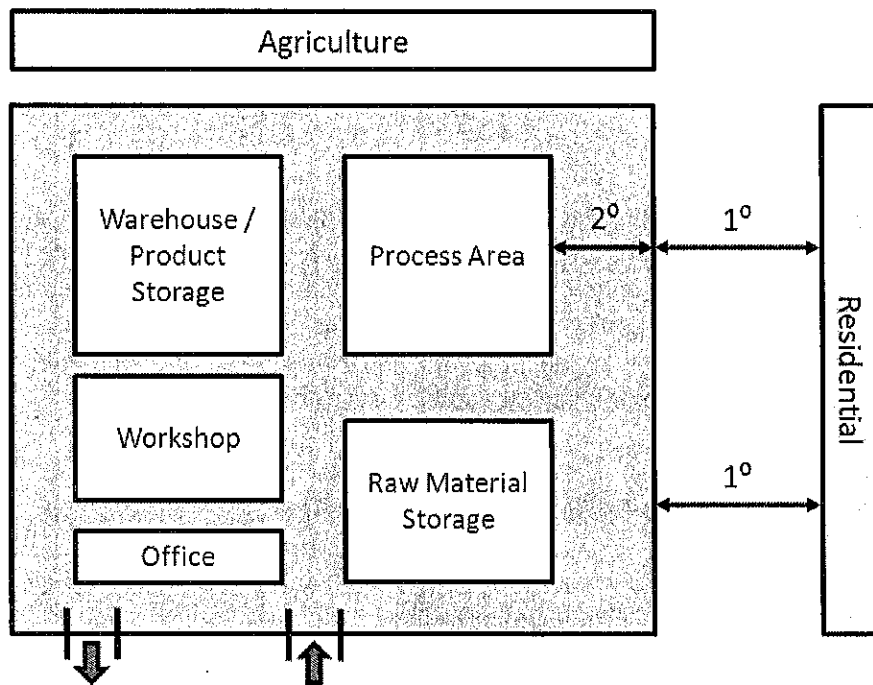
The '**Secondary Buffer Zone**' is defined as *'the additional buffer area or distance found within the property boundary of the project or activity measured from the source of pollution to the property boundary of the project or activity, that, if taken together with the buffer area between the two adjacent properties will allow the Overall Buffer Zone requirement to be met'*.

4.2.4 Application of Primary and Secondary Buffer

Two examples of how the Primary and the Secondary buffer may be applied are shown in the following examples (**Figures 4-1a & 4-1b**, and **Figures 4-2a & 4-2b**, respectively).

As can be seen, the overall objective is to meet the Overall Buffer Zone and this is achieved by varying the Secondary buffer while ensuring that the Primary buffer distance is met at all times. 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.

Figure 4-1a Initial Layout Adjacent to Residential Area



Sectional View

4.3 PRIMARY BUFFER ZONE CHARACTERISTICS

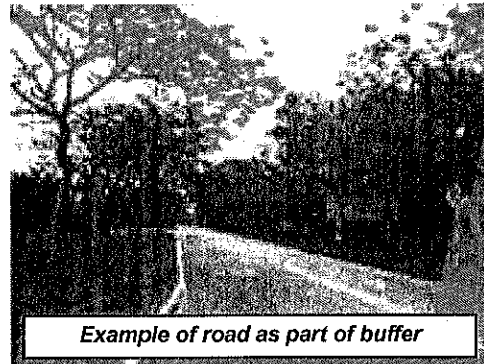
The 'Primary buffer zone' represents an area or distance which is to be found outside of the property boundary of the project or proposed activity. Hence, it involves land that may not belong to the owner of the project or the proposed activity. The use of land within such buffer areas are designated within land use plans that are approved by the Local Authorities or the Land Authorities and are generally contained within Local, Structure, Development and other official plans.

Acceptability of the buffer zone for purposes of meeting the requirements for approval of the site depends on the land uses and activities which occur or are planned for the area. 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 within the Primary buffer zone depend on their compatibility with the sensitive receptor in the neighbouring or adjacent areas as outlined in the following.

4.3.1 Buffer Zone Next to Designated Residential Area

Land uses and activities which are acceptable within Primary buffer zones adjacent to designated **residential area** include 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,
- i) golf courses and other sporting facilities,
- j) agriculture involving the planting of 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) cottage industries which are compatible with the industrial or activities.



4.3.2 Buffer Zone Next to Sensitive Public Facilities

'Sensitive public facilities' mean such facilities as hospitals, schools (normal and residential), national historical, cultural and heritage buildings and sites, and religious and cultural facilities which are recognised to have social significance. Land uses and activities which are acceptable within the Primary buffer zone include all of the above described in Section 4.2.1, and may include cottage industries and light service industries which do not generate significant air emissions, heat, noise or vibration, except the following:

- a) warehousing and warehousing service, and
- b) all industry types including service workshops.

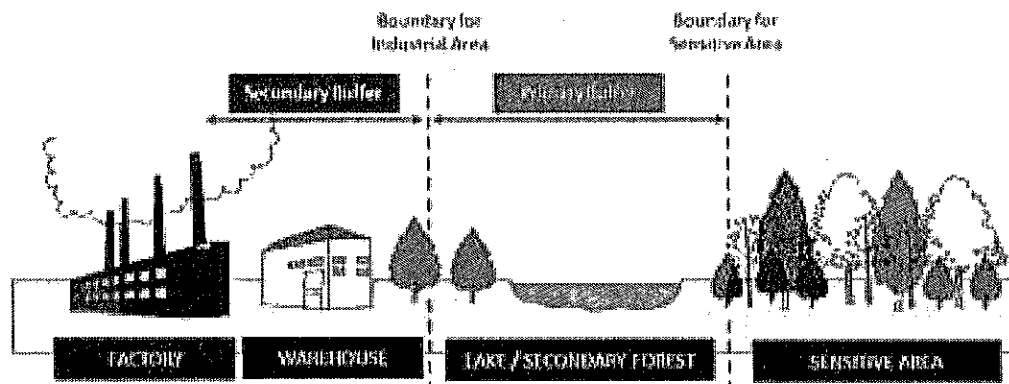
4.3.3 Buffer Zone Next to Ecologically Sensitive Receptors

'Ecologically sensitive receptors' are taken to include, designated wildlife sanctuaries, habitat conservation areas for migratory birds and for conservation of rare, endemic, endangered or totally protected species, geological sites known for their uniqueness and sensitivity, important natural lakes and wetlands, and aquifer recharge zones. The preferred land uses and activities acceptable in the Primary buffer zone include the following:

- a) forests (primary, secondary or disturbed),
- b) parks and green areas,
- c) rivers and riparian reserves,
- d) soil conservation and slope protection areas,
and
- e) drains and drain reserves,

An idealized situation may be seen in **Figure 4-3**.

Figure 4-3: Primary Buffer Zone Type Adjacent to an Ecologically Sensitive Area



Other land uses and activities which may be considered include:

- a) agriculture involving the planting of permanent crops such as rubber, oil palm, cocoa, coffee, and other permanent crops;
- b) agro-forestry and areas reserved for planting of commercial timber trees, and
- c) golf courses.

4.4 SECONDARY BUFFER ZONE CHARACTERISTICS

As earlier mentioned, the 'Secondary buffer zone' is the area that is found within the property boundary of the project or the proposed activity, hence belongs to the owner of the project or activity. The concept for the Secondary buffer zone is to achieve the Overall buffer distance through such means as:

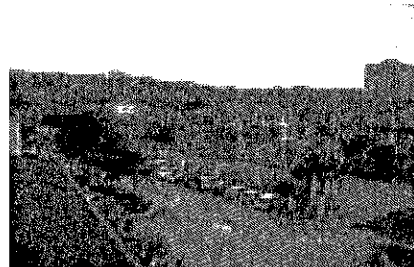


- a) revision to the project layout to achieve an 'extended' buffer zone,
- b) relocation of polluting facilities or activities away from sensitive receptors,
- c) introduction of 'barriers' or physical measures to reduce impacts to the receptor (generally applicable to impacts due to noise, fire, visual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

4.4.1 Amenities and Facilities Acceptable in Secondary Buffer Zone

Acceptable amenities or facilities within the Secondary buffer zone include the following:

- a) office and associated staff facilities and amenities (including canteen, gym, rest rooms, etc),
- b) road and road reserves,
- c) car park,
- d) building setback,
- e) drains and drain reserves,
- f) playing field, open spaces and sporting facilities,
- g) other downstream activities (which may include packing, packaging, or other preparation processes) which do not generate significant noise, vibration, odour or air emissions which cannot be contained within the project boundary,
- h) warehouses not involved in the storage of hazardous or dangerous goods, and
- i) cottage industries, workshops and service centres.



SECTION 5 : RECOMMENDED BUFFER DISTANCES

5.1 CONSIDERATIONS FOR SETTING BUFFER DISTANCE

Buffer distances are prescribed 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 normally 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 production,
- e) the risk posed to human health and safety due to exposure to a pollutant, fire and explosion, and
- f) the significance of the residual impact taking account of the industry standard for pollution control.

5.2 BUFFER DISTANCES ACCORDING TO INDUSTRY OR ACTIVITY TYPE

The Overall buffer distances for each of the industry categories or industry type and various activities are described in **Appendix 1**.

The types of buffer indicated for each of the industry or activity category are:

- a) Overall Buffer,
- b) Primary Buffer, and
- c) Secondary Buffer.

5.3 CONSIDERATIONS FOR APPLYING BUFFER

The following considerations shall be taken into account when applying the buffer types indicated:

- a) The Overall Buffer represents the prescribed buffer to be met and it is the sum total of the Primary and Secondary buffer.
- b) The Primary Buffer indicated shall at all times be met.
- c) Where the Overall Buffer cannot be met entirely by the Primary Buffer, the Secondary Buffer may be applied to achieve the requirements of the Overall Buffer.
- d) The Secondary Buffer shall normally be applied to manage situations such as the following:

- Process areas which are significant sources of residual air pollutants or odour;
 - Process areas which have potential for significant fire and explosion;
 - Process areas which have potential to release hazardous chemical or fumes;
 - 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;
 - Storage areas for hazardous chemicals or materials which have potential to result in fire or explosion;
 - Product handling, transfer and storage which may result in significant fugitive emission(s),
 - Stacks and other point sources of air emissions; and
 - Areas from which residual noise is expected to be significant.
- e) The Secondary Buffer is not applicable to the following facilities:
- Facilities involved in the use, process or storage of highly hazardous chemicals and compounds [*defined as 'those that may cause cancer, birth defects, induce genetic damage, cause miscarriage, or otherwise interfere with the reproductive process, or they may be a cholinesterase inhibitor, a cyanide, or other highly toxic chemical that, after a comparatively small exposure, can lead to serious injury or even death or cause acute toxicity'*]⁴; and
 - Facilities with significant potential to cause or result in major fire and/or explosion which can lead to serious injury or death.
- f) For facilities identified in (e), the appropriate buffer distance for such facilities is recommended to be established from modeling studies which are approved by the DOE.
- g) Similarly, in case of uncertainty of actual buffer distances required, consideration may be given to establish the appropriate buffer distance from modeling studies as described below.

5.4 BUFFER BY MODELLING

There may be instances whereby a specific buffer distance may not be completely fulfilled and the difference may be too little or small, for example it could be short by 20 meters or 10 meters. In this scenario, it is recommended that further consideration of the likely nature and extent of its environmental impacts to be established from a simple modelling exercise which may show that the buffer distance is still acceptable. The establishment of the buffer has to be supported by appropriate modelling software that is acceptable by the DOE and commitment

⁴Reference may also be made to: Occupational Safety & Health (Use and Standard of Exposure of Chemical Hazardous to Health) Regulation, 2000

should be in place by the project proponent to minimise potential impacts with provision of appropriate mitigation and controls measures.

5.5 BUFFER SPECIFIED BY OTHER AGENCIES AND AUTHORITIES

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) *Malaysian Sewerage Industry Guidelines – Volume IV, Sewage Treatment Plants, 3rd Edition, National Water Services Commission (SPAN). Jan 2009.*
- b) *Garis panduan Perancangan Kawasan Perindustrian – 1st Edition, Jabatan Perancangan Bandar dan Desa Semanjung Malaysia. 2011.*

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*].

The Siting and Zoning 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 Secondary Buffer in these Guidelines.

Similarly, *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 to be adopted.

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SECTION 6 : ADMINISTRATIVE PROCEDURES FOR SITE SUITABILITY APPROVAL

6.1 INTRODUCTION

Site suitability assessment for the establishment of any new industrial plant, facility or any prescribed premise or activity, whether within or outside of a designated industrial area, is a basic requirement of the DOE to avoid environmental conflicts with adjacent and surrounding land users. As such, Project Proponents are advised to notify the DOE of its intention to establish or undertake such projects or activities and to seek advice or comments from the Director General of Environmental Quality on the project or activity.

6.1.1 Written Permission

Various provisions under the *Environmental Quality Act 1974* and regulations made under it require that a Project Proponent intending to establish any new industrial project or construct on any land or any building, or carry out any work that would cause the land or building to become prescribed premises would require written permission to be obtained from the Director General prior to carrying out the activity. The provisions include:

- a) Section 19, *Environmental Quality Act, 1974* – relating to ‘carry out work, or construct on any land any building, that would cause the land or building to become prescribed premises’, for which written permission is required. This Section is applied in the following regulations:
 - *Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations, 1977,*
 - *Environmental Quality (Prescribed Premises) (Raw Natural Rubber Regulations, 1978, and*
 - *Environmental Quality (Prescribed Premises) (Scheduled Waste Treatment and Disposal Facilities) Regulations, 1978.*
- b) Regulation 4, *Environmental Quality (Clean Air) Regulations, 1978* – for new industrial facilities or installations described in the First Schedule which are located adjacent to residential areas.
- c) Written permission is also applied for purposes other than construction of new facilities or installations, such as:
 - Regulations 15 & 16, *Environmental Quality (Sewage) Regulations, 2009,*
 - and
 - Regulation 23, *Environmental Quality (Industrial Effluent) Regulations, 2009.*

6.1.2 Prior Notification

Besides written permission, ‘prior notification’ of any work on any premise that may result in a new source of discharge of effluent (sewage, leachate, industrial, or mixed effluent) is

to be made to the Director General. Prior notification is a requirement under the following regulations:

- a) Regulation 4, *Environmental Quality (Sewage) Regulations, 2009*,
- b) Regulation 4, *Environmental Quality (Industrial Effluent) Regulations, 2009*, and
- c) Regulation 4, *Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations, 2009*.

6.2 SITE SUITABILITY ASSESSMENT

Site suitability assessment is applied to all new industrial projects or activities, whether they are subject or not to Section 34A of the Environmental Quality Act 1974. All such new project proposals are advised to submit a site suitability assessment application to the State DOE for consideration and in-principle consent as to suitability of the site. It is to be given first priority in the overall environmental project planning and permitting process as outlined in **Figure 6-1**(see following page).

In determining and selecting a site the following considerations are advised to be given by the Project Proponent:

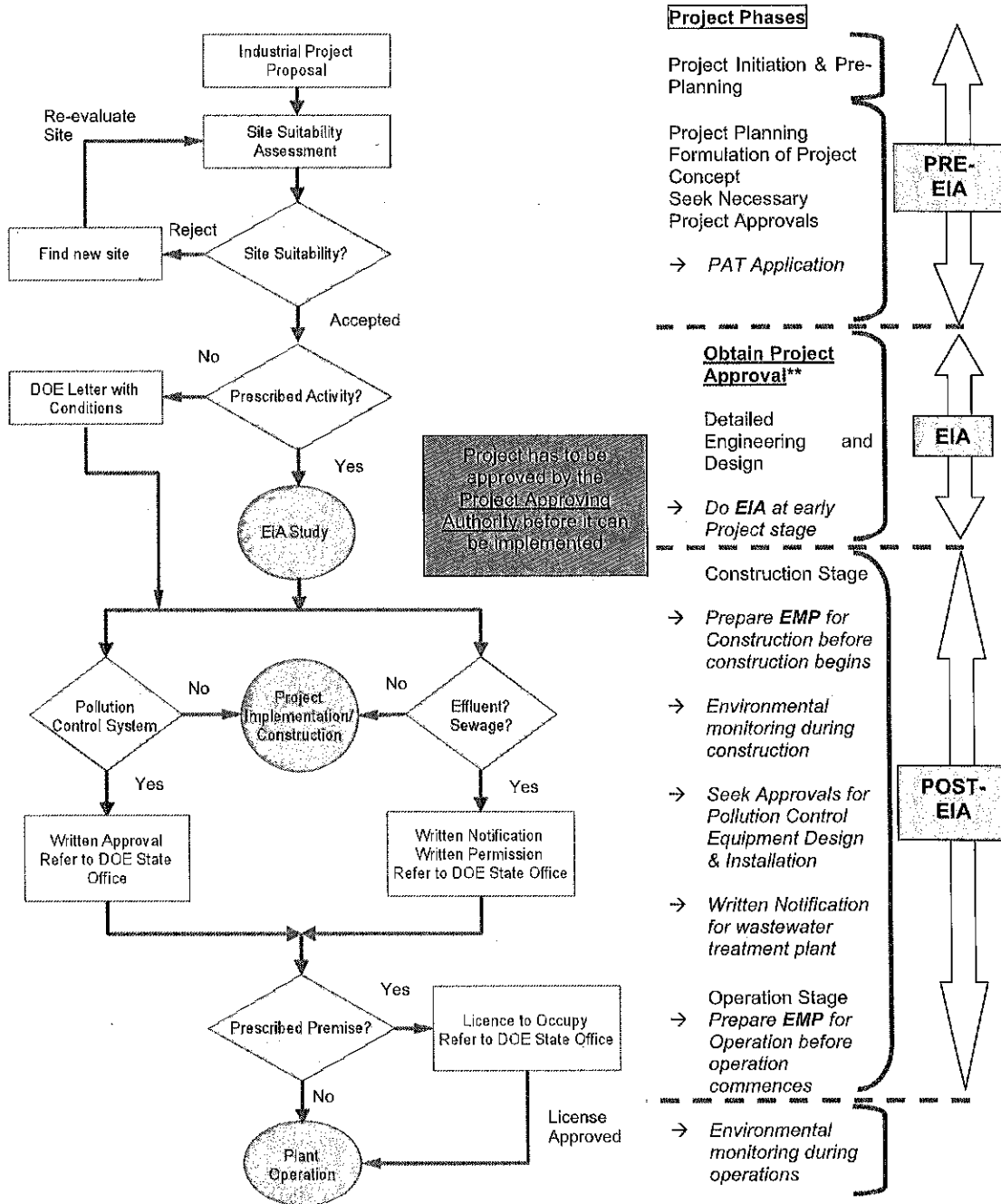
- a) Examine more than one (1) site as an option,
- b) Evaluate the selected site to determine if it meets the general guidelines for siting of the project,
- c) Undertake a due diligence audit (optional) if the site is not a 'greenfield site' and there is concern that contamination from past use or operations on the site may be of concern, and
- d) Submit and obtain DOE's views and advice on the selected site prior to full commitment to purchase the site.

6.2.1 Procedure for Application

The procedure requires the following to be made.

1. Application to the State DOE is to be made by way of submission of a form, *AS PAT 1-12 FORM: Preliminary Site Assessment for Development Project*, or '*Borang AS PAT 1-12: Penilaian Awal Tapak Bagi Projek Pembangunan*, (see sample in **Appendix 2**).
2. The application form is to be accompanied by the following:
 - Site and location plan,
 - Layout plan of the project,
 - Land use analysis map showing buffer zones or distances,
 - Project description, and
 - Relevant information about pollution prevention and control.
3. Where appropriate and required, for those identified as highly hazardous (see Section 5.3 (d) and (e), a report showing the results of modelling studies is to be appended.

Figure 6-1 : Overall Environmental Planning & Permitting Process



6.2.2 Criteria for Site Suitability Acceptability

Site suitability acceptability shall take account of the following considerations:

- a) The proposed project land use is appropriate and not in conflict with that designated or proposed for the site as detailed in the gazetted Structure or Local plan, or such other approved land use plans prescribed by the relevant authority;
- b) The project land use is generally compatible with the surrounding land use that is designated in the gazetted Structure or Local Plans or such other approved land use plans prescribed by the relevant authority;
- c) The site generally meets the buffer zone or setback distances prescribed for the activity in the *Guidelines for the Siting and Zoning of Industrial and Residential Area*;
- d) 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
- e) Appropriateness of process technology and pollution control prevention and control measures proposed to be adopted.

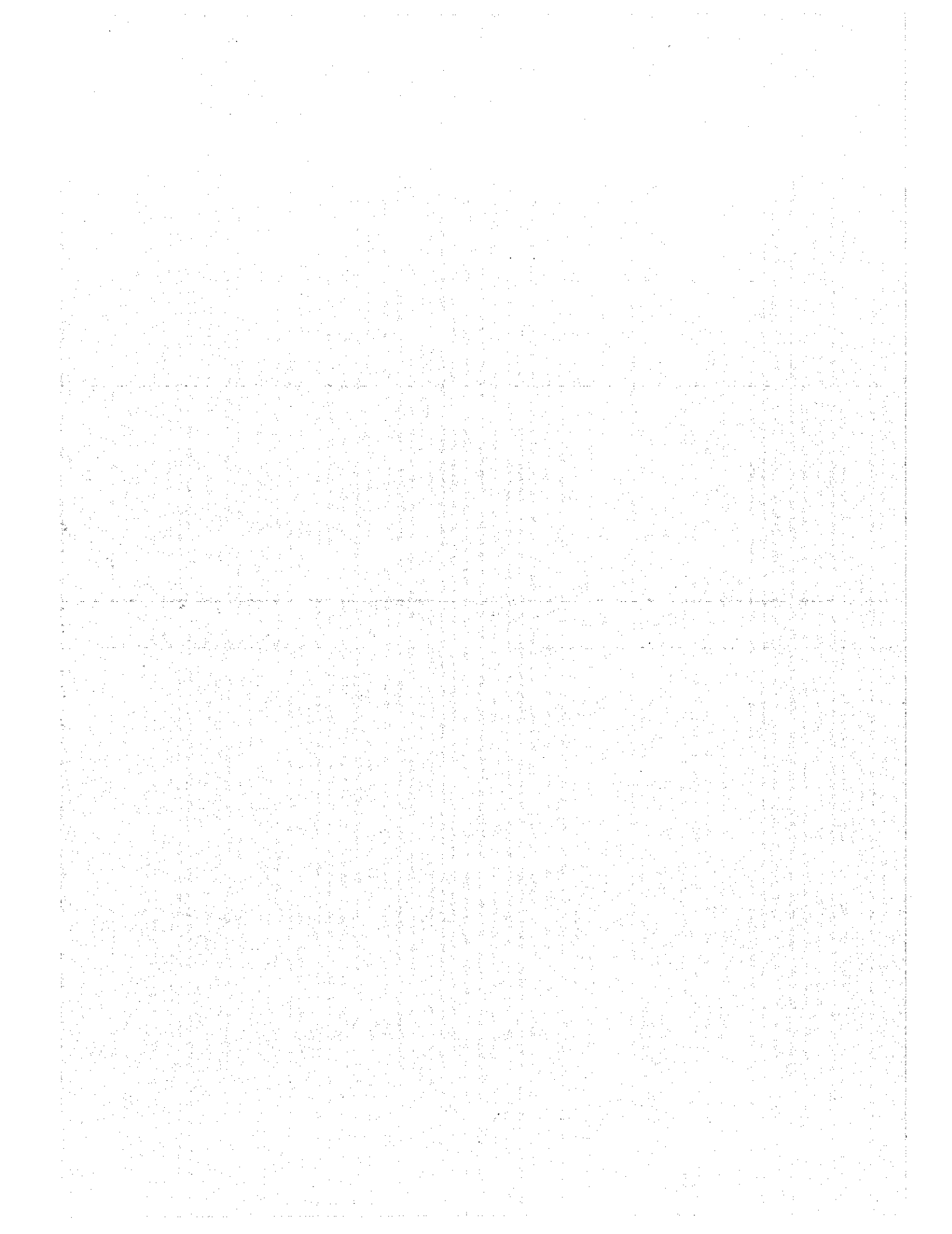
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3. Department of Occupational Safety & Health: Occupational Safety & Health (Use and Standards of Exposure of Chemical Hazardous to Health) Regulations, 2000.
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5. Government of Malaysia; *National Land Code, 1965 (Act 56).*
6. Government of Malaysia; *Solid Waste and Public Cleansing Management Act 2007 (Act 672)*
7. Government of Malaysia; *Water Services Industry Act 2006.*
8. Government of Malaysia; *The Industrial Coordination Act, 1975 (Act 156)*
9. Government of Malaysia; *Environmental Quality Act 1974 (Act 127)*
10. Government of Malaysia; *Environmental Quality (Clean Air) Regulations, 1978.*
11. Government of Malaysia; *Environmental Quality (Sewage) Regulations, 2009.*
12. Government of Malaysia; *Environmental Quality (Industrial Effluent) Regulations, 2009.*
13. Government of Malaysia; *Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulations, 1977.*
14. Government of Malaysia; *Environmental Quality (Prescribed Premises) (Raw Natural Rubber Regulations, 1978.*
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17. International Atomic Energy Agency (2009), *Classification of Radioactive Waste, IAEA Safety Standard Series, No GSG-1, 2009.*

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APPENDIX A

CLASSIFICATION OF INDUSTRIES AND POTENTIALLY POLLUTING HAZARDOUS ACTIVITIES



**CLASSIFICATION OF INDUSTRIES AND POTENTIALLY
POLLUTING HAZARDOUS ACTIVITIES**

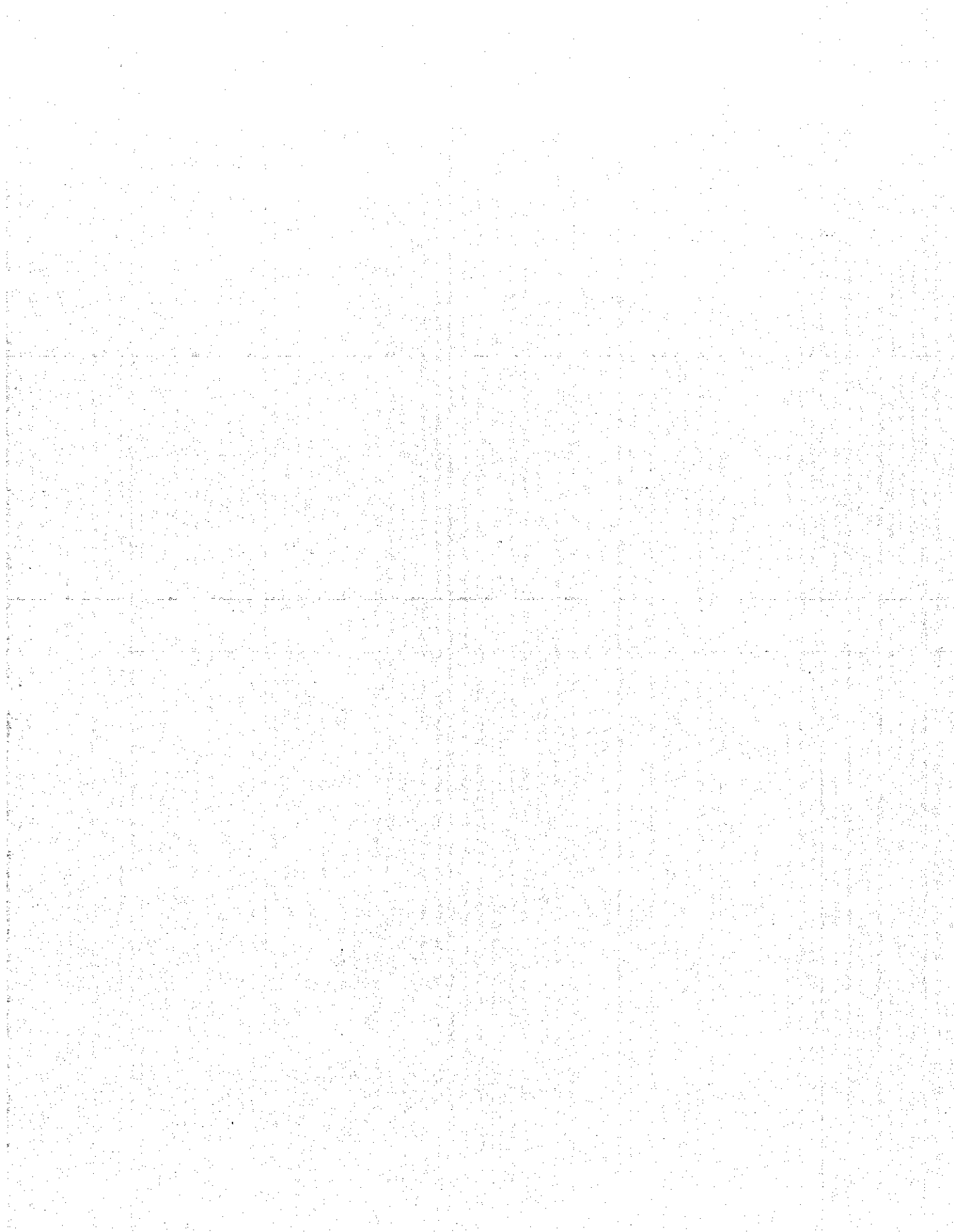
| Category | Description of Nature of Industry/ Activity | Indicative Primary Buffer Distance From Sensitive Receptor |
|-----------------|---|--|
| 1 | <p>High risk industries, installations or activities characterized by:</p> <ul style="list-style-type: none"> • Very high risk due to fire, explosion, radiation, and highly hazardous chemicals • Raw material used in production or products may include those classified as 'highly hazardous' • Emit significant levels of residual particulate and/ or gaseous air pollutants • Discharge very large quantities wastewater containing significant levels of residual contaminants • Generate large quantities of scheduled wastes some of which are very difficult to treat. | <ul style="list-style-type: none"> • Minimum of 1 km or more. • Actual buffer to be established from modeling study taking account of the type and level of risks associated with the industry or activity. |
| 2 | <p>Heavy type industries or activities are characterized by:</p> <ul style="list-style-type: none"> • High pollution potential and risk due to fire, explosion, radiation, and/or highly hazardous chemicals • High air pollution potential (including odour) from residual pollutants in air emissions (fugitive and source emissions) • High potential for emission of greenhouse gases and/or ozone depleting substances • Generate excessive noise and/or vibration exceeding safe limits • Generate large quantities of wastewater containing significant levels of residual contaminants • Use large quantities of raw material(s) with potential to cause significant fugitive emissions during handling, transfer and storage • Generate significant amounts of scheduled wastes some of which are difficult to treat or managed. | <ul style="list-style-type: none"> • Minimum of 300 m or more • Buffer distance for specific processes or polluting sources which are difficult to control effectively may require greater buffer distances. • Actual buffer for these processes or sources are to be established from modeling studies. |

| Category | Description of Nature of Industry/ Activity | Indicative Primary Buffer Distance From Sensitive Receptor |
|-----------------|---|--|
| <p>3</p> | <p>Medium type industries or activities are characterized by:</p> <ul style="list-style-type: none"> • Moderate pollution potential and risk due to fire, explosion, and/or hazardous chemicals • Moderate air pollution potential (including odour) from low levels of residual air pollutants • Moderate potential for emission of greenhouse gases and/or ozone depleting substances • Moderate noise and/or vibration with no significant residual impact • Generate significant quantities of wastewater containing low levels of residual pollutants • Generate scheduled wastes which are mostly readily treated or managed within prescribed facilities. | <ul style="list-style-type: none"> • Minimum of 150 m or more • Buffer distance for specific processes or polluting sources which are difficult to control effectively may require greater buffer distances. • Where needed, modeling study is to be undertaken to determine actual buffer for these processes or sources. |
| <p>4</p> | <p>Light type industries or activities are characterized by:</p> <ul style="list-style-type: none"> • None or very low pollution potential for air pollution, noise, vibration, odour, fire or explosion • Does not involve the use hazardous raw materials or production of hazardous products • Use of renewal or low greenhouse gas emission sources of energy • Generate no or very low amounts of wastewater with potential to contribute to water pollution • Generate mostly non-hazardous solid waste and no significant amount of scheduled wastes • Industries are small scale and mostly compatible with each other. | <ul style="list-style-type: none"> • Minimum of 50 m or more • Buffer distance for specific processes or polluting sources which are difficult to control effectively may require greater buffer distances. • Where needed, modeling study is to be undertaken to determine actual buffer for these processes or sources |

| Category | Description of Nature of Industry/ Activity | Indicative Primary Buffer Distance From Sensitive Receptor |
|----------|--|--|
| 5 | <p>Cottage industries are characterized by:</p> <ul style="list-style-type: none"> • None or very low pollution potential for air pollution, odour, noise, vibration, fire or explosion • Are 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. | <ul style="list-style-type: none"> • No specified minimum buffer • Where significant noise and heat is generated, suggested buffer of <u>10 m or more</u>. • Control on scale of industry is required. |

APPENDIX B

**INDUSTRIES AND ACTIVITIES
ARE LISTED ACCORDING TO
MALAYSIA STANDARD INDUSTRIAL
CLASSIFICATION 2008 (MSIC 2008)
VERSION 1.0 (AS OFF 2012)**



Industries and Activities are listed according to Malaysia Standard Industrial Classification 2008 (MSIC 2008) Version 1.0 (as off 2012)

| MSIC 2008 | Description | Details | Category | Buffer (in meters) | | Remarks |
|-------------------------------|-------------------------------------|--|----------|--------------------|--------------|---|
| | | | | Overall | Primary (1') | |
| 014. Animal Production | | | | | | |
| 0141 | Raising of cattle and buffaloes | <ul style="list-style-type: none"> raising and breeding of cattle and buffaloes production of raw cow milk from cows or buffaloes <i>[Note; operations in feedlots or confined spaces]</i> | | 500 | 500 | Need for adoption of good-housekeeping practices to control odour |
| 0142 | Raising of horses and other equines | raising and breeding of horses (including racing horses), asses, mules or hinnies. <i>[Note; operations in feedlots or confined spaces]</i> | | 500 | 500 | Need for adoption of good-housekeeping practices to control odour |
| 0144 | Raising of sheep and goats | <ul style="list-style-type: none"> raising and breeding of sheep and goats production of raw sheep or goat milk <i>[Note; operations in feedlots or confined spaces]</i> | | 500 | 500 | Need for adoption of good-housekeeping practices to control odour |
| 0145 | Raising of swine/pigs | raising and breeding of swine (pigs) <i>[Note; operations in feedlots or confined spaces]</i> | | 500 | 500 | Need for adoption of good-housekeeping practices to control odour. Proper siting to avoid religious sensitivity |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|------------|--------------------------|--|----------|--------------------|--------------|---|
| | | | | Overall | Primary (1) | |
| 0146 | Raising of poultry | <ul style="list-style-type: none"> raising and breeding of poultry: <ul style="list-style-type: none"> -fowls of the species Gallus domesticus (chickens and capons), ducks, geese, turkeys and guinea fowls production of eggs operation of poultry hatcheries <p><i>[Note; operations in barns or confined spaces]</i></p> | | 500 (300) | 500 (300) | Larger buffer applied to farms which use open barn systems while buffer in brackets apply to modern farms using enclosed barns which have gas extraction and odour control systems. Good-housekeeping practices to control odour and flies are to be adopted. |
| 0149 | Raising of other animals | <p>This class includes:</p> <ul style="list-style-type: none"> raising and breeding of semi-domesticated or other live animals: <ul style="list-style-type: none"> -ostriches and emus -other birds (except poultry) -insects -rabbits and other fur animals production of fur skins, reptile or bird skins from ranching operation operation of worm farms, land mollusc farms, snail farms etc. raising of silk worms, production of silk worm cocoons bee-keeping and production of honey and beeswax raising and breeding of pet animals (except fish): <ul style="list-style-type: none"> -cats and dogs -birds, such as parakeets etc. -hamsters etc. raising of diverse animals | | 250 | 200 | Need for adoption of good-housekeeping practices to control odour |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|--|---|--|----------|--------------------|-------------|--|
| | | | | Overall | Primary (1) | |
| 05. Mining and Quarrying | | | | | | |
| 05510 | Mining of coal and lignite | | | | | |
| 050510510 | Mining of hard coal (coal, iron ore, bauxite, gold, etc.) | Mining of hard coal: underground or surface mining, including mining through liquefaction methods. . | 1 | 1000 | 1000 | Overall buffer is minimum; actual to be set by modelling |
| | | On-site facilities include for cleaning, sizing, grading, pulverizing, compressing etc | 2 | 500 | 500 | |
| 050510520 | Mining of lignite | Mining of lignite (brown coal): underground or surface mining, including mining through liquefaction methods. | 1 | 1000 | 1000 | Overall buffer is minimum; actual to be set by modelling |
| | | On-site facilities include washing, dehydrating, pulverizing, compressing, etc.) | 2 | 500 | 500 | |
| 06. Extraction of crude petroleum and natural gas | | | | | | |
| 060610610 | Extraction of crude petroleum | Offshore extraction of crude petroleum oils, bituminous or oil shale and tar sand production of crude petroleum from bituminous shale and sand including on-site processes to obtain crude oils: decantation, desalting, dehydration, stabilization etc. | 1 | See remarks | - | Buffer to be set by modeling |
| | | Onshore extraction of crude petroleum oils, bituminous or oil shale and tar sand production of crude petroleum from bituminous shale and sand | 1 | 1000 | 1000 | Overall buffer is minimum; actual to be set by modelling |
| | | On-site processes to obtain crude oils: decantation, desalting, dehydration, stabilization, storage, etc. at onshore extraction site | 1 | 1000 | 1000 | Overall is minimum; actual to be set by modelling |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|---------------------------------|---|---|----------|--------------------|-------------|---|
| | | | | Overall | Primary (1) | |
| 060610620 | Extraction of natural gas | Offshore production of crude gaseous hydrocarbon (natural gas), extraction of condensates, on-site facilities for draining and separation of liquid hydrocarbon fractions, gas desulphurization, mining of hydrocarbon liquids, obtained through liquefaction or pyrolysis | 1 | See remarks | - | Buffer to be set by modeling |
| | | Onshore production of crude gaseous hydrocarbon (natural gas), extraction of condensates, on-site facilities for draining and separation of liquid hydrocarbon fractions, gas desulphurization, mining of hydrocarbon liquids, obtained through liquefaction or pyrolysis | 1 | 1000 | 1000 | Overall is minimum; actual to be set by modelling |
| 07. Mining of metal ores | | | | | | |
| 070710710 | Mining of iron ores | Mining of ores valued chiefly for iron content Beneficiation and agglomeration of iron ores | 2 | 500 | 500 | Overall is minimum; actual to be set by modelling |
| 070710729 | Mining of non-ferrous metal ores other than uranium & thorium | Mining and preparation of ores valued chiefly for non-ferrous metal content: <ul style="list-style-type: none"> • aluminium (bauxite), copper, lead, zinc, tin, manganese, chrome, nickel, cobalt, molybdenum, tantalum, vanadium etc. • precious metals: gold, silver, platinum | 2 | 500 | 500 | Overall is minimum; actual to be set by modelling |

| MSIC 2008 | Description | Details | Category | Buffer (in meters) | | Remarks |
|--|---|---|----------|--------------------|-------------|--|
| | | | | Overall | Primary (1) | |
| 08. Other mining and quarrying | | | | | | |
| 080810810 | Quarrying of stone, sand and clay (include gypsum and anhydrite, chalk and uncalcined dolomite, | Quarrying, rough trimming and sawing of monumental and building stone such as marble, granite, sandstone etc. Onsite activities include crushing and breaking of mined materials | 2 | 500 | 500 | Overall is minimum; actual to be set by modelling |
| | | Extraction and dredging of industrial sand, sand for construction and gravel | 3 | 300 | 200 | |
| | | Quarrying of sand | 3 | 300 | 200 | |
| | | Mining of clays, refractory clays and kaolin | 3 | 300 | 200 | |
| 08082 | Mining and quarrying n.e.c. | | 2 | 500 | 500 | Actual buffer is to be set by modeling for type of materials mined |
| 09. Mining support service activities | | | | | | |
| 09091 | Support activities for petroleum and natural gas extraction | Pre-extraction activities include exploration, directional drilling, and redrilling; "spudding in"; derrick erection in situ, repairing and dismantling; cementing oil and gas well casings; pumping of wells; plugging and abandoning wells etc. Test drilling in connection with petroleum or gas extraction | 1 | 1000 | 1000 | Actual buffer to be set by modelling |
| 09092 | Support activities for other mining and quarrying | Exploration services, e.g. traditional prospecting methods, such as taking core samples and making geological observations at prospective sites | 3 | See remarks | - | If coring used -200m If blasting used -500m No buffer for geological observation |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|---|---|---|----------|--------------------|---------------------------|---|
| | | | | Overall | Primary (1 ^o) | |
| 10. Manufacture of food products | | | | | | |
| 10101 | Processing & preserving of meat | Operation of slaughterhouses engaged in killing, dressing or packing meat: beef, pork, poultry, lamb, rabbit, mutton, camel, etc. Include on-site production of fresh, chilled or frozen meat, in carcasses, cuts, individual portions, dried, salted or smoked meat, etc. | 2 | 500 | 500 | |
| | | production of hides and skins originating from slaughterhouses, including fellmongery | 2 | 500 | 400 | Enclosed facility is |
| | | processing of animal offal | 2 | 500 | 400 | Enclosed facility |
| | | rendering of lard and other edible fats of animal origin | 3 | 250 | 200 | Enclosed facility |
| | | production of pulled wool | 3 | 250 | 200 | |
| | | production of feathers and down | 3 | 250 | 200 | |
| 10102 | Processing & preserving of fish, crustaceans and molluscs | Preparation, preservation and production of fish, crustaceans and molluscs: freezing, deep-freezing, drying, smoking, salting, immersing in brine, canning etc. to produce cooked fish, fish fillets, roes, caviar, caviar substitutes etc.) | 3 | 250 | 200 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres) |
| | | Production of fishmeal for human consumption or animal feed | 3 | 350 | 300 | |
| | | Production of meals and solubles from fish and other aquatic animals unfit for human consumption | 3 | 350 | 300 | |
| 10103 | Processing & preserving of fruit and vegetables | Manufacture of food consisting chiefly of fruit or vegetables, except ready-made dishes in frozen or canned form Include: Preserving, freezing, drying, immersing in oil or in vinegar, canning etc. Products: fruit or vegetable food products, fruit or vegetable juices, jams, marmalades and table jellies, potatoes, etc. | 4 | 150 | 100 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres) |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|------------|---|---|----------|--------------------|--------------|---|
| | | | | Overall | Primary (1°) | |
| 10104 | Manufacture of vegetable and animal oils and fats | Manufacture, refining, processing of : | 3 | 250 | 200 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres) |
| | | <ul style="list-style-type: none"> • crude vegetable oils: olive oil, soya-bean oil, palm oil, sunflower-seed oil, cotton-seed oil, rape, colza or mustard oil, linseed oil, • non-defatted flour or meal of oilseeds, oil nuts or oil kernels | 4 | 100 | 60 | |
| | | Manufacture of margarine, mélanges, similar spreads and compound cooking fats | | | | |
| 10105 | Manufacture of dairy products | Manufacture of <ul style="list-style-type: none"> • fresh liquid milk, pasteurized, sterilized, homogenized and/ or ultra • heat treated • milk-based drinks • cream from fresh liquid milk, pasteurized, sterilized, homogenized • dried or concentrated milk whether or not sweetened • milk or cream in solid form • butter, yoghurt, cheese and curd, whey, casein or lactose • ice cream and other edible ice such as sorbet | 4 | 100 | 60 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres) |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|------------|--|---|----------|--------------------|--------------|---|
| | | | | Overall | Primary (1°) | |
| 10106 | Manufacture of grain mill products, starches and starch products | | | | | |
| 10106061 | Manufacture of grain mill products | <ul style="list-style-type: none"> Grain milling: production of flour, groats, meal or pellets of wheat, rye, oats, maize (corn) or other cereal grains | 3 | 250 | 200 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| | | <ul style="list-style-type: none"> Rice milling: production of husked, milled, polished, glazed, parboiled or converted rice; production of rice flour Vegetable milling: production of flour or meal of dried leguminous vegetables, of roots or tubers, or of edible nuts | 3 | 250 | 200 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| | | <ul style="list-style-type: none"> Manufacture of cereal breakfast foods Manufacture of flour mixes and prepared blended flour and dough for bread, cakes, biscuits or pancakes | 4 | 100 | 60 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 101060612 | Manufacture of starches and starch products | Manufacture of <ul style="list-style-type: none"> starches from rice, potatoes, maize etc. wet corn milling glucose, glucose syrup, maltose, inulin etc. gluten tapioca and tapioca substitutes prepared from starch corn oil | 4 | 150 | 100 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 10107 | Manufacture of other food products | Factory scale production of bakery products, sugar and confectionery, macaroni, noodles and similar products, prepared meals and dishes, coffee, tea and spices, as well as perishable and specialty food products | 4 | 100 | 60 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|------------|---|---|----------|--------------------|-------------|---|
| | | | | Overall | Primary (1) | |
| 10107071 | Manufacture of bakery products | Large scale production of fresh, frozen or dry bakery products, bread and rolls, fresh pastry, cakes, pies, tarts etc., rusks, biscuits and other "dry" bakery products, preserved pastry goods and cakes, snack products (cookies, crackers, pretzels etc.), whether sweet or salted, tortillas, frozen bakery products: pancakes, waffles, rolls etc. | 4 | 100 | 60 | Buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| | | Medium scale of fresh, frozen or dry bakery products, bread and rolls, fresh pastry, cakes, pies, tarts etc., rusks, biscuits and other "dry" bakery products, preserved pastry goods and cakes, snack products (cookies, crackers, pretzels etc.), whether sweet or salted, tortillas, frozen bakery products: pancakes, waffles, rolls etc. | 4 | 50 | 50 | Buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 10107072 | Manufacture of sugar | Manufacture or refining of sugar (sucrose) and sugar substitutes from the juice of cane, beet, maple and palm, sugar syrups, molasses, maple syrup and sugar | 3 | 250 | 200 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 10107073 | Manufacture of cocoa, chocolate and sugar confectionery | Manufacture of cocoa, cocoa butter, cocoa fat, cocoa oil, chocolate and chocolate confectionery (caramels, cachous, nougats, fondant, white chocolate), chewing gum, preserving in sugar of fruit, nuts, fruit peels and other parts of plants, confectionery lozenges and pastilles | 4 | 100 | 60 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 10107074 | Manufacture of macaroni, noodles, couscous and similar farinaceous products | Manufacture of pastas such as macaroni and noodles, whether or not cooked or stuffed, couscous, canned or frozen pasta products | 4 | 100 | 60 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |

| MSIC 2008* | Description | Details | Category | Buffer (In meters) | | Remarks |
|------------|--|---|----------|--------------------|-------------|--|
| | | | | Overall | Primary (1) | |
| 10107075 | Manufacture of prepared meals and dishes | Manufacture of: <ul style="list-style-type: none"> • meat or poultry dishes • fish dishes, including fish and chips • prepared dishes of vegetables • canned stews and vacuum-prepared meals • other prepared meals (such as "TV dinners", etc.) • frozen or otherwise preserved pizza | 4 | 150 | 100 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres). |
| 10107079 | Manufacture of other food products n.e.c | <ul style="list-style-type: none"> • Decaffeinating and roasting of coffee • Production of coffee products: • Manufacture of coffee substitutes • Blending of tea and maté • Manufacture of extracts and preparations based on tea or maté • Manufacture of soups and broths • Manufacture of special foods, such as infant, formula, follow up milks and other follow up foods, baby foods and foods containing homogenized ingredients • Manufacture of spices, sauces and condiments • Manufacture of artificial honey and caramel • Manufacture of perishable prepared foods, | 4 | 100 | 60 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres). |
| | | <ul style="list-style-type: none"> • Manufacture of vinegar | 3 | 250 | 200 | |

| MSIC 2008 ¹ | Description | Details | Category | Buffer (in meters) | | Remarks |
|-------------------------------------|---|--|----------|--------------------|---------------------------|---|
| | | | | Overall | Primary (1 ^o) | |
| 10108 | Manufacture of prepared animal feeds | Manufacture of: <ul style="list-style-type: none"> • prepared feeds for pets, including dogs, cats, birds, fish etc. • prepared feeds for farm animals, including animal feed concentrates and feed supplements • unmixed (single) feeds for farm animals | 3 | 200 | 150 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| | | Manufacture of fishmeal | 3 | 350 | 300 | |
| 11. Manufacture of beverages | | | | | | |
| 11110 | Manufacture of beverages | | | | | |
| 11101101 | Distilling, rectifying and blending of spirits | Manufacture of distilled, potable, alcoholic beverages: whisky, brandy, gin, liqueurs, "mixed drinks" etc., blending of distilled spirits and production of neutral spirits | 3 | 200 | 150 | 2 ^o buffer in addition to 1 ^o buffer to fermentation units. |
| 11101101 | Manufacture of wines | Manufacture/blending of wine, sparkling wine, wine from concentrated grape, fermented but not distilled alcoholic beverages: sake, cider, perry, mead, other fruit wines and mixed beverages containing alcohol, vermouth and the like | 4 | 150 | 100 | |
| 11101103 | Manufacture of malt liquors and malt | Manufacture of malt liquors, such as beer, ale, porter and stout, malt and low alcohol or non-alcoholic beer | 3 | 200 | 150 | |
| 11101104 | Manufacture of soft drinks; production of mineral waters and other bottled waters | Manufacture of non-alcoholic beverages, except non-alcoholic beer and wine, natural mineral waters and other bottled waters. Manufacture of soft drinks, non-alcoholic flavoured and/or sweetened waters: lemonade, orangeade, cola, fruit drinks, tonic waters etc. | 4 | 150 | 100 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|--|---|--|-------------|--------------------|---------------------------|---|
| | | | | Overall | Primary (1 ^o) | |
| 12. Manufacture of tobacco products | | | | | | |
| 12120 | Manufacture of tobacco products | Manufacture of tobacco products and products of tobacco substitutes: cigarettes, cigarette tobacco, cigars, pipe tobacco, chewing tobacco, snuff, "homogenized" or "reconstituted" tobacco. | 4 | 150 | 100 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 13. Manufacture of textiles | | | | | | |
| 13131 | Spinning, weaving and finishing of textiles | | | | | |
| 131311311 | Preparation and spinning of textile fibres | <p>Preparatory operations on textile fibres:</p> <ul style="list-style-type: none"> reeling and washing of silk degreasing and carbonizing of wool and dyeing of wool fleece carding and combing of all kinds of animal, vegetable and man-made fibres <p>Spinning and manufacture of yarn or thread for weaving or sewing, for the trade or for further processing including activities such as texturizing, twisting, folding, cabling and clipping of synthetic or artificial filament yarns</p> | 4 3 3 | 150 350 200 | 100 300 150 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 131311312 | Weaving of textiles | <ul style="list-style-type: none"> Manufacture of broad woven cotton-type, woollen-type, worsted-type or silk-type fabrics, including from mixtures or artificial or synthetic yarns Manufacture of other broad woven fabrics, using flax, ramie, hemp, jute, bast fibres and special yarns | 3 | 200 | 150 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 131311313 | Finishing of textiles | <ul style="list-style-type: none"> Bleaching and dyeing of textile fibres, yarns, fabrics and textile articles, including wearing apparel Dressing, drying, steaming, shrinking, mending, Sanforizing, mercerizing of textiles and textile articles, including wearing apparel | 3 | 200 | 150 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|------------|---|---|----------|--------------------|-------------|---|
| | | | | Overall | Primary (1) | |
| 13139 | Manufacture of other textiles | | | | | |
| 131391391 | Manufacture of knitted and crocheted fabrics | Manufacture and processing of knitted or crocheted fabrics, pile and terry fabrics, net and window furnishing type fabrics knitted on Raschel or similar machines, and other knitted or crocheted fabrics | 4 | 80 | 60 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 131391392 | Manufacture of made-up textile articles, except apparel | <ul style="list-style-type: none"> • Manufacture, of made-up articles of any textile material, including of knitted or crocheted • Fabrics, blankets, including travelling rug, bed, table, toilet or kitchen linen, quilts, eiderdowns, cushions, pouffes, pillows, sleeping bags etc. • Manufacture of made-up furnishing articles - curtains, valances, blinds, bedspreads, furniture or machine covers, tarpaulins, tents, camping goods, sails, sunblinds, loose covers for cars, machines or furniture etc., flags, banners, pennants, dust cloths, dishcloths and similar articles, life jackets, parachutes etc. | 4 | 80 | 60 | |
| 131391393 | Manufacture of carpets and rugs | Manufacture of textile floor coverings, carpets, rugs and mats, tiles | 4 | 150 | 100 | |
| 131391394 | Manufacture of cordage, rope, twine and netting | <ul style="list-style-type: none"> • Manufacture of twine, cordage, rope and cables of textile fibres or strip or the like (whether or not impregnated, coated, covered or sheathed with rubber or plastics) , knotted netting of twine, cordage or rope • Manufacture of products of rope or netting: fishing nets, ships' fenders, unloading cushions, loading slings, rope or cable fitted with metal rings etc. | 3 | 200 | 150 | |
| | | | 3 | 200 | 150 | |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|------------|--|---|----------|--------------------|-------------|---|
| | | | | Overall | Primary (1) | |
| 131391399 | Manufacture of other textiles not elsewhere classified (n.e.c) | <ul style="list-style-type: none"> • Manufacture of narrow woven fabrics, including fabrics consisting of warp without weft assembled by means of an adhesive • Manufacture of labels, badges etc. • Manufacture of ornamental trimmings: braids, tassels, pompons etc. • Manufacture of felt • Manufacture of tulle and other net fabrics, and of lace and embroidery, in the piece, in strips or in motifs | 4 | 80 | 60 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| | | | 4 | 150 | 100 | |
| | | <ul style="list-style-type: none"> • Manufacture of fabrics impregnated, coated, covered or laminated with plastics • Manufacture of metallized yarn or gimped yarn, rubber thread and cord covered with textile material, textile yarn or strip covered, impregnated, coated or sheathed with rubber or plastics • Manufacture of tyre cord fabric of high-tenacity man-made yarn • Manufacture of other treated or coated fabrics: tracing cloth, canvas prepared for use by painters, buckram and similar stiffened textile fabrics, fabrics coated with gum or amylaceous substances • Manufacture of diverse textile articles: textile wicks, incandescent gas mantles and • tubular gas mantle fabric, hosepiping, transmission or conveyor belts or belting • (whether or not reinforced with metal or other material), bolting cloth, straining cloth • Manufacture of automotive trimmings • Manufacture of pressure sensitive cloth-tape | | | | |

| MSIC 2008 | Description | Details | Category | Buffer (in meters) | | Remarks |
|--|---|--|----------|--------------------|--------------|--|
| | | | | Overall | Primary (1°) | |
| 14. Manufacture of wearing apparel | | | | | | |
| 14141 | Manufacture of wearing apparel, except fur apparel | Manufacture of wearing apparel, may be coated, impregnated or rubberized. (from leather or composition leather, including leather industrial work accessories such as welder's leather aprons, woven, knitted or crocheted fabric, nonwovens) | 4 | 100 | 60 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres). |
| 14142 | Manufacture of articles of fur | Manufacture of articles made of fur skins to produce wearing apparel and clothing accessories, assemblies of fur skins and diverse articles of fur-skins: rugs, unstuffed pouffes, industrial polishing cloths | 4 | 80 | 60 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres). |
| 14143 | Manufacture of knitted and crocheted apparel | Manufacture of knitted or crocheted wearing apparel and other made-up articles | 4 | 80 | 60 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres). |
| 15. Manufacture of leather and related products | | | | | | |
| 15151 | Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur | | | | | |
| 151511511 | Tanning and dressing of leather; dressing and dyeing of fur | <ul style="list-style-type: none"> • Tanning, dyeing and dressing of hides and skins • Manufacture of chamois dressed, parchment dressed, patent or metallized leathers • Manufacture of composition leather • Scraping, shearing, plucking, currying, tanning, bleaching and dyeing of fur skins and hides with the hair on | 3 | 350 | 300 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres). |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|--|---|--|----------|--------------------|-------------|---------|
| | | | | Overall | Primary (1) | |
| 151511512 | Manufacture of luggage, handbags and the like, saddlery and harness | <ul style="list-style-type: none"> • Manufacture of luggage, handbags and the like, of leather, composition leather or any other material, such as plastic sheeting, textile materials, vulcanized fibre or paperboard, where the same technology is used as for leather • Manufacture of saddlery and harness • Manufacture of non-metallic watch bands (e.g. fabric, leather, plastic) • Manufacture of diverse articles of leather or composition leather: driving belts, packings, shoe-lace, horse whips and riding crops, etc. | 4 | 150 | 100 | |
| 15152 | Manufacture of footwear | Manufacture of footwear for all purposes, of any material, by any process, including moulding | 4 | 150 | 100 | |
| 16. Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials | | | | | | |
| 16161 | Sawmilling and planning of wood | <ul style="list-style-type: none"> • sawing, planing, machining drying and impregnation of wood • slicing, peeling or chipping logs • manufacture of wooden railway sleepers • manufacture of unassembled wooden flooring • manufacture of wood wool, wood flour, chips, particles | 2 | 500 | 350 | |

| MSIC 2008 ¹ | Description | Details | Category | Buffer (in meters) | | Remarks |
|------------------------|---|--|----------|--------------------|---------------------------|---|
| | | | | Overall | Primary (1 ^o) | |
| 16162 | Manufacture of products of wood, cork, straw and plaiting materials | | | | | |
| 161621621 | Manufacture of veneer sheets and wood-based panels | <ul style="list-style-type: none"> • Manufacture of veneer sheets thin enough to be used for veneering, making plywood or other purposes • Manufacture of plywood, veneer panels and similar laminated wood boards and sheets • Manufacture of particle board and fibreboard • Manufacture of densified wood • Manufacture of glue laminated wood, laminated veneer wood | 2 | 350 | 300 | |
| 161621622 | Manufacture of builders' carpentry and joinery | <ul style="list-style-type: none"> • Manufacture of wooden goods intended to be used primarily in the construction industry, i.e. for beams, rafters, roof struts, glue-laminated or metal connected prefabricated wooden roof trusses, doors, windows, shutters and their frames, whether or not containing metal fittings, stairs, railings, wooden beadings and mouldings, shingles and shakes, and parquet floor blocks, strips etc., assembled into panels • Manufacture of prefabricated buildings, or elements thereof, predominantly of wood • Manufacture of mobile homes • Manufacture of wood partitions (except free standing) | 3 | 250 | 200 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 161621623 | Manufacture of wooden containers | <ul style="list-style-type: none"> • Manufacture of packing cases, boxes, crates, drums and similar packing of wood • Manufacture of pallets, box pallets and other load boards of wood • Manufacture of barrels, vats, tubs and other cooper's products of wood • Manufacture of wooden cable-drums | 3 | 250 | 200 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|--|--|--|----------|--------------------|-------------|--|
| | | | | Overall | Primary (1) | |
| 161621629 | Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials | <ul style="list-style-type: none"> Manufacture of various wood consumable products, household products, etc. Natural cork processing, manufacture of agglomerated cork Manufacture of articles of natural or agglomerated cork, including floor coverings Manufacture of plaits and products of plaiting materials: mats, matting, screens, cases, etc. Manufacture of basket-ware and wickerwork Manufacture of fire logs, made of pressed wood or substitute materials like coffee or soybean grounds | 4 | 150 | 100 | 2° buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 17. Manufacture of paper and paper products | | | | | | |
| 17170 | Manufacture of paper and paper products | | | | | |
| 171701701 | Manufacture of pulp, paper and paperboard | <p>Manufacture of bleached, semi-bleached or unbleached paper pulp by mechanical, chemical (dissolving or non-dissolving) or semi-chemical processes <u>from virgin wood or biomass</u> into paper (colour, white, brown) and paperboard, créped or crinkled paper, laminates and foils, if laminated with paper or paperboard, handmade paper, newsprint and other printing or writing paper, cellulose wadding and webs of cellulose fibres, carbon paper or stencil paper in rolls or large sheets, etc.</p> <p>Activities of pulping (chemical and/or mechanical, recycled fiber pulping, non-wood raw materials), debarking, bleaching, removal of ink, papermaking, etc.</p> <p>Manufacture of bleached, semi-bleached or unbleached paper pulp by mechanical, chemical (dissolving or non-dissolving) or semi-chemical processes <u>from waste paper, recycled paper</u>, etc. into paper (types as above).</p> | 2 | 1000 | 500 | <p>Primary buffer of >500m is desirable in view of fugitive dust, air emissions, & odour. Actual buffer best determined by modeling.</p> <p>Activity of debarking is best located within plantation or near to source of raw material</p> |
| | | | 2 | 350 | 300 | |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|------------|--|---|----------|--------------------|--------------|---------|
| | | | | Overall | Primary (1?) | |
| 171701702 | Manufacture of corrugated paper and paperboard and of containers of paper and paperboard | <p>Manufacture of semi-produced paper raw materials into:</p> <ul style="list-style-type: none"> • corrugated paper and paperboard • folding paperboard containers • containers of solid board • other containers of paper and paperboard • sacks and bags of paper • office box files and similar articles | 3 | 250 | 200 | |
| 171701709 | Manufacture of other articles of paper and paperboard | <p>Manufacture of semi-produced paper raw materials into:</p> <ul style="list-style-type: none"> • household and personal hygiene paper and cellulose wadding products • textile wadding and articles of wadding: sanitary towels, tampons etc. • printing and writing paper ready for use • computer printout paper ready for use • self-copy paper ready for use • duplicator stencils and carbon paper ready for use • gummed or adhesive paper ready for use • envelopes and letter-cards • registers, books, binders, albums and similar educational and commercial stationery • boxes, pouches, wallets and writing compendiums containing an assortment of paper stationery • wallpaper and similar wall coverings, including vinyl-coated and textile wallpaper • filter paper and paperboard • paper and paperboard bobbins, spools, cops etc. • egg trays and other moulded pulp packaging products etc. • paper novelties | 4 | 150 | 100 | |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|--|---|---|----------|--------------------|-------------|---------|
| | | | | Overall | Primary (1) | |
| 18. Printing and reproduction of recorded media | | | | | | |
| 18181 | Printing and service activities related to printing | | | | | |
| 181811811 | Printing | <ul style="list-style-type: none"> Printing of newspapers, magazines and other periodicals, books and brochures, music and music manuscripts, maps, atlases, posters, advertising catalogues, prospectuses and other printed advertising, postage stamps, taxation stamps, documents of title, cheques and other security papers, diaries, calendars, business forms and other commercial printed matter, personal stationery and other printed matter by letterpress, offset, photogravure, flexographic and other printing presses, duplication machines, computer printers, embossers etc., including quick printing Printing directly onto textiles, plastic, glass, metal, wood and ceramics (except silk-screen printing on textiles and wearing apparel) | 4 | 150 | 100 | |

| MSIC 2008 ¹ | Description | Details | Category | Buffer (in meters) | | Remarks |
|------------------------|--|--|----------|--------------------|-------------|-----------------------------------|
| | | | | Overall | Primary (!) | |
| 181811812 | Service activities related to printing | <ul style="list-style-type: none"> • Binding of printed sheets, e.g. into books, brochures, magazines, catalogues etc., by • folding, assembling, stitching, glueing, collating, basting, adhesive binding, trimming, gold stamping • Composition, typesetting, phototypesetting, pre-press data input including scanning and optical character recognition, electronic make-up • Plate-making services including imagesetting and plate-setting (for the printing processes • letterpress and offset) • Engraving or etching of cylinders for gravure • Plate processes direct to plate (also photopolymer plates) • Preparation of plates and dies for relief stamping or printing • Production of proofs • Artistic work including preparation of litho stones and prepared woodblocks • Production of reprographic products • Design of printing products e.g. sketches, layouts, dummies etc. • Other graphic activities such as die-sinking or die-stamping, Braille copying, punching and drilling, embossing, varnishing and laminating, collating and inseting, creasing | 4 | 60 | 50 | Can be located within buffer area |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|---|-----------------------------------|---|----------|--------------------|-------------|--|
| | | | | Overall | Primary (1) | |
| 18182 | Reproduction of recorded media | <ul style="list-style-type: none"> • Reproduction from master copies of gramophone records, compact discs and tapes with music or other sound recordings • Reproduction from master copies of records, compact discs and tapes with motion pictures and other video recordings • Reproduction from master copies of software and data on discs and tapes | 4 | 60 | 50 | Activity can be located within buffer area |
| 19. Manufacture of coke and refined petroleum products | | | | | | |
| 19191 | Manufacture of coke oven products | Operation of coke ovens Production of coke and semi-coke Production of pitch and pitch coke Production of coke oven gas Production of crude coal and lignite tars Agglomeration of coke | 2 | 600 | 500 | Larger buffer (> 500m) is desirable in view of fugitive dust, air emissions, & odour. Actual buffer best determined by modeling. |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|------------|---|--|----------|--------------------|-------------|--|
| | | | | Overall | Primary (1) | |
| 19192 | Manufacture of refined petroleum products | <p>Includes the manufacture of liquid or gaseous fuels or other products from crude petroleum, bituminous minerals or their fractionation products. Petroleum refining involves one or more of the following activities: fractionation, straight distillation of crude oil, and cracking to produce:</p> <ul style="list-style-type: none"> • motor fuel: gasoline, kerosene etc. • fuel: light, medium and heavy fuel oil, refinery gases such as ethane, propane, butane etc. • oil-based lubricating oils or greases, including from waste oil • products for the petrochemical industry and for the manufacture of road coverings • various products: white spirit, Vaseline, paraffin wax, petroleum jelly, etc. • hard-coal and lignite fuel briquettes • petroleum briquettes • blending of biofuels, i.e. blending of alcohols with petroleum (e.g. gasohol) | 1 | 1000 | 800 | <p>2^o buffer is mandatory for main process units</p> <p>300m is allowed for 2^o buffer for storage areas (non-flammable)</p> <p>Larger buffer (> 500m) is desirable in view of air emissions & odour. Actual buffer best determined by modeling.</p> |

| MSIC 2008* | Description | Details | Category | Buffer (in meters) | | Remarks |
|---|--|---|----------|--------------------|----------------------------|---|
| | | | | Overall | Primary (1 st) | |
| 20. Manufacture of chemicals and chemical products | | | | | | |
| 20201 | Manufacture of basic chemicals, fertilizers and nitrogen compounds, plastics and synthetic rubber in primary forms | | | | | |
| 202012011 | Manufacture of basic chemicals | Manufacture of chemicals using basic processes, such as thermal cracking and distillation. Products include separate chemical elements or separate chemically defined compounds for production of : • Inorganic • Organic chemicals | 1 | 600 | 500 | Overall buffer is minimum ; final buffer shall be determined by modeling. |
| | | Manufacture of liquefied or compressed inorganic industrial or medical gases (elemental gases, liquid or compressed air, refrigerant gases, mixed industrial gases, inert gases such as carbon dioxide, isolating gases, etc.) | 3 | 300 | 250 | |
| | | Manufacture of dyes and pigments from any source in basic form or as concentrate chemical elements | 3 | 250 | 200 | |
| | | Manufacture of inorganic acids except nitric acid | 2 | 500 | 350 | |
| | | Manufacture of alkalis, lyes and other inorganic bases except ammonia, other inorganic compounds, basic organic chemicals (acyclic hydrocarbons, saturated and unsaturated, cyclic hydrocarbons, saturated and unsaturated, acyclic and cyclic alcohols, mono- and polycarboxylic acids, including acetic acid, other oxygen-function compounds, including aldehydes, ketones, quinones and dual or poly oxygen-function compounds, synthetic glycerol, nitrogen-function organic compounds, including amines | 2 | 500 | 350 | |
| | | • Manufacture of fermentation of sugarcane, corn or similar to produce alcohol and esters, other organic compounds, including wood distillation products (e.g. charcoal) etc. | 3 | 300 | 250 | |
| | | • Manufacture of distilled water | 4 | 100 | 60 | |
| | | • Manufacture of synthetic aromatic products • Roasting of iron pyrites | 2 | 500 | 350 | |

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|-----------|---|---|---|-------------|-----|---|
| | | Manufacture of products of a kind used as fluorescent brightening agents or as luminophores | 2 | 500 | 350 | |
| | | Enrichment of uranium and thorium ores and production of fuel elements for nuclear reactors | 1 | See remarks | | Buffer is to be determined by AELB. |
| 202012012 | Manufacture of fertilizers and nitrogen compounds | <ul style="list-style-type: none"> • Manufacture of fertilizers: <ul style="list-style-type: none"> o straight or complex nitrogenous, phosphatic or potassic fertilizers o urea, crude natural phosphates and crude natural potassium salts • Manufacture of associated nitrogen products: <ul style="list-style-type: none"> o nitric and sulphonic acids, ammonia, ammonium chloride, ammonium carbonate, o nitrites and nitrates of potassium | 2 | 500 | 350 | Overall buffer is minimum ; final buffer shall be determined by modeling. |
| 202012013 | Manufacture of plastics and synthetic rubber in primary forms | <p>Manufacture of resins, plastics materials and non-vulcanizable thermoplastic elastomers, the mixing and blending of resins on a custom basis, as well as the manufacture of non-customized synthetic resins.</p> <p>Manufacture of plastics in primary forms:</p> <ul style="list-style-type: none"> • polymers, including those of ethylene, propylene, styrene, vinyl chloride, vinyl acetate and acrylics • polyamides • phenolic and epoxide resins and polyurethanes • alkyd and polyester resins and polyethers • silicones • ion-exchangers based on polymers | 2 | 500 | 350 | |
| | | <p>Manufacture of synthetic rubber in primary forms:</p> <ul style="list-style-type: none"> • synthetic rubber • factice <p>Manufacture of mixtures of synthetic rubber and natural rubber or rubber-like gums (e.g. balata)</p> | 2 | 500 | 350 | |

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|-----------|---|--|---|------|--------------------|--|
| 20201 | Manufacture of other chemical products | | | | | |
| 202012021 | Manufacture of pesticides and other agrochemical products | <ul style="list-style-type: none"> • Manufacture of insecticides, rodenticides, fungicides, herbicides • Manufacture of anti-sprouting products, plant growth regulators • Manufacture of disinfectants (for agricultural and other use) • Manufacture of other agrochemical products n.e.c. | 1 | 1000 | 1000 (see remarks) | Type of pesticide and their relative toxicity is to be taken into account in determining final buffer. |
| 202012022 | Manufacture of paints, varnishes and similar coatings, printing ink and mastics | <ul style="list-style-type: none"> • Manufacture of paints and varnishes, enamels or lacquers • Manufacture of prepared pigments and dyes, opacifiers and colours • Manufacture of vitrifiable enamels and glazes and engobes and similar preparations • Manufacture of mastics • Manufacture of caulking compounds and similar non-refractory filling or surfacing preparations • Manufacture of organic composite solvents and thinners • Manufacture of prepared paint or varnish removers | 3 | 300 | 250 | |
| | | Manufacture of printing ink | 3 | 250 | 200 | |
| 202012023 | Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations | <p>Manufacture of:</p> <ul style="list-style-type: none"> • organic surface-active agents • soap • paper, wadding, felt etc. coated or covered with soap or detergent • crude glycerol • surface-active preparations (e.g. washing powders in solid or liquid form and detergents, dish-washing preparations, textile softeners) • cleaning and polishing products • perfumes and toilet preparations | 3 | 250 | 200 | |

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|-----------|--|---|---|------|------|---|
| 202012029 | Manufacture of other chemical products n.e.c | Manufacture of propellant powders | 1 | 1000 | 1000 | Actual buffer is to be determined from modeling study |
| | | Manufacture of explosives and pyrotechnic products, including percussion caps, detonators, signalling flares etc. | 1 | 1000 | 1000 | Actual buffer is to be determined from modeling study |
| | | <ul style="list-style-type: none"> • Manufacture of gelatine and its derivatives, glues and prepared adhesives, including rubber-based glues and adhesives | 3 | 300 | 250 | |
| | | <ul style="list-style-type: none"> • Manufacture of extracts of natural aromatic products • Manufacture of resinoids • Manufacture of aromatic distilled waters • Manufacture of mixtures of odoriferous products for the manufacture of perfumes or food | 4 | 150 | 100 | |
| | | <ul style="list-style-type: none"> • Manufacture of photographic plates, films, sensitized paper and other sensitized unexposed materials • Manufacture of chemical preparations for photographic uses | 3 | 200 | 150 | |
| | | <ul style="list-style-type: none"> • Manufacture of various chemical products: <ul style="list-style-type: none"> o peptones, peptone derivatives, other protein substances and their derivatives n.e.c. o essential oils o chemically modified oils and fats o materials used in the finishing of textiles and leather o powders and pastes used in soldering, brazing or welding o substances used to pickle metal o prepared additives for cements o activated carbon, lubricating oil additives, prepared rubber accelerators, catalysts and other chemical products for industrial use o anti-knock preparations, antifreeze preparations o composite diagnostic or laboratory reagents o writing and drawing ink | 3 | 300 | 250 | |
| | | Manufacture of matches | 3 | 250 | 200 | |

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|---|--|--|---|-----|-----|---|
| 20203 | Manufacture of man-made fibres | <p>Manufacture of :</p> <ul style="list-style-type: none"> • synthetic or artificial filament tow • synthetic or artificial staple fibres, not carded, combed or otherwise processed for spinning • synthetic or artificial filament yarn, including high-tenacity yarn • synthetic or artificial monofilament or strip | 3 | 300 | 250 | |
| 21. Manufacture of basic pharmaceutical products and pharmaceutical preparations | | | | | | |
| 21210 | Manufacture of pharmaceuticals, medicinal chemical and botanical products | <ul style="list-style-type: none"> • Manufacture of medicinal active substances to be used for their pharmacological properties in the manufacture of medicaments: antibiotics, basic vitamins, salicylic and O-acetylsalicylic acids etc. • Manufacture of chemical contraceptive products for external use and hormonal contraceptive medicaments • Manufacture of medical diagnostic preparations, including pregnancy tests • Manufacture of biotech pharmaceuticals • Manufacture of radioactive in-vivo diagnostic substances | 4 | 150 | 100 | |
| | | | 3 | | | Buffer to be determined by AELB |
| 22. Manufacture of rubber and plastics products | | | | | | |
| 22221 | Manufacture of rubber products | | | | | |
| 222212211 | Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres | <ul style="list-style-type: none"> • Manufacture of rubber tyres for vehicles, equipment, mobile machinery, aircraft, toy, furniture and other uses. • Manufacture of inner tubes for tyres | 3 | 350 | 300 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| | | <ul style="list-style-type: none"> • Manufacture of interchangeable tyre treads, tyre flaps, "camelback" strips for retreading tyres etc. • Tyre rebuilding and retreading | 3 | 250 | 200 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |
| 222212219 | Manufacture of other rubber products | <ul style="list-style-type: none"> • Manufacture of other products of natural or synthetic rubber, unvulcanized, vulcanized, or hardened. • Manufacture of rubber brushes • Manufacture of hard rubber pipe stems • Manufacture of hard rubber combs, hair pins, hair rollers, and similar | 3 | 250 | 200 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)). |

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|-------|----------------------------------|---|---|-----|-----|--|
| 22222 | Manufacture of plastics products | Processing of new or spent (i.e. recycled) plastics resins into intermediate or final products, using such processes as compression molding, extrusion molding, injection molding, blow molding and casting. | 3 | 200 | 150 | 2 ^o buffer for auxiliary equipment such as boiler, blowers, gen-set, pumps, fuel storage (1000 litres)) |
| | | <p>Manufacture or semi-manufactures of plastic products into plastic plates, sheets, blocks, film, foil, strip etc. (whether self-adhesive or not). Manufacture of finished plastic products into plastic tubes, pipes and hoses; hose and pipe fittings. Manufacture of plastic articles for the packing of goods. Manufacture of plastic tableware, kitchenware and toilet articles, cellophane film or sheet, resilient floor coverings, such as vinyl, linoleum etc. Manufacture of artificial stone (e.g. cultured marble) Manufacture of plastic signs (non-electrical)</p> <p>Manufacture of diverse plastic products such as plastic headgear, insulating fittings, parts of lighting fittings, office or school supplies, articles of apparel (if only sealed together, not sewn), fittings for furniture, statuettes, transmission and conveyer belts, self-adhesive tapes of plastic, plastic wall paper, plastic shoe lasts, plastic cigar and cigarette holders, combs, plastics hair curlers, plastics novelties, etc.</p> | 3 | 150 | 100 | |

| 23. Manufacture of other non-metallic mineral products | | | | | | |
|--|---|--|---|-----|-----|--|
| 23231 | Manufacture of glass and glass products | Manufacture of glass in all forms, made by any process and the manufacture of articles of glass into: <ul style="list-style-type: none"> • flat glass, including wired, coloured or tinted flat glass • toughened or laminated flat glass • glass in rods or tubes • glass paving blocks • glass mirrors • multiple-walled insulating units of glass | 2 | 350 | 300 | |
| | | Manufacture of glass in all forms, made by any process and the manufacture of articles of glass into: <ul style="list-style-type: none"> • bottles and other containers of glass or crystal • drinking glasses and other domestic glass or crystal articles • glass fibres, including glass wool and non-woven products thereof • laboratory, hygienic or pharmaceutical glassware • clock or watch glasses, optical glass and optical elements not optically worked • glassware used in imitation jewellery • glass insulators and glass insulating fittings • glass envelopes for lamps • glass figurines | 3 | 250 | 200 | |
| 23239 | Manufacture of non-metallic mineral products n.e.c. | | | | | |
| 232392391 | Manufacture of refractory products | <ul style="list-style-type: none"> • Manufacture of refractory mortars, concretes etc. • Manufacture of refractory ceramic goods (heat-insulating ceramic goods of siliceous fossil meals, refractory bricks, blocks and tiles, retorts, crucibles, muffles, nozzles, tubes, pipes etc.) • Manufacture of refractory articles containing magnesite, dolomite or chromite | 3 | 350 | 300 | |
| 232392392 | Manufacture of clay building materials | Manufacture of: <ul style="list-style-type: none"> • non-refractory ceramic hearth or wall tiles, mosaic cubes etc. • non-refractory ceramic flags and paving • structural non-refractory clay building materials: • ceramic bricks, roofing tiles, chimney pots, pipes, conduits etc. • flooring blocks in baked clay • ceramic sanitary fixtures | 3 | 300 | 250 | |

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|-----------|---|---|---|------|-----|--|
| 232392393 | Manufacture of other porcelain and ceramic products | Manufacture of: ceramic tableware and other domestic or toilet articles statuettes and other ornamental ceramic articles electrical insulators and insulating fittings of ceramics ceramic and ferrite magnets ceramic laboratory, chemical and industrial products ceramic pots, jars and similar articles of a kind used for conveyance or packing of goods ceramic furniture ceramic products n.e.c. | 3 | 250 | 200 | |
| 232392394 | Manufacture of cement, lime and plaster | Manufacture of clinkers and hydraulic cements, including Portland, aluminous cement, slag cement and superphosphate cements | 2 | 1000 | 800 | 2° buffer is mandatory for main process units (kiln, grinding plant, bagging area, and other main sources of fugitive emissions) |
| | | <ul style="list-style-type: none"> • Manufacture of quicklime, slaked lime and hydraulic lime • Manufacture of plasters of calcined gypsum or calcined sulphate • Manufacture of calcined dolomite | 2 | 1000 | 500 | 2° buffer is mandatory for main process units (kiln, grinding plant, bagging area, and other main sources of fugitive emissions) |

| | | | | | | |
|-----------|---|--|---|-----|-----|---|
| 232392395 | Manufacture of articles of concrete, cement and plaster | <ul style="list-style-type: none"> • Manufacture of precast concrete, cement or artificial stone articles for use in construction (e.g. tiles, flagstones, bricks, boards, sheets, panels, pipes, posts etc.) • Manufacture of prefabricated structural components for buildings or civil engineering of cement, concrete or artificial stone • Manufacture of plaster articles for use in construction (e.g. boards, sheets, panels etc.) • Manufacture of building materials of vegetable substances (wood wool, straw, reeds, rushes) agglomerated with cement, plaster or other mineral binder • Manufacture of articles of asbestos-cement or cellulose fibre-cement or similar into corrugated sheets, other sheets, panels, tiles, tubes, pipes, reservoirs, troughs, basins, sinks, jars, furniture, window frames etc. • Manufacture of other articles of concrete, plaster, cement or artificial stone into statuary, furniture, bas- and haut-reliefs, vases, flowerpots etc. • Manufacture of powdered mortars • Manufacture of ready-mix and dry-mix concrete and mortars | 3 | 300 | 250 | |
| 232392396 | Cutting, shaping and finishing of stone | <ul style="list-style-type: none"> • Cutting, shaping and finishing of stone for use in construction, in cemeteries, on roads, as roofing etc. • Manufacture of stone furniture | 3 | 250 | 200 | Not applicable for cottage industries (e.g. for tombstones) |
| 232392399 | Manufacture of other non-metallic mineral products n.e.c. | <ul style="list-style-type: none"> • Manufacture of millstones, sharpening or polishing stones and natural or artificial abrasive products, including abrasive products on a soft base (e.g. sandpaper) • Manufacture of friction material and unmounted articles thereof with a base of mineral substances or of cellulose • Manufacture of mineral insulating materials • Manufacture of articles of diverse mineral substances: • Manufacture of articles of asphalt or similar material, e.g. asphalt-based adhesives, coal tar pitch etc. • Carbon and graphite fibers and products (except electrodes and electrical applications) | 3 | 250 | 200 | |

| 24. Manufacture of basic metals | | | | | | |
|---------------------------------|--|--|---|-----|-----|---|
| 24241 | Manufacture of basic iron and steel | <p>Operation of blast furnaces, steel converters, casting line producing iron and steel into semi-finished products:</p> <ul style="list-style-type: none"> • Pig iron and spiegeleisen in pigs, blocks or other primary forms • ferro-alloys • ferrous products by direct reduction of iron and other spongy ferrous products • iron of exceptional purity by electrolysis or other chemical processes • granular iron and iron powder • steel in ingots or other primary forms • remelting of scrap ingots of iron or steel | 2 | 600 | 500 | 2 ^o buffer is mandatory for sinter, blast furnace, EAF |
| | | <p>Operation of rolling and finishing mills to produce:</p> <ul style="list-style-type: none"> • hot-rolled and cold-rolled flat-rolled products • hot-rolled bars and rods • hot-rolled open sections • steel bars and solid sections by cold drawing, grinding or turning • open sections by progressive cold forming on a roll mill or folding on a press of flat-rolled products of steel • wire of steel by cold drawing or stretching • sheet piling of steel and welded open sections of steel • railway track materials (unassembled rails) of steel • seamless tubes, pipes and hollow profiles of steel, by hot rolling, hot extrusion or hot drawing, or by cold drawing or cold rolling • welded tubes and pipes of steel, by cold or hot forming and welding, delivered as welded or further processed by cold drawing or cold rolling or manufactured by hot forming, welding and reducing • tube fittings of steel | 2 | 350 | 300 | |
| 24242 | Manufacture of basic precious and other non-ferrous metals | <p>Production of basic precious metals Production and refining of unwrought or wrought precious metals: gold, silver, platinum etc. from ore and scrap into:</p> <ul style="list-style-type: none"> • precious metal alloys • precious metal semi-products • silver rolled onto base metals • gold rolled onto base metals or silver • platinum and platinum group metals rolled onto gold, silver or base metals • precious metal foil laminates | 2 | 500 | 400 | |

| | | | | | |
|--|---|---|-------------|------|---------------------------------|
| | <ul style="list-style-type: none"> Production of aluminium from alumina | 2 | 500 | 400 | |
| | <ul style="list-style-type: none"> Production of aluminium from electrolytic refining of aluminium waste and scrap | 2 | 350 | 300 | |
| | <ul style="list-style-type: none"> Production of aluminium oxide (alumina) | 2 | 500 | 400 | |
| | <ul style="list-style-type: none"> Production of aluminium alloys Semi-manufacturing of aluminium Production of aluminium wrapping foil Manufacture of aluminium (tin) foil laminates made from aluminium (tin) foil as primary component | 3 | 300 | 250 | |
| | Production of lead, zinc and tin from ores | 1 | 1000 | 1000 | |
| | Production of lead, zinc and tin from electrolytic refining of lead, zinc and tin waste and scrap | 2 | 500 | 350 | |
| | Production of lead, zinc and tin alloys Semi-manufacturing of lead, zinc and tin | 2 | 500 | 350 | |
| | Production of copper from ores | 1 | 1000 | 1000 | |
| | Production of copper from electrolytic refining of copper waste and scrap | 2 | 500 | 350 | |
| | Production of copper alloys Manufacture of copper fuse wire or strip Semi-manufacturing of copper | 2 | 500 | 350 | |
| | Production of chrome, manganese, nickel etc. from ores or oxides | 2 | 1000 | 1000 | |
| | <ul style="list-style-type: none"> Production of chrome, manganese, nickel etc. from electrolytic and aluminothermic refining of chrome, manganese, nickel etc., waste and scrap Production of alloys of chrome, manganese, nickel etc. Semi-manufacturing of chrome, manganese, nickel etc. Production of mattes of nickel | 2 | 500 | 350 | |
| | Production of uranium metal from pitchblende or other ores Smelting and refining of uranium | 1 | See remarks | | Buffer to be determined by AELB |

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|-----------|-------------------------------|---|---|-----|-----|--|
| 24243 | Casting of metals | | | | | |
| 242432431 | Casting of iron and steel | <ul style="list-style-type: none"> • Manufacture of semi-finished products and various castings by a casting process. • Casting of semi-finished iron products, grey iron castings, spheroidal graphite iron castings, malleable cast-iron products, semi-finished steel products, steel castings, etc. | 2 | 500 | 350 | |
| | | <ul style="list-style-type: none"> • Manufacture of tubes, pipes and hollow profiles and of tube or pipe fittings of cast-iron • Manufacture of seamless tubes and pipes of steel by centrifugal casting • Manufacture of tube or pipe fittings of cast-steel | 3 | 350 | 200 | |
| 242432432 | Casting of non-ferrous metals | <ul style="list-style-type: none"> • Casting of semi-finished products of aluminium, magnesium, titanium, zinc etc. • Casting of light metal castings • Casting of heavy metal castings • Casting of precious metal castings • Die-casting of non-ferrous metal castings | 2 | 500 | 350 | |

| 25. Manufacture of fabricated metal products, except machinery and equipment | | | | | | |
|--|--|---|-------------|--------------------|--------------------|--|
| 25251 | Manufacture of structural metal products, tanks, reservoirs and steam generators | | | | | |
| 252512511 | Manufacture of structural metal products | <ul style="list-style-type: none"> • Manufacture of metal frameworks or skeletons for construction and parts thereof (towers, masts, trusses, bridges etc.) • Manufacture of industrial frameworks in metal (frameworks for blast furnaces, lifting and handling equipment etc.) • Manufacture of prefabricated buildings mainly of metal (e.g. site huts, modular exhibition elements etc.) • Manufacture of metal doors, windows and their frames, shutters and gates, metal room partitions for floor attachment | 3 | 250 | 200 | |
| 252512512 | Manufacture of tanks, reservoirs and containers of metal | <ul style="list-style-type: none"> • Manufacture of reservoirs, tanks and similar containers of metal, of types normally installed as fixtures for storage or manufacturing use • Manufacture of metal containers for compressed or liquefied gas • Manufacture of central heating boilers and radiators | 3 | 250 | 200 | |
| 252512513 | Manufacture of steam generators, except central heating hot water boilers | <ul style="list-style-type: none"> • Manufacture of steam or other vapour generators • Manufacture of auxiliary plant for use with steam generators such as condensers, economizers, superheaters, steam collectors and accumulators • Manufacture of nuclear reactors, except isotope separators • Manufacture of parts for marine or power boilers | 3 | 250 | 200 | |
| 25252 | Manufacture of weapons and ammunition | <ul style="list-style-type: none"> • Manufacture of heavy weapons (artillery, mobile guns, rocket launchers, torpedo tubes, heavy machine guns) • Manufacture of small arms (revolvers, shotguns, light machine guns) • Manufacture of air or gas guns and pistols • Manufacture of war ammunition • Manufacture of hunting, sporting or protective firearms and ammunition • Manufacture of explosive devices such as bombs, mines and torpedoes | 2 3 1 | 350 250 1000 | 300 200 1000 | |

| | | | | | | |
|-----------|---|---|---|-----|-----|--|
| 25259 | Manufacture of other fabricated metal products; metalworking service activities | | | | | |
| 252592591 | Forging, pressing, stamping and roll-forming of metal; powder metallurgy | <ul style="list-style-type: none"> Forging, pressing, stamping and roll-forming of metal Powder metallurgy: production of metal objects directly from metal powders by heat treatment (sintering) or under pressure | 2 | 350 | 300 | |
| 252592592 | Treatment and coating of metals; machining | <ul style="list-style-type: none"> Plating, anodizing etc. of metals Heat treatment of metals Deburring, sandblasting, tumbling, cleaning of metals Colouring and engraving of metals Non-metallic coating of metals, e.g. plasticizing, enamelling, lacquering etc. Hardening, buffing of metals Boring, turning, milling, eroding, planing, lapping, broaching, levelling, sawing, grinding, sharpening, polishing, welding, splicing etc. of metalwork pieces Cutting of and writing on metals by means of laser beams | 3 | 250 | 200 | |
| 252592593 | Manufacture of cutlery, hand tools and general hardware | <p>Manufacture of:</p> <ul style="list-style-type: none"> domestic cutlery, e.g. knives, forks, spoons etc. other articles of cutlery, e.g. cleavers and choppers, razors and razor blades, scissors and hair clippers knives and cutting blades for machines or for mechanical appliances hand tools such as pliers, screwdrivers etc. non-power-driven agricultural hand tools saws and saw blades, including circular saw blades and chainsaw blades interchangeable tools for hand tools, whether or not power-operated, or for machine tools: drills, punches, milling cutters etc. press tools blacksmiths' tools: forges, anvils etc. moulding boxes and moulds (except ingot moulds) vices, clamps padlocks, locks, keys, hinges and the like, hardware for buildings, furniture, vehicles etc. cutlasses, swords, bayonets etc. | 3 | 200 | 150 | |

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|-----------|---|--|---|-----|-----|--|
| 252592599 | Manufacture of other fabricated metal products n.e.c. | <p>Manufacture of :</p> <ul style="list-style-type: none"> • pails, cans, drums, buckets, boxes • tins and cans for food products, collapsible tubes and boxes • metallic closures • metal cable, plaited bands and similar articles • uninsulated metal cable or insulated cable not capable of being used as a conductor of electricity • articles made of wire: barbed wire, wire fencing, grill, netting, cloth, etc. • nails and pins • rivets, washers and similar non-threaded products • screw machine products • bolts, screws, nuts and similar threaded products • springs (except watch springs) • chain, except power transmission chain • metal household articles • baths, sinks, washbasins and similar articles • metal goods for office use, except furniture • safes, strongboxes, armoured doors etc. • various metal articles such as ship propellers and blades thereof, anchors, bells, assembled railway track fixtures, clasps, buckles, hooks • foil bags • permanent metallic magnets • metal vacuum jugs and bottles • metal signs (non-electrical) • metal badges and metal military insignia • metal hair curlers, metal umbrella handles and frames, combs | 3 | 200 | 150 | |
|-----------|---|--|---|-----|-----|--|

| 26. Manufacture of computer, electronic and optical products | | | | | | |
|--|---|---|---|-----|----|--|
| 26261 | Manufacture of electronic components and boards | <p>Manufacture of semiconductors and other components for electronic applications:</p> <ul style="list-style-type: none"> • capacitors, electronic • of resistors, electronic • microprocessors • bare printed circuit boards • electron tubes • electronic connectors • integrated circuits (analog, digital or hybrid) • diodes, transistors and related discrete devices • inductors (e.g. chokes, coils, transformers), electronic component type • electronic crystals and crystal assemblies • solenoids, switches and transducers for electronic applications • dice or wafers, semiconductor, finished or semi-finished • interface cards (e.g. sound, video, controllers, network, modems) • display components (plasma, polymer, LCD) • light emitting diodes (LED) • components onto printed circuit boards • printer cables, monitor cables, USB cables, connectors etc. | 4 | 100 | 80 | |

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|-------|---|---|---|-----|----|--|
| 26262 | Manufacture of computers and peripheral equipment | <p>Manufacture and/or assembly of electronic computers, such as mainframes, desktop computers, laptops and computer servers; and computer peripheral equipment, such as storage devices and input/output devices (printers, monitors, keyboards).</p> <p>Manufacture of :</p> <ul style="list-style-type: none"> • desktop computers • laptop computers • main frame computers • hand-held computers (e.g. PDA) • magnetic disk drives, flash drives and other storage devices • optical (e.g. CD-RW, CD-ROM, DVD-ROM, DVD-RW) disk drives • printers, monitors, keyboards • all types of mice, joysticks, and trackball accessories • dedicated computer terminals • computer servers • scanners, including bar code scanners • smart card readers • virtual reality helmets • computer projectors (video beamers) • computer terminals, like automatic teller machines (ATM's), point-of-sale (POS) terminals, not mechanically operated • multi-function office equipment, such as fax-scanner-copier combinations | 4 | 100 | 80 | |
|-------|---|---|---|-----|----|--|

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|-------|--|--|------------|----------------|--------------|--|
| 26263 | Manufacture of communication equipment | <p>Manufacture of telephone and data communications equipment used to move signals electronically over wires or through the air such as radio and television broadcast and wireless communications equipment.</p> <p>Manufacture of :</p> <ul style="list-style-type: none"> • central office switching equipment • cordless telephones • private branch exchange (PBX) equipment • telephone and facsimile equipment, including telephone answering machines • data communications equipment, such as bridges, routers, and gateways • transmitting and receiving antenna • cable television equipment • pagers, cellular phones, mobile communication equipment • radio and television studio and broadcasting equipment, including television cameras • modems, carrier equipment • burglar and fire alarm systems, sending signals to a control station • radio and television transmitters • infrared devices (e.g. remote controls) | 4 4 | 100 100 | 80 80 | |
| 26264 | Manufacture of consumer electronics | <p>Manufacture of electronic audio and video equipment for home entertainment, motor vehicle, public address systems and musical instrument amplification.</p> <p>Manufacture of :</p> <ul style="list-style-type: none"> • video cassette recorders and duplicating equipment • televisions, television monitors and displays • audio recording and duplicating systems • stereo equipment, radio receivers, speaker systems • household-type video cameras • jukeboxes, amplifiers for musical instruments and public address systems, microphones • CD and DVD players • karaoke machines • headphones (e.g. radio, stereo, computer) • video game consoles | 4 | 100 | 80 | |

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|-----------|---|--|---|-----|----|--|
| 26265 | Manufacture of measuring, testing, navigating and control equipment; watches and clocks | | | | | |
| 262652651 | Manufacture of measuring, testing, navigating and control equipment | <p>Manufacture of search, detection, navigation, guidance, aeronautical and nautical systems and instruments; automatic controls and regulators for applications, such as heating, air-conditioning, refrigeration and appliances; instruments and devices for measuring, displaying, indicating, recording, transmitting and controlling industrial process variables, such as temperature, humidity, pressure, vacuum, combustion, flow, level, viscosity, density, acidity, concentration and rotation; totalizing (i.e. registering) fluid meters and counting devices; instruments for measuring and testing the characteristics of electricity and electrical signals; instruments and instrumentation systems for laboratory analysis of the chemical or physical composition or concentration of samples of solid, fluid, gaseous or composite material and other measuring and testing instruments and parts thereof.</p> <p>Manufacture of non-electric measuring, testing, navigating and control equipment (except simple mechanical tools).</p> | 4 | 100 | 80 | |
| 262652652 | Manufacture of watches and clocks | <p>This class includes the manufacture of watches, clocks and timing mechanisms and parts thereof.</p> <p>Manufacture of :</p> <ul style="list-style-type: none"> • watches and clocks of all kinds, including instrument panel clocks • watch and clock cases, including cases of precious metals • time-recording equipment and equipment for measuring, recording and otherwise displaying intervals of time with a watch or clock movement or with synchronous motor, such as parking meters, time clocks, time/date stamps, process timers • time switches and other releases with a watch or clock movement or with synchronous motor • components for clocks and watches, e.g. springs, jewels, dials, hands, plates, bridges and other parts | 4 | 80 | 60 | |

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|-------|---|--|---|-----|----|--|
| 26266 | Manufacture of irradiation, electromedical & electrotherapeutic equipment | <ul style="list-style-type: none"> • Manufacture of irradiation apparatus and tubes (e.g. industrial, medical diagnostic, medical therapeutic, research, scientific): beta-, gamma, X-ray or other radiation equipment • Manufacture of CT scanners • Manufacture of PET scanners • Manufacture of magnetic resonance imaging (MRI) equipment • Manufacture of medical ultrasound equipment • Manufacture of electrocardiographs • Manufacture of electromedical endoscopic equipment • Manufacture of medical laser equipment • Manufacture of pacemakers • Manufacture of hearing aids | 4 | 100 | 80 | |
| 26267 | Manufacture of optical instruments and photographic equipment | Manufacture of optical instruments and lenses, such as binoculars, microscopes (except electron, proton), telescopes, prisms and lenses (except ophthalmic); the coating or polishing of lenses (except ophthalmic); the mounting of lenses (except ophthalmic) and the manufacture of photographic equipment such as cameras and light meters. | 4 | 100 | 80 | |
| 26268 | Manufacture of magnetic and optical media | Manufacture of magnetic and optical recording media. Manufacture of blank magnetic audio and video tapes, blank diskettes, blank optical discs, hard drive media, etc. | 4 | 100 | 80 | |

| 27. Manufacture of electrical equipment | | | | | | |
|---|---|--|---|-----|-----|--|
| 27271 | Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus | <p>Manufacture of power, distribution and specialty transformers; electric motors, generators and motor generator sets; switchgear and switchboard apparatus; relays and industrial controls.</p> <p>Manufacture of:</p> <ul style="list-style-type: none"> • distribution transformers, electric • arc-welding transformers • fluorescent ballasts (i.e. transformers) • substation transformers for electric power distribution • transmission and distribution voltage regulators • electric motors (except internal combustion engine starting motors) • power generators (except battery charging alternators for internal combustion engines) • motor generator sets (except turbine generator set units) • prime mover generator sets • armatures on a factory basis • power circuit breakers • surge suppressors (for distribution level voltage) • control panels for electric power distribution • electrical relays • duct for electrical switchboard apparatus • electric fuses • power switching equipment • electric power switches (except pushbutton, snap, solenoid, tumbler) | 4 | 150 | 100 | |

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|-----------|---|---|---|-----|-----|--|
| 27272 | Manufacture of batteries and accumulators | <p>Manufacture of primary cells and primary batteries cells containing manganese dioxide, mercuric dioxide, silver oxide etc.</p> <ul style="list-style-type: none"> • Manufacture of electric accumulators, including parts thereof separators, containers, covers • Manufacture of NiCad batteries • Manufacture of NiMH batteries • Manufacture of lithium batteries • Manufacture of dry cell batteries • Manufacture of lead acid batteries • Manufacture of wet cell batteries | 4 | 150 | 100 | |
| | | | 3 | 300 | 250 | |
| 27273 | Manufacture of wiring and wiring devices | | | | | |
| 272732731 | Manufacture of fibre optic cables | Manufacture of fiber optic cable for data transmission or live transmission of images | 4 | 100 | 80 | |
| 272732732 | Manufacture of other electronic and electric wires and cables | Manufacture of insulated wire and cable, made of steel, copper, aluminium | 4 | 150 | 100 | |
| 272732733 | Manufacture of wiring devices | <p>This class includes the manufacture of current-carrying and non-current carrying wiring devices for electrical circuits regardless of material.</p> <p>Manufacture of :</p> <ul style="list-style-type: none"> • bus bars, electrical conductors (except switchgear-type) • GFCI (ground fault circuit interrupters) • lamp holders • lightning arrestors and coils • switches for electrical wiring (e.g. pressure, pushbutton, snap, tumbler switches) • electrical outlets and sockets • boxes for electrical wiring (e.g. junction, outlet, switch boxes) • electrical conduit and fitting • transmission pole and line hardware • plastic noncurrent-carrying wiring devices including plastic junction boxes, face plates, and similar, plastic pole line fittings | 3 | 200 | 150 | |

Guidelines for the Siting and Zoning of Industry and Residential Areas

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|-------|--|---|---|-----|-----|--|
| 27274 | Manufacture of electric lighting equipment | <p>Manufacture of electric light bulbs and tubes and parts and components thereof (except glass blanks for electric light bulbs), electric lighting fixtures and lighting fixture components (except current-carrying wiring devices).</p> <p>Manufacture of :</p> <ul style="list-style-type: none"> • discharge, incandescent, fluorescent, ultra-violet, infra-red etc. lamps, fixtures and bulbs • ceiling lighting fixtures, chandeliers, table lamps (i.e. lighting fixture) • Christmas tree lighting sets • electric fireplace logs • flashlights, electric insect lamps, lanterns (e.g. carbide, electric, gas, gasoline, kerosene) • spotlights • street lighting fixtures (except traffic signals) • lighting equipment for transportation equipment e.g. for motor vehicles, aircraft, boats) | 3 | 200 | 150 | |
| 27275 | Manufacture of domestic appliances | <p>Manufacture of small electric appliances and electric housewares, household-type fans, household-type vacuum cleaners, electric household-type floor care machines, household-type cooking appliances, household-type laundry equipment, household-type refrigerators, upright and chest freezers and other electrical and nonelectrical household appliances, such as dishwashers, water heaters and garbage disposal units.</p> <p>Manufacture of appliances with electric, gas or other fuel sources.</p> | 4 | 150 | 100 | |

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|-------|---|--|---|-----|-----|--|
| 27279 | Manufacture of other electrical equipment | <p>Manufacture of miscellaneous electrical equipment other than motors, generators and transformers, batteries and accumulators, wires and wiring devices, lighting equipment or domestic appliances.</p> <p>Manufacture of :</p> <ul style="list-style-type: none"> • battery chargers, solid-state • door opening and closing devices, electrical • electric bells • ultrasonic cleaning machines (except laboratory and dental) • tanning beds • solid state inverters, rectifying apparatus, fuel cells, regulated and unregulated power supplies • uninterruptible power supplies (UPS) • surge suppressors (except for distribution level voltage) • appliance cords, extension cords, and other electrical cord sets with insulated wire and connectors • carbon and graphite electrodes, contacts, and other electrical carbon and graphite products • particle accelerators • electrical capacitors, resistors, condensers and similar components • electromagnets • sirens • electronic scoreboards, electrical signs, electrical signalling equipment such as traffic lights and pedestrian signalling equipment • electrical insulators (except glass or porcelain) • electrical welding and soldering equipment, including hand-held soldering irons | 3 | 200 | 150 | |
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| 28. Manufacture of machinery and equipment n.e.c | | | | | | |
|--|---|---|---|-----|-----|--|
| 28281 | | Manufacture of general-purpose machinery | | | | |
| 282812811 | Manufacture of engines and turbines, except aircraft, vehicle and cycle engines | <ul style="list-style-type: none"> • Manufacture of internal combustion piston engines, except motor vehicle, aircraft and • cycle propulsion engines for marine engines and railway engines • Manufacture of pistons, piston rings, carburetors and such for all internal combustion engines, diesel engines etc. • Manufacture of inlet and exhaust valves of internal combustion engines • Manufacture of turbines and parts thereof steam turbines and other vapour turbines, hydraulic turbines, waterwheels and regulators thereof, wind turbines, gas turbines, except turbojets or turbo propellers for aircraft propulsion • Manufacture of boiler-turbine sets • Manufacture of turbine-generator sets | 3 | 300 | 250 | |
| 282812812 | Manufacture of fluid power equipment | <ul style="list-style-type: none"> • Manufacture of hydraulic and pneumatic components (including hydraulic pumps, hydraulic motors, hydraulic and pneumatic cylinders, hydraulic and pneumatic valves, hydraulic and pneumatic hose and fittings) • Manufacture of air preparation equipment for use in pneumatic systems • Manufacture of fluid power systems • Manufacture of hydraulic transmission equipment | 3 | 300 | 250 | |
| 282812813 | Manufacture of other pumps, compressors, taps and valves | <ul style="list-style-type: none"> • Manufacture of air or vacuum pumps, air or other gas compressors • Manufacture of pumps for liquids whether or not fitted with a measuring device • Manufacture of pumps designed for fitting to internal combustion engines: oil, water and fuel pumps for motor vehicles etc. • Manufacture of industrial taps and valves, including regulating valves and intake taps • Manufacture of sanitary taps and valves • Manufacture of heating taps and valves • Manufacture of hand pumps | 3 | 250 | 200 | |

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|-----------|--|--|---|-----|-----|--|
| 282812814 | Manufacture of bearings, gears, gearing and driving elements | <ul style="list-style-type: none"> • Manufacture of ball and roller bearings and parts thereof • Manufacture of mechanical power transmission equipment, e.g. transmission shafts and cranks: camshafts, crankshafts, cranks, bearing housings and plain shaft bearings, etc. • Manufacture of gears, gearing and gear boxes and other speed changers • Manufacture of clutches and shaft couplings • Manufacture of flywheels and pulleys • Manufacture of articulated link chain • Manufacture of power transmission chain | 3 | 250 | 200 | |
| 282812815 | Manufacture of ovens, furnaces and furnace burners | <ul style="list-style-type: none"> • Manufacture of electrical and other industrial and laboratory furnaces and ovens, including incinerators • Manufacture of burners • Manufacture of permanent mount electric space heaters, electric swimming pool heaters • Manufacture of permanent mount non-electric household heating equipment, such as solar heating, steam heating, oil heat and similar furnaces and heating equipment • Manufacture of electric household-type furnaces (electric forced air furnaces, heat pumps, etc.), non-electric household forced air furnaces • Manufacture of mechanical stokers, grates, ash dischargers etc. | 3 | 250 | 200 | |
| 282812816 | Manufacture of lifting and handling equipment | <ul style="list-style-type: none"> • Manufacture of hand-operated or power-driven lifting, handling, loading or unloading • Machinery such as pulley tackle and hoists, winches, capstans and jacks, derricks, cranes, mobile lifting frames, straddle carriers, works trucks, whether or not fitted with lifting or handling equipment, whether or not self-propelled, of the type used in factories (including hand trucks and wheelbarrows), mechanical manipulators and industrial robots specifically designed for lifting, handling, loading or unloading • Manufacture of conveyors, telfers (téléphériques) etc. • Manufacture of lifts, escalators and moving walkways • Manufacture of parts specialized for lifting and handling equipment | 3 | 250 | 200 | |

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|-----------|---|--|---|-----|-----|--|
| 282812817 | Manufacture of office machinery and equipment (except computers and peripheral equipment) | <p>Manufacture of :</p> <ul style="list-style-type: none"> • calculating machines, adding machines, cash registers, calculators (electronic or non-electronic) • postage meters, mail handling machines (envelope stuffing, sealing and addressing machinery; opening, sorting, scanning), collating machinery • typewriters, stenography machines, office-type binding equipment (i.e. plastic or tape binding) • cheque writing machines • coin counting and coin wrapping machinery • pencil sharpeners, staplers and staple removers • voting machines • tape dispensers • hole punches • cash registers, mechanically operated • photocopy machines • toner cartridges • blackboards; white boards and marker boards • dictating machines | 4 | 100 | 80 | |
| 282812818 | Manufacture of power-driven hand tools | <p>Manufacture of hand tools, with self-contained electric or non-electric motor or pneumatic drive, such as:</p> <ul style="list-style-type: none"> • circular or reciprocating saws • drills and hammer drills • hand held power sanders • pneumatic nailers • buffers • routers • grinders • staplers • pneumatic rivet guns • planers • shears and nibblers • impact wrenches • powder actuated nailers | 4 | 150 | 100 | |

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|-----------|--|---|---|-----|-----|--|
| 282812819 | Manufacture of other general-purpose machinery | <p>Manufacture of :</p> <ul style="list-style-type: none"> • industrial refrigerating or freezing equipment, including assemblies of major components • air-conditioning machines, including for motor vehicles • non-domestic fans • weighing machinery (other than sensitive laboratory balances): • filtering or purifying machinery and apparatus for liquids • equipment for projecting, dispersing or spraying liquids or powders: • packing and wrapping machinery: • machinery for cleaning or drying bottles and for aerating beverages • distilling or rectifying plant for petroleum refineries, chemical industries, beverage industries etc. • heat exchangers • machinery for liquefying air or gas • gas generators • calendering or other rolling machines and cylinders thereof (except for metal and glass) • centrifuges (except cream separators and clothes dryers) • gaskets and similar joints made of a combination of materials or layers of the same material • automatic goods vending machines • parts for general-purpose machinery • attic or roof ventilation fans (gable fans, roof ventilators, etc.) • manufacture of levels, tape measures and similar hand tools, machinists' precision tools (except optical) • non-electrical welding and soldering equipment | 4 | 150 | 100 | |
| 28282 | Manufacture of special-purpose machinery | <p>Manufacture of special-purpose machinery, i.e. machinery for exclusive use in an ISIC industry or a small cluster of ISIC industries. While most of these are used in other manufacturing processes, such as food manufacturing or textile manufacturing, this group also includes the manufacture of machinery specific for other (non-manufacturing industries), such as aircraft launching gear or amusement park equipment.</p> | 3 | 250 | 200 | |

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|-----------|--|---|---|-----|-----|--|
| 282822821 | Manufacture of agricultural and forestry machinery | <p>Manufacture of:</p> <ul style="list-style-type: none"> • tractors used in agriculture and forestry • walking (pedestrian-controlled) tractors • mowers, including lawnmowers • agricultural self-loading or self-unloading trailers or semi-trailers • agricultural machinery for soil preparation, planting or fertilizing: • harvesting or threshing machinery: • milking machines • spraying machinery for agricultural use • diverse agricultural machinery, e.g. poultry-keeping machinery, bee-keeping machinery, equipment for preparing fodder, etc. • machines for cleaning, sorting or grading eggs, fruit etc. | 3 | 300 | 250 | |
| 282822822 | Manufacture of metal-forming machinery and machine tools | <p>Manufacture of :</p> <ul style="list-style-type: none"> • machine tools for working metals and other materials (wood, bone, stone, hard rubber, hard plastics, cold glass etc.), including those using a laser beam, ultrasonic waves, plasma arc, magnetic pulse etc. • machine tools for turning, drilling, milling, shaping, planing, boring, grinding etc. • stamping or pressing machine tools • punch presses, hydraulic presses, hydraulic brakes, drop hammers, forging machines etc. • draw-benches, thread rollers or machines for working wires • stationary machines for nailing, stapling, glueing or otherwise assembling wood, cork, bone, hard rubber or plastics etc. • stationary rotary or rotary percussion drills, filing machines, riveters, sheet metal cutters etc. • presses for the manufacture of particle board and the like • electroplating machinery | 3 | 300 | 250 | |
| 282822823 | Manufacture of machinery for metallurgy | <ul style="list-style-type: none"> • Manufacture of machines and equipment for handling hot metals, e.g. • converters, ingot moulds, ladles, casting machines • Manufacture of metal-rolling mills and rolls for such mills | 3 | 300 | 250 | |

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|-----------|--|---|---|-----|-----|--|
| 282822824 | Manufacture of machinery for mining, quarrying and construction | <p>Manufacture of :</p> <ul style="list-style-type: none"> • continuous-action elevators and conveyors for underground use • boring, cutting, sinking and tunnelling machinery (whether or not for underground use) • machinery for treating minerals by screening, sorting, separating, washing, crushing etc. • concrete and mortar mixers • earth-moving machinery • pile drivers and pile extractors, mortar spreaders, bitumen spreaders, concrete surfacing machinery etc. • tracklaying tractors and tractors used in construction or mining • bulldozer and angle-dozer blades • off-road dumping trucks | 3 | 300 | 250 | |
| 282822825 | Manufacture of machinery for food, beverage and tobacco processing | <p>Manufacture of :</p> <ul style="list-style-type: none"> • agricultural dryers • machinery for the dairy industry • machinery for the grain milling industry • presses, crushers etc. used to make wine, cider, fruit juices etc. • machinery for the bakery industry or for making macaroni, spaghetti or similar products • machines and equipment to process diverse foods • machinery for the extraction or preparation of animal or vegetable fats or oils • machinery for the preparation of tobacco and for the making of cigarettes or cigars, or for pipe or chewing tobacco or snuff • machinery for the preparation of food in hotels and restaurants | 3 | 300 | 250 | |

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|-----------|--|--|---|-----|-----|--|
| 282822826 | Manufacture of machinery for textile, apparel and leather production | <p>Manufacture of</p> <ul style="list-style-type: none"> • textile machinery (preparing, producing, extruding, drawing, texturing or cutting man-made textile fibres, materials or yarns, for preparing textile fibres: cotton gins, bale breakers, garnetters, cotton spreaders, wool scourers, wool carbonizers, combs, carders, roving frames, spinning machines, reelers, warpers and related machines weaving machines (looms), including hand looms, knitting machines, machines for making knotted net, tulle, lace, braid etc. • auxiliary machines or equipment for textile machinery, e.g. dobbies, jacquards, automatic stop motions, shuttle changing mechanisms, spindles and spindle flyers etc. • textile printing machinery • machinery for fabric processing (for washing, bleaching, dyeing, dressing, finishing, coating or impregnating textile fabrics, reeling, unreeling, folding, cutting or pinking textile fabrics) • laundry machinery • sewing machines, sewing machine heads and sewing machine needles (whether or not for household use) • machines for producing or finishing felt or non-wovens • machinery for preparing, tanning or working hides, skins or leather • machinery for making or repairing footwear or other articles of hides, skins, leather or fur skins | 3 | 300 | 250 | |
|-----------|--|--|---|-----|-----|--|

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|-----------|--|--|---|-----|-----|--|
| 282822829 | Manufacture of other special-purpose machinery | <p>Manufacture of :</p> <ul style="list-style-type: none"> • machinery for making paper pulp • paper and paperboard making machinery • dryers for wood, paper pulp, paper or paperboard • machinery producing articles of paper or paperboard • machinery for working soft rubber or plastics or for the manufacture of products of these materials - extruders, moulders, pneumatic tyre making or retreading machines and other machines for making a specific rubber or plastic product • printing and bookbinding machines and machines for activities supporting printing on a variety of materials • machinery for producing tiles, bricks, shaped ceramic pastes, pipes, graphite electrodes, blackboard chalk, foundry moulds etc. • semi-conductor manufacturing machinery • industrial robots performing multiple tasks for special purposes • diverse special-purpose machinery and equipment, e.g. machines to assemble electric or electronic lamps, tubes (valves) or bulbs, machines for production or hot-working of glass or glassware, glass fibre or yarn, machinery or apparatus for isotopic separation • tire alignment and balancing equipment; balancing equipment (except wheel balancing) • central greasing systems • aircraft launching gear, aircraft carrier catapults and related equipment • automatic bowling alley equipment (e.g. pin-setters) • roundabouts, swings, shooting galleries and other fairground amusements | 3 | 300 | 250 | |
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| 29. Manufacture of motor vehicles, trailers and semi-trailers | | | | | | |
|---|---|--|---|-----|-----|--|
| 29291 | Manufacture of motor vehicles | <p>Manufacture of :</p> <ul style="list-style-type: none"> • passenger cars • commercial vehicles, e.g. vans, lorries, over-the-road tractors for semi-trailers etc. • buses, trolley-buses and coaches • motor vehicle engines • chassis fitted with engines • other motor vehicles, e.g. snowmobiles, golf carts, amphibious vehicles, fire engines, street sweepers, travelling libraries, armoured cars, concrete-mixer lorries, etc. • ATVs, go-carts and similar including race cars <p>Factory rebuilding of motor vehicle engines</p> | 3 | 250 | 200 | |
| 29292 | Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers | <ul style="list-style-type: none"> • Manufacture of bodies, including cabs for motor vehicles • Outfitting of all types of motor vehicles, trailers and semi-trailers • Manufacture of trailers and semi-trailers • Manufacture of containers for carriage by one or more modes of transport | 3 | 250 | 200 | |

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|---|---|---|---|-----|-----|--|
| 29293 | Manufacture of parts and accessories for motor vehicles | <ul style="list-style-type: none"> • Manufacture of diverse parts and accessories for motor vehicles, e.g. brakes, gearboxes, axles, road wheels, suspension shock absorbers, radiators, silencers, exhaust pipes, catalytic converters, clutches, steering wheels, steering columns and steering boxes • Manufacture of parts and accessories of bodies for motor vehicles, e.g. safety belts, airbags, doors, bumpers • Manufacture of car seats • Manufacture of motor vehicle electrical equipment, such as generators, alternators, spark plugs, ignition wiring harnesses, power window and door systems, assembly of purchased gauges into instrument panels, voltage regulators, etc. | 3 | 250 | 200 | |
| 30: Manufacture of other transport equipment | | | | | | |
| 30301 | Building of ships and boats | | | | | |
| 303013011 | Building of ships and floating structures | <p>Building of ships, except vessels for sports or recreation, and the construction of floating structures.</p> <ul style="list-style-type: none"> • building of commercial vessels, e.g. passenger vessels, ferry boats, cargo ships, tankers, tugs etc. • building of warships • building of fishing boats and fish-processing factory vessels • building of hovercraft (except recreation-type hovercraft) • construction of drilling platforms, floating or submersible • construction of floating structures, e.g. floating docks, pontoons, coffer-dams, floating landing stages, buoys, floating tanks, barges, lighters, floating cranes, non-recreational inflatable rafts etc. • manufacture of sections for ships and floating structures | 2 | 500 | 400 | |

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|-----------|--|--|---|-----|-----|--|
| 303013011 | Building of pleasure and sporting boats | <ul style="list-style-type: none"> • Manufacture of inflatable boats and rafts • Building of sailboats with or without auxiliary motor • Building of motor boats • Building of recreation-type hovercraft • Manufacture of personal watercraft • Manufacture of other pleasure and sporting boats, e.g. canoes, kayaks, rowing boats, skiffs | 3 | 250 | 200 | |
| 30302 | Manufacture of railway locomotives and rolling stock | <ul style="list-style-type: none"> • Manufacture of electric, diesel, steam and other rail locomotives • Manufacture of self-propelled railway or tramway coaches, vans and trucks, maintenance or service vehicles • Manufacture of railway or tramway rolling stock, not self-propelled, such as passenger coaches, goods vans, tank wagons, self-discharging vans and wagons, workshop vans, crane vans, tenders etc. • Manufacture of specialized parts of railway or tramway locomotives or of rolling stock, e.g. bogies, axles and wheels, brakes and parts of brakes; hooks and coupling devices, buffers and buffer parts; shock absorbers; wagon and locomotive frames; bodies; corridor connections etc. • Manufacture of mechanical and electromechanical signalling, safety and traffic control equipment for railways, tramways, inland waterways, roads, parking facilities, airfields, etc. • Manufacture of mining locomotives and mining rail cars • Manufacture of railway car seats | 2 | 350 | 300 | |

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|-----------|---|---|---|-----|-----|--|
| 30303 | Manufacture of air and spacecraft and related machinery | <ul style="list-style-type: none"> • Manufacture of airplanes for the transport of goods or passengers, for use by the defense forces, for sport or other purposes • Manufacture of helicopters • Manufacture of gliders, hang-gliders • Manufacture of dirigibles and hot air balloons • Manufacture of parts and accessories of the aircraft • Manufacture of ground flying trainers • Manufacture of spacecraft and launch vehicles, satellites, planetary probes, orbital stations, shuttles • Manufacture of intercontinental ballistic missiles (ICBM) • Manufacture of aircraft seats | 2 | 500 | 500 | |
| 30304 | Manufacture of military fighting vehicles | <ul style="list-style-type: none"> • Manufacture of tanks • Manufacture of armored amphibious military vehicles • Manufacture of other military fighting vehicles | 2 | 500 | 500 | |
| 30309 | Manufacture of transport equipment n.e.c. | | | | | |
| 303093091 | Manufacture of motorcycles | <ul style="list-style-type: none"> • Manufacture of motorcycles, mopeds and cycles fitted with an auxiliary engine • Manufacture of engines for motorcycles • Manufacture of sidecars • Manufacture of parts and accessories for motorcycles | 3 | 250 | 200 | |
| 303093092 | Manufacture of bicycles and invalid carriages | <ul style="list-style-type: none"> • Manufacture of non-motorized bicycles and other cycles, including (delivery) tricycles, tandems, children's bicycles and tricycles • Manufacture of parts and accessories of bicycles • Manufacture of invalid carriages with or without motor • Manufacture of parts and accessories of invalid carriages • Manufacture of baby carriages | 4 | 150 | 100 | |
| 303093099 | Manufacture of other transport equipment n.e.c. | <p>Manufacture of hand-propelled vehicles: luggage trucks, handcarts, sledges, shopping carts etc.</p> <p>Manufacture of vehicles drawn by animals: sulkies, donkey-carts, hearses etc.</p> | 4 | 150 | 100 | |

| 31: Manufacture of furniture | | | | | | |
|------------------------------|--------------------------|--|---|-----|-----|--|
| 31310 | Manufacture of furniture | Manufacture of : <ul style="list-style-type: none"> • Home indoor and outdoor furniture • chairs and seats for offices, workrooms, hotels, restaurants, public and domestic premises • chairs and seats for theatres, cinemas • sofas, sofa beds and sofa sets • garden chairs and seats • special furniture for shops: counters, display cases, shelves etc. • furniture for churches, schools, restaurants • office furniture • kitchen furniture • cabinets for sewing machines, televisions etc. • laboratory benches, stools and other laboratory seating, laboratory furniture (e.g. cabinets and tables) | 3 | 200 | 150 | |

| 32: Other manufacturing | | | | | | |
|-------------------------|---|--|---|----|----|---|
| 32321 | Manufacture of jewellery, bijouterie and related articles | | | | | |
| 323213211 | Manufacture of jewellery and related articles | <ul style="list-style-type: none"> • Production of worked pearls • Production of precious and semi-precious stones in the worked state, including the working of industrial quality stones and synthetic or reconstructed precious or semiprecious stones • Working of diamonds • Manufacture of jewellery of precious metal or of base metals clad with precious metals, or precious or semi-precious stones, or of combinations of precious metal and precious or semi-precious stones or of other materials • Manufacture of goldsmiths' articles of precious metals or of base metals clad with precious metals, such as dinnerware, flatware, hollowware, toilet articles, office or desk articles, articles for religious use etc. • Manufacture of technical or laboratory articles of precious metal (except instruments and parts thereof): crucibles, spatulas, electroplating anodes etc. • Manufacture of precious metal watch bands, wristbands, watch straps and cigarette cases • Manufacture of coins, including coins for use as legal tender, whether or not of precious metal • Engraving of personal precious and non-precious metal products | 4 | 60 | 50 | Buffer not applicable for home based or cottage industries. |
| 323213212 | Manufacture of imitation jewellery and related articles | <ul style="list-style-type: none"> • Manufacture of costume or imitation jewellery • Manufacture of metal watch bands (except precious metal) | 4 | 60 | 50 | Buffer not applicable for home based or cottage industries. |

Guidelines for the Siting and Zoning of Industry and Residential Areas

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| 32322 | Manufacture of musical instruments | <ul style="list-style-type: none"> • Manufacture of stringed instruments • Manufacture of keyboard stringed instruments, including automatic pianos • Manufacture of keyboard pipe organs, including harmoniums and similar keyboard instruments with free metal reeds • Manufacture of accordions and similar instruments, including mouth organs • Manufacture of wind instruments • Manufacture of percussion musical instruments • Manufacture of musical instruments, the sound of which is produced electronically • Manufacture of musical boxes, fairground organs, calliopes etc. • Manufacture of instrument parts and accessories such as metronomes, tuning forks, pitch pipes, cards, discs and rolls for automatic mechanical instruments, etc. • Manufacture of whistles, call horns and other mouth-blown sound signalling instruments | 4 | 100 | 60 | Buffer not applicable for home based or cottage industries. |
| 32323 | Manufacture of sports goods | <p>Manufacture of sporting and athletic goods (except apparel and footwear).</p> <p>Manufacture of articles and equipment for sports, outdoor and indoor games, of any material:</p> | 4 | 60 | 50 | Buffer not applicable for home based or cottage industries. |
| 32324 | Manufacture of games and toys | Manufacture of dolls, toys and games (including electronic games), scale models and children's vehicles (except metal bicycles and tricycles). | 4 | 60 | 50 | Buffer not applicable for home based or cottage industries. |
| 32325 | Manufacture of medical and dental instruments and supplies | Manufacture of laboratory apparatus, surgical and medical instruments, surgical appliances and supplies, dental equipment and supplies, orthodontic goods, dentures and orthodontic appliances. Included is the manufacture of medical, dental and similar furniture, where the additional specific functions determine the purpose of the product, such as dentist's chairs with built-in hydraulic functions. | 4 | 150 | 100 | |

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| 32329 | Other manufacturing n.e.c. | <ul style="list-style-type: none"> • Manufacture of protective safety equipment <ul style="list-style-type: none"> o fire-resistant and protective safety clothing o linemen's safety belts and other belts for occupational use o cork life preservers o plastics hard hats and other personal safety equipment of plastics (e.g. athletic helmets) o fire-fighting protection suits o metal safety headgear and other metal personal safety devices o ear and noise plugs (e.g. for swimming and noise protection) o gas masks • Manufacture of brooms and brushes, including brushes constituting parts of machines, hand-operated mechanical floor sweepers, mops and feather dusters, paint brushes, paint pads and rollers, squeegees and other brushes, brooms, mops etc. • manufacture of shoe and clothes brushes • manufacture of pens and pencils of all kinds whether or not mechanical, pencil leads • manufacture of date, sealing or numbering stamps, hand-operated devices for printing, or embossing labels, hand printing sets, prepared typewriter ribbons and inked pads • manufacture of globes • manufacture of umbrellas, sun-umbrellas, walking sticks, seat-sticks • manufacture of buttons, press-fasteners, snap-fasteners, press-studs, slide fasteners • manufacture of cigarette lighters • manufacture of articles of personal use: smoking pipes, scent sprays, vacuum flasks and other vacuum vessels for personal or household use, wigs, false beards, eyebrows • manufacture of miscellaneous articles: candles, tapers and the like; bouquets, wreaths and floral baskets; artificial | 3 | 150 | 100 | |
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| 33. Repair and Installation of machinery and equipment | | | | | | |
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| 33331 | Repair of fabricated metal products, machinery and equipment | | | | | |
| 333313311 | Repair of fabricated metal products | Repair and maintenance of fabricated metal products of division 25, includes: <ul style="list-style-type: none"> • repair of metal tanks, reservoirs and containers • repair and maintenance for pipes and pipelines • mobile welding repair • repair of steel shipping drums • repair and maintenance of steam or other vapour generators • repair and maintenance of auxiliary plant for use with steam generators, such as condensers, economizers, superheaters, steam collectors and accumulators • repair and maintenance of nuclear reactors, except isotope separators • repair and maintenance of parts for marine or power boilers • platework repair of central heating boilers and radiators • repair and maintenance of fire arms and ordnance (including repair of sporting and recreational guns) | 3 | 300 | 250 | |
| 333313312 | Repair of machinery | Repair and maintenance of industrial machinery and equipment like sharpening or installing commercial and industrial machinery blades and saws; the provision of welding (e.g. automotive, general) repair services; the repair of agricultural and other heavy and industrial machinery and equipment (e.g. forklifts and other materials handling equipment, machine tools, commercial refrigeration equipment, construction equipment and mining machinery), comprising machinery and equipment of division 28. | 3 | 200 | 150 | |
| 333313313 | Repair of electronic and optical equipment | <ul style="list-style-type: none"> • Repair and maintenance of goods produced in groups 265, 266 and 267, except those that are considered household goods. • Repair and maintenance of the measuring, testing, navigating and control equipment of group 265, • Repair and maintenance of irradiation, electromedical and electrotherapeutic equipment of class 2660 • Repair and maintenance of optical instruments and equipment of class 2670, if the use is mainly commercial | 4 | 100 | 60 | |

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| 333313314 | Repair of electrical equipment | <ul style="list-style-type: none"> • Repair and maintenance of goods of division 27, except those in class 2750 (domestic appliances). • Repair and maintenance of power, distribution, and specialty transformers • Repair and maintenance of electric motors, generators, and motor generator sets • Repair and maintenance of switchgear and switchboard apparatus • Repair and maintenance of relays and industrial controls • Repair and maintenance of primary and storage batteries • Repair and maintenance of electric lighting equipment • Repair and maintenance of current-carrying wiring devices and non current-carrying wiring devices for wiring electrical circuits | 4 | 100 | 60 | |
| 333313315 | Repair of transport equipment, except motor vehicles | <ul style="list-style-type: none"> • Repair and maintenance of transport equipment of division 30, except motorcycles and bicycles. However, the factory rebuilding or overhaul of ships, locomotives, railroad cars and aircraft is classified in division 30. • Repair and routine maintenance of ships • Repair and maintenance of pleasure boats • Repair and maintenance of locomotives and railroad cars (except factory rebuilding or factory conversion) • Repair and maintenance of aircraft (except factory conversion, factory overhaul, factory rebuilding) • Repair and maintenance of aircraft engines • Repair of animal drawn buggies and wagons | 3 | 300 | 250 | |
| | | | 4 | 100 | 60 | |

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| 333313319 | Repair of other equipment | Repair and maintenance of equipment not covered in other groups of this division. | 4 | 60 | 50 | Activity can be located within buffer area. |
| | | <ul style="list-style-type: none"> Repair of fishing nets, including mending Repair or ropes, riggings, canvas and tarps | 4 | 100 | 80 | |
| | | <ul style="list-style-type: none"> Repair of fertilizer and chemical storage bags Repair or reconditioning of wooden pallets, shipping drums or barrels, and similar items | 4 | 80 | 60 | |
| | | <ul style="list-style-type: none"> Repair of pinball machines and other coin-operated games Restoring of organs and other historical musical instruments | | | | |
| 35. Electricity, gas, steam and air conditioning supply | | | | | | |
| 351 | Electric power generation, transmission and distribution | <ul style="list-style-type: none"> Generation of bulk electric power, transmission from generating facilities to distribution centers and distribution to end users – gas fired. | 2 | 500 | 350 | |
| | | <ul style="list-style-type: none"> Generation of bulk electric power, transmission from generating facilities to distribution centers and distribution to end users – coal. | 2 | 1000 | 1000 | |
| | | <ul style="list-style-type: none"> Generation of bulk electric power, transmission from generating facilities to distribution centers and distribution to end users – distillate | 2 | 500 | 400 | |
| | | <ul style="list-style-type: none"> Operation of generation facilities that produce electric energy from hydro | 2 | 350 | 350 | |
| | | <ul style="list-style-type: none"> Operation of generation facilities that produce electric energy from renewable sources (solar) | 4 | 200 | 150 | Applicable for commercial scale operations |
| | | <ul style="list-style-type: none"> Operation of transmission systems that convey the electricity from the generation facility to the distribution system | - | 60 | 50 | Non industrial activity |

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| | | <ul style="list-style-type: none"> Operation of distribution systems (i.e. consisting of lines, poles, meters, and wiring) that convey electric power received from the generation facility or the transmission system to the final consumer | - | - | - | No buffer requirement |
| | | <ul style="list-style-type: none"> Operation of electricity and transmission capacity exchanges for electric power | - | 100 | 80 | Non industrial activity |
| 35352 | Manufacture of gas; distribution of gaseous fuels through mains | <ul style="list-style-type: none"> Production of gas for the purpose of gas supply by carbonation of coal, from by-products of agriculture or from waste | 2 | 500 | 500 | |
| | | <ul style="list-style-type: none"> Manufacture of gaseous fuels with a specified calorific value, by purification, blending and other processes from gases of various types including natural gas | | | | |
| | | <ul style="list-style-type: none"> Transportation, distribution and supply of gaseous fuels of all kinds through a system of mains | 3 | | See remarks | Buffer to be determined by modeling. |
| 35353 | Steam and air conditioning supply | <ul style="list-style-type: none"> Production, collection and distribution of steam and hot water for heating, power and other purposes | 3 | 250 | 200 | Source of fuel is to be considered in decision |
| | | <ul style="list-style-type: none"> Production and distribution of cooled air | 4 | 150 | 100 | |
| | | <ul style="list-style-type: none"> Production and distribution of chilled water for cooling purposes | 4 | 150 | 100 | Enclosed facility |
| | | <ul style="list-style-type: none"> Production of ice, including ice for food and non-food (e.g. cooling) purposes | 4 | 60 | 50 | Enclosed facility |

| 36. Water collection, treatment and supply | | | | | | |
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| 36360 | Water collection, treatment and supply | <p>Water collection, treatment and distribution activities for domestic and industrial needs.</p> <ul style="list-style-type: none"> • collection of water from rivers, lakes, wells etc. • collection of rain water • purification of water for water supply purposes • treatment of water for industrial and other purposes • desalting of sea or ground water to produce water as the principal product of interest • distribution of water through mains, by trucks or other means • operation of irrigation canals <p>The operation of irrigation canals is also included; however the provision of irrigation services through sprinklers, and similar agricultural support services, is not included.</p> | 3 | 150 | 100 | |
| 37. Sewerage | | | | | | |
| 37370 | Sewerage | <p>Operation of sewer systems or sewage treatment facilities (municipal or regional facilities)</p> <p>Treatment of wastewater (including human and industrial wastewater, water from swimming pools etc.) by means of physical, chemical and biological processes like dilution, screening, filtering, sedimentation etc.</p> | 3 | 250 | 200 | <p>Buffer applicable for treatment plant 50,000 PE and above, including regional and municipal scale plants.</p> <p>Reference is to be made to SPAN Guidelines for STP in housing areas</p> |
| | | <p>Temporary STP for construction activities</p> | - | 50 | 50 | Non industrial activity |
| 38. Waste collection, treatment and disposal activities; materials recovery | | | | | | |
| 38382 | Waste treatment and disposal | <p>Disposal at landfill for</p> <ul style="list-style-type: none"> • Municipal waste • Non-toxic and non-hazardous waste • Dead animals, • Disposal of transition medical waste from hospitals, etc.; • disposal of waste by incineration, or combustion | 2 | 500 | 500 | Not applicable for disposal of transition radioactive waste from hospitals |
| | | <ul style="list-style-type: none"> • Dumping of refuse on land or in water; burial or ploughing-under of refuse; disposal of used goods such as refrigerators to eliminate harmful waste. | 2 | 350 | 300 | |

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| | | Disposal at landfill for <ul style="list-style-type: none"> • Construction waste • Inert wastes • Green wastes | 2 | 350 | 300 | |
| | | Disposal at landfill for <ul style="list-style-type: none"> • Toxic and Hazardous waste • Scheduled wastes • Toxic and/or contaminated animals • Other contaminated waste | 1 | 1000 | 800 | |
| | | Disposal for transition medical waste from hospitals, etc.; | 2 | 500 | 500 | Not applicable for treatment of transition radioactive waste from hospitals |
| | | Treatment prior to disposal of various forms of waste by different means, such as waste treatment of organic waste with the aim of disposal; | 2 | 350 | 350 | Subject to review for type of waste to be treated |
| | | Generation of electricity resulting from waste incineration processes | 2 | 350 | 300 | Non hazardous wastes only |
| 383823821 | Treatment and disposal of non-hazardous waste | Solid or non-solid non-hazardous waste. Operation of landfills for the disposal of non-hazardous waste | 2 | 500 | 500 | Overall buffer is minimum; final buffer shall be determined by modeling. |
| | | Treatment of non-hazardous waste by combustion or incineration or other methods, with or without the resulting production of electricity or steam, substitute fuels, biogas, ashes or other by-products for further use etc. | 2 | 350 | 350 | |
| | | Treatment of organic waste for disposal | 2 | 350 | 350 | |
| | | Production of compost from organic waste | 2 | 500 | 400 | |

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| 383823822 | Treatment and disposal of hazardous waste | Solid or non-solid hazardous waste, including waste that is explosive, oxidizing, flammable, toxic, irritant, carcinogenic, corrosive or infectious and other substances and preparations harmful for human health and environment. | 1 | 1000 | 800 | Buffer not applicable for radioactive nuclear waste. Overall buffer is minimum; final buffer shall be determined by modeling. |
| | | <ul style="list-style-type: none"> • Operation of facilities for treatment of hazardous waste • Incineration of hazardous waste | | | | |
| | | Treatment and disposal of toxic live or dead animals and other contaminated waste | 1 | 500 | 500 | Overall buffer is minimum; final buffer shall be determined by modeling. |
| | | Disposal of used goods such as refrigerators to eliminate harmful waste | 2 | 350 | 300 | |

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| 38383 | Materials recovery | <p>Processing of metal and non-metal waste and scrap and other articles into secondary raw materials, usually involving a mechanical or chemical transformation process</p> <p>Recovery of materials from waste streams in the form of:</p> <ul style="list-style-type: none"> • separating and sorting recoverable materials from non-hazardous waste streams (i.e. garbage) • separating and sorting of commingled recoverable materials, such as paper, plastics, used beverage cans and metals, into distinct categories <p>Examples of the mechanical or chemical transformation processes that are undertaken are:</p> <ul style="list-style-type: none"> • mechanical crushing of metal waste such as used cars, washing machines, bikes etc. with subsequent sorting and separation • dismantling of automobiles, computers, televisions and other equipment for materials recovery • mechanical reduction of large iron pieces such as railway wagons • shredding of metal waste, end-of-life vehicles etc. • other methods of mechanical treatment as cutting, pressing to reduce the volume • ship-breaking • reclaiming metals out of photographic waste, e.g. fixer solution or photographic films and paper • reclaiming of rubber such as used tires to produce secondary raw material • sorting and pelleting of plastics to produce secondary raw material for tubes, flower pots, pallets and the like • processing (cleaning, melting, grinding) of plastic or rubber waste to granulates • crushing, cleaning and sorting of glass • crushing, cleaning and sorting of other waste such as demolition waste to obtain | 2 | 350 | 300 | |
| | | <ul style="list-style-type: none"> • Processing of other food, beverage and tobacco waste and residual substances into secondary raw materials • Processing of used cooking oils and fats into secondary raw materials | 2 | 350 | 300 | |

