Best Practice Guideline for the Establishment and Operation of a Waste Derived Fuels Preparation Facility
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<th>Description</th>
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<tbody>
<tr>
<td>BA</td>
<td>Basic Assessment</td>
</tr>
<tr>
<td>DEA</td>
<td>Department of Environmental Affairs</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Authorisation</td>
</tr>
<tr>
<td>EMF</td>
<td>Environmental Management Framework</td>
</tr>
<tr>
<td>EMP</td>
<td>Environmental Management Plan</td>
</tr>
<tr>
<td>EMPr</td>
<td>Environmental Management Programme</td>
</tr>
<tr>
<td>EMS</td>
<td>Environmental Management System</td>
</tr>
<tr>
<td>GNR</td>
<td>Government Notice Regulation</td>
</tr>
<tr>
<td>MEC</td>
<td>Member of Executive Council</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Environmental Management Act (No. 107 of 1998)</td>
</tr>
<tr>
<td>NEM:BA</td>
<td>National Environmental Management: Biodiversity Act (No. 10 of 2004)</td>
</tr>
<tr>
<td>NEM:PAA</td>
<td>National Environmental Management: Protected Areas Act (No. 57 of 2003)</td>
</tr>
<tr>
<td>NWMS</td>
<td>National Waste Management Strategy</td>
</tr>
<tr>
<td>S&amp;EiR</td>
<td>Scoping and Environmental Impact Reporting</td>
</tr>
<tr>
<td>SANS</td>
<td>South African National Standard</td>
</tr>
<tr>
<td>SAWIS</td>
<td>South African Waste Information System</td>
</tr>
<tr>
<td>SDS</td>
<td>Safety Data Sheet</td>
</tr>
<tr>
<td>SEMA</td>
<td>Specific Environmental Management Acts</td>
</tr>
<tr>
<td>SHEQ</td>
<td>Safety, Health, Environment and Quality</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedure</td>
</tr>
<tr>
<td>WDF</td>
<td>Waste Derived Fuels</td>
</tr>
<tr>
<td>WML</td>
<td>Waste Management License</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<td>-------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Co-Processing</td>
<td>The utilisation of alternative fuels and/or raw materials in industrial processes for the purpose of energy and/or resource recovery and resultant reduction in the use of conventional fuels and/or raw materials through substitution.</td>
</tr>
<tr>
<td>Decommissioning</td>
<td>The taking out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned.</td>
</tr>
<tr>
<td>Environment</td>
<td>The surroundings within which humans exist and that are made up of: • The land, water and atmosphere of the earth (i); • Micro-organisms, plant and animal life (ii); • Any part or combination of (i) and (ii) and the interrelationships among and between them; and • The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.</td>
</tr>
<tr>
<td>Environmentally Sound Management Principles</td>
<td>Operating according to standards that take all practicable steps to ensure that waste is managed in a manner that will protect the health and the environment.</td>
</tr>
<tr>
<td>Expansion</td>
<td>The modification, extension, alteration or upgrading of a facility, structure or infrastructure at which a waste management activity takes place in such a manner that the capacity of the facility or volume of waste recycled, used, treated, processed or disposed of is increased.</td>
</tr>
<tr>
<td>Facility</td>
<td>A place, infrastructure, structure or containment of any kind including associated structures or infrastructure, wherein, upon or at, a waste management activity takes place and includes a waste transfer facility, a waste storage facility, waste disposal facility, incinerators, recycling, and co-processing.</td>
</tr>
<tr>
<td>General Waste</td>
<td>Waste that does not pose an immediate hazard or threat to health or to the environment, and includes: • Domestic Waste; • Building and Demolition Waste; • Business Waste; and • Inert Waste.</td>
</tr>
<tr>
<td>Hazardous Waste</td>
<td>Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have detrimental impact on health and the environment.</td>
</tr>
<tr>
<td>Incineration</td>
<td>Any method, technique or process to convert waste to flue gases and residues by means of oxidation.</td>
</tr>
<tr>
<td>Industry</td>
<td>Includes commercial, agricultural, commercial agricultural, mining activities and the operation of power stations.</td>
</tr>
<tr>
<td>Member of Executive Council</td>
<td>Responsible for waste management at a provincial level.</td>
</tr>
<tr>
<td>Minister</td>
<td>Responsible for waste management at a national level.</td>
</tr>
<tr>
<td>Person</td>
<td>Includes: any divisional council, municipal council, village management board, or like authority; any company incorporated or registered as such under any law; anybody of persons corporate or unincorporated and includes an organ of state.</td>
</tr>
<tr>
<td>Pollution</td>
<td>Any change in the environment caused by: • Substances; • Radioactive or other waves; or • Noise, odours, dust or heat; • Emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.</td>
</tr>
<tr>
<td>Processing</td>
<td>The reuse, recycling, recovery and/or treatment of a waste.</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<td>Pyrolysis</td>
<td>A thermochemical decomposition of organic material at elevated temperatures in the absence of oxygen. It involves the simultaneous change of chemical composition and physical phase, and is irreversible. E.g. the manufacture of a higher density carbon or charcoal.</td>
</tr>
<tr>
<td>Recovery</td>
<td>The controlled extraction or retrieval of any substance, material or object from waste.</td>
</tr>
<tr>
<td>Re-use</td>
<td>To utilise the whole, a portion of or a specific part of any substance, material or object from the waste stream for a similar or different purpose without changing the form or properties of such substance, material or object.</td>
</tr>
<tr>
<td>Recycle</td>
<td>A process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or a raw material.</td>
</tr>
<tr>
<td>Standard Operating Procedure</td>
<td>A Standard Operating Procedure is a set of written instructions that document a routine or repetitive activity followed by an organisation.</td>
</tr>
<tr>
<td>Storage</td>
<td>The accumulation of waste in a manner that does not constitute treatment or disposal of that waste.</td>
</tr>
<tr>
<td>Treatment</td>
<td>Any method, technique or process that is designed to: • Change the physical, biological or chemical character or composition of a waste; or • Remove, separate, concentrate or recover a hazardous or toxic component of a waste; or • Destroy or reduce the toxicity of a waste, in order to minimise the impact of the waste on the environment prior to further use or disposal.</td>
</tr>
<tr>
<td>Waste</td>
<td>Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered (includes all NEM:WA Schedule 3 wastes [refer to the NEM:WA for further details]); or any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister, unless the waste or portion of the waste, ceases to be a waste for the following reasons: • An application for its re-use, recycling or recovery has been approved by the Minister/MEC or, after such approval, once it is, or has been re-used, recycled or recovered; • Where approval is not required, once a waste is, or has been re-used, recycled or recovered; and • Where the Minister has, exempted any waste or a portion of waste generated by a particular process from the definition of waste or where the Minister has, excluded any waste stream or a portion of a waste stream from the definition of waste.</td>
</tr>
<tr>
<td>Waste Classification</td>
<td>Establishing whether a waste is hazardous based on the nature of its physical, health and environmental hazardous properties (hazard classes) and the degree of severity of hazard posed (hazard categories).</td>
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<tr>
<td>Waste Derived Fuel</td>
<td>A fuel produced by the recycling, recovery and/or treatment of a waste material to create a material which can be used as a fuel to generate heat and energy.</td>
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<tr>
<td>Waste Derived Fuel Facility</td>
<td>A facility that prepares a waste material for use as a fuel, by means of recycling, recovery and/or treatment of a waste material.</td>
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<tr>
<td>Waste Generator</td>
<td>Any person whose actions, production processes or activities, including waste management activities, results in the generation of waste.</td>
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<tr>
<td>Waste Management Activity</td>
<td>Includes: • The importation and exportation of waste; • The generation of waste, including the undertaking of any activity or process that is likely to result in the generation of waste; • The accumulation and storage of waste; • The collection and handling of waste; • The reduction, re-use, recycling and recovery of waste; • The trading in waste; • The transportation of waste; • The transfer of waste; and • The disposal of waste.</td>
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V
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<tr>
<th>Waste Management Control Officer</th>
<th>A waste management control officer is responsible for:</th>
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<tr>
<td></td>
<td>• Working towards the development and introduction</td>
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<td>of clean production technologies and practices to</td>
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<td>achieve waste minimisation;</td>
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<td>• Identifying and submitting potential measures in</td>
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<td>respect of waste minimisation, including the</td>
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<td></td>
<td>reduction, recovery, re-use and recycling of waste</td>
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<td>to the waste management licence holder and the</td>
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<td>licensing authority;</td>
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<td></td>
<td>• Taking all reasonable steps to ensure compliance</td>
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<td>by the holder of the waste management licence with</td>
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<td>the licence conditions and requirements and the</td>
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<td>provisions of NEM:WA; and</td>
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<td></td>
<td>• Promptly report any non-compliance with any licence</td>
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<td></td>
<td>conditions or requirements or provisions of NEM:WA</td>
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<td>to the licensing authority through the most</td>
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<td>effective means reasonably available.</td>
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| Waste Manifest System | A system of control documentation, which accompanies a load of hazardous waste transported from the point of generation to the waste management facility. |

| Waste Transporter | Means any person who conveys or transfers waste between the waste generator and a waste management facility or between waste management facilities. |
1 INTRODUCTION

1.1 PURPOSE
The purpose of this Guideline is to provide best practice measures for the preparation of Waste Derived Fuel (WDF) in South Africa.

The Guideline has been developed to address the lack of uniform operational standards for management of potential environmental impacts resulting from the preparation of WDF, and is intended to support the diversion of waste from landfill through waste-to-energy initiatives in accordance with the Waste Classification and Management Regulations and the associated Norms and Standards promulgated in terms of the National Environmental Management: Waste Act (No.59 of 2008), as amended (NEM:WA).

1.2 OBJECTIVES
The specific objectives of this Guideline are as follows:

1. To document the best practical management option of the transfer, storage, and treatment of wastes which are intended for use as, or in, a WDF;
2. To assist current/existing WDF facilities in ensuring that the WDF facility is operating according to best environmental practice standards;
3. To provide WDF facility operators, existing or prospective, with an understanding of the intended national approach to the overall management of such facilities;
4. To assist the Licensing Authority reviewing Waste Management Licenses (WML) for current and proposed WDF production facilities through improved consistency; and
5. To ensure that the manufacture of the WDF does not result in greater harm to human health and the environment than the extraction/production of conventional fuels.

1.3 APPLICATION
This document has applicability throughout the Republic of South Africa. The relevance of certain guidance contained within this document will depend on the type of facility and the type of waste treatment activities. Hence, the guidance provided in this document must always be regarded as subject to consideration of applicability in respect of the specific facility and activity contemplated.

This document does not in any manner preclude the manufacturer of a WDF from the requirements of any other South African legislation which may be applicable. This Guideline is specifically aimed at the industries and respective activity types as indicated in Table 1.1. This Guideline may however be applied to other industry types which are producing WDF, although the applicability of the guidance provided will be reliant on the technical details of the WDF type facility.

1.4 EXCLUSIONS AND LIMITATIONS
This Guideline does not apply to the following:

- Management of any material which is not defined as a waste in terms of the NEM:WA definition;
- Management of waste not intended for the manufacturing of a WDF;
- Management of environmental impacts associated with the use of WDF;
- Landfill gas extraction as this is managed under National Norms and Standards for the Extraction, Flaring or Recovery of Landfill Gas (GN 924); and
- Management of air quality related impacts from preparation of WDF.

The Guideline considers national legislation as well as international/national guidelines and standards which were available at the time of Guideline compilation. However, the Guideline does not detail all the requirements of other potentially applicable legislation. The Guideline user must ensure compliance with any other applicable legislation/policy/guidelines.
2 GUIDELINE STRUCTURE
This Guideline is structured as follows:

• Section 1 covers the purpose, objectives and application of this Guideline. Furthermore, the Section indicates what exclusions and limitations apply to the Guideline;
• Section 2 outlines structure of the Guideline. Each Section of the Guideline is aimed at providing the context and/or direction to the user;
• Section 3 summarises the current legal framework in South Africa which is applicable to development and use of this Guideline and outlines the authority structure;
• Section 4 discusses the document technical considerations;
• Section 5 contains environmental considerations for the establishment, construction and/or upgrading of a WDF facility;
• Section 6 contains environmental considerations for the operating of a WDF facility;
• Section 7 indicates the requirements of a waste manifest system;
• Section 8 provides guidance on the need to allocate roles and responsibilities to employees;
• Section 9 outlines the level of training required to ensure safety of employees and protection of the environment;
• Section 10 provides the purpose and requirements of an Environmental Management System (EMS);
• Section 11 provides planning requirements with respect to emergency scenarios;
• Section 12 outlines environmental monitoring requirements during the operational phase of the WDF facility;
• Section 13 outlines auditing and reporting requirements of the WDF facility;
• Section 14 outlines the need, purpose and requirements of Standard Operating Procedure (SOP);
• Section 15 contains environmental considerations for the Decommissioning/Closure of a WDF facility; and
• Section 16 references all information sources used during the formulation of this Guideline

3 LEGISLATIVE FRAMEWORK
Chapter 2 of the Constitution of the Republic of South Africa Act (No. 108 of 1996) Section 24, states that “everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecological sustainable development and use of natural resources while promoting justifiable economic and social development”.

The National Environmental Management Act (No. 107 of 1998) (NEMA) which sets principles for environmental management within South Africa, provides framework legislation for protection of these constitutional rights. The NEMA also defines the framework for a set of Specific Environmental Management Acts (SEMA). The SEMAs include the (see Figure 3 1):

• NEM:WA;
• National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA);
• National Environmental Management: Biodiversity Act (No. 39 of 2004) (NEM:BA);
• National Environmental Management: Protected Areas Act (No. 57 of 2003) (NEM:PAA);
• National Environmental Management Integrated Coastal Management Act (No 24 of 2008).
3.1 THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NO.107 OF 1998)

The NEMA prescribes the over-arching environmental legal framework within which inter alia industry, waste managers and all spheres of government in South Africa operate. The NEMA seeks to meet the Constitutional right to an environment that is not harmful to the health and well-being of South African citizens, the equitable distribution of natural resources, sustainable development, environmental protection and the formulation of environmental management framework (EMFs).

The Act’s primary objective is to provide for co-operative governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state and to provide for matters connected therewith. Further to the above, the NEMA introduced a number of guiding principles into environmental legislation such as the life-cycle approach to waste management, producer responsibility, the precautionary principle, and the polluter pays principle, as well as ‘duty of care’ which places the onus on any person who causes significant pollution/degradation to the environment to institute measures to prevent pollution from occurring and to minimise and rectify the pollution or degradation where unavoidable. An additional principle, contained within the NEMA, is that of “Sustainable Development” which states that waste generation is to be avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner (the “Waste Hierarchy”).

The NEMA enables the Minister to identify activities which may not commence without prior authorisation from the Minister or Member of Executive Council (MEC) and may also identify geographical areas in which specified activities may not commence without prior authorisation. The Minister thus published GNR 983, 984 and 985 (2014) which indicates listed activities that may not commence prior to receipt of authorisation. Should the intended activity trigger a listed activity, the prospector will need to undertake one of the following three processes:

- GNR 983 listed activity trigger – undertake a Basic Assessment (BA) process;
- GNR 984 listed activity trigger – undertake a Scoping and Environmental Impact Reporting (S&EiR) process; and
- GNR 985 listed activity trigger – undertake a BA process.

The prescribed BA and S&EIR processes (according to GNR 982) have been summarised into flow charts for ease of Guidelines user reference. BA and S&EIR process flow charts included in Appendix A and Appendix B, respectively.

3.2 THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (NO.59 OF 2008)

The NEM:WA (forms part of the SEMAs) serves to regulate waste management in order to protect human health and the environment. This is managed by providing reasonable measures for the prevention of pollution and ecological degradation. The NEM:WA aims to secure ecologically sustainable development while promoting justifiable economic and social development and achieves this by placing minimum requirements on activities producing or handling waste. The ‘handling’ of a waste includes the storage, transportation and processing (treatment, re-use or recycling) of waste. Furthermore, the NEM:WA aims to provide:

- National Norms and Standards for regulating the management of waste by all spheres of government;
- Specific waste management measures; and
- For the licensing and control of waste management activities.

3.2.1 WASTE MANAGEMENT: LISTED ACTIVITIES

Section 19 of the NEM:WA states the Minister may publish a list of waste management activities which are likely to have a detrimental effect on the environment. The Minister published GNR 921, in response NEM:WA Section 19, which lists waste management activities which are likely to cause a detrimental effect on the environment. GNR 921, contains categories A, B and C, all of which require a form of waste licensing prior to commencement.

NEM:WA Section 20, indicates that no person may commence, undertake or conduct a waste management activity (as listed in accordance with NEM:WA Section 19) except in accordance with a WML. As such, waste handlers/users are required to determine whether or not the undertaking triggers a listed activity in GNR 921.

Should the intended activity trigger a GNR 921 listed activity, the following will be required in order to obtain a WML:

- Category A – BA process;
- Category B – S&EIR process; and
- Category C – Waste Storage Application/Registration process.
The WML application process will follow either a prescribed BA or a S&EIR process according to NEMA GNR 982 (see Appendices A and B). Should a listed activity under Category C be triggered by the intended activity, the applicant will require a waste storage registration in terms of GNR 926 (as indicated in sub-section 3.2.2). Furthermore, the existing/proposed activity will need to be undertaken in accordance with the conditions of GNR 926, should a GNR 921 Category C listed activity be triggered by the proposal.

The focus of this Guideline is on waste management activities that are likely to trigger one or more of the following listed activities under GNR 921:

- **Category A:**
  1. The sorting, shredding, grinding, crushing, screening or bailing of general waste at a facility that has an operational area in excess of 1000m²;
  2. The recycling of general waste at a facility that has an operational area in excess of 500m², excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises;
  3. The recycling of hazardous waste in excess of 500kg but less than 1 ton per day calculated as a monthly average, excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises;
  4. The recovery of waste including the refining, utilisation, or co-processing of waste in excess of 10 tons but less than 100 tons of general waste per day or in excess of 500kg but less than 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises;
  5. The treatment of general waste using any form of treatment at a facility that has the capacity to process in excess of 10 tons but less than 100 tons;
  6. The treatment of hazardous waste using any form of treatment at a facility that has the capacity to process in excess of 500kg but less than 1 ton per day excluding the treatment of effluent, wastewater or sewage;
  7. The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity);
  8. The expansion of a waste management activity listed in Category A or B of this Schedule which does not trigger an additional waste management activity in terms of this Schedule; and
  9. The decommissioning of a facility for a waste management activity listed in Category A or B of this Schedule.

- **Category B:**
  2. The reuse or recycling of hazardous waste in excess of 1 ton per day, excluding reuse or recycling that takes place as an integral part of an internal manufacturing process within the same premises;
  3. The recovery of waste including the refining, utilisation, or co-processing of waste at a facility that processes in excess of 100 tons of general waste per day or in excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises;
  4. The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage;
  5. The treatment of hazardous waste in lagoons, excluding the treatment of effluent, wastewater or sewage;
  6. The treatment of general waste in excess of 100 tons per day calculated as a monthly average, using any form of treatment; and
  7. The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).

- **Category C:**
  1. The storage of general waste at a facility that has the capacity to store in excess of 100m³ of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste;
  2. The storage of hazardous waste at a facility that has the capacity to store in excess of 80m³ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste; and
  3. The storage of waste tyres in a storage area exceeding 500m².

**3.2.2 WASTE RELATED REGULATIONS**

Section 69 of Chapter 8 of the NEM:WA indicates that the Minister may set Regulations for the manner in which particular waste types must be managed. As such the Minister has published the following:
• **GNR 625: National Waste Information Regulations**

**Purpose:**
- To regulate the collection of data and information to fulfil the objectives of the national waste information system as per the requirements of Section 61 of the NEM:WA.

**Application of the Regulation:**
- Apply uniformly to all persons conducting an activity listed in Annexure 1 of GNR 625 (refer to GNR 625 Annexure 1);
- A person who conducts an activity in a province that has an established waste information system in terms of section 62 of NEM:WA and collects the minimum information required by these Regulations must submit the information to the provincial waste information system; and

Where a province has developed waste information regulations that are compatible with these Regulations, a person who conducts an activity contemplated in Annexure 1 of GNR 625 must comply with the provincial waste information regulations.

**Registration Procedure:**
- Any person conducting an existing activity listed in GNR 625, Annexure 1, must apply to the Department to be registered on the South African Waste Information System (SAWiS) within ninety days of the GNR 625 promulgation date;
- Any person commencing such an activity after the promulgation of GNR 625 must apply to be registered on the SAWiS thirty days after the commencement of such an activity;
- Where a person conducts more than one activity in different facilities, such activities must be registered individually; and
- An application must be submitted in a form determined by the Department.

- Refer to GNR 625 for details regarding the following:
  - Reporting and Record Keeping Requirements; and
  - Verification of Information received by the Authority.

**Additional Considerations:**
- Gauteng and the Western Cape are the only two provinces which implement their own waste information systems. Visit http://www.gwis.gpg.gov.za and http://www.westerncape.gov.za to obtain further details.
- All other provinces do not have provincial level waste information systems, as such, the Guideline user should utilise the National waste information system (visit: http://www.sawic.environment.gov.za).

• **GNR 634 – Waste Classification and Management Regulations**

**Purpose:**
- To regulate the classification and management of waste in a manner which supports and implements the provisions of the NEM:WA;
- To establish a mechanism and procedure for the listing of waste management activities that do not require a WML;
- To prescribe requirements for the disposal of waste to landfill;
- To prescribe requirements and timeframes for the management of certain wastes; and
- To prescribe general duties of waste generators, transporters and managers.

**Application of the Regulation:**
- Apply uniformly to all provinces of South Africa;
- Does not apply to generators of domestic waste that is collected by the Municipality; and
- Applies to all waste generators, waste transporters and waste managers.

**Waste Classification Requirements:**
- Wastes listed in Annexure 1 of GNR 634 do not require classification in terms of the South African National Standard (SANS) 10234;
- Excluding Annexure 1 wastes, all waste generators must ensure that the waste they generate is classified in accordance with SANS 10234 within 180 days of generation.

- Waste must be kept separate for the purposes of classification and must not be mixed prior to classification.

- Wastes must be re-classified in terms of the requirements of GNR 634 every five years or within 30 days of modification of the process or activity that generates the waste including the changing of raw materials or other inputs, or any other variation of relevant factors.

- Wastes that have been subjected to any form of treatment must be re-classified correctly in terms of GNR 634; and

- The Minister may request a classification be peer reviewed should the Minister believe necessary.

Refer to GNR 634 for details regarding the following:

- Waste management including waste treatment and disposal to landfill;

- Waste management activities that do not require a WML;

- Record keeping and waste manifest system requirements; and

- General Matters.

3.2.3 WASTE RELATED NATIONAL NORMS AND STANDARDS

Chapter 2, Section 7, of Part 2, of the NEM:WA indicates that the Minister may set national Norms and Standards for the classification, storage, treatment and disposal of wastes. The Minister published the following:

- **GNR 635 – National Norms and Standards for the Assessment of Waste for Landfill Disposal**

  Purpose and Application:

  - Specifically aimed at the assessment of waste prior to landfill disposal.

  Refer to GNR 635 for details regarding the standard assessment methodology.

- **GNR 636 – National Norms and Standards for the Disposal of Waste to Landfill**

  Purpose and Application:

  - Specifically aimed at the requirements for the disposal of waste to landfill.

  Refer to GNR 636 for details regarding the standard design containment barrier, waste acceptance and waste disposal requirements.

- **GN 924 – National Standards for the Extraction, Flaring or Recovery of Landfill Gas**

  Purpose and Application:

  - Controlling the extraction, flaring or recovery of landfill gas at facilities in order to prevent or minimise potential negative impacts on the bio-physical and socio-economic environments.

  Application:

  - Not considered relevant to this Guideline.

- **GNR 926 – National Norms and Standards for the Storage of Waste**

  Purpose:

  - Provide a uniform national approach relating to the management of waste storage facilities;

  - Ensure best practice in the management of waste storage facilities; and

  - Provide minimum standards for the design and operation of proposed and existing waste storage facilities.

  Application:

  - Apply to any person who stores general or hazardous waste in a waste storage facility;

  - Waste storage facilities are required to comply GNR 926 without a need to conduct a BA process to obtain a WML as required by GNR 921 (waste management listed activities); and

  - Does not apply to the storage of general or hazardous waste in surface impoundments or lagoons.

Refer to GNR 926 for details regarding the requirements for waste storage facilities.
Each of the above Norms and Standards relates to a form of waste management. The Norm and Standards outline the parameters within which a waste handling facility must operate.

3.2.4 NATIONAL WASTE MANAGEMENT STRATEGY

Chapter 2 of the NEM:WA refers to the requirement for the Minister to develop a National Waste Management Strategy (NWMS), which serves to further drive and achieve the objectives of the Act. The NWMS (GNR 344) refers to the need to develop plans, guidelines, systems and procedures relating to the protection of the environment and the generation, re-use, recycling, recovery, treatment, disposal, use, control and management of waste in order to achieve the objects of the NEM:WA.

Furthermore, the Authority, according to Section 48 of Chapter 5 of the NEM:WA, stipulates that any guidelines the licensing authority may wish to issue relevant to an application, will be considered during the review of such an application (contributing to “Guideline Objective 5”).

As such, guidelines developed in support of the Act can be used by the Department of Environmental Affairs (DEA) when reviewing WML applications relevant to the particular waste management activity being proposed or undertaken.

3.2.5 NEM:WA – NATIONAL POLICY

3.2.5.1 NATIONAL POLICY ON THERMAL WASTE TREATMENT OF GENERAL AND HAZARDOUS WASTE

The policy document (GNR 777) presents the Ministers position on thermal waste treatment as an acceptable waste management option in South Africa, and provides the framework within which the following thermal waste treatment technologies shall be implemented in South Africa:

- The incineration of general and hazardous waste in dedicated incinerators or other high temperature thermal treatment technologies, including but not limited to pyrolysis and gasification; and
- The co-processing of selected general and hazardous wastes as alternative fuels and/or raw (AFRs) materials in cement production.

The National Policy on thermal waste treatment aims to:

- Accept and advance the implementation of an integrated waste management system for South Africa in line with the waste management hierarchy, by facilitating the move away from single waste management solutions towards the integration of thermal waste treatment technologies;
- Promote efficient resource use and harmonisation of the environment and the economy;
- Promote waste management options that allow for the recovery of energy and raw materials from waste together with the effective treatment thereof, in order to reduce the pressure on certain non-renewable resources;
- Provide minimum environmental requirements for the development and implementation of waste incineration and co-processing technologies;
- Enable informed decision-making around the use of thermal waste treatment alternatives, and guide the consistent application of regulatory instruments;
- Facilitate the use of cement production plants for the effective treatment of selected general and hazardous waste, and the recovery of energy and raw materials; and
- Demonstrate the country’s commitment to reducing its greenhouse gas emissions from landfills and calcination and coal combustion in cement production.

The Policy implementation is planned as follows:

- Although thermal waste treatment technologies are accepted waste management options in terms of this policy, each individual project proposal will be considered on its own merit;
- Proponents of these technologies must comply with the requirements and provisions of current and future legislation relevant to thermal waste treatment;
- Waste incineration in dedicated installations and co-processing of waste as an alternative fuel in cement production shall be conducted in compliance with relevant and prevailing legal and other requirements, including sector specific guidelines and conditions of authorisation;
The Department will ensure procedures are put in place for the efficient and integrated consideration of Environmental Authorisation (EAs) required for thermal waste treatment applications in terms of different legal requirements within its mandate;

The Department will continue to develop the necessary regulatory tools (legislation, norms and standards, sector guidelines and conditions of authorisation) relevant to thermal waste treatment technologies, for the implementation of and compliance with best available technology and best environmental practice, as appropriate;

Cement kiln co-processing shall primarily be used for recovering energy and materials as part of the cement manufacturing process, i.e. co-processing of waste that can substitute parts of conventional fossil fuel and/or virgin raw materials;

Each cement production plant authorised to co-process waste as an alternative fuel must develop a detailed, site-specific Operational and Environmental Management Plan (EMP) in accordance with the provisions of and framework set by the Guidelines for the Co-Processing of Alternative Fuels and Raw Materials and Treatment of Organic Hazardous Wastes in Cement Kilns (refer to sub-section 3.3.2); and

No mechanical or other pre-treatment, pre-processing or blending of hazardous waste will be allowed at the cement production plant where waste is co-processed, without a site-specific EA for this specific purpose of pre-treatment, pre-processing or blending of hazardous waste.

The National Policy includes the following schedules which should be implemented at a WDF facility (focusing on the cement co-processing and incineration industry) as a minimum:

1. Air emission standards - Waste Incineration;
2. Air emission standards - Alternative Fuel Co-processing;
3. Waste excluded from Co-processing; and
4. Conditions of EA.

As per sub-section 1.4, air quality related legal requirements will not be detailed further in this Guideline. Item 3 above, lists all wastes which are not allowed to be received, stored, handled or co-processed in cement kilns. These excluded wastes are considered applicable with respect to definition of prohibited waste streams for any type of WDF preparation and are referenced in this respect in sub-section 6.2 of this guideline.

Item 4 above details the generic conditions that may be included within an EA document issued by the competent authority when reviewing and authorising any cement plant co-processing general or hazardous waste (i.e. a WDF operation/plant within the co-processing industry) or any incineration facility. The generic conditions have been incorporated into this Guideline and relevance indicated where necessary.

3.3 BEST PRACTICES

3.3.1 BEST PRACTICE GUIDELINES

A ‘best practice’ is a method/technique which is viewed as the most effective, most efficient means of undertaking an activity. A ‘best practice’ is generally used as a benchmark and often adopted as a standard way of conducting a certain type of activity. A ‘best practice’ can evolve and improve with time based on future experiences/discoveries and can be applied across multiple organisations, departments or in some cases industries.

The development of a Guideline involves the consolidation of ‘best practice’ methods/techniques into a reference document which can be used to guide a person/organisation/department in managing an activity of a specified nature. A Guideline is not gazetted and thus not legally enforceable however, regulators auditing against existing legislation, which the Guideline seeks to support, may consult the Guideline [as per Chapter 5 Section 48 (i) of the NEM:WA].

3.3.2 NEM:WA – EXISTING GUIDELINE

3.3.2.1 GUIDELINE FOR TREATMENT OF HAZARDOUS WASTES AND CO-PROCESSING OF ALTERNATIVE FUEL RESOURCES IN CEMENT

The overall objective of the guideline is to develop a uniform standard that can be applied by cement plants which are co-processing AFRs (referred to as “WDF” throughout this Guideline document) and incinerators that are treating wastes in South Africa. The guideline ensures that the facilities are operating according to environmentally sound management principles. This Guideline aims to guide the implementation of the National Policy outlined in sub-section 3.2.5.1.

3.3.3 THIS GUIDELINE

Section 71(1)(d) of Chapter 8 of the NEM:WA stipulates that NEM:WA Regulations can incorporate, by reference, any guideline, minimum requirements, code of practice or any national or international standard relating to waste management.
The Guideline may contribute to the achievement of the objectives of other legislation however, it should be noted that the Guideline may not meet all the requirements of other legislation, including the SEMAs. As such, the Guideline user is encouraged to consult other potentially applicable legislation to ensure compliance with best practice measures.

Furthermore, other legislation may require formal permitting/licensing/authorisation which will form a separate legal process to that of the NEM:WA. Figure 3.3 provides a brief structure as to which department should be contacted in relation to the SEMAs. The specific permitting/licensing/authorisation requirements of each department should be investigated to determine if the WDF facility will/does require authorisation in terms of other related legislation.

4 DOCUMENT TECHNICAL CONSIDERATIONS

The Guideline takes the following technical aspects into consideration:

- The location of the WDF facility;
- The orientation of the WDF facility;
- The relationships between the components of the WDF facility;
• The design of the WDF facility;
• The method of construction applied;
• The type of input waste material (i.e. nature of the waste pre-processing); and
• The process conducted in order to manufacture the WDF.

The WDF facility design specifications influence the relationships and connections between the man-made feature (the facility) and the environment(s). As such, it should be emphasised that the application of this Guideline to a site specific scenario is to be assessed based on a comprehensive understanding of the WDF facility. Recommendations contained within this Guideline may be completely applicable or partially applicable to the facility.

Sections 5, 6 and 15 define the environmental considerations which should be applied to all WDF facilities/operations during the Design/Construction/Upgrading, Operational and Closure/Decommissioning phases. In order to determine the most important environmental considerations, the most common generic type activities taking place at WDF facilities should be understood. For the purposes of this Guideline, the following general (common) activity types have been focused upon:

• The storage of a waste prior to the manufacture of a WDF;
• The transfer of the waste within the facility prior to the manufacture of a WDF;
• The transfer of the waste between two different facilities, both of which contribute to the manufacture of a WDF;
• The physical/chemical processing of the waste undertaken to manufacture a WDF; and
• The storage/handling of the WDF, following the manufacturing of a WDF.

5 ENVIRONMENTAL CONSIDERATIONS FOR ESTABLISHMENT, CONSTRUCTION AND/OR UPGRADING

5.1 SITE LOCATION

Purpose: To ensure that the WDF facility operator takes into account the context of the site on which the facility is established which will influence the level of human and environmental impact resulting from the WDF facility.

Site location and suitability should be carefully considered in order to minimise risks associated with proximity to the populations of concern, impact of releases, logistics, transport and infrastructure. When considering preferred and alternative locations for a new WDF facility, the owner/operator is to take consideration of the following:

• The existence of potentially sensitive environments
The WDF facility should be located outside of potentially environmentally sensitive areas and/or areas within which sensitive receptors preside.

• The current land-use and zoning of the area as well as the proposed land use and zoning of the property
Should the land be zoned as residential, commercial, agricultural, conservation area, tourism, settlement and/or forestry, the prospective/existing WDF facility owner/operator should consider an alternative location, especially when handling/managing hazardous waste. A facility of this nature should ideally be located within an area zoned as industrial. A facility dealing with general waste may be located within a residential area, subject to approval (if activity triggers a listed activity) and municipal approval (if applicable). Considerations in terms of noise and traffic should be made to ensure nuisance caused is not excessive (surrounding stakeholders should be consulted).

• The geology of the site
The WDF facility should avoid areas where dolomite underlies the general area to ensure the structure of the facility is not compromised by natural disasters such as ground subsidence and/or sinkhole formation.

• The topography of the site
Steep areas should be avoided where possible to further promote the structural integrity of the facility.

• The presence of human settlement in proximity to the WDF facility
The WDF facility operator should avoid the establishment of a facility within close proximity to human settlements, where possible.

• Areas which have high frequencies of extreme weather events
The WDF facility should avoid the establishment within a region/area/country which is known to experience extreme weather conditions.
Availability of accessible transport routes

The WDF facility should be located in an area which is host to well established transport routes to ensure effective efficient transport of the WDF to the end user or to a storage facility.

See Table 5.1 for Regulation/Guideline/SANS and Industry/Waste Type relevance of the recommendations.

### TABLE 5.1: SITE ESTABLISHMENT, CONSTRUCTION AND/OR UPGRADING: LOCATION CONSIDERATIONS

<table>
<thead>
<tr>
<th>No.</th>
<th>Best Practice Measure</th>
<th>Regulation/Guideline Relevant</th>
<th>Industry Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SANS</td>
<td>GN(R)</td>
</tr>
<tr>
<td>1.</td>
<td>WDF facility should be located outside potentially environmentally sensitive areas and/or areas within which sensitive receptors preside.</td>
<td>NEMA GNR 982</td>
<td>Provincial Conservation Plan Integrated Development Plan (IDP) EMF</td>
</tr>
<tr>
<td>2.</td>
<td>Should the land be zoned as residential, commercial, agricultural, conservation area, tourism, settlement and/or forestry, the prospective/existing WDF facility owner/operator should consider a different location, especially when handling/managing hazardous waste.</td>
<td>NEMA GNR 982</td>
<td>IDP Spatial Development Framework Land Use Management Planning</td>
</tr>
<tr>
<td>3.</td>
<td>The WDF facility should avoid areas where dolomite underlies the general area to ensure the structure of the facility is not compromised by natural type incidents/disasters such as ground subsidence or sinkhole formation.</td>
<td>633 1936-1 1936-2 1936-3 1936-4</td>
<td>Geotechnical Reports Council for Geosciences</td>
</tr>
<tr>
<td>4.</td>
<td>Steep areas should be avoided where possible to further promote the structural integrity of the facility.</td>
<td>-</td>
<td>Geotechnical Reports Visual Inspection Local Municipal Planning Regulations</td>
</tr>
<tr>
<td>5.</td>
<td>The WDF facility operator should avoid the establishment of a facility within close proximity to a/many human settlement[s].</td>
<td>-</td>
<td>Visual Inspection Local Municipal Planning Regulations</td>
</tr>
<tr>
<td>6.</td>
<td>The WDF facility should avoid the establishment of a facility within a region/area/country which is known to experience extreme weather conditions.</td>
<td>-</td>
<td>The South African Weather Service</td>
</tr>
</tbody>
</table>
5.1 DOCUMENTS REFERRED TO IN TABLE 5.1:

- Provincial Conservation Plan

A provincial conservation plan is intended to guide conservation and land-use decisions in support of sustainable development within a province.

- Integrated Development Plan

Local municipalities in South Africa use “integrated development planning” as a method to plan future development in their areas.

- Environmental Management Framework

An EMF is a study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific land-uses may best be practiced and to offer performance standards for maintaining appropriate use of such land.

- Spatial Development Framework

The Spatial Development Framework is a legally enforceable component of the IDP, which indicates both to the municipality (councillors and officials) and to the public (developers, land owners etc.) where certain types of land-use and associated developments are permissible, and where certain activities are unlikely to be permitted.

- Land Use Management Planning

A branch of urban planning encompassing various disciplines which seek to order and regulate land use in an efficient and ethical way, thus preventing land-use conflicts. Governments use land-use planning to manage the development of land within their jurisdictions.

- Geotechnical Reports

Geotechnical engineering is the branch of civil engineering concerned with the engineering behaviour of earth materials. Past geotechnical studies undertaken can be used to inform the prospective WDF facility owner/user of underlying earth stability.

- Council for Geosciences

One of the councils main objectives is the mapping of geology throughout South Africa. The council may have geological information relating to the proposed WDF facility site which can be used as a reliable source of information (www.geoscience.org.za).

- The South African Weather Service

Responsible for mapping south African weather patterns, amongst other functions (http://www.weathersa.co.za).

- Local Municipal Planning Regulations

GNR 796 – Local Government: Municipal Planning and Performance Management Regulations, 2001. The Regulation outlines the need for a Municipality in South Africa to develop an IDP which directs future growth. Furthermore, the Regulation outlines the required contents of an IDP.

5.2 SITE ORIENTATION

Purpose: To ensure that the WDF facility is orientated in a manner that ensures optimum handling, transfer and transportation of waste.

Once the site location is decided upon, the WDF facility owner/operator is to design the layout of the site, including consideration of:

- Waste acceptance onto the site;
- Waste storage requirements;
- On-site waste transfer requirements;

<table>
<thead>
<tr>
<th>Best Practice Measure</th>
<th>Regulation/Guideline Relevant</th>
<th>Industry Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. The WDF facility should be located in an area which is host to well established transport routes.</td>
<td>Guidlines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
<td>X X X X</td>
</tr>
</tbody>
</table>
• Waste processing requirements;
• Off-site waste transport requirements; and
• Emergency response requirements.

This will include ease of site access from surrounding roads, the distances between storage and processing areas within the facility and ease of transfer/transport of the process output (WDF) to the intended user.

In addition, the impact of the environment on the facility should be considered. The following factors are deemed to have possible implications on the facility:

• Climatic conditions (including seasonal variations);
• Local topography;
• Sensitive environmental receptors; and
• Near-by communities.

The facility should be orientated in such a way that provides shelter and protection from environmental elements to prevent loss of the waste into the surrounding environment as well as changing of the nature of the waste. Furthermore, the orientation of the site should be designed to ensure that the gradient of the land does not result in operational issues and/or environmental impact in the case of an incident and/or spillage.

5.3 SECURITY AND ACCESSIBILITY

Purpose: To ensure that the WDF facility is accessible to transport routes as well as ensuring that unauthorised access is considered during the design phase.

Access to transport routes including local, regional and national routes will improve the efficiency of the operations as well as the number and magnitude of environmental incidents at the facility. Furthermore, in the case of an emergency or major spillage incident, the response team will be able to access the site with relative ease. In the case of hazardous waste handling, access to the areas containing such material should be strict to prevent harm to the employee/contractor/visitor. The design and construction of such a facility should consider the following aspects:

• Access to the facility to be prevented by the establishment of structures such as:
  - Fencing;
  - Enclosures;
  - Gates;
  - Warning signage;
  - Doors; and
  - Locks.

The quality of material used to construct the above mechanisms to be considered to ensure robustness. The application of the above mechanisms should be considered on a site specific basis.

• The location of the facility may impact upon the risk profile of the site from a theft/unauthorised access perspective. The level of security/accessibility measures should consider the surrounding land users and the crime levels of the area within which the site operates.

See Table 5.2 for Regulation/Guideline/SANS and Industry/Waste Type relevance of the recommendations.

<table>
<thead>
<tr>
<th>Best Practice Measure</th>
<th>Regulation/Guideline Relevant</th>
<th>Industry/Waste Type Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Measure</td>
<td>SANS</td>
<td>GN(R)</td>
</tr>
<tr>
<td></td>
<td>10222-3:2000</td>
<td>NEM:WA GNR 926</td>
</tr>
<tr>
<td>1. Establishment of fencing.</td>
<td>10222-3:2000</td>
<td>NEM:WA GNR 926</td>
</tr>
</tbody>
</table>

See Table 5.2 for Regulation/Guideline/SANS and Industry/Waste Type relevance of the recommendations.
<table>
<thead>
<tr>
<th>No.</th>
<th>Measure</th>
<th>SANS</th>
<th>GN(R)</th>
<th>Other</th>
<th>Anaerobic Digestion</th>
<th>Used Oil/ Solvents</th>
<th>Co-Processing</th>
<th>Energy Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Establishment of enclosures.</td>
<td>-</td>
<td>NEM:WA GNR 926</td>
<td>EA conditions</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3.</td>
<td>Establishment of warning signage.</td>
<td>10231</td>
<td>NEM:WA GNR 926</td>
<td>EA conditions</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4.</td>
<td>Installation of gates/doors (including locks).</td>
<td>-</td>
<td>NEM:WA GNR 926</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5.</td>
<td>The level of security/accessibility measures.</td>
<td>-</td>
<td>NEM:WA GNR 926</td>
<td>EA conditions</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

### 5.4 FACILITY DESIGN AND CONSTRUCTION

**Purpose:** To ensure that wastes being used by the WDF facility is controlled as far as practically possible in an effort to reduce environmental and human impact.

Following consideration of sub-sections 5.1, 5.2 and 5.3, the WDF facility owner/developer should design and construct the WDF facility in such a manner that avoids and/or minimises the overall impact of the facility on the receiving environment. Environmental management mechanisms (environmental considerations) are discussed within the section to follow.

Note: The implementation all environmental management mechanisms discussed in the sections to follow should be investigated on a case by case scenario based on the site context. A professionally registered engineer (from an appropriate discipline) should be consulted (internal or external) to input into the practical design of the facility. Upon final design and contemplated construction, the contractor/construction personnel, are to ensure that construction is undertaken in line with the approved civil engineering designs.

Should the contractor/construction personnel deem that a deficiency exists within the design drawings, the contractor/construction personnel should consult the professionally registered engineer for additional input and subsequent Municipal approval of the amended drawings. From an environmental management perspective, the design phase should take account of the following aspects as a minimum:

- Site gradient;
- Site attitude;
- Site stability;
- Site surface compactness; and
- Site surface permeability.

As discussed in sub-sections 5.1, 5.2 and 5.3.

- Specific environmental design considerations for WDF waste handling areas as well as areas over which any waste material is/will be transferred include:
  - All WDF facility surfaces should be firm and impermeable, unless a waste stockpile area is required in which case a liner system can be considered;
  - Depending on the nature of the waste being stored, chemical resistant floors should be established to prevent corrosion;
  - All areas containing waste should be roofed/waste should be stored in lidded skips to prevent contamination of stormwater as well as environmental pollution off-site due to contaminated stormwater runoff from the facility. However, when dealing with waste stockpiles, a roof may not be considered practical in which case leachate management should be considered during the operational phase of the WDF facility (see Section 12.1.2);
  - Waste storage and process areas should be the minimum area required to ensure effective and efficient operation of the facility;
• Waste stockpile storage areas should be lined to prevent the filtration of leachate into groundwater reserves;

• A leachate detection system can be established to detect volumes of leachate generated by the waste stockpile areas (see Section 12.1.2);

• Storage vessels or containers shall be designed in accordance with specifications in GNR 926 and GNR 634;

• In the case of fluid and/or pumpable waste, a sufficient number of storage tanks (at the correct volumes) should be established at the facility;

• In the case of liquid (or mobile) waste management (focusing on the storage component), a secondary containment system, such as a bund or similar structure, should be used. The size of the secondary containment is dependent on the maximum volume of liquid (or mobile waste) which may be in use within a specific area within the greater facility. The industry best practice is 110% of the maximum contents of the largest liquid (mobile waste) storage container should be maintained (or 25% of the total liquid (mobile waste) holding capacity;

• Tanks, pipelines, valves and seals should be adapted to the waste characteristics. The components should be corrosion resistant and should provide for the cleaning;

• An interception trench should be established/installed around the waste handling/process areas to ensure that a spillage event does not result in spillage from the hard-standing surface onto surrounding uncontaminated natural/operational areas;

• A sump, of sufficient capacity (consider the liquid waste volume managed), should be established/installed to collect the spilled liquid waste which is captured by the interception trench(s); and

• The facility spillage/drainage containment mechanism should be capable of collecting/holding stormwater collecting in the waste management areas resulting from a flood event. Maintaining a freeboard of 0.5 m is considered best practice.

See Table 5.3 for Regulation/Guideline/SANS and Industry/Waste Type relevance of the recommendations.

<table>
<thead>
<tr>
<th>No.</th>
<th>Measure</th>
<th>Regulation/Guideline Relevant</th>
<th>Industry/Waste Type Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>WDF facility surfaces should be firm and impermeable.</td>
<td>10131 &amp; 10089-1 Municipal By-Laws</td>
<td>X</td>
</tr>
<tr>
<td>2.</td>
<td>Chemical resistant floors should be established to prevent corrosion.</td>
<td>10131 Municipal By-Laws</td>
<td>X</td>
</tr>
<tr>
<td>3.</td>
<td>Areas containing waste should be roofed or waste should be stored within lidded skips such that water ingress is prevented.</td>
<td>NEM:WA GNR 926 Municipal By-Laws</td>
<td>X</td>
</tr>
<tr>
<td>4.</td>
<td>Waste storage and process areas should be the minimum area required.</td>
<td>Municipal By-Laws</td>
<td>X</td>
</tr>
<tr>
<td>5.</td>
<td>Waste stockpile storage areas should be lined to prevent the filtration of leachate into groundwater reserves.</td>
<td>Municipal By-Laws</td>
<td>X</td>
</tr>
<tr>
<td>6.</td>
<td>A leachate detection system can be established to detect volumes of leachate generated by the waste stockpile areas.</td>
<td>Municipal By-Laws</td>
<td>X</td>
</tr>
<tr>
<td>No.</td>
<td>Best Practice Measure</td>
<td>Regulation/Guideline Relevant</td>
<td>Industry/Waste Type Relevance</td>
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<td></td>
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<td></td>
<td>Anaerobic Digestion</td>
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<tr>
<td>7</td>
<td>Storage vessels or containers shall be designed in accordance with specifications in regulations or adopted standards.</td>
<td>10131 NEM:WA GNR 926, NEM:WA GNR 634</td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>In the case of fluid and/or pumpable waste, a sufficient number of storage tanks (at the correct volumes) should be established at the facility.</td>
<td>10131 NEM:WA GNR 926</td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td>In the case of liquid (or mobile) waste management (focusing on the storage component), a secondary containment system, such as a bund or similar structure, should be used.</td>
<td>10131 NEM:WA GNR 926</td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>Tanks, pipelines, valves and seals should be adapted to the waste characteristics. The components should be corrosion resistant and should provide for the cleaning.</td>
<td>10131 -</td>
<td>X</td>
</tr>
<tr>
<td>11</td>
<td>An interception trench should be established/installed around the waste handling/process areas.</td>
<td>- NEM:WA GNR 926</td>
<td>X</td>
</tr>
<tr>
<td>12</td>
<td>A sump, of sufficient capacity, should be established to collect the spilled liquid waste which is captured by the interception trench(s).</td>
<td>10131 NEM:WA GNR 926</td>
<td>X</td>
</tr>
<tr>
<td>13</td>
<td>The facility spillage/drainage containment mechanism should be capable of collecting/holding stormwater collecting in the waste management areas resulting from a flood event.</td>
<td>10131 NEM:WA GNR 926</td>
<td>X</td>
</tr>
<tr>
<td>No.</td>
<td>Measure</td>
<td>Regulation/Guideline Relevant</td>
<td>Industry/Waste Type Relevance</td>
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<td></td>
<td></td>
<td>Practice Guideline G1 - Stormwater Management DWAF Best Practice Guideline A4 - Pollution Control Dams</td>
<td>Anaerobic Digestion</td>
</tr>
</tbody>
</table>

### 5.5 WASTE PROCESSING AREA CONSIDERATIONS

**Purpose:** To ensure the processing section of the WDF facility is designed and constructed in a manner which accounts for possible environmental impacts during the operational phase of the WDF facility. Furthermore, to ensure that the physical processing of the waste can be undertaken according to the requirements of sub-section 6.

This section focuses on the physical or chemical processing of the waste following acceptance onto the site and possible temporary storage. The section considers the process undertaken in order to change the physical or chemical form of the wastes to manufacture a WDF which can either be used on the same property for the generation of energy or transferred/transported off the facility to a different facility which will use the WDF for energy generation.

The design phase of the WDF facility should take account of the following aspects:

- Expected process input material;
- The process to be undertaken (heating, curing, pelletising, incinerating, fermentation, anaerobic digestion, filtering, etc); and
- Expected nature of process output material.

Of each of the above aspects the following details should be understood:

- The general and/or hazardous nature of the input waste;
- The physical state (gas, liquid or solid) of the waste; and
- The consistency of the waste.

The expected waste input should be that of the original waste classification, as discussed in sub-section 5.6.1. The process undertaken may result in the physical/chemical change of the waste. The changing nature of the waste may change the manner in which the waste should be managed/handled.

The following best practice measures should be considered by the professionally registered engineer (from an appropriate discipline) in conjunction with the above factors:

- Best available technology should be investigated and considered by the WDF facility;
- The area containing the waste processing component of the site, should be enclosed and serviced by a suitable vapour management system should the process type (such as heating and evaporation) be expected to result in any form of emissions;
- The processing equipment and machinery should be designed to safely and effectively process the required volume of waste. The machinery and/or equipment should be designed in a manner which prevents facility overflow even during scenarios where the input waste material exceeds the safely manageable volume;
- Any waste proposed for inclusion in the production of a WDF must not contain Prohibited Wastes (refer to sub-section 6.2);
- An equipment/machinery (plant) operating manual should be developed as part of the design and construction phase, in the form of an SOP (see Section 14);
- Dependant on the nature of waste the waste processing facility should be on hard-standing and chemically resistant (as per design considerations in sub-section 5.4);
• The processing facility should be positioned upon an artificial stable structure/foundation to ensure structural integrity of the process equipment/machinery as well as prevention of the infiltration of spillages into the soil and possibly the groundwater;

• Boreholes are to be established up and down gradient of the processing equipment/machinery (where required) to ensure early detection of groundwater contamination (see sub-section 12.1.4);

• The waste classification and Safety Data Sheet (SDS), as per GNR 634, should be consulted by the prospective WDF facility user/operator to ensure all specifications are met during design and construction;

• In terms of combustion/incineration, the physical properties, moisture content, the major elements and other properties of the waste input should be understood to ensure optimum conditions for the efficient processing of the waste;

• In the case of liquid waste recovery, the equipment forming the process plant should be of a sufficient quality to ensure machinery/equipment intactness especially when considering pressure and heat input. A professionally registered engineer (from an appropriate discipline) should be consulted to advise on the specifications of the equipment;

• Where possible, the processing activity should be self-contained (i.e. all outputs contained, not released into the environment) or be serviced by a suitable vapour management system to ensure compliance to emission standards;

• A temporary waste storage area (or containment vessel in the case of liquid waste) should be designed and constructed to accommodate the residual waste resulting from waste processing;

• In-process interim waste storage areas, used for solid waste and/or WDF material should be hard-standing, roofed (or stored within lidded skips) and protected from environmental conditions (best practice measures discussed in sub-section 5.4 to be applied where applicable); and

• Emergency and incident provisions should be accounted for in the design phase and documented for use during the operational phase (refer to sub-section 11).

See Table 5.4 for Regulation/Guideline/SANS and Industry/Waste Type relevance of the recommendations

<table>
<thead>
<tr>
<th>No.</th>
<th>Measure</th>
<th>Regulation/Guideline Relevant</th>
<th>Industry/Waste Type Relevance</th>
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<tr>
<td></td>
<td></td>
<td>SANS GN(R) Other</td>
<td>Anaerobic Digestion</td>
</tr>
<tr>
<td>1.</td>
<td>Best available technology should be investigated and considered.</td>
<td>NEMA:GNR982</td>
<td>NEM:WA GN.777</td>
</tr>
<tr>
<td>2.</td>
<td>The area containing the waste processing component of the site, should be enclosed and serviced by a suitable vapour management system should the process type (such as heating and evaporation) be expected to result in any form of emissions.</td>
<td>-</td>
<td>NEM:AQA Guidelines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns. NEM:WA GN.777</td>
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<td>No.</td>
<td>Measure</td>
<td>Best Practice Measure</td>
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<tr>
<td>3.</td>
<td>The processing equipment and machinery should be designed to safely and effectively process the required volume of waste. The machinery and/or equipment should be designed in a manner which prevents facility overflow even during scenarios where the input waste material exceeds the safely manageable volume.</td>
<td>-</td>
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<td>5.</td>
<td>An equipment/machinery (plant) operating manual should be developed as part of the design and construction phase.</td>
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<td>6.</td>
<td>The entire waste processing facility should be hard-standing and have chemically resistant flooring (dependant on the nature of waste).</td>
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<td>NEM: WA GN.926</td>
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<td>7.</td>
<td>The processing facility should be</td>
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<td>NEM: WA</td>
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<td>8.</td>
<td>Monitoring devices/mechanisms to be included in the design and manufacturing phase.</td>
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<td>NEM: WA GNR 926</td>
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<td>No.</td>
<td>Measure</td>
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<td>Industry/Waste Type Relevance</td>
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<td>Anerobic Digestion</td>
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<td>Used Oil/Solvents</td>
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<td>Energy Generation</td>
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<tr>
<td>9.</td>
<td>Boreholes are to be established up and down gradient of the processing equipment/machinery (where required) to ensure early detection of groundwater contamination.</td>
<td>10299 NEM:WA GNR 926</td>
<td>X</td>
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<td>10.</td>
<td>The SDS and waste classification, as per GNR 634, should be consulted by the prospective WDF facility user/operator to ensure all specifications are met during design and construction.</td>
<td>10234 NEM:WA GNR 634</td>
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<td>11.</td>
<td>In terms of combustion/incineration, the physical properties, moisture content, the major elements and other properties of the waste input should be understood to ensure optimum conditions for the efficient processing of the waste.</td>
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<td>12.</td>
<td>In the case of liquid waste recovery, the equipment forming the process plant should be of a sufficient quality to ensure machinery/equipment intactness especially when considering pressure and heat input.</td>
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<tr>
<td>13.</td>
<td>Where possible, the processing activity should be as self-contained as possible/be serviced by a suitable vapour management system to ensure compliance to emission standards (i.e. all outputs contained, not released into the environment).</td>
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<td>14.</td>
<td>Containment vessels should be designed to accumulate any process mobile by-products.</td>
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</table>
5.6 ADDITIONAL DESIGN, CONSTRUCTION AND UPGRADING CONSIDERATIONS

5.6.1 SPECIFIED DESIGN/MANAGEMENT MEASURES

5.6.1.1 WASTE CLASSIFICATION DOCUMENT: ENVIRONMENTAL MANAGEMENT CONSIDERATIONS

**Purpose:** To ensure that wastes being handled by the WDF facility are correctly classified and the WDF facility designed according to the waste risk profile.

The risk profile of the site from an environmental and Health & Safety perspective is dependent on the type of waste intended for handling by the WDF facility. In order to ensure the correct design and construction specifications (in addition to the design, construction, operation and closure requirements contained within this Guideline), the waste(s) being handled should be considered in terms of the predefined list contained in Schedule 3 of the NEM:WA and Annexure 1 of GNR 634. Should the waste not be pre-defined, or should the waste be captured under both the general and hazardous waste pre-listings, the user/operator should undertake a waste classification in terms of NEM:WA GNR 634. The GNR 634 classification may further outline the required facility design and construction requirements.

Should the waste be deemed of a hazardous nature, the GNR 634 classification will result in the development of a SDS which should be provided by the waste generator which focuses on the health and safety requirements when handling the waste. The SDS may further inform the design and construction specifications for the WDF facility.

Documents/Regulations consulted:
- GNR 634 - Waste Classification and Management Regulations; and
- SANS 10234 - Globally Harmonized System of Classification and Labelling of Chemicals.

6 ENVIRONMENTAL CONSIDERATIONS FOR OPERATIONS

Section 6 details environmental considerations which should be applied to the operation of a WDF facility. The applicability of the recommendations provided within this section is to be determined using the tables following each sub section.

6.1 ACCESS CONTROL AND NOTICES

**Purpose:** To minimise the risk of unauthorised access to waste handling areas and reduce harm to the general public.

The WDF should have effective access control to prevent unauthorised entry. Weatherproof, durable signage should be displayed at the entrance which should include details on necessary personal protective equipment (PPE) when entering the site. The signage displayed should include three local languages. A site access register should be considered to provide the WDF facility manager with an understanding of who entered the site when. Access to hazardous waste handling areas should be restricted to trained responsible persons as nominated by facility management.
6.2 TRANSPORT AND ACCEPTANCE OF WASTE

Purpose: To ensure that waste inspection/assessment procedures are in place to ensure that no prohibited wastes are accepted into the WDF facility and to ensure the transport of the waste to the WDF facility is undertaken in a safe and efficient manner.

All wastes must be transported in accordance with the requirements of the Road Transportation Act, 1977 (Act 74 of 1977) and associated regulations and standards.

All wastes accepted into the WDF facility which are not pre-defined in terms of Schedule 3 of the NEM:WA or Annexure 1 to GNR 634, should have undergone a waste classification process according to GNR 634. The GNR 634 prescribes the use of SANS 10234 as a classification methodology. The type of waste being delivered to the site should be communicated to the WDF facility prior to delivery.

The following SANS codes of practice are applicable to the packaging and transporting of hazardous goods which may be relevant to the WDF facility:

- SANS 10228: The Identification and Classification of Dangerous Substances; and
- SANS 10229: Packing of Dangerous Goods for Road and Rail Transportation.

All containers containing waste classified as hazardous should be labelled correctly to reflect the contents and date of containerisation and must ensure that a SDS accompanies the hazardous waste during transportation.

Prior to acceptance of a waste on to the facility, the WDF facility operator is to ensure the following is considered:

- The transportation contractor is in possession of a procedure for the overall transport of the waste from the generator to the WDF facility which takes into account:
  - The Road Transportation Act, 1977 (Act 74 of 1977);
  - SANS 10228;
  - SANS 10229;
  - SANS 10234; and
  - Local By-Laws and relevant guidelines.

- Procedures should account for the loading and off-loading of wastes;
- The distance between the waste storage area and the off-loading point should be the minimum possible to avoid human harm or environmental damage resulting from spillages during transfer;
- An Emergency Preparedness Response Plan (EPRP) (refer to Section 11) should be developed for the WDF facility to account for an incident during waste transport and transfer onto the WDF facility site;
- Should any spillage take place during the transport, off-loading and handling activities, the following actions should apply (as per the EPRP):
  - Minor spillage - clean up with use of a spill kit (to be included in the EPRP; and
  - Major spillage - Remediation measures to be investigated and a NEMA Section 30 incident report to be submitted to the national Department (to be included in the EPRP).

- The transport vehicles delivering the waste to the WDF facility should be kitted with the relevant EPRP and the driver trained in emergency/spillage response requirements (see Section 9);
- Adequate information pertaining to the risk of the waste based on the known constituents must be provided to the WDF facility prior to delivery to the site (including waste classification information);
- Depending on the hazardous nature of the waste, a waste acceptance area should be designated which is hard-standing and incorporated into the relevant pollution controls (i.e. interception trenches, sufficient spillage containment, etc.);
- Should the waste fall into one of the following categories, the waste is considered prohibited:
  - Anatomical, infectious or biologically active medical/health care waste;
  - Bio-hazardous waste;
  - Explosive wastes;
  - Asbestos-containing wastes;
  - High-concentration cyanide wastes;
- Battery waste;
- Mineral acid and corrosive wastes; - Radioactive wastes;
- Electronics metals scrap wastes; and
- Unknown or unidentified wastes.

Prohibited wastes material should be rejected and the reason for rejection documented.

- The waste accepted should not be blended with prohibited waste materials;
- Each hazardous waste supplier/generator must prepare a waste sample which should be tested to ensure classification is in line with the wastes which the WDF facility is authorised to handle, prior to acceptance of the waste into the WDF facility;
- The WDF facility operator should undertake confirmatory sampling of the waste prior to acceptance onto the facility to ensure the nature of the waste is as per agreement with the generator (contains no prohibited wastes);
- A waste manifest (see section 7) should be maintained by the WDF facility user/operator to ensure that the nature and volume of waste accepted into the WDF facility is recorded;
- Should confirmatory testing by the WDF facility/operator prove the waste to be different to that indicated on the waste manifest, the waste delivery should be rejected and the reason stipulated;
- A waste sampling procedure should be developed by the WDF facility user/operator to ensure sampling is undertaken regularly and is undertaken by an accredited laboratory to ensure robustness of the sampling results;
- Should an EA be in place for the site, the waste accepted onto the WDF facility should comply with the nature/specification of the waste material stipulated in the EA;
- When dealing with hazardous waste, the SDS should contain risk/hazard indicators to ensure that the downstream waste user is made aware of the risks/hazards involved in handling the waste material;
- The generator of the waste must provide a SDS to the WDF facility to ensure the health, safety and environmental management recommendations are understood;
- In the case of a pipeline being used as a transfer/transport method, a monitoring system should be installed to determine the total input waste into the WDF facility and the total volume of waste leaving the WDF facility following the processing of the waste (considered part of the waste manifest);
- Any employees/individuals allocated a role or responsibility (see Section 8) in terms of accepting the waste onto the facility, should be sufficiently trained to do so (see Section 9); and
- A waste evaluation and acceptance procedure should be developed in order to apply the Guideline requirements.

See Table 6.1 for Regulation/Guideline/SANS and Industry/Waste Type relevance of the recommendations.

### TABLE 6.1: SITE OPERATION: WASTE TRANSPORT AND ACCEPTANCE CONSIDERATIONS

<table>
<thead>
<tr>
<th>No.</th>
<th>Measure</th>
<th>Regulation/Guideline Relevant</th>
<th>Industry/Waste Type Relevance</th>
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<tr>
<td></td>
<td></td>
<td>SANS GN(R)</td>
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<td>Anaerobic Digestion</td>
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<td>Used OW Solvents</td>
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<td>Co-Processing</td>
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<td></td>
<td>Energy Generation</td>
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</tr>
<tr>
<td>1.</td>
<td>The transportation contractor should implement a procedure for the overall transport of the waste from the generator to the WDF facility.</td>
<td>10234 10228 NEM:WA GNR 926 NEM:WA GNR 625 NEM:WA GNR 634</td>
<td>National Road Traffic Act, 1996 (Act No. 93 of 1996)</td>
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<td></td>
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<tr>
<td>2.</td>
<td>Procedures for the loading and off-loading of wastes should be developed and applied.</td>
<td>- NEM:WA GNR 926</td>
<td>-</td>
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<tr>
<td>No.</td>
<td>Measure</td>
<td>Regulation/Guideline Relevant</td>
<td>Industry/Waste Type Relevance</td>
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<tr>
<td></td>
<td>Best Practice Measure</td>
<td>SANS</td>
<td>GN(R)</td>
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<tr>
<td>3.</td>
<td>The distance between the waste storage area and the off-loading point should be the minimum possible to avoid human harm or environmental damage resulting from spillages during transfer.</td>
<td>-</td>
<td>NEM:WA GNR 625</td>
</tr>
<tr>
<td>4.</td>
<td>An EPRP should be developed for the WDF facility</td>
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<td>NEM:WA GNR 926</td>
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<tr>
<td>5.</td>
<td>The transport vehicles delivering the waste to the WDF facility should be provided with the relevant incident reporting procedures and the driver trained in emergency/spillage response requirements.</td>
<td>10234</td>
<td>10228</td>
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<td>6.</td>
<td>Adequate information pertaining to the risk of the waste must be provided to the WDF facility prior to delivery to the site.</td>
<td>-</td>
<td>NEM:WA GNR 634</td>
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<tr>
<td>7.</td>
<td>Depending on the hazardous nature of the waste, a waste acceptance area should be designated which is hard-standing and incorporated into the relevant pollution controls (i.e. interception trenches, sufficient spillage containment, etc.).</td>
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<td>NEM:WA GNR 926</td>
</tr>
<tr>
<td>8.</td>
<td>Prohibited wastes to be rejected upon delivery to the WDF facility.</td>
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<td>9.</td>
<td>The waste accepted should not have been blended with prohibited waste materials.</td>
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<td>No.</td>
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<td>Regulation/Guideline Relevant</td>
<td>Industry/Waste Type Relevance</td>
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<td>SANS</td>
<td>GN(R)</td>
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<td>10</td>
<td>Each hazardous waste supplier/generator must prepare a waste sample which is to be tested to ensure classification is in line with the wastes which the WDF facility is authorised to handle, prior to delivery.</td>
<td>NEM:WA GNR 634</td>
<td>Guidelines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
</tr>
<tr>
<td>11</td>
<td>The WDF facility operator should undertake confirmatory sampling of the waste prior to acceptance onto the facility to ensure the nature of the waste is as per agreement with the generator (contains no prohibited wastes).</td>
<td>NEM:WA GNR 634</td>
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<tr>
<td>12</td>
<td>A waste manifest should be maintained by the WDF facility user/operator to ensure that the nature and volume of waste accepted into the WDF facility is recorded.</td>
<td>NEM:WA GNR 634</td>
<td>NEM:WA GN.777 Guidelines for treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
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<tr>
<td>13</td>
<td>Should confirmatory testing by the WDF facility/operator prove the waste to be different to that indicated on the waste manifest, the waste delivery should be rejected and the reason stipulated.</td>
<td>-</td>
<td>Guidelines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
</tr>
<tr>
<td>14</td>
<td>A waste sampling procedure should be developed by the WDF user/operator to ensure sampling is undertaken regularly and is undertaken by an accredited laboratory to ensure robustness of the sampling results.</td>
<td>NEM:WA GNR 634</td>
<td>NEM:WA GN.777 Guidelines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
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<tr>
<td>15</td>
<td>Should an EA/WML be in place for the site, the waste accepted onto the WDF facility should be equal to the nature of the waste material stipulated in the EA/WML (including the EA/WML supporting documents).</td>
<td>-</td>
<td>WML/EA</td>
</tr>
<tr>
<td>No.</td>
<td>Measure</td>
<td>Regulation/Guideline Relevant</td>
<td>Industry/Waste Type Relevance</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>16.</td>
<td>In the case of hazardous waste handling, the SDS should contain risk/hazard indicators to ensure that the downstream waste user is made aware of the risks/hazards involved in handling the waste material.</td>
<td>NEM:WA GNR 634</td>
<td>Guidelines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
</tr>
<tr>
<td>17.</td>
<td>The SDS is to be provided to the WDF facility to ensure the health, safety and environmental management recommendations are understood.</td>
<td>NEM:WA GNR 634</td>
<td>-</td>
</tr>
<tr>
<td>18.</td>
<td>In the case of a pipeline being used as a transfer/transport method, a monitoring system should be installed to determine the total input waste into the WDF facility and the total volume of waste leaving the WDF facility following the processing of the waste (considered part of the waste manifest).</td>
<td>NEM:WA GNR 634</td>
<td>-</td>
</tr>
<tr>
<td>19.</td>
<td>An individual(s) should be allocated a dedicated responsibility to ensure all recommendations relating to the acceptance of waste onto the facility are applied as far as practically possible.</td>
<td>NEM:WA GNR 634</td>
<td>NEM:WA GN.777 Guidelines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
</tr>
<tr>
<td>20.</td>
<td>Any employees/individuals allocated a role or responsibility in terms of accepting the waste onto the facility, should be sufficiently trained to do so.</td>
<td>NEM:WA GNR 634</td>
<td>NEM:WA GN.777 Guidelines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
</tr>
<tr>
<td>21.</td>
<td>A waste evaluation and acceptance procedure should be developed in order to apply the Guideline requirements.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
6.3 WASTE STORAGE AND HANDLING

Purpose: To ensure that waste is handled in a manner which limits human exposure and accidental release into the environment surrounding the facility (focusing on hazardous wastes).

In order to prevent human exposure to hazardous wastes and harm to the environment, waste storage/processing areas on-site must be operated in such a way as to prevent the unauthorised or accidental release of any polluting substances (gaseous, liquid or solid) into the air, soil, surface water and groundwater. The following general management measures should be applied to a WDF facility:

- Waste streams which are non-compatible should not be stored together;
- Flammable liquids shall be stored separately to substances with a high oxidising potential;
- Storage vessels containing waste materials and/or other dangerous substances should be labelled appropriately. Labels should include hazards associated with entering the facility;
- Suitable and safe transfer systems from transportation to storage areas to avoid health, safety and environmental risks from spillage;
- Containers, tanks, valves and piping containing hazardous waste must be inspected for leaks, structural integrity and any sign of deterioration (e.g. corrosion or wearing of protective coatings) on a regular basis;
- If a groundwater and soil leak detection system has been installed during the design/construction phase, the system should be implemented to detect environmental issues potentially resulting from the WDF facility during operations;
- A record of storage and processing equipment leak detection measures should be maintained at the WDF facility;
- A professionally registered engineer (from an appropriate discipline) must inspect tanks containing hazardous waste at least once per annum to check tank integrity, corrosion, piping, valves, bunding, and impermeability of the bund wall and bund floor. Should potential leakages be detected by groundwater and soil monitoring records, a professionally registered engineer (from an appropriate discipline) should be consulted immediately to determine potential causes;
- Appropriate signage is to be erected at the waste storage and stockpiling vessels/areas;
- Specific preferred routes, both within the WDF facility or outside of the facility boundaries, should be identified and used by waste and/or WDF transport/transfer vehicles/equipment;
- Fire-fighting equipment should be located around storage and process areas in cases of both hazardous and general waste types;
- Areas containing/hosting hazardous wastes which are considered to have a high risk rating in terms of the SANS 10234 classification should be fitted with measures as detailed in the SANS 10234 classification document;
- The liner beneath waste stockpile areas should be inspected regularly to ensure the integrity of the liner;
- A leachate detection system should be monitored to detect volumes of leachate generated by the waste stockpile (refer to Section 12);
- An EPRP should be developed and applied in emergency scenarios related to the facilities accommodating waste or WDF materials associated with the WDF facility (see Section 11);
- The storage of hazardous waste or a dangerous good associated with a WDF facility should take place in close proximity to the equipment/machinery used to manufacture the WDF;
- Storage and processing areas should be incorporated into a stormwater management system to ensure clean and dirty water separation is achieved. A stormwater management plan should be developed to document the management practices;
- The potentially contaminated stormwater, which is collected by the interception trenches (Sub-section 5.4), should be tested to determine water quality or treated as contaminated water and treated as such. Discharge into the municipal sewer system should only be allowed if the water quality meets the municipal sewer discharge standards; and
- All residual waste processed by the WDF facility should be recorded in the waste manifest (see Section 7).

The conditions contained within the Norms and Standards for the storage of waste (NEM:WA GNR 926) are included within the Guideline recommendations. Should the Guideline user require further details regarding the storage of wastes, the Guideline user should refer to NEM:WA GNR 926. All Guideline users storing waste should adhere to the best practice measures contained herein as well as to the requirements of NEM:WA GNR 926 regardless of the capacity of their waste storage facilities.

See Table 6.2 for Regulation/Guideline/SANS and Industry/Waste Type relevance of the recommendations.
<table>
<thead>
<tr>
<th>No.</th>
<th>Measure</th>
<th>Regulation/Guideline Relevant</th>
<th>Industry/Waste Type Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Waste streams which are non-compatible should not be stored together.</td>
<td>10234, NEM:WA GN.777</td>
<td>X</td>
</tr>
<tr>
<td>2.</td>
<td>Flammable liquids shall be stored separately to substances with a high oxidising potential.</td>
<td>10234, NEM:WA GN.777</td>
<td>X</td>
</tr>
<tr>
<td>3.</td>
<td>Storage vessels containing waste materials and/or other dangerous substances should be labelled appropriately.</td>
<td>10234, NEM:WA GNR 926, Guidelines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
<td>X</td>
</tr>
<tr>
<td>4.</td>
<td>Suitable and safe transfer systems from transportation to storage areas to avoid health, safety and environmental risks from spillage.</td>
<td>10228, 10230, 10231, 1518, NEM:WA GN.777, Guidelines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
<td>X</td>
</tr>
<tr>
<td>5.</td>
<td>Containers, tanks, valves and piping containing hazardous waste must be inspected for leaks, structural integrity and any sign of deterioration (e.g. corrosion or wearing of protective coatings) on a weekly basis.</td>
<td>- NEM:WA GNR 926, Guidelines for Treatment of Hazardous Wastes and Co-processing of Alternative Fuel Resources in Cement Kilns.</td>
<td>X</td>
</tr>
<tr>
<td>6.</td>
<td>If a groundwater and soil leak detection system has been installed during the design/construction phase, the system should be implemented to detect environmental issues potentially resulting from the WDF facility during operations;</td>
<td>- - NEM:WA GN.777</td>
<td>X</td>
</tr>
<tr>
<td>7.</td>
<td>A record of storage and processing equipment leak detection measures/actions should be maintained at the WDF facility.</td>
<td>- NEM:WA GNR 926, NEM:WA GN.777</td>
<td>X</td>
</tr>
<tr>
<td>No.</td>
<td>Measure</td>
<td>Regulation/Guideline Relevant</td>
<td>Industry/Waste Type Relevance</td>
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<tr>
<td></td>
<td>Best Practice Measure</td>
<td>SANS</td>
<td>Anaerobic Digestion</td>
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<td></td>
<td></td>
<td>GN(R)</td>
<td>Used Oil/Solvents</td>
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<td></td>
<td></td>
<td></td>
<td>Co-Processing</td>
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<td></td>
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<td>Energy Generation</td>
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<tr>
<td>8.</td>
<td>A professionally registered engineer (from an appropriate discipline)</td>
<td>-</td>
<td>X</td>
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<tr>
<td></td>
<td>must inspect tanks containing hazardous waste at least once per annum</td>
<td>NEM:WA GNR 926</td>
<td>X</td>
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<tr>
<td></td>
<td>to check tank integrity, corrosion, piping, valves, bunding, and</td>
<td></td>
<td>X</td>
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<td></td>
<td>impermeability of the bund wall and bund floor.</td>
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<td>X</td>
</tr>
<tr>
<td>9</td>
<td>Appropriate signage is to be erected at the waste storage and</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>stockpiling vessels/areas.</td>
<td>NEM:WA GNR 926</td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>Specific preferred routes, both within the WDF facility or outside of</td>
<td>10228 10230 10231 1518</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>the facility boundaries, should be identified and used by waste and/</td>
<td>NEM:WA GN.777 Guidelines for</td>
<td>X</td>
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<td></td>
<td>or WDF transport/transfer vehicles/equipment.</td>
<td>Treatment of Hazardous Wastes</td>
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<td></td>
<td></td>
<td>and Co-processing of</td>
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<td></td>
<td></td>
<td>Alternative Fuel Resources</td>
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<td></td>
<td></td>
<td>in Cement Kilns.</td>
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<tr>
<td>11</td>
<td>Fire-fighting equipment should be located around storage and process</td>
<td>-</td>
<td>X</td>
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<tr>
<td></td>
<td>areas in cases of both hazardous and general waste types.</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>12</td>
<td>Areas containing/hosting hazardous wastes which are considered to</td>
<td>10234 NEM:WA GNR 634</td>
<td>X</td>
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<tr>
<td></td>
<td>have a high risk rating in terms of the SANS 10234 classification</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>should be fitting with measures as detailed in the SANS 10234</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>classification document.</td>
<td></td>
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</tr>
<tr>
<td>13</td>
<td>The liner beneath waste stockpile areas should be inspected regularly</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>to ensure the integrity of the liner.</td>
<td>NEM:WA GNR 926</td>
<td>X</td>
</tr>
<tr>
<td>No.</td>
<td>Measure</td>
<td>Regulation/Guideline Relevant</td>
<td>Industry/Waste Type Relevance</td>
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<tr>
<td>14</td>
<td>A leachate detection system should be established to detect volumes of leachate generated by the waste stockpile. The leachate detection system should be designed to measure also detect any leakages from the liner into the groundwater reserves.</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>15</td>
<td>An EPRP should be developed and applied in emergency scenarios related to the facilities accommodating waste or WDF materials associated with the WDF facility.</td>
<td>10234 NEM:WA GNR 634</td>
<td>X X X</td>
</tr>
<tr>
<td>16</td>
<td>An EPRP is to be developed (should dangerous goods and hazardous wastes be managed by the WDF facility) and subsequently applied during a spillage scenario at the WDF facility.</td>
<td>ARP 5 NEM:WA GNR 926</td>
<td>X X X</td>
</tr>
<tr>
<td>17</td>
<td>The storage of hazardous waste or a dangerous good associated with a WDF facility should take place in close proximity to the equipment/machinery used to manufacture the WDF.</td>
<td>-</td>
<td>X X</td>
</tr>
<tr>
<td>18</td>
<td>Storage and processing areas should be incorporated into a stormwater management system to ensure clean and dirty water separation is achieved. A stormwater management plan should be developed to document the management practices.</td>
<td>-</td>
<td>X X</td>
</tr>
<tr>
<td>No.</td>
<td>Measure</td>
<td>Regulation/Guideline Relevant</td>
<td>Industry/Waste Type Relevance</td>
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<tr>
<td></td>
<td></td>
<td>SANS</td>
<td>GN(R)</td>
</tr>
<tr>
<td>19</td>
<td>The potentially contaminated stormwater, which is collected by the interception trenches, should be tested to determine water quality or treated as contaminated water and treated as such. Discharge into the municipal sewer system should only be allowed if the water quality meets the municipal sewer discharge standards.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>All residual wastes generated by the WDF facility should be recorded in the waste manifest.</td>
<td>-</td>
<td>NEM:WA GNR 625</td>
</tr>
</tbody>
</table>

### 7 WASTE MANIFEST SYSTEM

A waste manifest system will allow the WDF facility operator/user to record all waste collection, acceptance, processing, generation and disposal information and in so doing, will be able to verify the processing of such waste and safe disposal of waste, should disposal be required. The waste manifest system should record all requirements as stipulated in Section 5 as well as meet the NEM:WA GNR 634. Local and provincial requirements should be considered by the WDF facility operator/user.

The following waste information should be included in a waste manifest as a best practice. Information to be supplied by the waste generator (supplier) for inclusion into the manifest must include:

- Unique consignment identification number;
- If applicable, the SAWIS Registration number;
- Generator’s contact details (contact person, physical and postal address, phone, fax, email);
- Physical address of the site where the waste was generated;
- Emergency contact number;
- Origin/source of the waste (process/activity);
- Waste Classification (if applicable) of the waste and SDS;
- Quantity of waste by volume (m3) or weight (tons);
- Date of collection/dispatch;
- Intended receiver (waste manager); and
- Declaration (content of the consignment is fully and accurately described, classified, packed, marked and labelled, and in all respects in proper condition for transportation in accordance with all applicable laws and regulations).

The information to be supplied by the waste transporter for inclusion into the manifest may include:

- Name of transporter;
- Address and telephone number of transporter; and
- Declaration acknowledging receipt of waste.
Information to be supplied by the waste manager for inclusion into the manifest may include:

- Name, address and contact details;
- Receiving waste management facility name, address and contact details;
- WML reference number;
- Date of receipt;
- Quantity of waste received by weight (tons) and volume (m³) if applicable;
- Type of waste management applied (reuse, recycling, recovery, treatment, disposal);
- Any discrepancies in information between the different holders of the waste (related to waste quantity, type, classification, physical and chemical properties);
- Details on any waste diverted to another waste management facility, and the details of the facility; and
- Certification and declaration of receipt and final management of waste.

### 8 ROLES AND RESPONSIBILITIES

The WDF facility operator should define roles and responsibilities for each designation within its organisation that is associated with the transport, handling, use or processing of waste at the WDF. These should specify or reference reporting and chain of command in the sections of this document. Table 8.1 will assist the Guideline user in the development of a formal structure for roles and responsibilities for the WDF facility. The formal structure is intended as a guide and is acknowledged as not necessarily being applicable to smaller operations, where the same individual may carry the responsibility of one or more of the roles indicated in Table 8.1

#### TABLE 8.1: ROLES AND RESPONSIBILITIES FORMAL STRUCTURE

<table>
<thead>
<tr>
<th>Responsible Personnel</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>WDF facility owner (Chief Operating Officer)</td>
<td>• Accountable for the overall application of this guideline;</td>
</tr>
<tr>
<td></td>
<td>• Accountable for the overall management of the WDF facility design, construction, operation and decommissioning phases;</td>
</tr>
<tr>
<td></td>
<td>• Management of sound contractual agreements between the waste generator, the transporter and the WDF facility;</td>
</tr>
<tr>
<td></td>
<td>• Responsible for appointing a site manager, Safety, Health, Environment and Quality (SHEQ) Manager/Environmental Manager/Waste Management Control Officer.</td>
</tr>
<tr>
<td>Site Manager</td>
<td>• Responsible for the practical on-site implementation of the Guideline;</td>
</tr>
<tr>
<td></td>
<td>• Should monitor the implementation of the Guideline on a regular basis;</td>
</tr>
<tr>
<td></td>
<td>• Ensure that waste delivered to the site is as per the reported composition before accepting onto the site;</td>
</tr>
<tr>
<td></td>
<td>• Reporting to the WDF facility owner on any significant negative findings based on the undertaking of daily operations at the WDF facility;</td>
</tr>
<tr>
<td></td>
<td>• May, in consultation with the WDF facility owner effect changes in the SOPs to ensure safe and efficient operations of the WDF facility.</td>
</tr>
<tr>
<td>SHEQ Manager/Environmental Manager/Waste Management Control Officer</td>
<td>• Responsible for inspecting/auditing the waste handling areas on a regular basis (see Section 13) to verify that all applicable Guideline recommendations are being applied as best as practically possible;</td>
</tr>
<tr>
<td></td>
<td>• Should ensure that all inspection, incident and negative finding records are documented;</td>
</tr>
<tr>
<td></td>
<td>• Responsible for ensuring that waste related areas are being operated in accordance with their maximum design specifications;</td>
</tr>
</tbody>
</table>
### Responsible Personnel

<table>
<thead>
<tr>
<th>Responsible Personnel</th>
<th>Responsibility</th>
</tr>
</thead>
</table>
| The SHEQ Manager/Environmental Manager/Waste Management Control Officer              | • To ensure that all waste handling area risk and content labelling is maintained;  
• Ensure that all employees who are given access to waste handling areas (including areas where a spillage has taken place) receive the required waste management training to ensure safe carrying out of operational requirements;  
• Communicating any disagreements with the waste transporter during waste acceptance procedures;  
• Ensuring that any waste spillage incidents are handled according to the Emergency Preparedness commitments; and  
• Accountable for the maintenance of the waste manifest system (see section 7) according to the recommendations made within this Guideline. |
| Waste Generator                                                                      | • Responsible for undertaking waste classifications, where required, and handing over required risk/management information to the waste transporter and subsequently to the WDF facility;  
• Informing the WDF facility of any suspected change in waste composition prior to delivering to the WDF facility;  
• Undertaking regular waste classifications to ensure the composition of the waste is maintained;  
• Auditing the WDF facility to ensure the waste cradle to grave principle is considered (see Section 13); and  
• Providing feedback to the WDF facility operator to ensure negative findings can be resolved as quickly and effectively as possible. |
| The Waste Management Contractor                                                     | Responsible for the implementation of any Guideline recommendation which has been allocated to the contractor due to lack of WDF facility internal resources. |

Note: The various responsibilities stipulated in Table 8.1, can be covered by one or more individuals/employees. The may be interchangeable between personnel/positions as long as the required responsibilities are being covered in totality.

### 9 TRAINING AND COMPETENCY

Training should be provided to all employees working with waste associated with the WDF facility. Initial training usually takes place in the form of a site induction presentation which considers the risks associated with the operation of the site including waste handling requirements. Training is to be continued for the duration of the employees working contract to ensure continuous updates on best practices and lessons learned from past incidents. Temporary employees and/or new permanent employees should be trained using the same induction presentation. Contractors commissioned to undertake work on behalf of the WDF operator/user should be trained at a level applicable to the waste handling activity being undertaken. A training programme should be developed to incorporate the different levels of training required for employees who are responsible for dealing with different handling areas and the hazard rating associated with the waste.

The training programme should, amongst other things, include the following:

- General and job safety rules, including roles and responsibilities (Section 8);
- Safe operation of equipment/machinery (as per manufacturer specifications);
- Precautionary measures that need to be taken when handling hazardous wastes;
- Training on the EPRP (Section 11);
- Procedures that they need to apply to their particular type of work, based on the SOPs;
- Procedures for dealing with spillages and accidents, as per the facility emergency preparedness requirements (see Section 11); and
- Appropriate use of PPE.

A sufficient number of employees should receive training to cover personnel for leave periods, absences due to illness and public holidays. An attendance register is to be kept and signed by each employee at each training session. Only trained personnel may be allowed to handle hazardous waste types. The waste classification, if applicable as well as the SDS developed for the hazardous waste should form part of the training material and made available to the employees.
on a daily basis. The labelling of hazardous waste materials and handling areas should be emphasised during employee/contractor training.

10 ENVIRONMENTAL MANAGEMENT SYSTEM

A new WDF facility should consider the compilation of an environmental management system (EMS) to practically implement the recommendations contained within this Guideline. Furthermore, the EMS will promote continuous improvement at the WDF facility. An EMS should include the structure of the organisation/business, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental objectives of this Guideline. The EMS is a tool that will provide the WDF facility with a method to systematically manage the environmental aspects of the facility. ISO 14001 does not specify requirements for environmental performance, but maps out a framework that the WDF facility can follow to set up an effective EMS. The following key clauses below should be formulated when designing an EMS that is compliant with the ISO 14001 standards:

- Environmental policy;
- Environmental aspects;
- Legal and other requirements;
- Objectives;
- Resources, roles and responsibilities (further detailed in Section 8);
- Competence training and awareness (further detailed in Section 9);
- Communication structure;
- Documentation requirements and document control procedures;
- Operational control and emergency preparedness and response plan (see Section 11);
- Monitoring requirements (further detailed in Section 12);
- Evaluation of compliance (further detailed in Section 13);
- Non-conformance, corrective action and preventative action;
- Record keeping;
- Auditing (further detailed in Section 13); and
- Management review.

11 EMERGENCY PREPAREDNESS

An EPRP should be developed and implemented to identify potential for and response to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be associated with them. The EPRP can form part of the WDF facility EMS which will result in the tracking and management of significant environmental aspects. The purpose of the EPRP is to provide guidance to employees and contractors as to their responsibilities in the event of an actual environmental emergency or potential environmental emergency at the facility, with regards to chemical, oil, fuel, spills and other incidents. The WDF facility EPRP should be reviewed and revised, where necessary, based on operations lessons learned, in particular, after the occurrence of incidents. Sub-section 11.1.1 provides guidance on the expected contents of a EPRP.

11.1 EMERGENCY PREPAREDNESS RESPONSE PLAN

According to ISO 14001, an EPRP should include the following criteria:

- Identify critical assets - usually major items of plant;
- Defining the disaster team and describing responsibilities;
- Emergency services – how to contact them;
- Enforcement agencies – how to contact them;
- Listing communications – including out-of-hours phone numbers;
- Holding regular exercises – to test the system; and
- Setting up a media response team – details of who is responsible for contacting the media.

Additionally an EPRP can cover the following topics/aspects:

- Understanding legal aspects;
- Alarm sounds;
- Risk assessment requirements;
• Risk profile summary;
• Neighbours contact information;
• Understanding external threats;
• Vehicle/machinery fire and malfunctioning;
• Emergency procedures to be followed;
• Escape plans;
• Evacuation drills;
• Training requirements;
• PPE requirements;
• Preventative measures;
• Hazard identification;
• Remedial actions, including immediate action and clean-up procedures;
• Power failures;
• Site fires;
• Natural disasters, such as floods; and
• Emergency action required in the case of road accidents and spillages of wastes en-route.

The EPRP should be reviewed annually and after each major emergency incident and/or accident.

12 ENVIRONMENTAL MONITORING

12.1 MONITORING

The operation of a WDF facility can impact upon water resources within the surrounding area. A WDF facility should establish and maintain procedures to monitor and measure the key characteristics of its operations and activities that may have a significant impact on the surrounding environment. Monitoring can be in terms of compliance to a license (such as a WML or waste storage Norms & Standards) or compliance to best practise measures. Testing of samples should be carried out in accordance with published laboratory analysis methods or those prescribed by and obtained from the South African Bureau of Standards.

Monitoring results should be structured and presented for review on an ongoing basis so that, if objectives and targets are not met, corrective action can be taken. Monitoring results should be documented and evaluated on an on-going basis. A monitoring and management program should be established to determine the success of groundwater, surface water, stormwater, and air quality management measures.

Monitoring the effects that a WDF facility has on surface water, groundwater, stormwater and air quality is dependent on the waste type, waste volume, leachate formation, vulnerability of groundwater resources and potential for groundwater usage.

12.1.1 SURFACE WATER MONITORING

Surface water monitoring should be performed in all storm water drains on and adjacent to the site at the locations selected in conjunction with the Department of Water and Sanitation, at a frequency determined by the responsible authority. Monitoring points should be established immediately downstream of any surface water discharge point(s) and should monitor both flow and quality. Water that has become contaminated may be released into the sewer system however the quality of such water should be confirmed prior to ensure within the municipal guideline requirements. Contaminated water may not be disposed directly into a natural water source without prior authorisation (in the form of a WUL) and/or treatment. Water monitoring on waste management facilities, including a WDF facility, should be undertaken according to the minimum requirements for water monitoring at waste management facilities as published in 1998 by the DWAF.

12.1.2 LEACHATE MONITORING

The potential for leachate generation and risk to surface and groundwater should be assessed in cases where waste storage includes stockpiles of waste or other materials not otherwise contained on hard standing and fully under cover. A risk assessment should be used to inform appropriate leachate monitoring measures including early warning detection systems.

12.1.3 EFFLUENT/SEWAGE MANAGEMENT

The release of effluent or sewage into the municipal sewer or trade effluent system, stormwater management system or
transfer to the municipal waste water treatment plant (WWTP) is dependent on the water quality of the effluent or sewage generated by the WDF facility. Effluent and/or sewage discharge into the municipal sewer and/or trade effluentsystem will be subject to receipt of a discharge permit from the relevant municipality. The accepted water quality limits for municipal WWTP is either set by municipal by-laws, effluent discharge permit or the WWTP itself based on the treatment infrastructure available at the WWTP.

12.1.4 GROUNDWATER MONITORING

It is essential that groundwater quality is managed in an integrated and sustainable manner that provides adequate protection to the resource and secures the supply of acceptable quality for all recognised users. The main aim of groundwater monitoring is to determine if the WDF facility is resulting in groundwater pollution. There are several types of groundwater monitoring measures that can be implemented as best practise depending on the level to which the groundwater has been degraded and the type of aquifer (shallow or deep) (Minimum Requirements for Water Monitoring at Waste Management Facilities, Department of Water and Forestry [Department of Water and Forestry [DWAF], 1998).

Based on the data collected from groundwater monitoring, an action plan can be devised to reduce/minimise the impact from a WDF facility on groundwater quality in future by implementing controls and incentives, to manage these impacts. The impacts on groundwater should be managed in such a manner to at least ensure fitness for use of groundwater by recognised beneficial users and to restore groundwater quality to a suitable level.

There are several steps outlined in the DWAF Minimum Requirements for Water Monitoring at Waste Management Facilities document that should be considered when designing a groundwater monitoring system. Some of the steps, relevant to a WDF facility site include:

- Sampling surface and groundwater for chemical analysis to determine the presence and level of pollutants;
- Identifying possible pollution plumes at existing waste sites;
- Obtaining information on activities that utilise the groundwater in the surrounding areas;
- Undertaking a risk assessment on groundwater as a minimum requirement to determine the type of monitoring that will be required;
- Characterising rainwater penetration into waste stockpiles; and
- Analysis of groundwater samples.

Refer to the minimum requirements for water monitoring at waste management facilities issued by the DWAF in 1998 for further details.

12.1.5 AIR QUALITY MONITORING

For facilities producing WDF from waste streams that contain volatile or semi-volatile compounds, a monitoring plan for fugitive air emissions should be implemented in accordance with the National Environmental Management: Air Quality Act (Act 39 of 2004) and associated regulations and standards.

12.1.6 STORMWATER MANAGEMENT PLAN

A Stormwater Management Plan (SWMP) can be devised and implemented in an attempt to prevent contaminated water from a WDF facility reaching a natural water body. This is done through appropriate separation, diversion and containment of clean and dirty stormwater generated at a WDF facility. The development of a SWMP for a WDF facility should take cognisance of the following guidelines:

- DWAF Government Notice No. 704 (GN704) Guideline Document for the Implementation of Regulations on use of Water for Mining and Related Activities aimed at the Protection of Water Resources. Whilst it is recognised that the site is not a mining activity, this document provides suitable guidance in terms of stormwater management;
- DWAF Best Practice Guideline G1 - Stormwater Management; and
- DWAF Best Practice Guideline A4 - Pollution Control Dams.

The main aim of a SWMP is to ensure that:

- All clean water that has not been contaminated should be directed to a natural water source which is separate from dirty/contaminated water;
- Dirty water must be contained in a separate system to the clean water to prevent the risk of contamination;
- Infrastructure should not be situated within the 100 year flood line or within a horizontal distance of 100m from any watercourse; and
- Appropriate maintenance of the stormwater management infrastructure.

Where mixing of water and oily residue takes place on the WDF facility, the installation of an oil/water separator should be considered. An adequate oil/water separator should remain at the correct operating capacity in order for the separation and retention of hydrocarbons to occur.
The development of a SWMP should include best practise procedures outlined in the DWAF Best Practice Guidelines (A4: Pollution Control Dams, G1: Storm Water Management, GN 704 and the DWAF Minimum Requirements for Water Monitoring at Waste Management facilities) and include:

- The SWMP should continuously be reviewed and updated after every major change to the WDF facility;
- Pollution prevention should be implement to prevent and manage all contamination at the site;
- All clean areas should be kept separate from stockpiles or material that could potential cause contamination by placing them in a bunded area;
- All hard-standing and bunded areas should be regularly inspected and maintained;
- Erosion control measures should be implemented at all WDF facilities;
- Channels, sediment traps, oil separators and Pollution Control Dams (PCD) should be regularly inspected and maintained;
- A PCD should be constructed in such a way as to allow for appropriate freeboard; and
- The PCD should be lined with synthetic liner to prevent leachate entering the groundwater.

The success of the stormwater management system in meeting the designed criteria is dependent on the implementation of an appropriate maintenance and monitoring program. Key management and monitoring requirements are as follows:

- Regular inspections and maintenance should occur for all channels and pipes on a monthly basis and after any major rainfall event;
- All blockages or accumulation of sediment in the channels and pipes should be removed to ensure the design capacity is maintained;
- All sediment that is extracted from the channels and pipes should be removed and depending on the level of contamination dealt with in an acceptable manner;
- The oil traps must be maintained and all oil spills cleaned up using a spill kit and disposed of in an acceptable manner;
- Course grates should be installed to prevent large particles/objects from entering the channels/pipes and causing blockages; and
- Dirty water should be either recycled back into the operation or discharged into a sewer/water source if the quality of the water meets the Water Use License (WUL) conditions.

It is recommended that an annual audit of the SWMP is conducted to ensure the infrastructure is adequate and appropriate. This should take into account changing circumstances and needs as well as changing regulations.

### 13 AUDITING AND REPORTING

#### 13.1 AUDITING

##### 13.1.1 INTERNAL

Internal audits of WDF facilities and infrastructure that are not ISO 14001 accredited should be conducted on a biannual basis and on each occasion an official report must be compiled by the responsible individual (as per Table 8.1) or relevant auditor to report the findings and observations of the audits, which must be made available to an external auditor on request. The audit should be undertaken on existing WDF facility EAs, such as a WML. Should an EA not be required for the site, the WDF facility operator can audit the WDF facility against this Guideline document to determine the best practise/legal status of the facility.

##### 13.1.2 EXTERNAL

If any EA requires an external audit, the audit process and reporting should be undertaken in accordance with the conditions of the EA(s). Where no EA is in place for the WDF, an external audit may be undertaken against this Guideline, typically on an annual basis. WDF facilities that have obtained ISO 14001 accreditation should be audited externally on a biannual basis.

The audit report should:

- Specifically state whether conditions of the requirements contained in the EA (such as a WML) and/or this Guideline are adhered to;
- Include an interpretation of all available data and test results regarding the operation of the WDF facility. Included in this interpretation is the impact that maybe/is occurring on the environment;
- Specify target dates for the implementation of the recommendations to achieve compliance/best practice;
• Contain recommendations regarding non-compliance or potential non-compliance and must specify target dates for the implementation of the recommendations and whether corrective action taken for the previous audit non-conformities were adequate; and
• Show audit results graphically and conduct trend analysis.

13.1.3 REPORTING AUTHORITY SUBMISSION
This section is only relevant to WDF facilities which have been issued with an EA (such as a WML). Each external audit report must be submitted to the relevant authority within 30/60 days (dependant on the requirements of the EA/WML) from the date on which the external auditor finalised the audit.

Document Considerations: The WDF facility owner/operator is to ensure that the specific auditing requirements as stipulated in the NEMA GNR 982, is considered to ensure compliance with the prevailing legislation.

14 STANDARD OPERATING PROCEDURE(S)
An SOP is a set of written instructions that document a routine or repetitive activity followed by an organisation (in this case a WDF facility). The development and use of SOPs contributes to the completion of routine activities such as inspections and monitoring of various components of the WDF facility. The SOP ensures the correct level of detail is observed and the logging and reporting of such is undertaken in a consistent manner which can be understood by all responsible individuals, auditors and the Department. Should an existing WDF facility have established operating procedures, codes of practice and/or operating manuals, those documents should be deemed as SOPs for the purpose of this Guideline. The SOP assist with the practical achievement of the best practice measures stipulated in this Guideline as well as aligning with the requirements of the EMS (see section 10).

15 ENVIRONMENTAL CONSIDERATIONS FOR DECOMMISSIONING/CLOSURE
Section 15 provides the general considerations which will apply to the WDF facility upon the consideration of decommissioning and closure. Decommissioning, in relation to waste handling facilities, means the planned management and subsequent remediation of a waste facility once no further use exists for that facility.

The intent of this section is to ensure legal compliance during and following site closure and any need to rehabilitation and remediate the site. The level of any rehabilitation and remediation is dependent upon the history of operations and associated impacts at a site.

The section provides for general measures when dealing with wastes across the four focus industries. The applicability of the recommendations provided within Section 15 are to be determined using the tables following each sub section.

15.1 GENERAL CLOSURE PLANNING
Purpose: To minimise the on-going pollution risk resulting from the site following closure and to reduce the risk level of environmental pollution resulting from physical site closure activities.

The following should be considered by a WDF facility operator/owner upon making a decision to close the WDF facility: 

• Should an EA have been issued for the facility during the establishment and/or operational phases of the WDF facility, the EA should be consulted for site specific permitted closure requirements. The Environmental Management Programme (EMPr) which was created for the establishment phase of the facility should include commitments for site closure.
• Based on the requirements of the EA (including the EMPr), a WDF facility may be required to develop a closure plan to put the EA/EMPr conditions into practice. Should closure planning be required, the Guideline user should consult the NEMA GNR 982 for detailed requirements.
• Should the decommissioning activity trigger a listed activity in terms of the NEMA 2014 Regulations (most notably listed activity 31 of GNR 983) the WDF facility operator/owner will be required to undergo a prescribed legal process before commencing such activities.
• Should the WDF facility site manager (or responsible person) be aware of significant contamination of the site or have undertaken activities on the site which inherently lead to contamination of the land upon which the facility is situated, the WDF facility operator/owner should consider the requirements of Part 8 of the NEM:WA.

In this instance a NEM:WA Part 8 application should be submitted to the DEA Contaminated Land Directorate in place of a prescribed legal process in terms of the NEMA 2014 Regulations (i.e. both the NEMA and NEM:WA processes will not apply simultaneously). Applicability of NEM:WA Part 8 may result in the need to undertake a site assessment on the affected area to determine the environmental risk associated with the presence of the contaminated land. Should sufficient environmental risk be identified, remediation efforts may need to follow. The need for remediation efforts to follow will depend on the competent DEA’s review of the site assessment report.
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<td>61558</td>
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</tr>
</tbody>
</table>
OTHER REFERENCES


South Africa. 2013. National Environmental Management: Waste Act: List of Waste Management Activities that have, or are likely to have, a detrimental effect on the environment. (Promulgation No. GNR 921, 2013). Government Notice, 37083, November. 29.


APPENDIX A – BASIC ASSESSMENT PROCESS FLOW CHART

BAR PROCESS

Pre-Application
- Pre-application consultation with CA
- Confirm Listed Activities
- Draft Plan of Study
- Commence specialist studies

Formal Application Process
- Submit Application from- include proof of payment.
  - 10 days
    - Department acknowledge receipt.
    - 30 days
      - Release Draft BAR and EMPr.
    - 10 days
      - Compile Issues and Response Report and Finish BAR and EMPr.
      - Release Final BAR and EMPr.
      - 30 days
        - Submit Final BAR and EMPr.
      - 10 days
        - Department acknowledge receipt.
      - 30 days
        - Decision.
      - 14 days
        - Notify IAPs of decision and appeal process.

ANTICIPATED TO BE 30-60 DAYS

MAY NOT EXCEED 90 DAYS

MAY NOT EXCEED 107 DAYS
APPENDIX B – SCOPING & ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FLOW CHART

44 DAYS
- Application
- Consultation
- Scoping Report
- Public Participation 30 Days

43 DAYS
- Scoping Report Submitted
- Accept/ Reject

106 DAYS
- Consultation EIR & EMPR
- Public Participation 30 Days

107 DAYS
- Submit EIR & EMPR
- Review Decision
- Notification
- Public Participation 50 Days
- Consultation EIR & EMPR
ENVIROMENT HOUSE
473 STEVE BIKO ROAD
ARCADIA
PRETORIA
0002

To use this QR code conveniently you must have a smartphone equipped with a camera and a QR code reader/scanner application feature.