

Draft Waste Management Plan

DAS Steel Mini Steel Foundry

16 August 2012

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DAEA Reference : DM/0053/2011

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**DRAFT WASTE MANAGEMENT PLAN THE DAS STEEL MINI FOUNDRY**

<b>TERRATEST NO.:</b> 41190		<b>DATE:</b> August 2012		<b>REPORT STATUS:</b> Draft	
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<b>SYNOPSIS:</b>					
<b>KEY WORDS:</b> FERROUS INDUSTRY, ENVIRONMENTAL AUTHORISATION, AIR EMISSIONS APPLICATION, WASTE MANAGEMENT LICENSE, CATO RIDGE, ETHEKWENI, KWAZULU NATAL.					
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## Definitions

The National Environmental Management Act (NEMA) and the National Environmental Management Waste Act (NEM:WA) provide definitions which are pertinent to the management of waste.

**“acceptable exposure”** means the exposure of the maximum permissible concentration of a substance to the environment that will have a minimal negative effect on health or the environment

**“activity”** means an activity identified in any notice published by the Minister or MEC in terms of section 24D(1)(a) of the Act as a listed activity or specified activity;

**“best practicable environmental option”** means the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term;

**“commence”** means the start of any physical activity on the site in furtherance of a listed activity;

**“community”** means any group of persons or a part of such a group who share common interests, and who regard themselves as a community;

**“Constitution”** means the Constitution of the Republic of South Africa, 1996;

**“container”** means a disposable or re-usable vessel in which waste is placed for the purposes of storing, accumulating, handling, transporting, treating or disposing of that waste, and includes bins, bin-liners and skips

**“cumulative impact”**, in relation to an activity, means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area;

**“disposal”** means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land;

**“EAP”** means an environmental assessment practitioner as defined in section 1 of the Act;

**“environment”** means the surroundings within which humans exist and that are made up of:

- (i) *the land, water and atmosphere of the earth;*
- (ii) *micro-organisms, plant and animal life;*
- (iii) *any part or combination of (i) and (ii) and the interrelationships among and between them; and*

(iv) *the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.*

**“environmental authorisation”**, means the authorisation by a competent authority of a listed activity in terms of this NEMA;

**“environmental impact assessment”**, means a systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes basic assessment and S&EIR;

**“environmentally sound management”** means the taking of all practicable steps to ensure that waste is managed in a manner that will protect health and the environment;

**“extended producer responsibility measures”** means measures that extend a person’s financial or physical responsibility for a product to the post-consumer stage of the product, and includes:

(a) *waste minimisation programmes;*

(b) *financial arrangements for any fund that has been established to promote the reduction, re-use, recycling and recovery of waste;*

(c) *awareness programmes to inform the public of the impacts of waste emanating from the product on health and the environment; and*

(d) *any other measures to reduce the potential impact of the product on health and the environment*

**“general waste”** means waste that does not pose an immediate hazard or threat to health or to the environment, and includes:

(a) *domestic waste;*

(b) *building and demolition waste;*

(c) *business waste; and*

(d) *inert waste;*

**“hazardous waste”** means 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 a detrimental impact on health and the environment;

**“high-risk activity”** means an undertaking, including processes involving substances that present a likelihood of harm to health or the environment;

**“holder of waste”** means any person who imports, generates, stores, accumulates, transports, processes, treats, or exports waste or disposes of waste;

**“independent”**, in relation to an EAP or a person compiling a specialist report or undertaking a specialised process or appointed as a member of an appeal panel, means—

*(a) that such EAP or person has no business, financial, personal or other interest in the activity, application or appeal in respect of which that EAP or person is appointed in terms of these Regulations other than fair remuneration for work performed in connection with that activity, application or appeal; or*

*(b) that there are no circumstances that may compromise the objectivity of that EAP or person in performing such work;*

**“inert waste”** means waste that:

*(a) does not undergo any significant physical, chemical or biological transformation after disposal;*

*(b) does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and*

*(c) does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant;*

**“listed activity”**, means an activity identified in terms of [section 24\(2\)\(a\)](#) and (d) of the NEMA;

**“plan of study for environmental impact assessment”** means a document contemplated in [regulation 28(1)(l)] regulation **28(1)(n)**, which forms part of a scoping report and sets out how an environmental impact assessment must be conducted;

**“pollution”** means any change in the environment caused by -

*(i) substances;*

*(ii) radioactive or other waves; or*

*(iii) 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.

**“priority waste”** means a waste declared to be a priority waste in terms of section 14 of the NEM:WA

**“registered interested and affected party”**, in relation to an application, means an interested and affected party whose name is recorded in the register opened for that application in terms of regulation **55**;

**“significant impact”** means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment;

**“specialised process”** means a process to obtain information which—

(a) *is not readily available without undertaking the process; and*

(b) *is necessary for informing an assessment or evaluation of the impacts of an activity, and includes risk assessment and cost benefit analysis;*

**“State department”** means any department or administration in the national or provincial sphere of government exercising functions that involve the management of the environment;

**“sustainable development”** means the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure that development serves present and future generations;

**“storage”** means the accumulation of waste in a manner that does not constitute treatment or disposal of that waste;

**“waste”** means any substance, whether or not that substance can be reduced, re-used, recycled and recovered—

(a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;

(b) which the generator has no further use of for the purposes of production;

(c) that must be treated or disposed of; or

(d) that is identified as a waste by the Minister by notice in the *Gazette*, and includes waste generated by the mining, medical or other sector, but—

(i) a by-product is not considered waste; and

(ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste;

**“waste disposal facility”** means any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premise;

**“waste management activity”** means any activity listed in Schedule 1 of the NEM:WMA or published by notice in the *Gazette* under section 19;

**“waste management control officer”** means a waste management control officer designated under section 58(1) under NEM:WMA;

**“waste management licence”** means a licence issued in terms of section 49 of the NEM:WMA;

**“waste management services”** means waste collection, treatment, recycling and disposal services



# 1 Introduction

## 1.1 Project Background

Secondary production of steel involves the refining of steel to produce higher quality steel or steel which is tailored to a specific specification. Modern process units in secondary steel making include Electric Arc Furnace (EAF) and Induction Furnace with ladle refining to allow for additives and decarbonisation.

### 1.1.1 Proposed Project

This project entails the construction of a secondary mini steel foundry (2x20Mt furnaces) and hot rolling mill in Cato Ridge. The proposed project uses technology commonly used internationally. Recovered steel is the main raw material and is processed to form steel billets, typically for the conversion into products for the construction industry.

The proposed project entails two development phases. These being the secondary steel foundry in Phase I and the Hot Rolling Mill in Phase II.

The process uses medium frequency mini induction furnaces and refining ladles to ensure product quality prior to continuous casting. The Hot Rolling Mill beneficiates the billets produced in the foundry into rolls, tubes and bars.

### 1.1 LICENSE HOLDER

**Project applicant:** DAS Steel (Pty) Ltd

Trading name (if any):

Contact person:

Physical address:

Postal address:

Postal code:

Telephone:

E-mail:

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## 1.2 Site Location

The proposed site is located on Eddie Hagen Drive, Cato Ridge in Kwazulu Natal. The area falls within Ward 1 of the eThekweni Metropolitan Municipality.

## 2 Legal Framework and Principals of Waste Management

### 2.1 National Environmental Management Waste Act

Waste legislation in South Africa provides for section 24 of the Constitution of South Africa through the National Environmental Management: Waste Act (59 of 2008) (NEM:WA). The NEM:WA's objectives include:

- to protect health, well-being and the environment by providing reasonable
- measures for—
  - minimising the consumption of natural resources;
  - treating and safely disposing of waste as a last resort;
  - preventing pollution and ecological degradation;
  - securing ecologically sustainable development while promoting justifiable economic and social development;
  - achieving integrated waste management reporting and planning;
  - to ensure that people are aware of the impact of waste on their health, well-being and the environment; and
  - to give effect to Section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

The NEM:WA regulates waste management activities through the General Notice GN718 List of waste management activities that have, or are likely to have a detrimental effect on the environment (3<sup>rd</sup> July 2009). The waste management activities included in this WMP include:

- storage;
- treatment; and
- recovery of waste.

The waste management activities require a waste management license in which the conditions associated with the management of the activity is legally outlined.

In terms of Section 7.1(c) NEM:WA the Minister has published Draft Norms and Standards for the Storage of Waste (GN436 of 2011). The document sets out the minimum requirements for the design and operation of storage facilities, provides a uniform approach relating to storage facilities and attempts to provide best practice. Whilst this document is not

promulgated, it is considered in terms of good practice and is used in the preparation of this WMP.

## **2.2 Municipal By-laws**

Municipal by-laws and policies are covered by the Scheduled Trade Permits of the eThekweni Metropolitan Municipality. These cover various aspects but foremost with respect to waste the policies concerning the installation and operation of conservancy tanks will be considered.

## **2.3 Principals**

### **2.3.1 Cradle-to-Cradle**

Typically, the cradle-to-grave principal has been used in waste management. The principal focused the responsibility of the waste for generator to the disposal of the waste. This has been superseded recently by ensuring that generator is responsible for the waste until such time as it is recycled, re-used or recovered. This is a principal which attempts to bring sustainability into waste management.

### **2.3.2 Duty of Care**

The Duty of Care principal is inherent in South African legislation and the National Waste Management Strategy through extended producer responsibility. The term apportions responsibility of the generator to ensure that waste is correctly handled in the most appropriate and diligent manner.

### **2.3.3 General Duty**

The holder of waste has specific duties in terms of the NEM:WA which include:

measures to—

- (a) avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;
- (b) reduce, re-use, recycle and recover waste;
- (c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- (d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;
- (e) prevent any employee or any person under his or her supervision from contravening this Act; and
- (f) prevent the waste from being used for an unauthorised purpose.

(2) Any person who sells a product that may be used by the public and that is likely to result in the generation of hazardous waste must take reasonable steps to inform the public of the impact of that waste on health and the environment.

#### **2.3.4 Extended Producer Responsibility**

Extended Producer Responsibility refers to the financial and physical responsibility placed upon a generator to inform downstream users or consumers of potential or inherent hazards associated with the waste. According to Section 18.1 of the NEM:WA the Minister is to declare objects to which this section pertains to. To date no such declaration has been made however it would be considered good practice and is included where possible.

Waste Hierarchy – Avoid, reduce, re-use, recycle, treatment and disposal

The NEM:WA and the National Waste Management Strategy (DEA, 2010) use the core principal of the waste hierarchy. This involves the promotion of avoidance in preference to reduction, re-use and recycling. Where possible this is used in the development of the WMP.

#### **2.4 Minimum Requirements**

The Department of Water Affairs and Forestry produced a series of minimum standards for waste management. This is focused on the disposal of waste however, the third edition (2005)<sup>1</sup>, does focus on the re-use and recycling of hazardous wastes in industries typifying the mining and beneficiation industries. This series is not enforceable however, it is considered in preparing this WMP.

### **3 Waste Management Control Officer**

Under section 58 of the NEM:WA the license holder may be required to appoint a Waste Control Officer. According to the NEM:WA the WMCO must:

- (a) work towards the development and introduction of clean production technologies and practices to achieve waste minimisation;
- (b) identify and submit potential measures in respect of waste minimisation, including the reduction, recovery, re-use and recycling of waste to the waste management license holder and the licensing authority;
- (c) take all reasonable steps to ensure compliance by the holder of the waste management license with the license conditions and requirements and the provisions of this Act; and

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<sup>1</sup> The

- (d) promptly report any non-compliance with any license conditions or requirements or provisions of this Act to the licensing authority through the most effective means reasonably available.

The WMCO must be in a position of management and must be supplied with a letter of appointment with a terms of reference. The terms of reference must relate to all matters concerning waste and should include:

- Manage all waste handling contractors and it is recommended that the WMCO is involved in the construction of the contractual arrangements with the service provider.
- Manage and report on the waste management accounting system;
- Manage all measuring and monitoring functions;
- The overseeing of all auditing functions;
- Maintain all records relating to waste;
- Undertake all necessary investigations and implementation of findings thereof;
- Undertake and implement all remediation measures identified during inspections, internal, external and regulatory audits.
- Ensure matters are reported to a senior management review;
- Ensure relevant authorities are notified in accordance with the WML.

## **4 Waste Characterisation**

### **4.1.1 Wastes Generated**

Solid wastes generated include slag, refractory waste, metallurgical wastes (baghouse dust) and mill scale. Small volumes of sludge from water treatment plants (See Section 7) can be expected. General domestic solid waste will be produced. Wet sludge from the conservancy tank can be expected.

### **4.1.2 Solid Waste Characterisation**

Waste is categorized as general waste and hazardous waste. General waste is waste which does not pose an immediate hazard or threat to health and/or environment and includes:

- Domestic waste;
- Construction and demolition waste;
- Business waste; and
- Inert waste.

Waste streams which are considered to be general waste are listed in Table 1 below.

### **4.1.3 Hazardous Waste Classification**

It is noted that metallurgical wastes, slag and refractory materials are not considered hazardous by the proponent. There is sufficient background information pertaining to the constituents within the materials to justify the non-hazardous nature of the material however, there is no analysis to confirm this. Internationally, there is a plethora of information on the use of slag in road construction and aggregate industries. Furthermore, there are several foundries in the country which have delisted their slags and metallurgical wastes. However, the current Minimum Requirements does not facilitate delisting based on information other than analysis using Toxicity Chemical Leaching Potential (TCLP) analysis. Hence the authorities are likely to consider the material hazardous until such time as the material can be analysed or until such time as the legislation changes and SANS 10234 can be utilized.

Hazardous wastes are those wastes that contain organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics, have a detrimental impact on health and the environment. Potential hazardous wastes are listed in Table 2.

**Table 1: Typical General Waste Category**

Sub Category	Description
Domestic Waste	Waste generated typically from canteens and offices. Although classified as a general waste, this waste contains organic substances and small volumes of hazardous substances (DWAF, 1998).
Paper and Cardboard Waste	Solid waste composed of paper and cardboard and typically found in offices and administrative areas as well as goods receiving / despatch areas where materials often arrive packaged in cardboard boxes.
Food Waste	Wastes generated in the preparation of food stuffs and unconsumed food stuffs emanating from the canteen.
Garden Refuse	Solid decomposable waste from the maintenance of gardens and grounds.
Building Rubble	Waste building materials, packaging, and rubble resulting from construction, remodelling, repair, and demolition operations.
Metal Waste	Ferrous and non-ferrous metal usually generated as a result of manufacturing, servicing and general maintenance.
Mineral Waste <sup>2</sup>	Operational waste that is generated as a result of the metallurgical process, spillage of minerals from materials conveyance systems and stormwater drains (silt). Constituents often include: <ul style="list-style-type: none"><li>• Metallurgical slag</li><li>• Refractory materials</li></ul>
Wood Waste	The majority of wood waste comprises old or damaged dunnages and packing materials associated with storage and loading / offloading of cargoes.

<sup>2</sup> Currently this waste is not confirmed as general waste and is dealt with in both general and hazardous waste sections

**Table 2: Typical Hazardous Waste Category**

Sub Category	Description
Hydrocarbon Waste	Oily substances arising as a waste product of the use of oils / greases in a wide range of industrial and commercial activities, such as engineering, power generation and vehicle maintenance. Liquid and solid waste containing hydrocarbons which occur as a result of spillages, as waste oils from maintenance, hydrocarbon containers and oil contaminated materials.
Asbestos Waste	Waste materials containing Anon friable and/or 'friable' asbestos material in a concentration greater than 1% asbestos by volume. Asbestos in a fibre form can be, when dry, crumbed or reduced to powder by hand pressure.
Chemical Waste	<p>Chemical waste includes solids, liquids or gases containing or contaminated with any of the following: (these include certain paints, disinfectants, cleaning agents, batteries, explosives etc)</p> <ul style="list-style-type: none"> <li>▪ Flammable wastes;</li> <li>▪ Leachate toxic materials (e.g., heavy metals, pesticides);</li> <li>▪ Corrosives;</li> <li>▪ Reactives such as oxidizers, explosives, unstable materials and water-reactive materials;</li> <li>▪ Toxic materials including mutagenic, carcinogenic, acute or chronic toxicity materials;</li> <li>▪ Polychlorinated biphenyls (&gt; 50 ppm concentration).</li> </ul>
Fluorescent Tube Waste	Burnt out fluorescent light bulbs containing toxic materials such as mercury, cadmium and lead.
Medical Waste	Anatomical materials used in the clinic such as soiled surgical dressings, hypodermic needles, sharps and other materials requiring special disposal procedures.
Mixed Waste	Waste that has not been subjected to any form of screening and/or separation and therefore comprises an undetermined ratio of general and hazardous waste. Waste of this type is considered hazardous by means of the precautionary principle.
Mineral Waste	<p>Mixed operational waste that is generated as a result of the spillage of minerals from materials conveyance systems, stormwater drains (silt) and settled dust from the off-gas filtration plant. Constituents often include:</p> <ul style="list-style-type: none"> <li>▪ Baghouse filter dust</li> <li>▪ Ash from re-heater</li> <li>▪ Process water sludge</li> </ul>
Sewage Waste	Untreated sewage requiring treatment in a sewage treatment works.
Wastewater Treatment Sludge	Sludge emanating from the wastewater treatment works may comprise high salt content, metal content and oily sludges



**Table 3: Waste generation matrix**

Area Number	Area name	Hydrocarbon Waste	Asbestos Waste	Chemical Wastes	Fluorescent Tube Waste	Medical Waste	Mixed Waste	Mineral Waste	Industrial Solid Waste	Sewage Waste	Domestic	Paper and Cardboard	Food Waste	Garden Waste	Building Rubble	Metal	Mineral Waste	Wood Waste
	Weigh Bridge	X			X						X	X						
	Raw Material off-load	X					X											X
	Melt Shop	X		X	X		X	X			X	X			X	X	X	X
	Continuous Caster	X	X	X	X		X	X			X	X			X	X	X	X
	Billet Storage	X			X						X	X			X	X		X
	Pre-heater	X	X				X		X		X				X			
	Hot Rolling Mill	X	X	X	X		X				X	X			X	X	X	
	Billet and Bar Distribution				X						X	X			X	X		X
	Mechanical Workshop	X	X	X	X		X		X		X	X			X	X		X
	Electrical Workshop	X	X	X	X		X		X		X	X			X	X		X
	Air Separation	X		X	X										X			

Area Number	Area name	Hydrocarbon Waste	Asbestos Waste	Chemical Wastes	Fluorescent Tube Waste	Medical Waste	Mixed Waste	Mineral Waste	Industrial Solid Waste	Sewage Waste	Domestic	Paper and Cardboard	Food Waste	Garden Waste	Building Rubble	Metal	Mineral Waste	Wood Waste
	Unit																	
	Offices and Ablutions			X	X					X	X	X	X					X
	Open Areas			X	X		X	X			X			X				X
	Clinic				X	X	X				X	X						
	Conservancy Tanks									X								
	WWTW	X		X	X		X				X				X			X
	Canteen												X					

## 5 Solid Waste Management

A solid waste management area will be constructed to store solid wastes. The construction of the waste management area will be defined by the waste classification but is likely to be a lined system. The draft Regulations for the Norms and Standards for the Storage of Waste will be applied for the construction requirements.

The following objectives for solid waste management are developed:

- No impact to the environment through the storage of solid wastes.
- Slag, refractory lining and metallurgical waste will be sent to recycling operations to recover metallic constituents or for use as an aggregate.
- Metallurgical waste (millscale) can be briquetted and returned to the foundry for re-use or sent to a recycling operation.
- Sludge from water treatment, will be of small volumes and will be disposed of at a suitably registered and constructed facility eg. Shongweni (pending Classification).
- General wastes will be despatched to recycling operations or to landfill for disposal.

### 5.1 Storage Locality

The process waste storage area will be located at the south eastern portion of the site. These facilities will be a roofed structure with stormwater run-off being diverted around the structure. The facility will need to be secured with authorised personal only allowed into the facilities. Furthermore, it will be managed by a foreman with the WMCO overseeing operations.

General waste will be stored in a central waste area and where possible waste materials will be separated for recycling and diversion from landfill. The waste storage area will be secured and placed on an impermeable standing.

## **6 Waste Infrastructure**

### **6.1 General Waste Receptacles**

Waste Containers must be suitable for the purpose, volume, handling and nature of the waste. Please see Appendix A for examples of waste infrastructure which is applicable. The following general requirements are made:

- Containers must be of sufficient strength and must not break under normal use;
- Containers must be handled under appropriate safety requirements and all waste lost during handling must be contained;
- Waste must be stored in covered containers;
- Liquid wastes stored in leak resistant containers and inspected weekly;
- Foundations, where appropriate, must be protected and be resistant to internal and external wear, vibration, chemical activity, fire, heat or activities which may cause failure of the foundation;
- Lining of containers, where appropriate, must be compatible with the substance stored therein and must meet relevant standards (SANS etc).

### **6.2 Hazardous Waste**

All areas constructed for the storage of hazardous waste should be:

- Designed by a professional engineer;
- Impermeable/hardstanding;
- In the case of liquid waste storage the facility must be surrounded by a interception trench; must have secondary containment with 110% of the largest tank capacity or 25% of the total storage capacity (whichever is greater);
- In case of hazardous wastes should be covered by a roofing structure or have an impervious lid;
- The facility must be able to provide drainage and containment of all run-off with the capacity of maintaining 500mm freeboard under conditions of flooding;

#### **6.2.1 Medical Waste Receptacles**

- Re-usable containers must be disinfected before re-use and meet standards specified in SANS;
- Floors of the storage area must be disinfected twice per day;

- Sharps stored in puncture proof, rigid and tamper proof containers which are clearly marked;
- Stand alone plastic bags must have a minimum thickness of 80µm whilst liners must be of 60µm;

### 6.2.2 Ash Storage

The ash generated by the reheating furnace will be stored at the furnace in an enclosed and secured receptacle (skip) until collection by the waste management service provider.

### 6.2.3 Asbestos Waste

Asbestos waste generated in the caster will need to be double bagged and disposed of at a registered landfill. The handling of asbestos waste will need to be undertaken in terms of the Policy on the handling and disposal of asbestos and asbestos containing waste in terms of Section 20 of the Environment Conservation Act (ECA).

## 7 Liquid Waste Management

### 7.1 Sewage

Sewage is contained in a conservancy tank and serviced by a registered provider. Sludge is to be sent to the nearest water treatment works, namely the Southern Wastewater Treatment Works (SWWTW). Sewage may be treated for recovery of water and re-used within the process water system however, sludge waste will still be generated from this operation and will be stored until disposal at the SWWTW.

### 7.2 Liquid Oily Waste

Oily waste generated from the caster, roll mill and workshops will be sent to oil recycling operations. Suitably licensed facilities will be used with a preference for National Oil Recycling Association of South Africa (NORA: SA) members.

### 7.3 Wastewater

Water is integral to the steel making process for cooling of furnaces, casting moulds and rollers. Cooling water is re-used within the process to reduce consumption. Water quality is important to ensure that scaling does not occur in the cooling systems. Requisite soft water specification is achieved through ion exchange and demineralisation. The potential configurations of water treatment is as follows:

- RO – Demineralisation – Mix Bed; and
- RO – RO

In both cases reject water will produce wastewater or sludge/brine. Solids are contained in lined beds with sludge removal being conducted on demand. Solids are then disposed of at a registered landfill.

## **8 Waste Management**

### **8.1 Waste Management System**

DAS Steel has decided to obtain accreditation to ISO14001 Environmental Management Systems (EMS), ISO 9000 Quality Management and Total Quality Management.

These systems will deal with the management of wastes, set targets and aim to achieve continuous improvement. This document will form a starting point for the EMS development. The EMS will have *inter alia*:

- Policy;
- Legal Register;
- Aspects and Impacts;
- Environmental Program; and
- Management Plans & Procedures.

This document is to be updated during the course of the EMS implementation.

### **8.2 Waste Information Systems**

#### **8.2.1 Colour coding of waste streams**

At this point there is no proposed waste colour coding system. This will be determined through the EMS development.

### **8.3 Access and Notices**

Access to hazardous wastes is restricted to those who are responsible for the handling of the waste materials. Securing several areas is not likely to be practical, however the waste yard should be secured with access being managed through the responsible foreman and the WMCO.

All waste areas must display signage of waste storage and describe hazards posed by waste. The notices should include contact details for the WMCO and the foreman responsible for the area. Future regulations will require a WSDS which will need to be developed on gazetting of the regulations. Operational Measures

Waste management procedures must be developed for each waste stream and used in waste management training and auditing. The waste management procedures must be developed for each of the sub category wastes. This will be finalized during the development of the EMS. An example of these is provided in Appendix B. The following management aspects must be adhered to:

- The facility must be operated within the constraints of the design capacity;
- Separation at source of waste streams should occur, where feasible;
- Documented procedures to prevent mixing of waste streams must be produced;
- Waste must be managed in accordance with an approved EMS, waste management plan or industry waste management plan;
- Health Care Risk Waste must be stored for no longer than 30 days from date of generation.

#### **8.4 Waste Records**

The design, construction, operation and management of the facility must maintain records for a period no less than five years. All records must be available for inspection.

- Records of deviations from the waste management plan must be kept.
- Records of deviations to waste management procedures must be kept.

#### **8.5 Waste Accounting**

A waste accounting system is to be developed in line with the EMS (which is to be developed) and in line with the requirements of the draft Norms and Standards for the Storage of Waste.

The following is considered to be a minimum:

- Waste Stream;
- Waste Type;
- Volume Generated per operation per month;
- Volume Despatched per month;
- Destination of waste material;
- Date of Receipt of Waste Material.

## 8.6 Waste Manifest

A waste manifest is the basis of the waste accounting system and is a minimum requirement for the safe management of wastes leaving the site. The manifest or waybill is a document that is signed by both the transferee and transferor at each stage as it is passed from one authorised person to the other and a copy is retained by both parties. This document can also act as proof of final destination of a particular consignment of waste.

- The contact details of the consignee and consignor
- The quantity of waste transferred (kg if possible)
- Type, size and packaging
- Description of the waste

## 8.7 TREMCARD

In addition, when transporting dangerous goods in larger quantities (as stipulated for the UN Number of the Category Of Dangerous Goods) the operator of the vehicle is required to carry instructions in writing as a precaution against accident or emergency during the transporting. These written instructions are commonly referred to as a TREMCARD. For South African requirements, further emergency details can be obtained from SANS 10232-1.

## 9 Waste Management Training

A training program and waste awareness program must be developed.

The awareness program must deal with the management of wastes on the site and the benefits of avoidance of waste generation. Awareness is a continual program and can comprise of tool box talks, employee notices and formal instruction.

Training must comprise of:

- Induction of employees and contractors;
- Official on-site instruction courses;
- Supervision and inspection training.

The content of training programs must include:

- Identification of waste streams;
- Instruction on hazards associated with hazardous wastes,
- Precautionary measures and handling measures;
- Waste Management Procedures ;



- Spill and contingency procedures; and
- Appropriate handling and clothing.

Records of all training must be maintained as per Section 8.4.

## **10 Emergency Preparedness**

An emergency plan is to be established and approved by the Board of Directors. The Emergency Plan should comprise the following:

- Emergency Planning;
- Hazard Identification;
- Emergency Organogram and Contact Details;
- Emergency Procedures;
- Emergency Classification;
- Remedial Actions;
- Emergency Training and Awareness.

## **11 Environmental Inspection and Monitoring**

### **11.1 Inspections**

Inspection of all waste management facilities and infrastructure must be undertaken by the WMCO or delegated persons. The inspections must check for integrity and functioning of containers, piping, tanks and valves on a weekly basis for hazardous wastes.

Secondary containment systems must be checked weekly or after significant rainfall events to ensure containment capacity is not consumed and drainage is not adversely affected.

Spill response kits must be inspected weekly to ensure the capacity, adequacy and appropriateness of the contents of the kit.

Key findings of inspections and any remedial action implemented, must be recorded.

### **11.2 Environmental Monitoring**

Environmental monitoring is a key function demonstrating the effectiveness of waste management and providing a measure for protection for the degradation of the surrounding environment. The environmental monitoring is incorporated into the environmental management plan and comprises of:

- Air Quality Monitoring;

- Particulate Monitoring;
- Surface Water Monitoring;
- Groundwater Monitoring; and
- Occupational Health and Safety Risk Assessments and Surveys.

Internal and External Audits perform an important role in environmental monitoring (see Section 12).

## **12 Waste Management Auditing**

### **12.1 Internal Audits**

Internal audits must comprise of both Observed Tasks Assessments (OTA) and scheduled internal audits of the waste management areas and waste management activities.

Observed Task Assessments must be carried out by the appointed WMCO and should be conducted on a bi-weekly basis of selected waste management activities. An official observation assessment report should be generated based on the approved waste management procedure. The reports are filed and provided for review during the external audits and potential regulator assessments.

The quarterly internal audit is to comprise of a minimum of:

- Waste infrastructure integrity;
- Waste infrastructure capacity;
- Waste handling procedures; and
- Waste handling training and awareness.

### **12.2 External Audits**

An external audit should be conducted on an annual basis by an experienced independent waste management practitioner. The external audit should include:

- WML compliance assessment;
- Waste accounting review;
- Waste infrastructure inspection;
- An assessment of the extended producer responsibility function;
- A review of waste classification records;
- An assessment of monitoring data;
- Review of the complaints register.

The external audit must provide non-compliance findings and recommendations, including implementation target dates, for the relevant findings.

### 12.3 Downstream Audits

Audits of recyclers and disposal facilities of waste materials must be carried out on an annual basis. This function may be carried out by the operator or an appointed independent experienced waste practitioner. This exercise is to ensure cradle to cradle/cradle to grave principals and extended producer responsibility are upheld. A formal report must be generated and archived for inspection upon request by authorities, the board of directors and external audits.

## 13 Waste Management Records

The following records should be maintained regarding waste management

Waste Management License	Waste Inventory	Infrastructure	Waste Management Building Plans
Waste Accounting Records	Waste Manifests		Waste Inventory
Internal Audit Reports	External Audits		
Waste Management Training	Legal Appointment Letters		
Environmental Monitoring	Waste Classification Reports		
Waste Accounting Records	Waste Manifests		
Internal Audit Reports	External Audits		
Waste Management Training	Legal Appointment Letters		
Environmental Monitoring	Waste Classification Reports		

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## Appendix A

	<p>Wheelie bin - Injection moulded high density polythene (HDPE) wheelie bins are ideal for storage of solid waste (general or hazardous) and have the advantages of a large capacity (120 litres), range of available colours to suit colour coding requirements, ease of mobility, and general durability.</p>	<ul style="list-style-type: none"> <li>▪ General domestic waste;</li> <li>▪ Recyclable waste;</li> <li>▪ Paper and cardboard;</li> <li>▪ Mixed waste (sweepings);</li> <li>▪ Metal Waste</li> <li>▪ Medical Waste</li> </ul>
	<p>Waste skips - large volume waste receptacles available in sizes ranging from 6m<sup>3</sup> to 22m<sup>3</sup> sizes. Skips are generally constructed from 4.5mm mild steel and are durable enough for the storage of heavy industrial waste. 6m<sup>3</sup> skips can be lifted and transported by 8 and 16 ton vehicles. It is recommended that skips be sealed and lidded for the storage of hazardous waste types.</p>	<ul style="list-style-type: none"> <li>▪ Pre-heating ash</li> <li>▪ WWTW sludge</li> <li>▪ Mineral Waste</li> <li>▪ Mixed Waste</li> <li>▪ Wood Waste</li> <li>▪ Building Rubble</li> <li>▪ Garden Waste</li> <li>▪ Metal Waste</li> </ul>

	<p>Intermediate Bulk Containers - IBC's can be conveniently used for both the storage and transport of liquid waste and make very effective use of the available space.</p>	<ul style="list-style-type: none"> <li>▪ Liquid Hydrocarbon Waste</li> <li>▪ Liquid Chemical Waste</li> </ul>
	<p>Bulk bags - for the storage and distribution of unconsolidated materials in bulk. The bags can be re-used and provide signage</p>	<ul style="list-style-type: none"> <li>▪ Spent refractory waste;</li> <li>▪ Metallurgical waste;</li> <li>▪ Paper and Cardboard;</li> <li>▪ Mixed Waste ; or</li> <li>▪ Mineral Waste</li> </ul>
	<p>Plastic bags - 25-50kg for the storage and distribution of unconsolidated materials which prevents the generation of fugitive dust on site and during transport. Can contain signage and colour coded.</p>	<ul style="list-style-type: none"> <li>▪ Refractory waste; or</li> <li>▪ Metallurgical waste.</li> </ul>
	<p>Asbestos bags - double bag of minimum 70micron thickness providing hazard warnings.</p>	<ul style="list-style-type: none"> <li>▪ Asbestos sheets</li> </ul>
	<p>Medical waste containers - for sharps and swabs/biological waste with hazard identification</p>	<ul style="list-style-type: none"> <li>▪ Medical waste</li> </ul>



	<p>Fluorescent tube container – storage device for used FLT's for disposal by service provider. Provides protection against accidental breakage and efficient handling.</p>	<ul style="list-style-type: none"> <li>▪ FLT</li> </ul>
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## **Appendix B**

Example: Waste Management Procedure

Procedure Number: HWP6

### PROCEDURE FOR MANAGEMENT OF MINERAL WASTE

#### **Activity areas**

All areas of bulk materials handling, conveyance systems, off-gas baghouses where spillage of materials generates mineral waste must have dedicated areas for the placement of mineral waste receptacles. The waste receptacle should comprise of:

- The area must be clearly signposted as [MINERAL WASTE]
- The waste receptacle may be a yellow wheelie bin or a yellow skip, depending on volumes of waste produced in the area
- The area should be covered and protected from the elements (specifically rain)
- The area should be readily accessible for removal to storage area

All collected mineral waste should be placed into a yellow wheelie bin. Bins should be fitted with lids and should be kept closed in order to prevent spillage and fugitive dust generation.

In areas of high volume mineral waste generation, a good quality yellow skip with a lid may be used. The lid should be kept closed in order to prevent spillage and fugitive dust generation.

Skips and wheelie bins should be labelled as follows:

<b>MINERAL WASTE</b>	
HAZARDOUS WASTE	
Waste Type	Solid waste, no liquids
Area	Filtration Plant
Procedure	HWP6
Last Emptied	yy/mm/dd

#### **Cleaning of drains and collection of silt**

- Drains are to be inspected for blockage on a bi-weekly basis. Areas of blockage are to be reported to the SHEQ Manager.
- Drains are to be cleaned out on a monthly basis using a drain cleanout team/contractor. A schedule of monthly cleanouts
- A mobile skip unit is to follow the cleanout team to load potentially contaminated silt and transport the waste directly to the storage area.

### **Transfer of Mineral and Sludge Waste to the storage area**

On arrival at the STORAGE FACILITY, mineral waste is to be placed directly into the mineral waste storage skip in the dedicated Hazardous waste section. The mineral waste storage skip must be:

- clearly signposted as [MINERAL WASTE]
- covered and protected from the elements (specifically rain)

The waste contractor in conjunction with the SHEQ Manager, will co-ordinate the collection of mineral waste from the mineral waste storage area as a minimum every four weeks.

On collection mineral waste skips should be placed directly onto the truck from within the storage facility. Care must be taken to prevent spillage during the loading procedure. The skips should be covered in order to prevent spillage and fugitive dust generation during transport to the waste facility for disposal.

The vehicles transporting the mineral waste for off-site disposal should be suitably licensed and carry safety signage. Prior to leaving the site the vehicle should report to the weighbridge prior to leaving the site and records of volumes disposed of should be kept.

Emptied wheelie bins are to be stored in a demarcated area inside the mineral waste storage area until such time as they are required as replacements for full drums at the activity areas. This area is to be signposted as [EMPTY MINERAL WASTE DRUMS]

### **Documentation**

On an annual basis the mineral waste removal contractor (who may be the waste contractor) must provide documentation to the SHEQ Manager detailing the intended location of disposal, and all necessary certifications (e.g. Scheduled Trade Permit).

A weigh bill must be generated whenever mineral waste is collected and removed from the site. The weigh bill must specify the amount of mineral waste removed from site, and the date of removal.

Weigh bills are authorised by the SHEQ Manager before any mineral waste is permitted to leave the site. These are to be filed by the waste contractor and forwarded to the SHEQ manager along with other waste waybills on a monthly basis.

A monthly reporting checklist is to be completed by the waste contractor and included in the monthly submission of weigh bills to the SHEQ Manager.

**Staff Training**

All employees and contractors responsible for the collection, transport or storage of mineral and sludge waste are to be trained on the respective methodologies contained in this procedure, and the clean up of any spillage, should it occur. Records of the training must be kept by the SHEQ Manager.

**History of Changes**

A. As a result of incidents	B. As a result of audit findings
C. Changes in Operating Procedures	D. Changes in Legislation
E. Changes in Technology	F. Changes in Machinery/Equipment
G. Results of risk assessments	H. Change in training requirements
I. New procedure format	J. Change due to spelling or grammatical error

The following changes have been made to this procedure:

Date of change	Revised Item (Paragraph number); include a reference if it is applicable	Reason	Name of reviewer	Signature of author