



DMS POWDERS

Waste Management License

Application - draft EMP

Locality: Meyerton, Gauteng Province

Departmental Ref No: 12/9/11/L1128/3

Date: 15 April 2014

SHANGONI
Management Services (Pty) Ltd



DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMP)

DMS POWDERS

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Application - draft EMP**

Locality: Meyerton, Gauteng Province

Departmental Ref No: 12/9/11/L1128/3

15 April 2014

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PROJECT DETAILS

Department of Environmental Affairs

Reference No.: 12/9/11/L1128/3

Project Title: DMS Powders – Hazardous waste storage, Ferrosilicon (FeSi) powder production and the construction of a Wastewater Treatment Works: Waste License Application

Project Number: DMS/EIA/12-01-31

Compiled by: Ms Christelle Hermann

Date: 15 April 2014

Location: Meyerton, Gauteng Province

Technical Reviewer: Ms Lizette Crous



Signature



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LIST OF ABBREVIATIONS

AQMP	-	Air Quality Management Plan
BID	-	Background Information Document
BTEX	-	Benzene, Toluene, Ethylbenze and Xylenes
CRR	-	Comments Response Report
DEA	-	Department of Environmental Affairs
DMS	-	Dense Medium Separation
EAP	-	Environmental Assessment Practitioner
ECA	-	Environmental Conservation Act of 1989
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EMF	-	Environmental Management Framework
EMP	-	Environmental Management Programme
FeSi	-	Ferrosilicon
GDARD	-	Gauteng Department of Agriculture and Rural Development
GN	-	Government Notice
HDI	-	Human Development Index
I&AP	-	Interested and Affected Party
IDP		Integrated Development Plan
NEMA	-	Environmental Management Act, Act 107 of 1998 as amended
NEMWA	-	National Environmental Management: Waste Act, Act No. 59, 2008
R	-	Regulation
S&EIR	-	Scoping and Environmental Impact Reporting
SDM	-	Sedibeng District Municipality
SAHRA	-	South African Heritage Resources Agency
SWMP	-	Storm Water Management Plan
TCLP	-	Toxicity Characteristic Leaching Procedure
VTAPA	-	Vaal Triangle Air-shed Priority Area
WWTW	-	Wastewater Treatment Works



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Shangoni Management Services (September 2012), *Specialist Groundwater Investigation Phase I*, Pretoria, Gauteng.

Shangoni Management Services (February 2013), *Specialist Groundwater Investigation Phase III* Pretoria, Gauteng.

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Vaal Triangle Airshed Priority area Air Quality Management Plan, Government Notice No 613, Government Gazette No 32263, (May 2009).

World Bank Group, 2007. Environmental, Health and Safety Guidelines for Foundries.

Refer also to Part 4 regarding relevant environmental legislation.



1. INTRODUCTION

Dense Medium Separation (DMS) Powders produces ferrosilicon (FeSi) powders for use in dense media separation technology. DMS is located on Portion 4 and 36 of the farm Kookfontein 545 IQ in Meyerton, which is approximately 8.7km to the north of Vereeniging, in the Gauteng Province.

Steel shavings, obtained from drilling operations, are used as an input for the FeSi production process (formerly GN 718, Category B, Activity No. 2 and 3, and now triggering GN 921, Category B, Activity No. 2 and 3). The steel shavings are stored in large unroofed stockpiles (formerly triggering GN 718, Category A, Activity No. 2, and now not subject to waste management licensing (Category C)). A Wastewater Treatment Works (WWTW) has been proposed to treat/purify the affected storm water runoff from the steel shaving stockpile area (formerly GN 718, Category A, Activity No. 11, 18 and 19, and now not subject to waste management licensing).

This EMP specifies mitigation measures that are applicable to the below listed activities (1.1 and 1.2) for the operational phase of the project, i.e. the production of FeSi powder.

1.1 GN 921 OF 29 NOVEMBER 2013, CATEGORY B, ACTIVITY NO. 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”

1.2 GN 921 OF 29 NOVEMBER 2013, CATEGORY B, ACTIVITY NO. 3:

“The recovery of waste including the refining, utilisation, or co-processing of the 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”.



2. ENVIRONMENTAL ASSESSMENT PRACTITIONER

Name of firm	Shangoni Management Services (Pty) Ltd.	
Postal address	PO Box 74726 Lynwood Ridge Pretoria 0040	
Telephone No.	(012) 807 7036	
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Team of Environmental Assessment Practitioners (EAP) on project		
Name	Qualifications & experience to conduct the Waste Management License Application and EIA	Responsibility
Lourens De Villiers	<ul style="list-style-type: none"> • MSc.(UP) • BSc. (Hons) (PU for CHE) • More than 12 years' experience conducting Environmental Impact Assessments and Waste Management License Applications 	Project Director
Lizette Crous	<ul style="list-style-type: none"> • Post Graduate Certificate Environmental Management (University of London) • More than 2 years' experience conducting Environmental Impact Assessments and Waste Management License Applications 	EAP
Christelle Hermann	<ul style="list-style-type: none"> • BSc (Hons) Environmental sciences (PU for CHE) 	Junior EAP

3. SITE DOCUMENTATION

The following documentation must be available at the site office at all times:

- A copy of the Environmental Impact Assessment (EIA) Report.
- A copy of this Environmental Management Programme (EMP).
- A copy of the Waste Management License.



4. LEGISLATION, BYLAWS & GUIDELINES

4.1 LAWS OF GENERAL APPLICATION

The list below form part of the general legislation within the Republic of South Africa:

- Constitution of the RSA, 1996 (Act No 108 of 1996);
- National Environmental Management Act, 1998 (Act No 107 of 1998);
- Environment Conservation Act, 1989 (Act No 73 of 1989, as amended); and
- Promotion of Access to Information Act, 2000 (Act No 2 of 2000, as amended).

4.2 Atmospheric emissions

The National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004) was promulgated in 2004 and this act repealed the old Atmospheric Pollution Prevention Act, 1965 (Act No 45 of 1965). Together with the new act is a list of activities indicated what standard needs to be complied with for the different industry types.

The documents listed below are strategic planning documents related to the Vaal Triangle Airshed Priority Area:

- Vaal Triangle Airshed Priority area Air Quality Management Plan, 29 May 2009, Government Notice No 613, Government Gazette No 32263 of 28 May 2009;
- Proposed regulations to provide for the application for atmospheric emission license and matter pertaining to the implementation of the atmospheric emission licensing system, General Notice No 141, Government Gazette No 32962 of 17 February 2010;
- Gauteng Province Air Quality Management Plan, GDARD, August 2009;
- Declaration of the Vaal Triangle Air-shed Priority area in terms of Section 18(1) of the National Environmental Management: Air Quality Act 2004, (Act 39 of 2004), Government Notice No 365, Government Gazette No 28732 of 21 April 2006;
- Regulation for implementing and enforcing the Vaal triangle Air-shed Priority Area Air Quality Management Plan, Government Notice 614, Government Gazette No 32254 of 29 May 2009; and
- Vaal Triangle Air-shed priority Area (VTAPA) Implementation Report one, DEAT, September 2011.

4.3 Water Management

- National Water Act, 1998 (Act No 36 of 1998); and
- Government Gazette Notice No 1199 of 2009, Department of Water Affairs and Forestry – Replacement of general authorisations in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998).



4.4 Waste Management

- National Environmental Management: Waste Act, 2008 (Act No 59 of 2008);
- Government Notice No. 921 of 29 November 2013: List of waste management activities that have, or are likely to have, a detrimental effect on the environment;
- Government Notice No. 926 of 29 November 2013: National Norms and Standards for the Storage of Waste;
- Government Notice No. 634 of 23 August 2013: Waste Classification and Management Regulations; and
- Government Notice No. 635 of 23 August 2013: National Norms and Standards for the assessment of waste for landfill disposal.

4.5 Planning of new activities

- National Environmental Management Act, 1998 (Act No 107 of 1998).

4.6 Biodiversity

- National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004);
- Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983);
- National Veld and Forest Fire Act, 1998 (Act No 101 of 1998);
- Agricultural Pest Act, 1983 (Act No 36 of 1983, as amended) – GN R276 of 5 March 2004;
- National Fencing Act, 1963 (Act No 31 of 1963, as amended); and
- National Forest and Fire Laws Amendment Act (Act No 12 of 2001).

4.7 Land and Soil Management

- National Environmental Management Act, 1998 (Act No 107 of 1998); and
- Environmental Conservation Act, 1989 (Act No 73 of 1989).

4.8 Heritage resources

- National Heritage Resources Act No 25 of 1999 (Act No 25 of 1999, as amended).

4.9 Protected areas

- National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003, as amended).

During the course of the project phases, the applicant and its contractors must comply with all other relevant legislation (including the bylaws of the local municipality).



5. ENVIRONMENTAL MANAGEMENT PROGRAMME

Refer to the tables below for the EMP. Responsibility is assigned to the relevant parties, keeping in mind that DMS Powders are ultimately still responsible for ensuring implementation of the EMP. The EMP must be updated should any significant changes occur to the operations with regards to the ferrosilicon powder production process.

The mitigation measures are set out in the tables below (per project phase), for the ferrosilicon powder production process.

5.1 GN 921 OF 29 NOVEMBER 2013, CATEGORY B, NO. 2 AND 3

5.1.1 Pre- construction and Construction phase, Operational phase and Decommissioning phase

Table 1: EMP - Pre-construction and Construction phase, Operational phase and Decommissioning phase - Environment in general

Activity:					
<ul style="list-style-type: none"> Operational activities as part of the Ferrosilicon powder production process. 					
Aspect:					
<ul style="list-style-type: none"> Lack of knowledge amongst workers and contractors in terms of how their actions may impact on the environment. Equipment failure. 					
Applicable Alternatives: Proposed activity (development option)					
Impact Description	Environmental Objective	Management / Mitigation Measures	Monitoring and Compliance Reporting	Timeframe	Responsibility
Construction Phase					
As this Environmental Impact Assessment process is for the licensing of an existing, operational facility, no construction activities will occur and there are therefore no construction phase impacts.	N/A				
Operational Phase					
Harm to the environment in general (this can include pollution of soil and water resources, as well as harm to employees and wasteful practices in terms of resource use and waste management).	To prevent harm to the environment by educating workers and contractors.	<ul style="list-style-type: none"> All employees are required to attend onsite Environmental Awareness/Training prior to commencing work on site. Follow-up Environmental Awareness/Training may be required from time to time as new employees commence work or for specific activities that may potentially impact the environment. The facility manager is to maintain accurate records of any training undertaken. Training is to cover all aspects of the EMP and procedures to be followed, as well as the requirements of DMS Powder’s internal Environmental Management Plan. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
<p>Molten metal is inherently dangerous. When molten metal comes into contact with water or any liquid-bearing-material it instantaneously turns water into steam, expanding 1 600 times its original volume and potentially producing explosions that endanger workers, the surrounding infrastructure and the environment.</p> <p>The furnace coils requires continual cooling to increase electrical efficiency and to prevent them from melting. If an electrical or</p>	To prevent emergencies, such as failure of equipment or control technologies and to ensure optimum operation of the M8 and M9 furnaces.	<ul style="list-style-type: none"> Train employees on the environmental risk of the M8 and M9 furnaces and the manner in which their tasks must be performed. A sufficient number of employees must receive training to cover for leave periods, absences due to illness and public holidays. The facility manager is to maintain accurate records of any training undertaken. Maintenance of the backup cooling system, or its installation if not already in place. Maintenance of the dry spill pits in front of the induction furnaces to contain any molten metal spills, or their installation if not already in place. Maintenance of the ground leak detection system to provide protection against electrical shock and warning of metal to coil penetration, or its installation if not already in place. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager



mechanical failure damages the cooling system, a dangerous build-up of heat and resulting explosion may result.					
Decommissioning Phase					
Closure and decommissioning of the facility is not anticipated for the foreseeable future. Should the facility close, a detailed closure and rehabilitation plan will be submitted to the National Department of Environmental Affairs prior to decommissioning.	N/A				

Table 2: EMP - Pre-construction and Construction phase, Operational phase and Decommissioning phase - Soil, Surface water and Groundwater

Activity: <ul style="list-style-type: none"> The storage of steel shavings (hazardous waste) at the raw materials stockpile area. The generation of general and hazardous waste as part of the Ferrosilicon powder production process. Storage and handling of hazardous chemical substances including fuel, greases and oils. Vehicle and equipment maintenance and fuelling. The production of Ferrosilicon powders. The storage of coal. 					
Aspect: <ul style="list-style-type: none"> Unroofed storage of the steel shavings (hazardous waste) at the raw materials stockpile area. Incorrect management and storage of general and hazardous waste prior to its removal off site. Poor management and spills of hazardous chemical substances including fuel, greases and oils. Leaking and/or spilling of fuels, greases and oils. Incorrect management of wastewater generated as part of the Ferrosilicon powder production process. Inadequate storage and management of coal. 					
Applicable Alternative: Proposed activity (development option)					
Impact Description	Environmental Objective	Management / Mitigation Measures	Monitoring and Compliance Reporting	Timeframe	Responsibility
Construction Phase					
As this Environmental Impact Assessment process is for the licensing of an existing, operational facility, no construction activities will occur and there are therefore no construction phase impacts.	N/A				
Operational Phase					
Surface and groundwater pollution as affected stormwater run-off, generated as rain water infiltrates through the steel shaving stockpiles, flows into the environment. The pollution of surface water can have significant impacts on the sensitive ecological systems usually associated with watercourses.	To ensure that hazardous waste (the steel shavings) is stored in a responsible manner and that affected stormwater run-off is contained and managed correctly to avoid pollution of water resources, as far as possible.	<ul style="list-style-type: none"> Ensure that the raw materials, including steel shavings, are kept on concrete areas to prevent seepage. Implement the storm water management plan developed for DMS Powders (refer to Appendix F) to prevent affected stormwater run-off from the raw material stockpiles from entering the clean water system. Operate the affected stormwater Wastewater Treatment Works in a responsible manner and conduct regular maintenance of the WWTW, sump and pumps as stipulated by the plant designer. Maintenance of the sump and pumps is important to ensure capacity and availability of the system. Brine water will be returned to the M8 and M9 processes and will not be contained or disposed of into the BHP Billiton Pollution Control Dam. Should heavy rainfall events occur (very rare) a first flush principle should be followed to treat the first 200mm of affected stormwater run-off. The remaining water should be allowed to spill over and drain into the BHP Billiton Pollution Control Dam. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager



		<ul style="list-style-type: none"> • Undertake regular Geohydrological Studies to determine the impact of the raw materials, including steel shavings, on groundwater quality. • Implement the groundwater monitoring programme as detailed in DMS's Integrated Water and Waste Management Plan (IWWMP). • Regular review of the monitoring programme by a competent person to identify areas of improvement and additional monitoring requirements. • New hazardous waste storage areas must be registered with the competent authority within ninety (90) days prior to construction taking place. • Waste storage facilities must have correct access control and signage as stipulated in GNR. 926 of 29 November 2013. • Waste storage facilities must be operated as stipulated in GNR. 926 of 29 November 2013. • All waste storage containers must comply with the conditions as stipulated in GNR. 926 of 29 November 2013. • Training must be provided continuously to employees working with waste. The training programme must include the provisions stipulated in GNR. 926 of 29 November 2013. • An Emergency Preparedness Plan must be compiled in accordance with GNR. 926 of 29 November 2013. • Monitoring, auditing, reporting and record keeping must be conducted in accordance with GNR. 926 of 29 November 2013. • All waste storage containers must be labelled, as stipulated in GNR. 634 of 23 August 2013. • All waste transporters must complete waste manifest documents for each load of hazardous waste transported to the site, as stipulated in GNR. 634 of 23 August 2013 (specifically Annexure 2). • Waste manifest documentation must be retained for a period of at least five (5) years. 			
<p>Surface and groundwater pollution due to incorrect management of general and hazardous waste generated at the site.</p>	<p>To ensure correct management of all waste generated on site.</p>	<ul style="list-style-type: none"> • Slag should be re-used as far as possible, or supplied to a licensed third party for re-use or recycling. • Waste must be collected regularly to prevent its accumulation on site. • New hazardous waste storage areas must be registered with the competent authority within ninety (90) days prior to construction taking place. • The location of hazardous waste storage areas must be in accordance with GNR. 926 of 29 November 2013 (National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): National Norms and Standards for the storage of waste). • The design of the hazardous waste storage facility must be conducted in accordance with GNR. 926 of 29 November 2013. • Waste storage facilities must have correct access control and signage as stipulated in GNR. 926 of 29 November 2013. • Waste storage facilities must be operated as stipulated in GNR. 926 of 29 November 2013. • All waste storage containers must comply with the conditions as stipulated in GNR. 926 of 29 November 2013. • Training must be provided continuously to employees working with waste. The training programme must include the provisions stipulated in GNR. 926 of 29 November 2013. • An Emergency Preparedness Plan must be compiled in accordance with GNR. 926 of 29 November 2013. • Monitoring, auditing, reporting and record keeping must be conducted in accordance with GNR. 926 of 29 November 2013. • Take note that hazardous waste includes ash, empty hazardous chemical substance containers, soil and material (e.g. cloths) contaminated by hazardous chemical substances, etc. • Implement a waste management plan/procedure. 	<ul style="list-style-type: none"> • Regular site inspections. • Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>



		<ul style="list-style-type: none"> • The waste management plan/procedure should consider the type of waste, description, source, storage, disposal method, disposal facility and responsible person. • The implementation of the waste management plan/procedure should ensure: <ul style="list-style-type: none"> ▪ Installation of sufficient waste bins, skips or bulk containers. The design of the bins, skips or bulk containers must ensure containment to prevent seepage, must be covered to prevent water ingress and must be placed on impermeable surfaces within bunded areas. ▪ All containers (bins, skips or bulk containers) shall be kept in a clean and hygienic manner. ▪ Containers (bins, skips or bulk containers) utilised for the disposal of general and hazardous waste must be demarcated accordingly. ▪ Waste material may only be temporarily stored at areas demarcated for such storage. ▪ General waste shall be stored in a manner that prevents the harbouring of pests. ▪ General and hazardous waste should always be stored and disposed of separately. ▪ General and hazardous waste should be disposed of in appropriately demarcated bins. Bins are then emptied into appropriately demarcated skips or bulk containers once a week or more often, if required. ▪ Skips or bulk containers should be removed to a licensed landfill site on a regular basis. No build-up of waste is permitted onsite. ▪ Safe disposal certificates should be requested from general and hazardous landfill sites with every waste disposal. Waste may only be disposed of at a licensed landfill in accordance with the Norms and Standards for Disposal to Landfill as stipulated in Section 7(1)(c) of the NEMWA, 2008. ▪ Safe disposal certificates should be kept on file to illustrate compliance with the cradle to grave principle. ▪ Hazardous waste may only be handled by a registered waste disposal company. • All waste generated at the facility must be classified in terms of GNR. 634 of 23 August 2013 (National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): Waste Classification and Management Regulations). • Safety data sheets must be obtained or prepared for all hazardous waste generated at the facility, as stipulated in GNR. 634 of 23 August 2013. • All waste storage containers must be labelled, as stipulated in GNR. 634 of 23 August 2013. • Detailed records must be kept of all waste generated, as stipulated in GNR. 634 of 23 August 2013. This includes the classification of the waste, quantities of waste generated and re-used, recycled, recovered, treated or disposed of (in tons or m³ per month), and by whom the waste was managed. • Waste manifest documents must be compiled for all hazardous waste generated onsite, as stipulated in GNR. 634 of 23 August 2013 (specifically Annexure 2). • All waste transporters must also complete waste manifest documents for each load of waste transported, as stipulated in GNR. 634 of 23 August 2013 (specifically Annexure 2). • Waste manifest documentation must be retained for a period of at least five (5) years. • No incineration of any kind of waste will be permitted onsite. 			
<p>Soil, surface water and groundwater pollution due to poor management and accidental spills of hazardous chemical substances, including fuel, greases and oils used onsite.</p>	<p>To ensure correct management of hazardous chemical substances.</p>	<ul style="list-style-type: none"> • Identify all chemical substances used onsite including fuel, greases, detergents etc. • Obtain the material safety data sheet of each of these chemical substances. • Ensure that the material safety data sheets have sufficient information to enable the user to take the necessary measures to protect his/her health and safety and that of the environment. • Material Safety Data Sheets for all hazardous chemical substances must be readily available on site. 	<ul style="list-style-type: none"> • Regular site inspections. • Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>



		<ul style="list-style-type: none"> • Develop and implement a dangerous goods management plan based on the material safety data sheets of all identified chemical substances and the 1995 Hazardous Chemical Substances Regulations in terms of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993). • Keep a stock inventory register of all chemicals in the store. • Powders must be stored above liquids. • Proper storage of chemicals in a lockable, well ventilated building. • Ensure adequate access control for the storage area. • Storage areas for hazardous chemicals must comply with standard fire safety regulations. • Safety signage including “No Smoking”, “No Naked Lights” and “Danger”, and product identification signs, are to be clearly displayed in areas housing chemicals. • Appropriate equipment to deal with emergency spill incidents must be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks and drums or containers for contaminated water. • Chemicals must be properly labelled and handled in a safety conscious manner. • All personnel handling hazardous chemicals materials must be issued with the appropriate Personal Protective Equipment (PPE). • Ensure that diesel or fuel tanks are in a bunded area with capacity to hold 110% of the total storage volume. • The removal of only the daily-required amount of chemicals to be used from the shed. • If refuelling on site or from drums, the ground must be protected and proper dispensing equipment must be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. • Use of drip trays during filling of machinery or equipment. Drip trays should be emptied into secondary containers on a regular basis. • Ensure that any spilled chemicals cannot exit the designated storage area by constructing a berm or bump at the exit or store chemicals in a spill tray. • Immediately clean any spillage of fuels, lubricants and other petroleum based products. • The contaminated material must be disposed of in accordance with the waste management procedure. • No hazardous chemical may be discarded in the sewage or stormwater system. • Train staff on the use of chemicals in accordance with the risks as described in the material safety data sheets. • Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. 			
<p>Hydrocarbon pollution of soil, surface water and groundwater due to the spilling of fuel, grease or oil or leaking equipment and vehicles.</p>	<p>To ensure the correct management of fuel, grease and oil.</p>	<ul style="list-style-type: none"> • Inspection and maintenance of equipment, generators, diesel tank(s) and vehicles owned by DMS Powders shall take place on a regular basis. • Security shall inspect vehicles on entering the facility to ensure vehicles are in sound condition. This will reduce the risk of oil and diesel spillages. • Equipment, generators, diesel tank(s) and vehicles are to be repaired immediately upon developing leaks. • Diesel storage tanks and bund walls must undergo a yearly integrity assessment. • Generators must be stored on a concrete floor in a bunded area. • Drip trays shall be supplied for all repair work undertaken on machinery on site. • Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to contain incidental spills and pollutants. • Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow. 	<ul style="list-style-type: none"> • Regular site inspections. • Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>



		<ul style="list-style-type: none"> Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site. If refuelling on site or from drums, the ground must be protected and proper dispensing equipment is to be used i.e. hand pumps and funnels. Drums may not be tipped to dispense fuel. All liquid fuels (petrol and diesel) are to be stored in tanks or containers with lids. 			
Surface and ground water pollution due to the release of process water from the M8 and M9 processes into trenches that lead to the BHP Billiton Pollution Control Dam.	To ensure containment and treatment of process water generated in the M8 and M9 production processes.	<ul style="list-style-type: none"> Implement the provisions of DMS Powders' Stormwater Management Plan. Process water must be treated in the process-water treatment works for M8 and M9. Process water may not be released into the stormwater trenches and should be re-used in the M8 and M9 processes. Slag produced in the treatment process must be reworked in the ferrosilicon production process or sent offsite for recycling or re-use by a licensed contractor. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Soil, surface water and groundwater pollution due to incorrect handling and storage of coal.	To ensure the proper handling and storage of coal.	<ul style="list-style-type: none"> Store coal in bunkers as far as possible. If possible, construct a bump/berm at the bunker entrance to prevent rain water from entering the bunker and becoming contaminated. If possible, construct a roof to prevent rain water from being contaminated by the coal. Prevent coal spillages during loading and remove any coal spillages from the soil and return to the coal bunker. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Decommissioning Phase					
Closure and decommissioning of the facility is not anticipated for the foreseeable future. Should the facility close, a detailed closure and rehabilitation plan will be submitted to the National Department of Environmental Affairs prior to decommissioning.	N/A				

Table 3: EMP - Pre-construction and Construction phase, Operational phase and Decommissioning phase - Resources (electricity and water)

Activity:					
<ul style="list-style-type: none"> Storage of treated, affected stormwater from the WWTW in a water reservoir. Operational activities as part of the Ferrosilicon powder production process. 					
Aspect:					
<ul style="list-style-type: none"> Inadequate capacity of the water reservoir for the storage of treated, affected stormwater. Inefficient or redundant use of water and electricity. 					
Applicable Alternatives: Proposed activity (development option)					
Impact Description	Environmental Objective	Management / Mitigation Measures	Monitoring and Compliance Reporting	Timeframe	Responsibility
Construction Phase					
As this Environmental Impact Assessment process is for the licensing of an existing, operational facility, no construction activities will occur and there are therefore no construction phase impacts.	N/A				
Operational Phase					



<p>Compromised storage capacity of the BHP Billiton Pollution Control Dam due to treated stormwater overflowing from the water reservoir and entering the Pollution Control Dam.</p>	<p>To ensure sufficient capacity is available for water storage in the reservoir.</p>	<ul style="list-style-type: none"> Affected stormwater that will be treated in the proposed wastewater treatment works will be stored in a reservoir prior to being used in the ferrosilicon production process. The reservoir levels should always be kept as low as possible so that as much treated water can be stored. This will ensure that minimal treated water needs to be released into the stormwater trenches that feed into the BHP Billiton Pollution Control Dam. The pumps that form part of the affected stormwater treatment plant should be regularly maintained to ensure that water is pumped out of the reservoir to the plant at the required rate. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>
<p>Wastage or depletion of valuable resources (water from the local municipality, via BHP Billiton Metalloys, and electricity from the local municipality) due to inefficient or redundant usage.</p>	<p>To prevent the wastage or depletion of valuable resources (water and electricity).</p>	<p>General</p> <ul style="list-style-type: none"> Ensure that all employees have been informed on the importance of natural resources (proper environmental training and awareness). Regular site inspection by supervisors. Inspect operations regularly to determine areas of improvement with regards to resource consumption. Regular maintenance and inspection of equipment such as hose pipes, to prevent leaks. Monitoring of resource consumption. Identify areas where resource consumption can be minimised. Set targets to try minimise resource consumption. Identify technologies and practices that may reduce resource consumption. Implementation of technologies and practices that can reduce resource consumption. <p>Water</p> <ul style="list-style-type: none"> Regular inspection and maintenance of all JoJo tanks, reservoirs, toilets, water pipes and taps. Leaking JoJo tanks, reservoirs, taps, toilets and pipes are to be repaired immediately. Running water taps and pipes may not be left unattended. All pipe, hose and tap connections are to be fitted with correct and appropriate plumbing fittings. The site Water Balance, as contained in the IWWMP, will be improved and updated, as and when required. <p>Electricity</p> <ul style="list-style-type: none"> Consider technologies in the furnaces that can reduce energy consumption. Consider installation of measures to increase energy efficiencies and limit energy consumption, such as surface insulation and heat recovery systems. Save electricity by turning off lights and computers when leaving the office. Halogen light bulbs convert approximately 80% of the energy used into heat rather than light. Replace spent light bulbs with energy saving CFLs (compact fluorescent lights) or newer and more efficient LEDs (light-emitting diodes). 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	<p>Life of operation</p>	<p>Facility Manager</p>
<p>Decommissioning Phase</p>					
<p>Closure and decommissioning of the facility is not anticipated for the foreseeable future. Should the facility close, a detailed closure and rehabilitation plan will be submitted to the National Department of Environmental Affairs prior to decommissioning.</p>	<p>N/A</p>				

Table 4: EMP - Pre-construction and Construction phase, Operational phase and Decommissioning phase - Atmosphere

<p>Activity:</p> <ul style="list-style-type: none"> Operational activities associated with the Ferrosilicon powder production process. Storage of raw materials (stockpiles), vehicles travelling within the DMS site and the Ferrosilicon powder production process.
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<ul style="list-style-type: none"> Operational activities associated with the Ferrosilicon powder production process. 					
Aspect: <ul style="list-style-type: none"> Ineffective abatement and/or mitigation measures to deal with atmospheric emissions. Generation of dust. Generation of noise. 					
Applicable Alternatives: Proposed activity (development option)					
Impact Description	Environmental Objective	Management / Mitigation Measures	Monitoring and Compliance Reporting	Timeframe	Responsibility
Construction Phase					
As this Environmental Impact Assessment process is for the licensing of an existing, operational facility, no construction activities will occur and there are therefore no construction phase impacts.	N/A				
Operational Phase					
Pollution of the atmosphere and degradation of ambient air quality. The site lies within the Vaal Triangle Airshed Priority Area (VTAPA).	To minimise the release of atmospheric emissions and therefore atmospheric pollution.	<ul style="list-style-type: none"> DMS Powders must ensure compliance with the requirements and conditions of their APPA Registration Certificate in terms of the Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965) and their Atmospheric Emission License in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004). Routine maintenance must be carried out at the plant to ensure optimal functioning and therefore minimal emission generation. Bag filters must be regularly replaced as stipulated by the manufacturer. A complaints register must be kept onsite. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how concern was addressed. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Degradation of ambient air quality.	To minimise the impact of dust on the ambient air quality.	<ul style="list-style-type: none"> Use indoor or covered stockpiles for the storage of raw materials as far as possible. Where not possible, use dust suppression, windbreaks and/or water spray systems to minimise dust generation. Reduce raw material handling steps as far as possible. Regularly clean conveyor belts to remove loose dust. A dustcart needs to be onsite to water down dusty road. Speed bumps or traffic speed signs need to be erected to reduce speeding onsite that could result in the generation of dust. Regular maintenance of vehicles to address wear of tires and breaks. Optimal engine combustion will allow for 'cleaner' exhaust emissions. If the soil is compacted, bare/open areas should be ripped, fertilised and re-vegetated as soon as possible using suitable grass species (indigenous seed mix). A complaints register must be kept onsite. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how concern was addressed. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager
Nuisance to adjacent land owners or tenants as well as a negative impact on workers that are exposed to high dB levels of noise as part of their work.	To minimise the amount of noise generated at the DMS Powders plant.	<ul style="list-style-type: none"> The site workers and contractors will adhere to the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) regarding hearing protection and noise control measures. Enclose and insulate process buildings as far as possible. Insulate ventilation pipes, enclose fans or use dampers to limit noise generation. Where possible, limit transportation and handling of raw materials, including scrap steel, during night time hours. 	<ul style="list-style-type: none"> Regular site inspections. Internal audits against this EMP must be conducted every 6 months and records kept onsite. Shortcomings must immediately be addressed. 	Life of operation	Facility Manager



		<ul style="list-style-type: none"> • Regular maintenance of vehicles, back-up generators and equipment. • All equipment and machinery should be fitted with adequate silencers. • No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site. • A complaints register must be kept onsite. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how concern was addressed. 			
Decommissioning Phase					
<p>Closure and decommissioning of the facility is not anticipated for the foreseeable future. Should the facility close, a detailed closure and rehabilitation plan will be submitted to the National Department of Environmental Affairs prior to decommissioning.</p>	<p>N/A</p>				



6. ENVIRONMENTAL AWARENESS PLAN

The following Environmental Awareness Plan must be implemented by DMS Powders in order to inform their employees and contractors of the environmental risk that may result from their work. The plan must be conducted as part of the induction process for all new employees (including contractors) that will perform work in terms of the proposed activities. Proof of all training provided must be kept on-site.

The Environmental Awareness Plan is referred to as the “SHE match” training programme. The training programme focuses on the following aspects:

1. Explaining clearly what the environment is and what the environment consist of namely: air, water, soil, fauna, flora and people.
2. Once participants have grasped the description of what the environment entails, the training focuses on the potential impacts that the construction and operational activities may have on each one of these environmental components. This is done by making use of the aspect register, where each one of the environmental aspects and associated impacts has been identified.
3. To ensure that the training is effective, visual aids are used. Photos are taken of actual and potential impacts occurring on site and in some cases role-play is used to illustrate a potential impact.
4. The participants are then exposed to a poster that reflects the various environmental components. The various photos taken are posted on the poster on a rotational basis and the participants indicate (based on the visual component) what environmental component was or could have been affected by the activities portrayed on the photo.
5. By doing this the participants visualise the action as well as the potential consequence (environmental impact) of their action.
6. This general awareness training must be done before construction commences and also when new employees start work. The training should be done every two years during the Operational Phase. The poster is posted in the communal area where the impacts are visualised and the photos rotated on a monthly basis.

