

**THE NATIONAL AIR QUALITY MANAGEMENT
PROGRAMME. THE PHASE II - TRANSITION PROJECT**

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17 May 2005

PROCESS TECHNOLOGY CENTRE



CONTRACT REPORT

**THE NATIONAL AIR QUALITY MANAGEMENT PROGRAMME. THE PHASE II -
TRANSITION PROJECT**

86DD / HT

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**This project report is to remain confidential between the CSIR and DEAT and
may not be revealed in any way to a third party without the prior written
permission of the DEAT.**

EXECUTIVE SUMMARY

The Department of Environmental Affairs and Tourism (DEAT) has contracted CSIR Environmentek to execute Phase II of the national air quality management programme. CSIR Environmentek has drawn together a team of appropriate specialists in the field of air quality management to execute the project. Specialists from CSIR Manufacturing and Materials (M&M) were part of the team to address the outputs b.4, Schedule of Listed Activities and b.5, Schedule of Controlled Emitters, as defined in the Tender; E939. In this report the preliminary results for the outputs b.4 and b.5 are presented.

The objectives of this specialist study were:

- To review the existing APPA list of scheduled processes and to compile an updated documented schedule of listed activities;
- To compile a schedule of controlled emitters with related emission standards and a protocol for their identification.

The conclusions of the study were:

- The current APPA list should be largely maintained and some industrial activities are recommended for addition;
- The process descriptions of the APPA list need to be updated in order to ensure that guidelines for all important emissions of the process are composed;
- A first cut for a list of controlled emitters has been made, based largely on known emission sources;
- Actual emissions for controlled emitters are difficult to measure in some cases, but suggestions are made how to address this issue;
- Inspection of appliances regarding emissions will be required in most cases.

The next step for the project will be a review of this report by the DEAT authorities and thereafter the results will be presented at a stakeholder workshop for comments.

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1 INTRODUCTION

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2 OBJECTIVES

The objectives of this specialist study were:

- To review the existing APPA list of scheduled processes and to compile an updated documented schedule of listed activities.
- To compile a schedule of controlled emitters with related emission standards and a protocol for their identification.

3 SCOPE

The scope of the study was:

- To compare the APPA schedule of listed activities with similar lists in Europe (European Pollutant Emission Register EPER) and in the USA (Environmental Protection Agency, EPA AP -42)
- To develop criteria for activities and appliances to decide if such activities and appliances should be regarded as listed activities or as controlled emitters.
- To propose adding or removing listed activities to the APPA list based upon the developed criteria.
- Based upon European and USA data, propose a way to group listed activities into categories.
- To propose a list of appliances, that meets the criteria for controlled emitters.
- To propose a list of activities, that meets the criteria for controlled emitters.

4 APPROACH

The approach to the study was to consult with the relevant staff in DEAT (Air Pollution Control Officers) regarding the listing of appliances and activities according to the definitions in the proposed legislation and the proposed criteria for listing. Consultation with the relevant staff in DEAT regarding the proposed updated legislation on Environmental Impact Assessment (EIA) was done on a regular basis to ensure compatibility between the NAQMP and the EIA legislation.

5 RESULTS

5.1 Listed Activities

5.1.1 Introduction

Listed activities are defined in Section 21. (1) National Environmental Management Air Quality Bill as follows “The Minister or MEC may, by notice in the Gazette, publish a list of activities which result in atmospheric emissions which have or are likely to have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage.”[2]

Regarding standards for listed activities, section 23 (a). (i) and (ii) state: “A notice referred to in subsection (1) may establish minimum emission standards in respect of a substance or mixture of substances resulting from a listed activity and identified in the notice, including”:

- (i) The permissible amount or concentrations of that substance or mixture of substances that may be emitted; and
- (ii) The manner in which measurements of such emissions must be carried out.

5.1.2 Criteria for application of APPA by DEAT for Air quality management.

5.1.2.1 Current criteria

Over the years, the principle for identifying a process for inclusion as a listed activity in the Air Pollution Prevention Act (APPA) was based on the following criteria [4]:

- Historical replication of processes in the older British Clean Air Act Scheduled processes (at the time of setting up the regulations in the 1960's and 1970's)
- Response to complaints and problem areas. Hence processes that attracted most complaints/problem-areas were included in the schedules so that DEAT could put controls in place to reduce emissions.

In the following section of this document criteria for listed activities are proposed taking into account the above quotations from the bill.

5.1.2.2 Proposed criteria

The following criteria are proposed for identifying a process for inclusion as a listed activity in the Air Pollution Prevention Act (APPA):

- The process should be active in South Africa and applies to large scale operating plants.
- The activity is not listed under the proposed NEMA Chapter 4 (22): Category I identified activities that require screening.
- The activity is listed under the proposed NEMA Chapter 4 (23): Category II identified activities that require environmental impact assessments. However this does not mean that all activities under category II are proposed to be included in the APPA guidelines, but only those activities that "are likely to have significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage"
- The emissions of the individual activity "are likely to have significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage". This implies that the combination of the toxicity of the pollutants with the released quantity may cause the quoted effects.
- There must be a method to measure the emissions of the activity.

The USA Emission Measurement Center (EMC) of the Environmental Protection Agency (EPA) has developed methods of measuring air pollutants emitted from the entire spectrum of industrial processes causing air pollution, which are widely used also in South Africa.

It is proposed that measurement methods developed by the EMC and accredited in South Africa should be followed or used as a guideline to measure specific pollutants in the stack for the activities, which are listed in the APPA schedule. The details of the measurements will be specified in the permit for the activity e.g. continuous measurement, measurements at certain intervals or measurements by an accredited third company. For activities where there are no stack emissions e.g. the disposal of general and hazardous waste emission factors according to AP-42 are proposed to be used.

5.1.3 Proposed grouping of listed activities in the current APPA schedule

It is proposed that all the listed activities in the current APPA schedule should be grouped under specific industrial categories, this has the following advantages (see also table 2):

- Enables a systematic approach for identifying and comparing air pollution releases from related activities.
- Brings SA into line with international practice (i.e. American and European methods).
- Enables an integrated pollution control approach (focussing on the expected pollutants from the specific industrial category) and provides an opportunity for cleaner production and waste minimization guidelines to be included (in line with trading partner approaches to management of technologies and industrial ecology [4]).

Further it is proposed that the descriptions of all processes for the current APPA guidelines should be reviewed or revised, as the descriptions for a number of processes is incomplete or lacking. Also some of the TLV and exposure data is not up to date with current knowledge.

Points are listed that require specific attention during the review.

- Typically the information on the process is very short or absent as well as information on the guidelines. More information will help to decide which pollutants require monitoring. E.g. copper processes release a variety of pollutants such as SO₂, Lead and arsenic.
- For many processes no emission limits are given.
- For a number of processes different limits are given depending on when the plant was erected. There is a need to agree upon a time frame for older plants to adhere to the same emissions as new plants.
- For a number of processes, decisions are left to the discretion of the Air Pollution Control Officer. This needs review as it is important to arrive at a uniform approach.
- It is likely that for a number of processes emission limits of pollutants require review. This has not been highlighted in the table as this needs to be reviewed for all processes based upon South African and international changes in emissions limits. The issue of quantity released versus concentrations need more attention.
- The issue of the phasing in of new technologies for certain processes need more attention. This has been listed under "other comments" in specific cases, but does not exclude the need for new technologies in additional cases.

In the following table (Table 1) comments are made which aspects for specific processes need specific attention during the review process. The numbering system is the same as that used in the guidelines.

Table 1: Aspects of the current schedule of listed processes that require review

Process number	Emission limits absent	Not enough information on process and guidelines	Different limits for old and new plants	Discretion of CAPCO	Other comments
1 Sulphuric acid		x	x	X	
2 Phosphate fertiliser		x	x	X	
3 Gas liquor	x	x			
4 Nitric acid		x	x		
5 Ammonium sulphate/chloride		x			
6 Chlorine		x			Need for appropriate technology
7 Hydrochloric acid		x	x		
8 Sulphide		x			
9 Alkali waste	x	x			
10 Oxide pigment		x			Only dust not metal emission limits
11 Arsenic		x			No SO ₂ emission limits
12 Carbon disulphide	x	x		x	
13 Sulphocyanide	x	x			No data
14 Hydrocarbon refining			x		No emission limits for SO ₂
15 Bisulphite		x	x		
16 Tar	x	x			
17 Zinc	x	x	x		
18 Benzene	x	x			
19 Pyridine	x	x			No guidelines
20 Bromine	x	x			
21 hydrofluoric		x	x		
22 Cement processes		x	x		
23 Lead	x	x			

24 Fluorine		x			
25 Acid sludge	x	x			
26 Alkali	x	x			No guidelines
27 Roasting		x			No emission limits for SO ₂
28 Asbestos	x	x			To be phased out
29 Power generation			x	x	Need for appropriate technology
30 Iron and steel			x		Need for appropriate technology
31 Copper	Only dust	x			No emission limits for SO ₂ /Cu/Pb
32 Aluminium		x	x	x	
33 Producer gas	x	x			
34 Gas coke and charcoal	x	x			Need for appropriate technology
35 Ceramics	Not for clamp kilns	x	x	x	Need for appropriate technology
36 Lime, dolomite, magnesite			x	x	
37 Sulphate reduction	x	x			No guidelines
38 Caustic soda	x	x		x	
39 Waste incineration					Furan/dioxine measurements?
40 Beryllium	x	x			No guidelines
41 Selenium	x	x			
42 Phosphorus		x			
43 Ammonia		x	x	x	
44 Hydrogen cyanide	x	x			
45 Acetylene	x	x		x	
46 Amine	x	x			
47 Calcium carbide		x	x	x	
48 Aldehyde	x	x			
49 Anhydride	x	x			

50 Chrome		x			Cr ^{VI} /Cr ^{III} not addressed
51 Magnesium	x	x			
52 Cadmium	x	x			
53 Manganese	Only dust	x			
54 Metal recovery	Only Cl ₂	x		x	
55 Galvanising	x	x			
56 Bagasse incineration		x	x		
57 Metal spraying	x	x		x	
58 Macadam preparation	Only dust	x			
59 Bulk coal/ore	x				Use emission factors
60 Vanadium		x	x		
61 Antimony	x	x			
62 Mercury	x	x			
63 Silicon		x			
64 Carbon black		x			
65 Glass		x			
66 Metallurgical slag		x			
67 Woodburning/drying		x			Need for appropriate technology
68 Paper and pulp		x	x		
69 Animal matter reduction	x	x			Size of operation not defined

It was also proposed to review and revise where appropriate the description of category II of the NEMA chapter 4 (23) in order to avoid contradictions and discrepancies between the APPA guidelines and this proposed act. This has been done to a large extent [Ref: Category 2 chapter 4 (23) of NEMA]

5.1.4 Proposed new activities for listing in the current APPA schedule

Nearly all the processes that are currently listed in the APPA schedule are still valid and active in South Africa and therefore no recommendations are made to remove processes from the list. The following activities were additionally identified based on

the proposed criteria, and are proposed for inclusion into the current/existing APPA list of activities:

- Gold refining
This is a large industry in South Africa and hazardous chemicals are used by this activity.
- PGMs refining
This is a large industry in South Africa and hazardous chemicals are used by this activity. The usage of specifically chlorine and hydrogen chloride may lead to significant emissions. (Some aspects of PGM refining are covered under the current APPA list)
- Pharmaceutical industry
The potential release of active pharmaceutical components is a concern
- Plastics industry (This heading serves as a subsection under organic chemicals)
The addition of this subsection is in line with international practice and helps with the grouping into categories.
- Monomer production (as a subsection under plastics industry)
The addition of this subsection is in line with international practice and helps with the grouping into categories.
- Explosives industry
This is a relative large industry and hazardous chemicals are used by this activity. Different chemicals are used and different emissions may occur, dependent on the different types of explosives being manufactured.
The addition of this subsection is in line with international practice.
- Disposal of hazardous and general waste
The addition of this activity is in line with the minimum requirements for the disposal of hazardous waste as well as with the proposed NEMA chapter 4 (23).
- Wood products industry
The inclusion is not an addition, but a grouping of three currently listed activities. The change is in line with international practice.
- Production and formulation of pesticides
The potential release of active pesticides is a concern.

Most activities that are proposed for listing as scheduled activities are based on the Category II list: Activities that require environmental impact assessment, from chapter 4 (23) of NEMA. The selection is based on such activities that “are likely to present a threat to health or the environment”.

In the following table (table 2) the processes are grouped, the proposed additional processes are included in bold and the relevant descriptions of Category II processes (NEMA) are added.

Table 2: Proposed list of scheduled processes from the Air Pollution Prevention Act [1]

List of scheduled processes from the air pollution prevention act [2]
<p>1. Combustion installations</p> <p>-The generation of electricity, where electricity output is >20 Megawatts [Ref: APPA, process 29]</p> <ul style="list-style-type: none"> ▪ 29 Power generation ▪ 56 Bagasse incineration
<p>2. Petroleum industry</p> <p>The bulk storage of crude petroleum and liquid petroleum products, in storage facilities with individual capacity >1 000 cubic metres each. [Ref: APPA process 14].</p> <ul style="list-style-type: none"> ▪ 14 Hydrocarbon refining ▪ 25 Acid sludge processes <p>NB: All petroleum processes will be listed because they are large scale processes and no small scale processes exist.</p>
<p>3. Carbonisation and coal gasification</p> <ul style="list-style-type: none"> ▪ 34 Coke and Gas processes ▪ 33 Producer gas processes ▪ 16 Tar processes ▪ 3 Gas liquor processes
<p>4. Metallurgical industry</p> <ul style="list-style-type: none"> ▪ Gold Refining ▪ PGM Refining ▪ 32 Aluminium processes ▪ 52 Cadmium processes ▪ 50 Chrome processes ▪ 31 Copper processes ▪ 30 Iron and Steel processes ▪ 23 Lead processes ▪ 62 Mercury processes ▪ 53 Manganese processes ▪ 54 Metal recovery processes ▪ 57 Metal spray processes ▪ 66 Metallurgical slag processes ▪ 27 Roasting processes ▪ 17 Zinc processes ▪ 60 Vanadium processes ▪ 55 Galvanising processes ▪ 63 Silicon processes ▪ 51 Magnesium processes ▪ 11 Arsenic processes

- 61 Antimony processes
- 40 Beryllium processes
- 71 Nickel processes

5. Mineral processing industry

- 22 Cement processes
- 65 Glass processes
- 35 Ceramic processes
- 10 Oxide pigment processes
- 36 Lime, Dolomite and Magnetite processes
- 28 Asbestos processes
- 59 Bulk storage and handling of ore or coal

The storage and handling of ore or coal at dumps designed to hold 100 000 tons or more and not situated on the premises of a mine or works as defined in the Mines and Works Act, 1956 [Ref: APPA, process 59].

6. Organic chemical industry

All of the following processes independent of scale

- 19 Pyridine processes
- 49 Anhydride processes
- 18 Benzene processes
- 45 Acetylene processes
- 48 Aldehyde processes
- 46 Amine processes
- 70 Acrylonitrile processes
- **Plastics (subsection)**
- **Monomer production (subsection)**
- 72 Vinyl chloride monomer processes

7. Inorganic chemical industry

All of the following processes independent of scale

- 5 Ammonium sulphate and Ammonium chloride processes
- 12 Carbon disulphide processes
- 38 Caustic soda
- 20 Bromine processes
- 47 Calcium carbide processes
- 24 Fluorine processes
- 2 Phosphate fertilizer processes
- 6 Chlorine processes
- 7 Hydrochloric acid processes
- 44 Hydrogen cyanide
- 1 Sulphuric acid processes
- 8 Sulphide processes
- 13 Sulphocyanide processes
- 4 Nitric acid processes
- 42 Phosphorus processes
- 26 Alkali processes
- 43 Ammonia processes
- 58 Macadam preparation
- 37 Sulphite reduction processes
- 15 Bisulphite processes

<ul style="list-style-type: none"> ▪ 41 Selenium processes
8. Explosives Industry <ul style="list-style-type: none"> ▪ The manufacturing of explosives including ammunition independent of scale
9. Pharmaceuticals production
10. Incineration processes including hazardous waste The use, recycling, handling, treatment, storage or final disposal of hazardous wastes (NEMA chapter 4 (23)) <ul style="list-style-type: none"> ▪ 39 Incineration processes
11. The disposal of hazardous and general waste <ul style="list-style-type: none"> ▪ The disposal of hazardous waste ▪ The disposal of general waste Ref: The final disposal of general waste covering an area in excess of 100 square meters or 200 cubic metres of airspace (NEMA chapter 4 (23)).
12. Wood products industry <ul style="list-style-type: none"> ▪ 68 Pulp and paper processes ▪ 9 Alkali waste processes ▪ 67 Wood burning and wood drying processes
13. Production and formulation of pesticides Independent of scale
14. Animal matter processing Processes for the rendering cooking, drying, dehydrating, digesting, evaporation or protein concentrating of any animal matter not intended for human consumption [Ref: APPA, process 59]. (The description needs to be extended to cover large slaughter houses and large tanning plants). <ul style="list-style-type: none"> ▪ 69 Animal matter reduction processes

5.1.5 References

[1] Council Directive 96/61/EC on Integrated Pollution Prevention and Control (IPPC), September 1996, Official Journal of the European Communities, L 257/26.

[2] The Atmospheric Pollution Prevention Act and Regulations of the Republic of South Africa, (Act 45 of 1965).

[3] Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, www.epa.gov/

[4] Meeting held on Sept 3, 2004 between CSIR and DEAT APPA

inspectorate. DEAT: J van Graan, C du Plooy, CSIR: Hietkamp SH, Rogers DEC and Nkhwashu V.

[5] Guidance document for European Pollutant Emission Register (EPER) implementation, European Commission Directorate-General for Environment, November 2000.

5.2 Controlled Emitters

5.2.1 Introduction

Controlled emitters are defined in Section 23. (1) National Environmental Management. Air Quality Bill as follows “The Minister or MEC may, by notice in the Gazette, declare any appliance or activity, or any appliance or activity within a specified category, as a controlled emitter if such appliance or activity, or appliances or activities falling within such category, result in atmospheric emissions, which through ambient concentrations, bioaccumulation, deposition or in any other way, present or are likely to present a threat to health or the environment”.

Regarding standards for controlled emitters, section 24. (1) and (2) state: “A notice contemplated in section 21(1) must establish emission standards, which must include standards setting the permissible amount or concentration of any specified substance or mixture of substances that may be emitted from the controlled emitter. (2) The minister must prescribe the manner in which measurements of emissions from controlled emitters must be carried out”.

In the following part of this document criteria for controlled emitters are proposed taking into account the above quotations from the bill.

5.2.2 Criteria for controlled emitters

The bill specifies two groups of controlled emitters

1. Appliances
2. Activities

1. Appliances

Proposed criteria:

- The appliance must be for sold or manufactured in South Africa.

Information must be made available regarding the number of the appliance installed or manufactured in South Africa.

- The number of the appliance in use in South Africa must be such that its combined emissions "are likely to present a threat to health or the environment".

Based upon the expected emissions per appliance and the number of appliances in operation (now or in the future) the total emissions must be estimated and based on this total an assessment must be made if the emissions of the appliance "are likely to present a threat to health or the environment".

- There must be a manner to measure the emissions of the appliance.

It is proposed to develop an emission testing protocol for the appliance including emission standards and before the appliance is introduced into the market, an independent body e.g. the SABS conducts the appropriate testing and when the results comply with the standard the appliance is certified for use. However emissions of an appliance during its use not only depend on the design specifications but also on the way the appliance is used which includes proper maintenance. It will therefore be required that during its life the appliance be inspected in regular intervals in order to establish if the emission standards are still been adhered to. In order to be inspected it is a requirement that the individual appliances are registered.

2 Activities

5.2.3 Proposed criteria:

- The activity is applied in South Africa
- The activity is not listed under scheduled processes.

The activity may be the same as a scheduled process but it will be differentiated due to its smaller scale.

- The emissions of the activity either of the individual activity or from the total of the same activity in South Africa or a certain area in South Africa “are likely to present a threat to health or the environment”.
- There must be a manner to measure the emissions of the activity. It is proposed to develop an emission testing protocol for the emissions of the activity including emission standards. The emission testing is to be done at regular intervals by an independent accredited company.

5.2.4 Process for the selection of controlled emitters

The following sources were consulted:

- US Environmental Protection Agency, Emission Factors & AP42
- EPER, The European Pollutant Emission Register
- Miscellaneous South African sources

The US EPA document was evaluated and the other documents were compared with this document to assess if other pollution sources needed to be added. The combined pollutant sources were screened against the criteria as spelled out in section 5.2.3. The results are listed under the section: List of proposed controlled emitters.

US Environmental Protection Agency, Emission Factors & AP42

In the following table (Table 3) the sections and subsections of industry have been listed for stationary emission sources, further subdivisions have not been listed.

Table 3 Evaluation of activities for possible inclusion in the controlled emitters list.

Sections	Criteria				Comments
	Used in RSA	Scheduled process	Significance of emissions	Measurement manner	
External combustion					
Bituminous and	Yes	Yes	Large	Stack	

subbituminous coal					
Anthracite	Yes	Yes	Large	Stack	
Wood residue	Yes	Yes	Large	Emission factors	
Lignite	Yes	Yes	Large	Stack	
Bagasse	Yes	Yes	Large	Stack	
Residential fireplaces	Yes	No	Large	Emission factors	Urban area
Residential wood stoves	Yes	No	Large	Emission factors	Urban area
Waste oil combustion	Yes	Yes	Large	Emission factors	Depends on size
Solid waste disposal					
Refuse combustion	Yes	Yes	Large	Emission factors	Depends on size
Sewage sludge incineration	No data	No data	No data	Stack	
Medical waste incineration	Yes	Yes	Large	Stack	Depends on size
Municipal landfills	Yes	Proposed	Large	Emission factors	Depends on size
Open burning	Yes	Yes	Large	Emission factors	Depends on size
Stationary internal combustion					
Gas turbines	Yes	No	Large	Specifications	
NG gas-fired reciprocating engines	Yes	No	Large	Specifications	
Gasoline and diesel industrial engines	Yes	No	Large	Specifications	
Large diesel and all dual-fuel engines	Yes	No	Large	Specifications	
Evaporation loss					
Dry cleaning	Yes	No	Large	Mass balance	
Surface coating	Yes	No	Large	Mass balance	
Waste water collection, treatment and	Yes	No	No data		Few units

storage					
Polyester resin plastics products	Yes	No	No data	Mass balance	
Asphalt paving	Yes	No	Large	Emission factors	
Solvent degreasing	Yes	No	Large	Mass balance	
Waste solvent reclamation	Yes	No	Large	Mass balance	
Tank and drum cleaning	Yes	No	Large	Emission factors	
Graphical printing	Yes	No	Small	Emission factors	
Consumer solvent use	Yes	No	Small	Emission factors	
Textile fabric printing	Yes	No	Large	Emission factors	
Manufacture of rubber products	Yes	No	Large	Emission factors	
Petroleum industry					
Petroleum refining	Yes	Yes	Large	Stack	
Transportation and marketing	Yes	No	Large	Emission factors	
NG processing	Yes	No data	No data		
Organic chemical process industry	The industry is listed under scheduled processes as the activities can be considered large.				
Liquid storage tanks					
Organic liquids	Yes	Yes	Large	Emission factors	Depends on size
Inorganic Chemicals	The industry is listed under scheduled processes as the activities can be considered large.				
Food and agricultural industries					
Tilling operations	Yes	No	Large	No data	
Growing operations	Yes	No	No data	Emission factors	
Harvesting operations Cane sugar	Yes	No	Large	No data	
Livestock & Poultry feed	Yes	No	No data	No data	

Animal & meat products preparation	Yes	Yes	No data	Emission factors	
Dairy products	Yes	No	No data	No data	
Cotton ginning	Yes	No	No data	Emission factors	
Preserved fruits and vegetables	Yes	No	No data	Emission factors	
Grain processing	Yes	No	No data	Emission factors	
Confectionary products	Yes	No	No data	Emission factors	
Vegetable oil processing	Yes	No	No data	Emission factors	
Beverages	Yes	No	No data	Emission factors	
Miscellaneous food & kindred products Fish processing	Yes	No	Large	Emission factors	Nuisance factor locally large
Leather tanning	Yes	Yes	Large	Emission factors	Nuisance factor locally large
Agricultural wind erosion	Yes	No	Large	No data	
Wood products industry					
Lumber (Timber)	Yes	No	No data	No data	
Chemical wood pulping	Yes	Yes	Large	Emission factors	
Pulp bleaching	Yes	Yes	Large	No data	
Papermaking	Yes	Yes	Large	No data	
Plywood manufacturing	Yes	Yes	Large	Emission factors	
Reconstituted wood products	Yes	Yes	Large	Emission factors	
Charcoal	Yes	Yes	Large	Emission factors	Depends on size
Wood preserving	Yes	No	Large	Emission factors	Depends on size
Engineered wood products	Yes	No	Large	Emission factors	Depends on size
Mineral products industry	The industry is listed under scheduled processes as nearly all activities can be considered large. Only the smaller activities are listed here.				
Bricks and related clay products	Yes	Yes	Large	Stack, Emission factors	Less than 1 million bricks/month
Metallic minerals					

processing					
Clay processing	Yes	No	Large	Emission factors	
Vermiculite processing	Yes	No	Large	Emission factors	
Metallurgical industry					
Primary aluminium production	Yes	Yes	Large	Stackj	
Coke production	Yes	Yes	Large	Stack	
Primary copper smelting	Yes	Yes	Large	Stack	
Ferroalloy production	Yes	Yes	Large	Stack	
Iron & steel production	Yes	Yes	Large	Stack	
Zinc smelting	Yes	Yes	Large	Stack	
Secondary aluminium operations	Yes	Yes	Large	Stack	
Secondary copper smelting	Yes	Yes	Large	Stack	
Secondary lead processing	Yes	Yes	Large	Stack	
Steel foundries	Yes	Yes	Large	Stack	
Secondary zinc processing	Yes	Yes	Large	Stack	
Storage battery production	Yes	No	Large	Stack, Emission factors	
Electric arc welding	Yes	No	Large	Emission factors	Depends on the size
Electroplating	Yes	Yes	Large	Stack	Depends on size
Miscellaneous					
Wild fires and prescribed burning	Yes	No	Large	Emission factors	Regulated by forest act
Fugitive dust sources	Yes	No	Large	Emission factors	
Industrial flares	Yes	Yes	Large	Emission factors	

Activities that are not part of the listed processes, but are defined as large in terms of the proposed act should be listed as controlled emitters. However in some cases there is no information on how to determine the emissions. Such cases do not

currently fall within the proposed legislation. Emission factors or mass balances can be used for certain activities to estimate the emissions.

In addition to the stationary emission sources, mobile sources are also considered for inclusion as controlled emissions.

5.2.5 List of proposed controlled emitters

1. Appliances.

From the above table and from the mobile sources the following list of proposed controlled emitters has been compiled for appliances. For each category a comment is made regarding the need of emission specifications and the need for testing:

- All transport vehicles powered by an internal combustion engine
Examples are: Light motor vehicles (car), Heavy motor vehicles (trucks), diesel locomotives, boats and ships that serve in harbours, ocean going vessels, fishing boats, pleasure crafts, airport serving vehicles, lawnmowers, tractors.
Emission specifications are required as well as regular emission testing.
- Residential fireplaces. *Emission factors to be used and the option exist to forbid residential fireplaces in specific area's.*
- Residential fuel burning stoves. *Equipment specifications are required. This may include fuel specifications.*
- Stationary internal combustion engines. *Emission specifications are required as well as regular emission testing.*
- Medical waste incinerators using an appliance with a capacity of less than 10 kg/day (Class2B-2). *Equipment specifications are required. This may include fuel specifications.*
- Dry cleaning equipment using solvents. *Equipment specifications are required. Solvent use may be calculated with a mass balance approach.*
- Tanks and other equipment for the transportation of liquid fuels. *Equipment specifications are required. Regular testing is advised.*
- Electric arc welding equipment for commercial use. *Equipment specifications are required. Regular testing is advised.*
- Equipment for the manufacture of charcoal not listed under scheduled activities. *Equipment specifications are requirement. Emission factors can be used. Regular testing is advised*
- Cooking oil appliances used in restaurants. *Equipment specifications are required. Regular testing is advised.*

2. Activities

The activities that are proposed for listing as controlled emitters are based on the table and on the category I list (Activities that require screening) from chapter 4 (22) of NEMA. The selection is based on such activities that “are likely to present a threat to health or the environment” due to its atmospheric emissions

The following activities are proposed to be listed:

- The same activities as under scheduled processes that operate on a scale, which is below the limit for scheduled processes. *Regular emission testing is required and compared with the permit for the activity.*
- The above ground storage, including temporary storage of petrol, diesel or paraffine in containers with a combined capacity of more than 30 cubic metres at any one location or site. The upper limit is 1000 cubic meters as more is subject to category II. *Regular inspection is required.*
- Filling stations or any other facility for the underground storage of petrol, diesel or paraffine. *Regular inspection is required*
- The storage, testing, or disposal of explosives including ammunition but excluding licensed retail outlets. *Regular emission testing is required and compared with the permit for the activity.*
- The storage of ore of any kind with a capacity from 1000 – 100 000 tons. . *Regular inspection is required*
- The storage of coal with a capacity from 250 – 100 000 tons. *Regular inspection is required.*
- The slaughter of animals and the processing of animal products with an annual product of >10 000 kilograms per year. Processes for the rendering, cooking, drying, dehydrating, digesting, evaporating or protein concentrating of any animal matter not intended for human consumption are listed under Category II independent of scale. *Regular inspection is required.*
- The recycling, handling, temporary storage or treatment of waste with a daily throughput capacity in excess of 10 cubic metres. *Regular inspection is required*
- Processes that fall in the category “Evaporation loss”
- This category includes processes which can lead to losses to the atmosphere of organic solvents e.g. surface coating, polyester resin plastics products, asphalt paving, solvent degreasing, waste solvent reclamation and tank and drum cleaning. *Regular emission testing is required and compared with the permit for the activity.*
- Harvesting operations e.g. cane sugar harvesting. *Emission factor estimations are required as no such data is available in the AP 42 of the EPA.*
- Other processes of the food and agricultural industry e.g animal and meat products preparation, cotton ginning, preservation of fruits and vegetables, grain processing, confectionary products (sugar products industry), vegetable oil processing, beverages (cool drinks, wine, beer industry), fish processing. *Regular inspection is required.*
- Leather tanning industry. *Regular inspection is required.*

- Wood products industry e.g. plywood manufacturing, wood preservation, engineered wood products . *Regular inspection is required.*
- Bricks and related products. Brick manufacturing capability less than one million bricks per month. A review of clamp kilns is advised and a phasing out of this technology should be considered. *Regular inspection is required.*
- Metallics minerals processing e.g. clay processing, vermiculite processing. *Regular inspection is required.*

Normally there are no specific emissions points in the cases where “*Regular inspection is required*” are specified. The inspection is required for the overall operation of the activity to ensure that the activity is running according to the original specified conditions.

6 CONCLUSIONS AND WAY FORWARD

It is concluded that:

- The current APPA list should be largely maintained and some industrial activities are recommended for addition.
- The process descriptions of the APPA list need to be updated in order to ensure that guidelines for all important emissions of the process are composed.
- A first cut for a list of controlled emitters has been made, based largely on known emission sources.
- Actual emissions for controlled emitters are difficult to measure in some cases, but suggestions are made how to address this issue.
- Inspection of appliances regarding emissions will be required in most cases.

The next step for the project will be a review of this report by the DEAT authorities and thereafter the results will be presented at a stakeholder workshop for comments.