



Chemicals Management
& Land Remediation
Summit

05 – 07 October 2015

WELCOME

DESKTOP STUDY ON LEAD AND CADMIUM IN SOUTH AFRICA VENUE:CSIR



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LEGISLATIVE REQUIREMENTS

- Section 24 of SA Constitution clearly states that everyone has the right to an environment that is not harmful to their health or well-being; and emphasis on the need to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures.
- Chapter 1 Section 2 (4) (a) (viii) of the **NEMA** clearly states that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.
- Under section 43 of the OHSA lead regulations were developed and regulation 3 states that the employer or a self-employed person shall take the following into account: the steps to be taken to reduce exposure to the lowest level reasonably practicable and the steps to be taken to reduce the release of airborne lead into the environment.
- South Africa is a very active state in the Strategic Approach to International Chemicals Management (SAICM), a UNEP global policy framework to promote chemical safety.
- The UN Environmental Assembly of Ministers has prioritised Lead and Cadmium for global action.



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USES

CADMIUM

- Batteries, contaminant in fertilizers, in plastics, enamels, ceramics, paints, and dyes as pigment
- Plating of iron, steel or other materials and protection of iron and steel
- Stabilizer in PVC and other polymers or copolymers of vinyl chloride
- Microspheres and other lab material, solar as solar cells, television and computers for picture, salts, tobacco for cigarette making and nuclear plants as a neutron-absorber in nuclear power plants.

LEAD

- Paint, ceramics, pipes and plumbing materials, solders, gasoline, batteries, ammunition, and cosmetics for glazing pottery, solder, ornaments, coins, piping, and cooking utensils, batteries, different compounds, lead sheets, ammunition, alloys, cable sheathing, tyres, electronic equipment, glass of cathode-ray tubes (CRTs), painted toys and petrol additives



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MAJOR PRODUCTS CONTAINING LEAD AND CADMIUM PRODUCTS TRADED IN SA

- Lead ores & concentrates
- Phosphatic fertilizer materials
- Tyres
- Unwrought lead
- Photocopy machines/Printers/faxes
- Data processing machines (computers)
- Lead acid electric accumulators for vehicles
- Cadmium Nickel
- Cigarette



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CHALLENGES WRT LEAD AND CADMIUM IN SA

- Among the heavy metals that are linked to a number of diseases and disorders affecting human health and present potential risks to environment.
- Lack of awareness and education amongst the general public regarding the hazards associated with chemicals.
- Rapid industrial development that may coincide with the increased release of these heavy metals into the environment.
- Cadmium-containing products are rarely recycled, but often dumped together with household waste which increases the degree of pollution.
- Are known EDCs; affect reproduction and also are possible carcinogen.



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HEALTH & ENVIRONMENTAL IMPACTS

- Major health effects of lead are manifest in three organ systems, the haematological system (haemoglobin synthesis leading to anaemia with pallor as classic symptom), CNS with (stopar, coma, convulsions, and convulsions) and the renal system.
- Diarrhea and reproductive failure (abortion and pre-term delivery in women and alterations in sperm and decreased fertility in men).
- Affects foetuses (delays in physical and mental development, lower IQ levels, shortened attention spans, and increased behavioural problems).
- Cadmium exposure has been associated with kidney, liver bone and lung damage, decreased birth weights reduction in sperm number, decreased reproduction and testicular damage, lung cancer and also affects the growth of plants



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SOUND INITIATIVES FOR COLLECTION, RECYCLING AND DISPOSAL OF USED PRODUCTS CONTAINING CADMIUM AND LEAD IN SOUTH AFRICA

- Environmentally sound initiatives in SA include the National Cleaner Production Centers (NCPCs) aimed promoting and building capacity in cleaner production concepts
- **Environmental quality standards or guidelines**, specifying maximum acceptable concentration of cadmium and lead for different medias
- **Environmental source actions and regulations** promoting the waste hierarchy and having waste disposal restrictions through the waste classification management regulations
- **Lead regulations** on exposure to lead in the workplace
- Lead batteries and E waste recycling facilities operating under WML conditions have been established which has taken an initiative to collect and recycle used batteries and electronic waste.
- The Waste Amendment Act 448 of 2014 has provided the basis for the establishment of the Waste Management Bureau. Some of the objectives of the Waste Management Bureau are to



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CONTIN.....

- ✓ promote and facilitate minimisation, re-use, recycling and recovery of waste;
- ✓ manage the disbursement of incentives and funds derived from waste management charges contemplated in sections 13B and 34D for the minimisation, reuse, recycling, recovery, transport, storage, treatment and disposal of waste and the implementation of IWMPs
- ✓ monitor implementation of IWMPs and the impact of incentives and disincentives;
- The Waste Pricing Strategy is currently being developed to inform the Waste Management Charges as envisaged in the Act.
- Section 7(2)(d) of the NEM: WA requires the Minister to set National Norms and Standards for the remediation of contaminated land and soil quality. These norms and standards have been developed as part of the implementation of Part 8 of NEM: WA which provides for the remediation of contaminated areas. The soil screening values for metals have been established in these norms and standards to protect human health via direct exposure routes and indirect exposure routes as the key starting point so that they can be used to define appropriate management actions.
- DEA is developing a Regulation for the control of Exports and Imports of waste in line with the requirements of the Basel Convention and the National Environmental Management: Waste



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GAPS

- Recycling facilities exist the country and does not have any specific regulations to control and manage hazardous waste such as waste products containing lead and cadmium.
- Distinguish between waste and non-waste as some of these EE equipment's may be traded as used product or second hand goods.
- Lack of a specific legislative framework on e-waste in South Africa and other products containing lead and cadmium.
- Although South Africa has ambient air quality standards on lead but there are no government-owned air quality monitoring networks monitoring lead.
- South Africa does not have ambient standard on Cadmium the only way to assess the countries status is to compare results with other countries case.
- Limited data exists for lead and cadmium for atmospheric trace metal concentrations in South Africa.
- Data available is for particulate matter (PM10 and PM2.5), which is characterized by physical size not chemical character. So the concentrations are of a mixture of particles in the atmosphere, not a specific for lead and cadmium.
- Limited information regarding waste generated and managed for these heavy metals.
- Cadmium-containing products are rarely recycled, but often dumped together with household waste.



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RECOMMENDATIONS

- South Africa to come up with a definition of second hand goods for electrical, electronic equipment batteries and other products contain hazardous materials.
- In order to prevent harmful exposure, awareness of sources and uses, modes of entry into the body, toxic effects and safe limits must be established.
- Phasing out any remaining uses of lead additives in motor fuels should be encouraged.
- Government to have air quality monitoring networks monitoring lead and cadmium
- Education and awareness raising on environmental and health effects on products that contain lead and cadmium to be done.
- Formulating strategies aimed at prevention of ill-health and disease caused by these chemicals.
- Hotspots for these heavy metals to be identified for future action.
- The need for real information about the quantities of lead and cadmium generated, recycled and disposed of in the environment.
- The need to collect data on concentration levels of these heavy metals on various media.
- Reduce consumption of raw materials and products that include lead and cadmium as impurity or use of low-lead and cadmium raw materials.



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RECOMMENDATIONS

- Substitution (or elimination) of products, processes and practices containing or using lead and cadmium with non-lead and cadmium alternatives.
- There is a need for educating the community of the informal settlement about pollution prevention and residents should be encouraged to recycle and reuse waste, to use environmentally friendly household products and try using natural fertilizers as far as possible
- There is a need for containers to be placed at central points in order for the South Africans to separate their waste at source and the location of these containers should consider the number of residents
- Once the containers are in place the prohibition of further dumping of wastes to reduce contamination of the surface water should be taken into consideration by reporting illegal dumping incidents
- Management of lead and cadmium-containing waste.
- Sensors to sense the heavy metals to be developed



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Ms B Maphanga

Assistant Policy Advisor : International Chemicals & Waste Cooperation

Email: bmaphanga@environment.gov.za

Tel.: 012 399 9769

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