GREENPEACE

Greenpeace Submission
LegCo Panel on Environmental Affairs and LegCo Panel on Health Services
On
Proposed Clinical Waste Control Scheme

16 May 2002

SUMMARY
Greenpeace strongly opposes the Proposed Clinical Waste Control Scheme submitted by the Government to Legislative Council. Greenpeace believes the recommendation of using incineration as ultimate treatment method is based on an extremely biased report.

The Proposed Clinical Waste Control Scheme was first circulated to members of Legco Panel on Health Services and Panel on Environmental Affairs on 20 March 2002. The recommendation of incineration as the ultimate treatment method is based on "The Review of Alternative Technologies for the Treatment of Clinical Waste" dated December 2000, which includes a copy of a November 2000 report prepared by the consultants Torgam Development Ltd, UK. The Review Document (Dec. 2000) has not been publicly released prior to that date's announcement. This shows clearly the government's attempts to bypass the public and secretly push through its incineration plan to handle medical waste. The report is now somewhat outdated in its assessment of alternatives and cost estimates.

The Review is inconsistent in its assessment of alternatives and is biased in favour of incineration. It underplays the risks of incineration and overplays the risks associated with the alternatives.

The assessment that the alternatives are not suitable because they cannot handle all kinds of clinical waste is disingenuous and misleading. In particular, the amount of wastes that can't be handled by the alternatives is only a small fraction of the total amount of clinical wastes.

Many of the issues raised against the alternatives are equally applicable to incineration, but not adequately assessed for incineration at Chemical Waste Treatment Centre. eg. the issue of mercury vapours being released from the alternatives is mentioned as an issue, but incineration does not destroy mercury either, but rather emits it to the air and ash residues. Appropriate separation of clinical wastes is essential regardless of the technology chosen to treat it.

The International implications of clinical waste incineration are not considered, even though there is a new international treaty which lists medical waste incineration as one of the most significant sources of dioxins and furans and requires countries to minimise and ultimately eliminate such dioxin sources. (Stockholm Convention on Persistent Organic Pollutants, adopted in Stockholm Sweden on 22 May 2001).

The discussion document presented to the Legco panel on 20 March does not accurately reflect the full recommendations of the November 2000 Consultants report. In particular, recommendation 7.4.9 (d) seems to completely conflict with the assessment of autoclaving as unacceptable for clinical waste treatment in HK SAR:

Incinerators for medical and municipal waste have been linked to severe public health threats and pollution as they are believed to be the top sources of dioxin, as well as mercury and other toxic substances. The government has proposed to utilise the spare incineration capacity of CWTC to burn medical waste. Hong Kong produces around 7 tonnes of medical waste per day.

Greenpeace demands the government to eliminate dioxin and other persistent organic pollutants (POPs), which are some of the most hazardous chemicals; scrap the plan to incinerate medical waste at CWTC; seek existing non-incineration facilities to treat medical waste on site before disposal; and adopt cheaper, safer and the least polluting alternatives in waste management.

Comments on "Review of Alternative Technologies for the Treatment of Clinical Wastes", Patrick C.K. Lei, David K.K. Ha and K.W. Lio, Waste Policy and Services Group

1. *Inconsistent methodology in the comparison of incineration and the alternatives.*

   For example, in section 4.5.1.2, it is stated that "Incineration is considered to be the most effective technology in sterilising waste because it burns the waste at high temperature to achieve complete destruction all types of bacteria, viruses, fungi and other infectious agents. The resulting residue is a small amount of completely sterilised inorganic ash which can be disposed of at a sanitary landfill."

   No mention is made of the highly technical and skilled operations required to burn the wastes to achieve these perfect operating conditions. Neither is there any reference to the potential problems and issues associated with incorrect operation of the incineration unit. A high temperature incinerator is a highly complex and sophisticated technology which requires considerable knowledge and skill to operate. If permitted to operate outside of the optimum conditions, which is not an unusual occurrence, significantly lower standards of operation will be achieved with concomitant increases in the release of toxic pollutants and decrease in the efficacy of the clinical waste treatment.

   Yet, in commenting on the alternative treatment technologies in section 4.5.1.3, it is stated that, "the efficacies of alternative technologies (autoclave, microwave, chemical treatment) in disinfecting clinical waste depend on a number of factors and conditions." Further, "…the proper disinfection of clinical wastes by these technologies is highly dependent on the skills of the waste disposal workers who determine the operating conditions during treatment of the clinical waste, the nature of the waste, the packaging, whether the waste is shredded or not, the operating temperature and the duration of the treatment."

   In reality most of these caveats applied to the correct operation of the alternative technologies apply to the operation of a high temperature incinerator. To only

highlight them for the alternatives and not for the option of incineration is a clear indication of bias on behalf of the authors of the report.

2. *Ignores recommendations of the independent experts.*

In the Review of Clinical Waste Treatment Technologies – Final Report, Torgam Developments Ltd, London, UK, November 2000, contained in Appendix D, section 7.4.9 (d) it is recommended that:

"Based on the findings of the Hospital Authority's report and the present report, it is suggested that **an autoclave can be considered**. [emphasis added]
The reasons are that:

I. the technology is well known in hospitals
II. the technology is comparatively simple and more well developed and the capital costs are likely to be less than other more complex technologies, and
III. the number of autoclaves being used in USA is greater than the number of other facilities.

It is suggested that the Hong Kong Government should not have all their eggs in one basket. Evaluation of autoclave technology should begin with one installation in the near future. The capital cost for 500 tonne per annum equipment is in the order of HK $2m. This figure includes automatic loading and post treatment shredding equipment. However extra costs should be allowed for special air pollution control equipment."

This recommendation from Torgam Consultants was not included in the executive summary or the findings and recommendations of the report produced by the Environment Protection Department, HK SAR. This once again appears to indicate a definite level of bias against the use of alternative technologies by the authors.

3. *Human body tissues*

In section 4.5.2.2 the comment is made that, "…it is against cultural practice to shred these [human body tissue] wastes (in many countries including Hong Kong), treat them with autoclave, chemical or microwave and then dispose of them with other municipal solid waste." Yet, the authors do not comment on the cultural sensitivities of the current proposal to co-dispose of these wastes in a hazardous waste incinerator.

Also, the report in Appendix A fails to indicate that alternative treatment for human body tissues using chemical disinfection is legally permitted in Queensland, Australia.[1]

[1] Information Sheet: Waste management — Clinical or related waste treatment and disposal. Queensland Government, Environment Protection Agency, undated. This information sheet provides clarification on the various treatment and disposal mechanisms available for managing clinical or related wastes as required under the Environmental Protection (Waste Management) Regulation 2000. "Chemical disinfection (hydrogen peroxide and lime, grinding/shredding). This chemical disinfection system is suitable for the treatment of clinical wastes and human body parts."

4. Emissions

In section 4.5.3.2 the authors state, "For incineration, the main concern is with air emissions such as dioxins and mercury." Adding that, "…if clinical waste incinerators are equipped with appropriate air pollution control equipment to meet the stringent air emission standards, incineration of clinical waste will not cause any adverse impacts on the environment and public health."

The authors have failed to include a detailed list of the extensive range of toxic chemical pollutants that have been identified in the stack gases of high temperature incinerators, in an apparent attempt to downplay the risks associated with the technology.

The list of pollutants know to be emitted from high temperature incineration of wastes includes, polychlorinated dioxins and furans, polychlorinated biphenyls, polychlorinated naphthalenes, chlorinated benzenes, halogenated phenols, brominated and mixed dioxins, polychlorodibenzothiophenes, polyaromatic hydrocarbons (PAHs), particulate matter (PM_{10}, $PM_{2.5}$) and volatile organic compounds (VOCs).

Nor do the authors even mention the chemical pollutants which are know to contaminate the solid and other waste streams from the incinerator itself. European studies have indicated that the most significant release of dioxins from a modern incinerator may be through the solid wastes such as fly ash from the incinerator.

Surprisingly, the authors of the report have highlighted the emission of VOCs from the alternative technologies (section 4.5.3.3), but have not included reference to the levels potentially high levels of VOCs from incineration of biomedical wastes! According to Environment Australia – the federal Australian environment agency – the emission factor for VOCs from biomedical incinerators is 0.15 kilograms of VOCs per tonne of dry feed.[2] A scientific study of the levels of VOCs emitted from a high temperature incinerator identified a total of over 250 different VOC compounds, including benzene and substituted phenols.[3]

In the Summary of Findings and Recommendations of the report, the authors in section 6.3 have highlighted (by printing in large type and in bold) the sentence "…there is no sufficient documented guideline and no emission standards supported by scientific researches or studies." This is a rather odd assertion to include in the summary section. While the authors appear to be referring to the current state of development of uniform operating standards being developed in

[2] National Pollutant Inventory - Emission Estimation Technique Manual For Sewage Sludge And Biomedical Waste Incineration, Environment Australia, February 1999. "Uncontrolled Emission Factors for Category 2a Substances from Biomedical Waste Incinerators Total Volatile Organic Compounds 0.15 kg/tonne dry feed. Emission factor rating B (indicating a high level of certainty in the emission factor). Further, no Air pollution Control methods were identified for VOC's and therefore the efficiency rating of abatement methods for VOC's was indicated at 0%."

[3] Jay K. and Steiglitz L. (1995). Identification and quantification of volatile organic components in emissions of waste incineration plants. Chemosphere 30 (7): 1249-1260.

the USA, they also appear to be suggesting that the considerable number of alternative technologies being used throughout the world (more than 1500 individual units in the USA alone) are operating without any regulatory oversight at all. This is simply not the case.

Occupational health and safety and ambient air quality guidelines exist for all of the chemicals of concern, and it is puzzling that the authors have not even given consideration to this aspect of regulating the potential emissions from these technologies.

5. Occupational Health Risks

In section 4.5.4.1, the risks of incineration of clinical wastes are simply dismissed, without any detailed evaluation as, "…the risk of incineration of clinical waste perceived by the public could be very significant, even though the actual risk of incineration at properly controlled facilities was very low."

The authors then go on to emphasise 2 reports of single incidents associated with alternative clinical waste treatment technologies. The first was microwave leakage from a microwave treatment facility in 1997. The second refers to a "suspected occupational health related tuberculosis among employees" at a radio-wave facility in USA. A review of the CDC Report into the tuberculosis outbreak indicated a poorly operated facility and numerous occupational health problems, which could equally apply to a poorly operated incineration facility.

The authors have failed to mention the significant body of scientific literature that is available demonstrating the potentially significant occupational and environmental contamination resulting from incineration of wastes. A detailed review of over 200 of these studies can be found in the 2001 Greenpeace International report "Incineration and Human health – State of Knowledge of the Impacts of waste Incinerators on Human health."

Greenpeace demands the government to:

- **eliminate dioxin and other persistent organic pollutants (POPs), which are some of the most hazardous chemicals;**
- **scrap the plan to incinerate medical waste at CWTC;**
- **seek existing non-incineration facilities to treat medical waste on site before disposal;**
- **and adopt cheaper, safer and the least polluting alternatives in waste management.**