



## Residual Waste Study

# Accommodating Durham Regional Council Direction in the Design of EFW Facility Air Emission Criteria

*Agenda Item # 5b*  
April 15, 2008





# Durham Council Resolutions January 15, 2008

## Residual Waste Study

1. Protect Health and Safety of Residents
  - ◆ EFW shall incorporate
    - ◆ Modern State of the Art Emission Control Technology
    - ◆ Meet or Exceed European monitoring and measurement standards
2. Commit to Maximum Achievable Control Technology (MACT)



# EU Waste and Incineration Directives

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### Two Key Documents

- ◆ Incineration - 2000/76/EC
  - ◆ Emission Criteria for incinerators and EFW facilities
  - ◆ Recognizes two types of facility:
    - ◆ INCINERATOR – primary purpose thermal waste treatment
    - ◆ CO-INCINERATION – primary purpose to generate energy and uses some waste as fuel.
- ◆ Waste - 2006/12/EC
  - ◆ Basic philosophy and standards for design of waste facilities
  - ◆ Environmental and Public Health Considerations



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# INCINERATION EU 2000/76/EC Priorities

- ◆ EU Directive 2000/76/EC sets maximum impact objectives for waste incineration
  - ◆ Critical limits recognized for
    - ◆ Nitrogen oxides (NO<sub>x</sub>)
    - ◆ Sulphur dioxide (SO<sub>2</sub>)
    - ◆ Heavy metals and dioxins
  - ◆ Effectively protect people against health risks from air pollution
    - ◆ Reduce dioxin emissions by 90% (by 2005)
    - ◆ Reduce lead, mercury and cadmium by 70%



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# INCINERATION EU 2000/76/EC Priorities

- ◆ Owner guarantees:
  - ◆ Plant design, construction and operation will meet requirements for all proposed waste categories
  - ◆ Maximum practical heat recovery through heat and power, steam generation and district heating
  - ◆ Minimized residuals with optimum material recovery
  - ◆ Appropriate disposal of residues
  - ◆ Sampling and monitoring procedures to assure compliance for:
    - ◆ Air pollutants
    - ◆ Water pollutants



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# EU 2006/12/EC Priorities Care and Control

- ◆ Establish integrated and adequate network of disposal installations
- ◆ Use cost effective best available technology
- ◆ Network should recognize:
  - ◆ Geographic constraints
  - ◆ Need for specialized waste services
- ◆ Nearest appropriate installation, most appropriate technology, protection of environment and public health



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# EU 2006/12/EC Goals and Priorities

- ◆ Self sufficiency in Waste Management
  - ◆ Reduce movement of waste
  - ◆ Resource efficient clean technologies
    - ◆ Avoid risk to water, air, soil, plants and animals
    - ◆ Don't produce noise and odours
    - ◆ Protect countryside and places of interest
- ◆ Extraction of 'secondary raw materials' through re-use, reclamation and recycling
- ◆ Recovery of energy from waste

## EFW Proposed Operational Limits

Pollutant	Units	Ontario A-7	EU Directive 2000/76/EU	Proposed Operational Limits
Particulate Matter	mg/m <sup>3</sup>	17	9	9
Carbon Monoxide (CO)	mg/m <sup>3</sup>	NS	46	45
Sulfur Dioxide (SO <sub>2</sub> )	mg/m <sup>3</sup>	56	46	35
Hydrogen Chloride (HCl)	mg/m <sup>3</sup>	27	9	20
Hydrogen Flouride (HF)	mg/m <sup>3</sup>		1	1
Nitrogen Oxides (NO <sub>x</sub> )	mg/m <sup>3</sup>	207	183	180
<i>Total Acid Gasses (not specified as single limit)</i>	mg/m <sup>3</sup>	290	239	236
Mercury (Hg)	μg/m <sup>3</sup>	20	not specified	15
Cadmium (Cd)	μg/m <sup>3</sup>	14	not specified	7
Lead (Pb)	μg/m <sup>3</sup>	142	not specified	70
Dioxins/Furans (ITEQ)	ng/m <sup>3</sup>	0.08	0.092	0.06
Organic Matter (as Methane)	mg/m <sup>3</sup>	66	not specified	49



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## EFW Criteria Highlights

- ◆ Lower than EU 2007/76 and Ontario A-7 for:
  - ◆ Dioxins
  - ◆ Greenhouse Gas Methane
  - ◆ Heavy Metals
    - ◆ Lead, Mercury and Cadmium
  - ◆ Total Acid Gasses
    - ◆ Lower Persistent Acids - Sulphur Dioxide and NOx
    - ◆ Blended A7 and EU value for less persistent HCl



## EFW Emission Criteria Progress with MOE

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- ◆ March 14th – Project Team present proposed Emissions Objectives to MOE Directors
  - ◆ MOE initial advice - exceed Guideline A-7 requirements
- ◆ March 25th – EFW proposed operational limits sent to Doris Dumais, Director MOE Certificates and Approvals Unit for comment



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# Emission Control Technology

- ◆ RFP will require vendors to guarantee EFW emission limits
  - ◆ Extra consideration for even more stringent emission guarantees
  - ◆ Vendors will propose emission control technology
- ◆ Provide Maximum Acceptable Control Technology that can meet the Proposed Operational Limits, e.g.
  - ◆ Combustion controls and a SNCR to control NO<sub>x</sub>
  - ◆ Lime injection to control acid gases
  - ◆ Carbon injection to control mercury, dioxins & furans
  - ◆ Fabric filter to to remove particulate & heavy metals



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# Emission Monitoring

- ◆ Specify continuous monitoring where it is technically possible to do so on a reliable basis
  - ◆ Exhaust Gas Monitoring
    - ◆ Acid Gasses - NO<sub>x</sub>, HCl, HF, SO<sub>2</sub>
    - ◆ Opacity, carbon monoxide, pressure and temperature
  - ◆ Process monitoring
    - ◆ Temperature and O<sub>2</sub> at critical points in process
- ◆ Quarterly or semi-annual stack testing
  - ◆ Dioxins
  - ◆ Heavy metals



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## **Recommendation to JWMG**

### **Recommendation**

- ◆ Subject to MOE acceptance of EFW Emission Limits
- ◆ Subject to Durham Council approval of business plan

**JWMG adopt the EFW Proposed Operating Limits for inclusion in the Request for Proposal to be sent to Selected Vendors**