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DENR ADMINISTRATIVE ORDER
NO. 2019 - 21

SUBJECT: GUIDELINES GOVERNING WASTE-TO-ENERGY (WtE) FACILITIES FOR THE INTEGRATED MANAGEMENT OF MUNICIPAL SOLID WASTES

Pursuant to Section 8 (f) of Republic Act (RA) 9003, otherwise known as the Ecological Solid Waste Management Act of 2000, NSWMC Resolution No.669, Series of 2016, Adopting the Guidelines Governing the Establishment and Operation of Waste to Energy Technologies for Municipal Solid Wastes (MSW), Executive Order 192 (Providing the Reorganization of the Department of Environment, Energy and Natural Resources; Renaming it as the Department of Environment and Natural Resources) dated 10 June 1987, the Department of Environment and Natural Resources (DENR) hereby adopts and promulgates these guidelines on the establishment and operation of Waste-to-Energy (WtE) facilities for municipal solid wastes.

These guidelines also adhere to the policy of the government to promote compliance with Presidential Decree (PD) 1586 (Establishing an Environmental Impact Statement System), RA 6969 (Toxic Substances and Hazardous and Nuclear Wastes Act of 1990), RA 8749 (Philippine Clean Air Act of 1999); and RA 9275 (Philippine Clean Water Act of 2004).

SECTION 1. DECLARATION OF POLICY

It is hereby declared the policy of the State to adopt a systematic, comprehensive and ecological solid waste management program which shall ensure the protection of public health and environment and set guidelines and targets for solid waste avoidance and volume reduction through source reduction and waste minimization measures, including composting, recycling, re-use, recovery, green charcoal process, and other schemes, before collection, treatment and disposal in appropriate and environmentally-sound solid waste management facilities in accordance with ecologically sustainable development practices.

SECTION 2. OBJECTIVE

This Order is issued to provide guidelines on the evaluation, establishment, operation and de-commissioning of waste-to-energy (WtE) facilities for the integrated management of municipal solid wastes.

SECTION 3. SCOPE AND COVERAGE

These guidelines cover the requirements, and procedures on the establishment and operation of WtE facilities utilizing municipal solid wastes.

SECTION 4. DEFINITION OF TERMS

- a) **Biodegradable Waste** shall refer to solid wastes that can be decomposed by microorganism into humus-like product.
- b) **Bottom Ash** shall refer to the agglomerate ash formed that are too large to be carried in the flue gases and fall through open grates to an ash hopper at the bottom of the furnace.
- c) **Bureau** shall refer to the Environmental Management Bureau.
- d) **Clustering** is a strategy of pooling available resources of neighboring cities, municipalities or barangays for the establishment of a common solid waste management facility or service.
- e) **Continuous Emissions Monitoring System (CEMS)** shall refer to the total equipment used to sample, analyze and provide a permanent record of emissions or process parameters.
- f) **Decommissioning** is a process in which the WtE facility is placed in a safe and environmentally acceptable condition prior to cessation of operation.
- g) **Department** shall refer to the Department of Environment and Natural Resources.
- h) **Environmental Permits and Clearances** shall refer to the Environmental Compliance Certificate (ECC), Permit to Operate (PTO) and other legal requirements that must be secured prior to construction, set-up and operation of a WtE facility.
- i) **Dioxins and Furans** shall refer to the polychlorinated organic compounds namely polychlorinated dibenzo p-dioxins (PCDDs) and polychlorinated dibenzo-furans (PCDFs) that are generated unintentionally from waste incinerators and other industrial processes, and 17 of which are toxic in nature. The 17 toxic congeners include seven (7) 2,3,7,8 - substituted PCDDs and ten (10) 2,3,7,8- substituted PCDFs.
- j) **Effluent Standard** shall refer to any legal restriction on quantities, rates, and/or concentrations or any combination thereof, of physical, chemical or biological parameters of effluent which a person or point source is allowed to discharge into a body of water or land.
- k) **Emission** shall refer to any air contaminant, pollutant, gas stream or unwanted sound from a known source which is passed into the atmosphere.
- l) **Fly Ash** shall refer to the ash formed that are too small and light and are carried in the flue gases.
- m) **Feedstock** refers to the segregated biodegradable or residual waste materials supplied to the WtE facility to generate heat or electricity.
- n) **Hazardous wastes** shall refer to by-products, side-products, process residues, spent reaction media, contaminated plant or equipment or other substances from manufacturing operations and as consumer discards of

manufactured products which present unreasonable risk and/or injury to health and safety and to the environment.

- o) **Host LGU** shall refer to the LGU (province, city, municipality or barangay) where the waste to energy facility is located.
- p) **Materials Recovery Facility (MRF)** shall include solid waste transfer station or sorting station, drop off center, a composting facility and a recycling facility (DAO 2001-34).
- q) **Municipal Solid Waste (MSW) or Municipal Wastes** shall refer to wastes produced from activities within local government units which include a combination of domestic wastes from residential, commercial, institutional and industrial wastes and street litters (DAO 2001-34).
- r) **Recyclable Materials** shall refer to any waste material retrieved from the waste stream and free from contamination that can still be converted into suitable beneficial use or for other purposes
- s) **Residual Waste** shall refer to any material generated after the implementation of 3Rs (Reduce, Reuse, Recycle) with fuel value.
- t) **Residuals Containment Area (RCA)** shall refer to the temporary storage for segregated residual wastes.
- u) **Sanitary Landfill** shall refer to a waste disposal site designed, constructed, operated and maintained in a manner that exerts engineering control over significant potential environmental impacts arising from the development and operation of the facility.
- v) **Segregation** shall refer to a solid waste management practice of separating different materials found in solid waste in order to promote recycling and re-use of resources and to reduce the volume of waste for collection and disposal.
- w) **Source Segregated Waste** shall refer to solid waste segregated at the point of origin/generation.
- x) **Toxic Equivalent (TEQ)** shall refer to the overall toxicity of a sample as if it was comprised completely of 2,3,7,8 - tetrachlorodibenzo-p-dioxin. This is obtained by multiplying the individual congener concentrations by their respective TEF value and summing the results.
- y) **Toxic Equivalency Factors (TEFs)** shall refer to the relative degree of toxicity of PCDD/PCDF congeners in relation to the most toxic dioxin congener 2,3,7,8 - tetrachlorodibenzo-p-dioxin which is assigned a nominal value of 1.
- z) **Waste-to-Energy (WtE)** shall refer to the process of converting wastes with various technologies, usually the conversion of non-recyclable waste materials into useable heat, electricity, or fuel through a variety of processes.
- aa) **WtE Facility** shall refer to the structure/appurtenant facility where the waste-to-energy operations are housed.

SECTION 5. REQUIREMENTS

The following conditions must be met prior to the establishment of a WtE facility:

- a) All WtE facilities shall undergo Environmental Impact Statement System and secure all applicable environmental permits, clearances and other legal requirements from concerned agencies prior to construction, set-up and operation of a WtE facility.
- b) Documentation for compliance with the requirements of PD 1586 shall include an environmental and health risk assessment.
- c) The host LGU including the LGUs where the source of the feedstock will originate from shall ensure that the plan to establish and/or utilize WtE facility is integrated in their approved 10-year solid waste management plan consistent with the provisions of RA 9003.
- d) The host LGU are allowed to implement clustering and/or form partnerships with the private sector in the establishment, construction and operation of WtE facility.
- e) The proponent shall submit an Environmental Technology Verification (ETV) Statement and Report following the DOST ETV Protocol as per DENR-DOST Joint Administrative Order 2006-001.
- f) The WtE facility owner shall:
 - i. Develop a manual of operation and quality assurance and control to be submitted to EMB for monitoring purposes.
 - ii. Maintain, at the highest possible standards, a quality control/assurance system to demonstrate its ability to consistently provide products and services that meet applicable statutory and regulatory requirements.
 - iii. Implement and communicate a detailed emergency response plan to ensure effective and rapid containment and clean-up in the event of an emergency incident. The facility must be equipped with adequate fire-fighting devices certified by the Bureau of Fire Protection.
 - iv. Provide appropriate personal protective equipment and medical care in compliance with existing laws, rules and regulations to all personnel of the facility directly handling or exposed to waste materials, in-process materials and finished products.
 - v. Ensure implementation of resource efficient and cleaner production program that follows the waste management hierarchy of source reduction, recycling, treatment and safe disposal.
 - vi. Provide appropriate, recent and state of the art pollution control and abatement facilities to ensure that all emissions and effluents comply with relevant environmental standards.

- vii. Avail services of EMB registered transporters and treatment, storage and disposal facilities for any hazardous waste resulting from the operations of the WtE facility.

SECTION 6. OPERATIONAL GUIDELINES FOR WTE FACILITY

6.1 Waste Delivery Control

Acceptable Municipal Solid Waste for WtE Facility

The facility shall only accept source segregated biodegradables or residual wastes collected from households, MRFs, Residual Containment Areas (RCAs), Sanitary Landfills and other disposal facilities.

For unsegregated wastes resulting from calamities, flooding and clean up, the waste must undergo pre-processing to achieve the quality and suitability as feedstock.

The WtE facility shall document and maintain records indicating the quantity in weight, source and type of source-segregated wastes to be processed including the date and time received. (*Annex A*)

6.2 Storage Facility

Appropriate storage facilities should be provided for source segregated wastes, in-process materials and any by-product from the WtE facility operation. Such storage shall institute measures to address the risks of potential explosion, combustion, corrosion, contamination, infection and odor emission that could pose potential hazard to human health and the environment.

6.3 Environmental Monitoring

- a) The WtE facility operator shall submit to EMB Regional Offices quarterly Self-Monitoring Report and semi-annual Compliance Monitoring Report in accordance with DAO 2003-27 and/or new relevant issuances thereof.
- b) The WtE facility operator shall install CEMS, linked with the EMB, measuring PM, NO₂, CO, HCl, Temperature and other parameters as determined by Bureau.
- c) In coordination with EMB, WtE facilities utilizing thermal process (whether burn or non-burn) must conduct sampling and analysis for dioxins and furans based on EMB Memorandum Circular No. 2007-003 (*Policy on Compliance and Permitting for Industrial Facilities Relating to Air Quality*) following the prescribed methodology; all average values of dioxins and furans measured over the sampling period of a minimum of six (6) hours and a maximum of eight (8) hours **must not exceed the limit value of 0.1 nanogram toxic equivalents per normal cubic meter (ng-TEQ/NCM)**. (For this guideline, TEF values to be used for calculation of Toxic Equivalents (TEQs) of a particular sample is based on the 1989 update of the United States Environmental Protection Agency (US

EPA) adopting the 1989 International NATO/CCMS TEF values, otherwise represented as I-TEF).

- d) Effluents from WTE facilities must conform with DENR Administrative Order No. 2016-08 (Water Quality Guidelines and General Effluent Standards) and/or the latest relevant issuance thereof.

6.4 Documentation and Data Management

All aspects of WtE facility operations must be well documented. As such, documents and records as listed below shall be maintained at least five (5) years and be made available for inspection:

- a) Delivery record of each waste material received in the facility
- b) Daily processing operation log sheet showing or attaching the following information:
 - i. Quantity of waste materials processed
 - ii. CEMS data online submission to EMB
- c) Laboratory analysis of effluent, source emission, fly ash and bottom ash.

6.5 Social Accountability

The facility owner shall endeavor to establish partnership with stakeholders through education and training, infrastructure improvements, disaster risk reduction and management and such other social development activities.

The WtE facility shall maintain a Light-Emitting Diode (LED) or similar system/device display board, in front of its site and within view of the general public, containing updated information on its air emissions and effluent.

6.6 Interim Cease and Desist Order by the Secretary

Whenever there is an exceedance of the emission standards set by the Department or if there is imminent threat to life, public health, safety or general welfare, or to plant or animal life, an interim order for the closure, suspension, or cessation of operations of the WtE facility may be immediately issued by the DENR Secretary or his authorized representative, without the need for a prior public hearing (Sec 45, RA 8749).

The interim cease and desist order shall be immediately executory and shall remain in force and effect until the WtE operator has reduced the limit value of the dioxin and furans to 0.1 nanogram toxic equivalent per normal cubic meter (ng-TEQ/NCM), or until a temporary lifting order is issued by the Pollution Adjudication Board (PAB) or an injunctive writ is issued by a Court of Law. (Sec 1, Rule X, of PAB Resolution No. 1, Series of 2010)

SECTION 7. DECOMMISSIONING OR ABANDONMENT

A detailed Decommissioning/Abandonment Plan shall be submitted to the Bureau for approval at least one (1) year prior to the decommissioning or abandonment of the facility. The Plan shall include rehabilitation measures, clean-up activities, remediation of areas affected by the WtE facility and proposed alternative post land use of the area.

SECTION 8. FINES AND PENALTIES

Fines and penalties for violating these guidelines shall be governed by pertinent provisions in Presidential Decree 1586 (Establishing an Environmental Impact Statement System), RA 6969 (Toxic Substances and Hazardous and Nuclear Wastes Act of 1990), RA 8749 (Philippine Clean Air Act of 1999), RA 9003 (Ecological Solid Waste Management Act of 2000), and RA 9275 (Philippine Clean Water Act of 2004).

Violation of any provision of these guidelines by WtE facility may result to the suspension or cancellation of relevant permits and clearances and/or the filing of appropriate charges, pursuant to relevant environmental laws and policies as determined by the Department.

SECTION 9. TRANSITORY CLAUSE

Any establishment operating a WtE facility using MSW as feedstock prior to the effectivity of this DAO shall be given one (1) year to comply with all permitting requirements set forth provided, that such facility does not cause or pose imminent threat to property, public health and environment as determined by DENR-EMB or other government agencies concerned.

SECTION 10. EFFECTIVITY

This guideline shall take effect fifteen (15) days after its publication in two (2) newspapers of general circulation and upon submission of a copy thereof to the Office of the National Administrative Registry (ONAR) at the University of the Philippines Law Center.


ROY A. CIMATU
Secretary



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