



Republic of the Philippines  
Department of Environment and Natural Resources  
Visayas Avenue, Diliman, Quezon City  
Tel. Nos. (632) 920-4301 \* (632) 928-0691 to 93  
924-2540 \* 928-8502  
929-6626 loc. 2012 - 2014

Memorandum Circular No. 2002- 13

NOV 13 2002

**Subject: ESTABLISHMENT OF GEOTHERMAL AREAS AS AIRSHEDS**

Pursuant to Sections 8 and 9 of Republic Act 8749, Rule XV of DENR Administrative Order 2000-81, and Sections 4c and 4f of Memorandum Circular 2002-03, the Department hereby provides the guidelines for the establishment of geothermal airsheds in the country.

**Section 1. Rationale for the Designation of Geothermal Airsheds.** Geothermal areas are being declared as airsheds based on the following considerations:

- a. Philippine geothermal areas are located in volcanic setting that is geologically different from other areas in the country. The development of geothermal areas involves the utilization of the geothermal fluids below ground for *in-situ* power generation, which requires a large contiguous area.

A geothermal project area is an integrated system consisting of the underground geothermal reservoir, the fault complexes conducting the steam/hot water from below, surface thermal manifestations, steam gathering and collection system and the power plant with its auxiliary structures. Thus, in addition to the plant, the air quality of the geothermal area is influenced by the natural emissions from the surface thermal manifestations such as but not limited to hot springs, sulfataras and fumaroles as well as vents integral to the project system for the safety of the operation. The natural emissions evolve in time and may change in number, location and intensity. Because of the nature of the geothermal project and its influence over a large area, it is an area emission source that can be segregated as an airshed in itself.

- b. Recognizing the environmental and economic contribution of geothermal resources to the country, these guidelines are being issued to facilitate compliance of the sector with RA 8749. Geothermal energy, a renewable and indigenous resource that provides power security to the country, is a vital component of the Philippine Energy Plan (PEP). It also replaces substantial quantities of imported fossil fuel, providing foreign exchange savings for the country that can be reallocated to much-needed basic social services for the people. Geothermal projects also address the problem of global warming through reduced greenhouse gas emissions.
- c. Consistent with Sec. 9 of RA 8749, a geothermal area has its own development prospects and problems for electric and non-electric uses, which

are different from other areas in the Philippines, thus, qualifying the area to be declared as a separate airshed.

**Section 2. Definition of Terms.** The following terms as used in this Memorandum Circular are defined as follows:

- a. **Airsheds** refer to areas with similar climate, meteorology and topology, which affect the interchange and diffusion of pollutants in the atmosphere, or areas which share common interest or face similar development programs, prospects or problems;
- b. **Bureau** refers to the Central Office Environmental Management Bureau and its Regional Offices under the Department;
- c. **Department** refers to the Department of the Environment and Natural Resources;
- d. **Department of Energy** refers to the agency created under RA 7638 of 1992;
- e. **Existing projects** refer to those projects that have been designed, bidded out or constructed or in operation before approval of RA 8749, promulgated on 23 June 1999;
- f. **EIS System** refers to the Environmental Impact Statement system as prescribed in PD 1586 and DENR Admin Order 96-37 and other relevant issuances;
- g. **Indigenous energy resources** refer to energy resources which originate or occur naturally in the Philippines, such as but not limited to geothermal, hydro power, biomass and natural gas;
- h. **Renewable energy resources** refer to energy resources that are replenishable and are in areas where energy can be extracted through a working medium or process without any measurable change or effect in the total energy content of the resource over a prolonged period of time;
- i. **Geothermal project** refers to the facilities including but not limited to geothermal wells, pipelines, power plants, non-electric facilities and auxiliary structures and equipment;
- j. **Geothermal area** refers to the geothermal reservoir, the fault complexes conducting the steam/hot water from below, surface thermal manifestations, geothermal project consisting of facilities including but not limited to geothermal wells, pipelines, power plants, non-electric facilities and auxiliary structures and equipment which is delimited by the geothermal block covered by an Environmental Compliance Certificate (ECC) per PD1586;

- k. **Geothermal resource** refers to all geothermal fluids existing naturally or formed by artificial introduction of fluids to naturally hot formations, heat energy from the earth, and any by-product derived from these;
- l. **Governing Board** refers to the Board that manages airsheds, consisting of representatives from local government units concerned, the private sector, people's organizations, NGOs and concerned government agencies, chaired by the Department Secretary;
- m. **New/modified project** refers to any plant, equipment or installation in any trade, business or establishment which generates, emits or disposes air emissions into the atmosphere and constructed after the effectivity of the Implementing Rules and Regulations of RA 8749; and
- n. **Stack** refers to a vertical conduit where concentrated waste gases from the power plant are discharged directly to the environment.

**Section 3. Coverage of the Geothermal Airshed.** The guidelines in defining the area of the geothermal airshed shall be as follows:

- a. The coverage of the geothermal airshed shall be the geothermal area as defined in this circular and the adjacent area that may be affected by the dispersion of the air pollutants from geothermal operation.
- b. Geothermal airshed is hereby provided for geothermal areas with existing projects and those listed in the Philippine Energy Plan and other geothermal areas certified by the Department of Energy thereafter.
- c. The areal coverage of the geothermal airshed can be amended consistent with the evolution of the geothermal project, in consultation with appropriate local government authorities and upon approval by the Department pursuant to Sec. 9 of RA 8749 and Rule XV, Sec. 12 of its IRR.

**Section 4. Procedures in the Establishment of the Geothermal Airshed.** The procedures in the establishment of the geothermal airshed are hereby provided:

- a. The Department shall undertake the inventory of all sources of hydrogen sulfide emissions in the geothermal areas and other pollutants that may be identified as critical in the future based on actual sampling, engineering estimates or other academic approaches, with the assistance of the project operator;
- b. The project operator shall conduct air dispersion modeling studies to determine the airshed boundary;
- c. The project operator shall submit to DENR-EMB the air dispersion modeling studies, management measures and the proposed air quality monitoring program;

- d. The Department, through the Bureau, shall delineate the boundaries of the airshed, upon consultation with the stakeholders;
- e. Upon consultation with appropriate local government authorities, the Secretary of the Department, upon recommendation of the Bureau shall, from time to time, revise the designation of airsheds utilizing eco-profiling techniques and undertaking scientific studies.

**Section 5. Air Quality Standards.** The following are the guidelines for compliance with air quality standards:

- a. Consistent with Sec. 1a of this Circular, the geothermal project shall be classified as area emission source and shall comply with ambient standards as provided for in R.A. No. 8749 and its Implementing Rules and Regulations. In cases where the geothermal project employs technologies that use a stack for the disposal of waste gases to the environment, the project shall comply with both emission and ambient standards.
- b. Hydrogen sulfide (H<sub>2</sub>S) as the critical gas may be the emission indicator that will be regulated for geothermal projects and other gaseous pollutants, which may be determined by the Department within the geothermal airshed.

**Section 6. Installation of Air Quality Monitoring Equipment.** The project operator shall install and maintain the following equipment:

- a. At least two continuous H<sub>2</sub>S ambient monitors for each major facility, (e.g. power plant) the location of which shall depend on the air dispersion model. If warranted, stations shall be established within the nearest population. In the case of several geothermal plants in a project within the airshed, monitoring equipment shall be strategically located between plants. Where practicable, the continuous stations shall be approximately co-linear with the geothermal facility.
- b. Meteorological stations to complement the continuous H<sub>2</sub>S ambient monitors.
- c. Discrete ambient monitors in case of breakdown or preventive maintenance of the ambient continuous monitors. The stations shall be monitored on a daily basis.

Data quality assurance must be observed and whenever necessary or as the need arises, auditing by a third party may be requested to ensure acceptability of data comparable with the standards.

**Section 7. Permits.** Operators of geothermal projects are required to secure Authority to Construct and/or Permit to Operate from the Department as provided for in RA 8749 and its Implementing Rules and Regulations.

**Section 8. Annual Reports.** At the end of every year, the operators of geothermal projects are required to submit a performance report to the Regional EMB, which shall include the monitoring results, compliance assessment with the air quality standards, status of the buffer zone, initiatives towards the improvement, status of monitoring equipment, and relevant maps.

**Section 9. The Governing Board and Its Composition.** The composition and functions of the Governing Board shall abide by the provisions of RA 8749 and its Implementing Rules and Regulations, provided that the geothermal operator shall be represented in the Governing Board.

**Section 10. Emission Charges and Air Quality Management Fund.** Geothermal areas shall be subject to provisions on Emission Charge System and Air Quality Management Fund, pursuant to Sections 13 and 14 of RA 8749 and its Implementing Rules and Regulations.

**Section 11. Review of Geothermal Airshed.** Review shall comply with the relevant provisions of RA 8749.

**Section 12. Effectivity.** This Memorandum Circular shall take effect immediately.



**HEHERSON T. ALVAREZ**  
Secretary

**NOV 13 2002**