MANAGEMENT OF COAL ASH

Coal ash is a solid fossil fuel combustion residue from coal burning power plants. This includes combustion residues such as fly ash, bottom ash, flue gas desulfurization sludge (FGDS), fluidized bed combustion waste (FBC), and some by-products including cenospheres, which are used as a lightweight filler in many products. Both the quantity and quality of coal ash are important to consider when managing this residue.

Chemical/Physical Characteristics

Coal ash contains certain elements (B, Se, As) in concentrations that may create toxic conditions when entering the food chain via plant uptake or by leaching into the ground and surface waters. Therefore, it is critical to define and characterize coal ash to ensure proper use and disposal procedures.

The following should be considered when characterizing and managing coal ash:

- pH
- total metals
- leachable metals (if total metal concentration are high)
- sodium adsorption ratio
- electrical conductivity
- physical form (dispersible, aggregate, etc.)

The quantity available, the physical form, and the chemical make up of coal ash are important factors when identifying potential negative effects on the environment, and may significantly affect the management options and handling procedures.

Legal Framework and Classification

The *Alberta User Guide for Waste Managers* states that "fly ash waste, bottom ash waste, slag waste or flue gas emission control waste generated from the combustion of domestic waste, coal, wood, or other fossil fuels" are not considered hazardous wastes. This Guide is available on line at http://environment.gov.ab.ca/info/home.asp.

Management Options

Given the volumes produced and the likelihood for creating airborne particles, most coal ash is managed on-site within mined-out areas adjacent to the mine or the coal power plant. Current management options for coal ash include: disposal in mined out areas, surface impoundments, off-site landfills, co-disposal with sour wastes, soil conditioner for pH adjustment, and re-use.

Disposal

- Mining/power companies' acceptable management for fly ash and other inert solid wastes includes on-site disposal within mined out areas. When properly conducted this practice is not likely to cause adverse environmental effects.

- Disposal at Class I and Class II landfills is acceptable in Alberta, provided that prior landfill operator permission is obtained. Co-disposal with municipal solid waste should be avoided to prevent leaching of contaminants present in the coal ash.
- Due to its caustic nature, the buffering capacity of the coal ash has also been used to neutralize landfill leachates and in co-disposal with sulphur-containing wastes or other acidic wastes in dedicated cells or trenches at Class I or Class II landfills.

Beneficial Use

- The use of coal ash requires information on its physical and chemical characteristics, precautions and procedures during handling, and identification of acceptable disposal when it becomes a waste. This information should be described in a material safety data sheet (MSDS) to minimize liability when transferring the product to third parties.
- The decision to use coal ash, rather than disposing of it, should be left to generators and its potential users. In using coal ash there should be no risk of environmental liability, as the quality of the product should meet the specifications or quality criteria required by the user.
- Examples of uses include: granulated coal ash, ground stabilizer, mined out areas reclamation material, soil conditioner (apple orchards, acidic soils), acidic water treatment, aggregate or spraying material, and cavity filler/embankment material.

Summary

The following summarizes Alberta Environment's position on the management of coal ash:

- Disposal or reuse on-site where there is minimal risk of causing an adverse environmental effect;
- Use as a product with proper documentation of the quality and handling procedures (MSDS); and
- Disposal into a Class I or Class II landfill, provided that prior landfill operator permission is obtained.

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