MATERIAL SAFETY DATA SHEET
MSDS No. BP - 001

PRODUCT: Class "F" Fly ash, coal fly ash

SECTION I - Manufacturer

Manager, Coal Combustion By-Products
Tennessee Valley Authority
1101 Market Street, LP 5G
Chattanooga, Tennessee 37402-2801
Telephone (423) 751-2422

SECTION II – Product Composition, Constituents, and Ingredients

Constituent	OSHA PEL		ACGIH TLV	
Silica – SiO_2 (40 – 60 %) Crystalline (3-7%) Amorphous (33-57%)	Crystalline: Quartz (Respirable) CAS 14808-60-7	$\frac{10 \text{ mg/m}^3}{\% SiO_2 + 2}$	Crystalline: Quartz (Respirable) CAS 14808-60-7	0.05 mg/m^3
	Quartz (Total)	$\frac{30 \text{ mg/m}^3}{\% SiO_2 + 2}$	Cristobalite (Respirable) CAS 14464-46-1	0.05 mg/m^3
	Amorphous	$\frac{80 \text{ mg/m}^3}{\% SiO_2}$	Tridymite (Respirable) CAS 15468-32-3	0.05 mg/m^3
			Amorphous: Precipitated silica and silica gel CAS 112926-00-8	10 mg/m^3
Aluminum oxide – Al_2O_3 (18–31%) CAS 1344-28-1	Respirable Total	5 mg/m^3 15 mg/m^3	Total	10 mg/m^3
Iron oxide – Fe_2O_3 (5–25%) CAS 1309-37-1	Total	10 mg/m^3	Total	5 mg/m^3
Calcium oxide – CaO (1–6%) CAS 1305-78-8	Total	5 mg/m^3	Total	2 mg/m^3
Magnesium oxide – MgO (1–2%) CAS 1309-48-4	Total	15 mg/m^3	Total	10 mg/m^3
Titanium oxide – TiO_2 (1-2%) CAS 13463-67-7	Total	15 mg/m^3	Total	10 mg/m^3
Inorganic arsenic (16-210 ppm) CAS 7440-38-4	Total	10 µg/m^3	Total	0.01 mg/m^3

CLASS "F" FLY ASH

SECTION III – Physical/Chemical Data	SECTION IV – Fire/Explosion Data
Boiling Point: No applicable information (N/A) **Vapor Pressure:** N/A **Vapor Density:** N/A **Water Solubility:** < 0.5% **Melting Point:** >2500ºF **Percent Volatile:** N/A **Evaporation Rate:** N/A **Appearance:** gray-brown or tan to black powdery solid **Odor:** none	**Flash Point:** none **Lower/Upper Flammable Limits**: none/none **Autoignition:** none **Fire/Explosion Hazard**: none/none **Firefighting:** N/A **Extinguishing Data:** N/A

SECTION V – Reactivity/Incompatibility Data

Reactivity: Fly ash is stable under most conditions

Incompatibilities:

Fly ash: N/A

Quartz: Test with small quantities of strong oxidizers before mixing.

Hazardous decomposition: none

Polymerization: none

SECTION VI – Health Hazard Data

Routes of entry: Inhalation? yes Skin? may cause irritation Ingestion? unlikely

Carcinogenicity: NTP? yes IARC? yes OSHA? yes

Inhalation Health Hazards:

Acute: Respiratory tract irritation causing coughing, wheezing, and difficulty breathing

Chronic: The primary routes of exposure are inhalation and contact with eyes and skin. Fly ash is composed of inert dust (possibly irritating to mucous membranes), crystalline silica (a pneumoconiosis producing dust and animal carcinogen),and low concentrations of calcium oxide (possibly irritating to mucous membranes and wet skin). Fly ash contains trace amount of inorganic arsenic (identified as a carcinogen).

Skin and Eye Health Hazards:

Acute: Eye contact can cause severe, mechanical irritation. Skin contact may cause irritation.

Chronic: Skin contact may cause irritation.

SECTION VII – First Aid

Inhalation: Remove person from exposure area to fresh air. Keep person warm and calm. Call for medical help if person has breathing difficulty. Give artificial respiration if person is not breathing.

Eye Contact: Wash-out eyes with warm water for 15 minutes, occasionally lifting eye lids. Send person for medical attention.

Skin Contact: Remove contaminated clothing. Wash with soap and water. Launder clothing before reuse.

SECTION VIII – Exposure Controls and Personal Protective Equipment

General: Do not use compressed air to remove fly ash.

Ventilation: Use local exhaust ventilation to remove airborne fly ash from work areas when feasible.

Eye Protection: Employees should use dust-proof safety goggles in areas of high levels of airborne fly ash. Eye wash facilities should be available in case of eye exposure.

Skin Protection: Employees should wear protective clothing to prevent repeated or prolonged skin contact with fly ash.

Respiratory Protection: Respiratory protection is selected based on a hazard assessment of the work location, including the specific airborne agents, the concentration of the agents, and the permissible exposure levels (PEL). Selection must be done by a knowledgeable person following the requirements in OSHA's Respiratory Protection Standard, 29CFR1910.134(d) in order to obtain adequate protection from the respirators. Employees must be qualified to use a respirator, and all respirators must be certified by NIOSH. The following table gives guidance on selecting an appropriate respirator for inorganic arsenic protection. It also should protect against other airborne particulates associated with fly ash that are not regulated by substance, such as aluminum and iron oxides.

Concentration of Airborne Agent	Required Respirator
Not greater than 10X PEL	Half-mask air-purifying respirator equipped with P100 (high efficiency) cartridge(s) or any respirator listed below.
Not greater than 50X PEL	Full facepiece air-purifying respirator equipped with P100 (high efficiency) cartridge(s) or any respirator listed below.
Not greater than 1000X PEL	Powered air-purifying respirator in all inlet face coverings and equipped with P-100 (high efficiency) cartridge(s) or any respirator listed below.
Not greater than 2000X PEL	Supplied air respirator with full facepiece, hood or helmet or suit and operated in positive pressure mode or any respirator listed below.
Greater than 2000X PEL	Self-contained breathing apparatus with full facepiece and operated in positive pressure mode.

SECTION IX – Safe Handling and Use Precautions

Spill Cleanup: Wet material and shovel into container with cover or HEPA vacuum. Avoid generating airborne dust.

Use: Handle material in closed systems if feasible to control dust.