

Table 3.5-1. List of Hazardous Constituents Potentially Used or Produced During Construction, Drilling, Production, and Reclamation Operations Associated with Oil and Gas Production.

Use	Material	Hazardous Constituents
Drilling Material	Barite	Barium compounds, Fine mineral fibers
	Bentonite	Fine mineral fibers
	Caustic Soda	Sodium hydroxide
	Glutaraldehyde	Isopropyl alcohol
	Lime	Calcium hydroxide
	Mica	Fine material fibers
	Modified Tannin	Ferrous sulfate, Fine material fibers
	Phosphate Esters	Methanol
	Polyacrylamides	Acrylamide, Polycyclic aromatic hydrocarbons (PAHs), Petroleum distillates, Polycyclic organic matter (POM), Fine mineral fibers
	Retarders	Fine mineral fibers
	Anionic Polyacrylamide	Acrylamide
	Polyanionic Cellulose	Fine mineral fibers
	Cement/Plug	Anti-foamer
Bentonite		Fine mineral fibers
Calcium Chloride Flake		Fine mineral fibers
Cellophane Flake		Fine mineral fibers
Cements		Aluminum oxide, Fine mineral fibers
Chemical Wash		Ammonium oxide, Glycol ethers
Diatomaceous Earth		Fine mineral fibers
Extenders		Aluminum oxide, Fine mineral fibers
Fluid Loss Additive		Acrylamide, Fine mineral fibers, Naphthalene
Friction Reducer		Fine mineral fibers, Naphthalene, PAHs, POM
Mud Flash		Fine mineral fibers
Retarder		Fine mineral fibers
Salt		Fine mineral fibers
Silica Flour		Fine mineral fibers
Fracturing Material	Biocides	Fine mineral fibers, PAHs, POM
	Breakers	Ammonium persulphate, Ammonium sulphate, Copper compounds, Ethylene glycol, Fine mineral fibers, Glycol ethers
	Clay Stabilizer	Fine mineral fibers, Glycol ethers, Isopropyl alcohol, Methanol, PAHs, POM
	Crosslinkers	Ammonium chloride, Methanol, Potassium hydroxide, Zirconium nitrate, Zirconium sulfate
	Foaming Agent	Glycol ethers
	Gelling Agent	Benzene, Ethylbenzene, Methyl tert-butyl ether (MTBE), Naphthalene, PAHs, POM, Sodium hydroxide, m-Xylene, o-Xylene, p-Xylene
	pH Buffers	Acetic acid, Benzoic acid, Fumeric acid, Hydrochloric acid, Sodium hydroxide
	Sands	Fine mineral fibers
	Solvents	Glycol ethers
	Surfactants	Glycol ethers, Isopropyl alcohol, Methanol, PAHs, POM
	Production Product/Fuel	Natural Gas

Table 3.5-1. List of Hazardous Constituents Potentially Used or Produced During Construction, Drilling, Production, and Reclamation Operations Associated with Coalbed Methane and Natural Gas (continued). Page 2 of 3

Production Product	Produced water/drill cuttings	Barium, Cadmium, Chromium, Lead, Manganese, Radium 226, Uranium, Other radionuclides
	Liquid hydrocarbons	Benzene, Ethyl benzene, n-Hexane, PAHs, POM, Toluene, m-Xylene, o-Xylene, p-Xylene
Fuel	Diesel fuel	Benzene, Cumene, Ethylbenzene, MTBE, Naphthalene, PAHs, POM, Toluene, m-Xylene, o-Xylene, p-Xylene
	Gasoline	Benzene, Cumene, Cyclohexane, Ethylbenzene, n-Hexane, MTBE, Naphthalene, PAHs, POM, Tetraethyl lead, Toluene, m-Xylene, o-Xylene, p-Xylene
	Jet A	Benzene, Cumene, Cyclohexane, Ethylbenzene, n-Hexane, MTBE, Naphthalene, PAHs, POM, Toluene, m-Xylene, o-Xylene, p-Xylene
	Propane	Propylene
Geophysical Survey Materials	Explosives, fuses, detonators, boosters, fuels	Aluminum, Ammonium nitrate, Benzene, Cumene, Ethylbenzene, Ethylene glycol, Lead compounds, MTBE, Naphthalene, Nitric acid, Nitroglycerine, PAHs, POM, Toluene, m-Xylene, o-Xylene, p-Xylene
Pipeline Material	Coating	Aluminum oxide
	Cupric sulfate solution	Cupric sulfate, Sulfuric acid
	Diethanolamine	Diethanolamine
	LP Gas	Benzene, n-Hexane, Propylene
	Molecular sieves	Aluminum oxide
	Pipeline primer	Naphthalene, toluene
	Potassium hydroxide solution	Potassium hydroxide
	Rubber resin coatings	Acetone, Coal tar pitch, Ethyl acetate, Methyl ethyl ketone (MEK), Toluene, Xylene
Emissions	Gases	Formaldehyde, Nitrogen dioxide, Ozone, Sulfur dioxide, Sulfur trioxide
	Hydrocarbons	Benzene, Ethylbenzene, n-Hexane, PAHs, Toluene, m-Xylene, o-Xylene, p-Xylene
	Particulate Matter	Barium, Cadmium, Copper, Fine mineral fibers, Lead, Manganese, Nickel, POM, Zinc
Miscellaneous	Acids	Acetic anhydride, Formic acid, Sodium chromate, Sulfuric acid
	Antifreeze, Heat Control, and Dehydration Agents	Acrolein, Cupric sulfate, Ethylene glycol, Freon, Phosphoric acid, Potassium hydroxide, Sodium hydroxide, Triethylene glycol
	Batteries	Cadmium, Cadmium oxide, Lead, Nickel hydroxide, Potassium hydroxide, Sulfuric acid
	Biocides	Formaldehyde, Isopropyl alcohol, Methanol
	Cleaners	Hydrochloric acid

Table 3.5-1. List of Hazardous Constituents Potentially Used or Produced During Construction, Drilling, Production, and Reclamation Operations Associated with Coalbed Methane and Natural Gas (continued). Page 3 of 3

	Corrosion Inhibitors	4-4' Methylene dianiline, Acetic acid, Ammonium bisulfite, Basic zinc carbonate, Diethylamine, Dodecylbenzenesulfonic acid, Ethylene glycol, Isobutyl alcohol, Isopropyl alcohol, Methanol, Naphthalene, Sodium nitrite, Toluene, Xylene
	Emulsion Breakers	Acetic acid, Acetone, Ammonium chloride, Benzoic acid, Isopropyl Alcohol, Methanol, Naphthalene, Toluene, Xylene, Zinc chloride
Miscellaneous (cont.)	Fertilizers	Unknown
	Herbicides	Unknown
	Lead-free thread compound	Copper, Zinc
	Lubricants	1,2,4-Trimethylbenzene, Barium, Cadmium, Copper, n-Hexane, Lead, Manganese, Nickel, PAHs, POM, Zinc
	Methanol	Methanol
	Motor oil	Zinc compounds
	Paints	Aluminum, Barium, n-Butyl alcohol, Cobalt, Lead, Manganese, PAHs, POM, Sulfuric acid, Toluene, Triethylamine, Xylene
	Paraffin Control	Carbon disulfide, Ethylbenzene, Methanol, Toluene, Xylene
	Photoreceptors	Selenium
	Scale inhibitors	Acetic acid, Ethylene diamine tetra, Ethylene glycol, Formaldehyde, Hydrochloric acid, Isopropyl alcohol, Methanol, Nitritotriacetic acid
	Sealants	1,1,1-Trichloroethane, n-Hexane, PAHs, POM
	Solvents	1,1,1-Trichloroethane, Acetone, t-Butyl alcohol, Carbontetrachloride, Isopropyl alcohol, MEK, Methanol, PAHs, POM, Toluene, Xylene
	Starting Fluid	Ethyl ether
	Surfactants	Ethylene diamine, Isopropyl alcohol, Petroleum naptha

Source: Modified from: BLM 2001 and BLM 1999