WASHINGTON

Controlling CO_2 emissions borders on the impractical, according to a study by the Energy Department's Carbon Dioxide and Climate Research Program. The study found that the only feasible control technology is absorption by monoethanolamine, but that disposal of the trapped CO_2 and the expense of the proposition are serious problems. It was estimated that a 50% removal efficiency of the gas from power plant emissions would double the cost of electricity. Many of the alternative control methods were rejected because of their low energy efficiencies: The CO_2 produced in generating the electricity to drive the control devices would be greater than the CO_2 removed. The DOE program is studying atmospheric CO_2 in light of calculations that predict a 2–3 °C rise in the average temperature of the earth for a doubling of the CO_2 content of the atmosphere.

The EPA has listed inorganic arsenic as a hazardous air pollutant, based on findings by the EPA's Carcinogen Assessment Group that inorganic arsenic is "closely linked" with human skin and lung cancer. The agency estimates that 3 million persons live within 12 miles of a major source of the compound, and that as many as 40 000 living near certain copper smelters are exposed to concentrations 100 times the national average. Arsenic is already controlled under the EPA's water pollution, drinking water, pesticide, and hazardous-waste programs and under OSHA's occupational health standards program. The listing appeared in the *Federal Register,* Thursday, June 5. The first emissions standards will likely appear early next year.

The Interior Department has recommended designating 44 national parks and monuments as Class I areas under the prevention of significant deterioration rules. The areas had originally been listed as Class II areas; under the Clean Air Act amendments of 1977, the Secretary of the Interior was required to review all Class II listings for promotion to Class I. Designation as Class I prohibits any significant increase in levels of SO_2 or particles. Most of the 44 sites are in the West.

CEQ's Speth

"Occupational exposure to carcinogens is a factor in more than 20% of all cancers," said Council on Environmental Quality Chairman Gus Speth in announcing the findings of the President's Toxic Substances Strategy Committee. The committee's report noted that the incidence of cancer in the U.S. increased by 10% between 1970 and 1976—even when increased longevity is taken into account. The incidence rate had remained relatively constant for the previous 30 years. "The trends of cancer incidence and mortality rates suggest new or intensifying causal factors," the report concluded. The report also found that prevention is the key to controlling diseases and environmental problems caused by toxic chemicals.

The EPA has requested $58 million to administer the proposed superfund for hazardous-waste cleanup. The EPA said it would need the funds for staff to handle the superfund, for an inventory of sites, and for enforcement, as well as for continued monitoring and health tests at Love Canal and at hazardous dump sites in Memphis, TN. The superfund legislation currently before Congress specifically prohibits the EPA from using the superfund monies for administrative costs. In requesting the additional appropriations—a $26.3-million supplement to the 1980 budget and an additional $31.7 million for 1981—the EPA has stressed the need to be prepared for immediate implementation of the superfund.

A Center for Water Quality Modeling has been established by the EPA at its Environmental Research Laboratory in Athens, GA. The center is intended to provide instruction and assistance to the agency's regional offices and to state pollution control agencies in the selection and use of water quality models. Four computer model packages have been selected by the center for initial distribution; more are expected. In addition to distributing the models, the center will offer workshops and seminars that will provide both general training in model use and instruction in specific applications. Additional information is available from the Center for Water Quality Modeling, Environmental Research Laboratory, US EPA, College Station Rd., Athens, GA 30613; telephone (404) 546-3585.

The Supreme Court overturned OSHA's benzene standard in a long-awaited decision, but failed to answer the question of whether cost–benefit analyses are required in standard setting. The majority in the confusing 5-to-4 ruling was formed from 3 separate opinions which failed to express a common basis for the decision. The plurality opinion, signed by 3 justices, found that OSHA had not shown a "significant risk of harm" from current exposure levels in ordering a reduction of exposure limits from 10 ppm to 1 ppm. A concurring opin-

ion argued that cost-benefit analyses must be performed; a second concurring opinion found that Congress had acted unconstitutionally in delegating excessive authority to OSHA. The remaining 4 justices joined in a single dissent, which argued that "risks of harm are often uncertain, but inaction has considerable costs of its own," and criticized the plurality opinion for placing "the burden of medical uncertainty squarely on the shoulders of the American worker."

STATES

New York state has criticized the EPA for failure to take action on acid rain. In a letter to EPA Administrator Douglas M. Costle, New York Environmental Conservation Commissioner Robert F. Flacke charged that recent EPA actions "slightly" lowering SO_2 emissions from two Ohio power plants would "do little to alleviate the problem" of acid rain in the

NY DEC's Flacke

Northeast. "Your agency must use its existing authority to develop emission standards for oxides of sulfur and nitrogen, establish a national program requiring coal washing, require coal-fired plants to install continuous in-stack monitors, and convince Congress that consideration should be given to requiring installation of antipollution equipment on all existing power plants within a reasonable number of years," Flacke said. He added that "we cannot wait 10 years while studies are conducted."

Connecticut has established a Hazardous Waste Facility Siting Board with the power to override local zoning laws. The board will receive all applications for building or operating hazardous waste disposal facilities in the state. After holding public hearings, the board will make a decision, which, according to the legislation, should take into account public health, safety, and welfare, including the risk of transportation accidents, risk of explosions and contamination, and consistency with local land-use plans. An override of local zoning laws would require a two-thirds vote; other decisions, a majority vote. The board is to begin operation on July 1, 1981.

Gasohol sales will be allowed in California under a law which exempts the fuel from volatility standards set by the Air Resources Board. The standards, aimed at limiting evaporative emissions, had effectively blocked the sale of gasohol in the state except during winter. Gasohol has a slightly higher vapor pressure than straight gasoline. The new law permits sale of gasohol for a 3-year test period beginning Jan. 1, 1981.

The response of human cells to air pollution will be studied at the University of North Carolina under a 3-year, $367 409 contract awarded by the EPA. Volunteers will be exposed to levels of specific air pollutants, such as nitrogen oxide and ozone, similar to those in large urban areas. Blood samples and nasal tissue will be examined for cellular injury. According to Dr. Albert M. Collier, the chief investigator for the project, any cellular injury detected will be examined by electron microscopy as well as biochemical and immunological methods in an effort to determine the mechanism of injury.

Nebraska will require industrial pretreatment of wastes that can interfere with the operation of sewage treatment plants. The state Department of Environmental Control is conducting a survey of industries, and will determine, from information supplied on the nature and concentration of discharges, which industrial plants will be subject to the regulations. Existing plants required to install pretreatment controls will have 3 years to comply; new plants will have to meet the requirements immediately. The regulations are expected to reduce operating costs of sewage treatment plants. The program is being administered on the state level with federal oversight. However, municipalities that can demonstrate the ability to monitor and enforce the program will be allowed to take over administration themselves.

MONITORING

Continuous monitoring of sulfur at synfuel plants may soon be possible thanks to a method called differential pulse voltammetry. Joseph Jordan and his associates at The Pennsylvania State University say that the technique is ready for in-plant analysis. The method can keep tabs on about a dozen pollutants, including a suspected sulfur-containing carcinogen called dibenzothiophene. The voltammetric analysis would be coupled with a thermochemical method to make the system as fail-safe as possible. Previously, there had been no "ready-to-go" in-plant method, the Penn State scientists said.

Sampling and data handling for inhalable particles from stationary sources are enhanced by new stack-sampling equipment developed by EPA (Research Triangle Park, NC). It consists of a two-stage cyclone with size cut points at 2.5 μ and 15 μ, for use with a Method 5 sampling train, and a 15-μ cyclone for use with cascade impactors. Sampling flow rates at temperatures of 23, 93, and 150 °C were determined empirically to be at certain fixed rates between 6.8 L/min and 23 L/min. Applicable devices have been demonstrated in the laboratory, and will be modified to handle fugitive emissions, as well.

TECHNOLOGY

"Diesohol" coming? Penn State scientist Samuel Lestz told how diesel oil might be burned with methanol, even though the two do not mix in liquid phase. Methanol vapor would enter the engine with intake air. About 15–20% methanol would be used. NO_x emissions would probably be lower than for straight diesel fuel, though other pollutants need more research.

A means of immobilizing low-level radioactive wastes by a proprietary method can work as fast as 150 tph, Sludgemaster (Santa Barbara, CA) announced. Applications include uranium mill tailings and debris from the decommissioning of milling and disposal facilities. The firm says that the product is insensitive to pH 1.5–12.0, is liquid-free and highly impermeable, immobilizes both radioactive and toxic chemicals, and prevents radon re-

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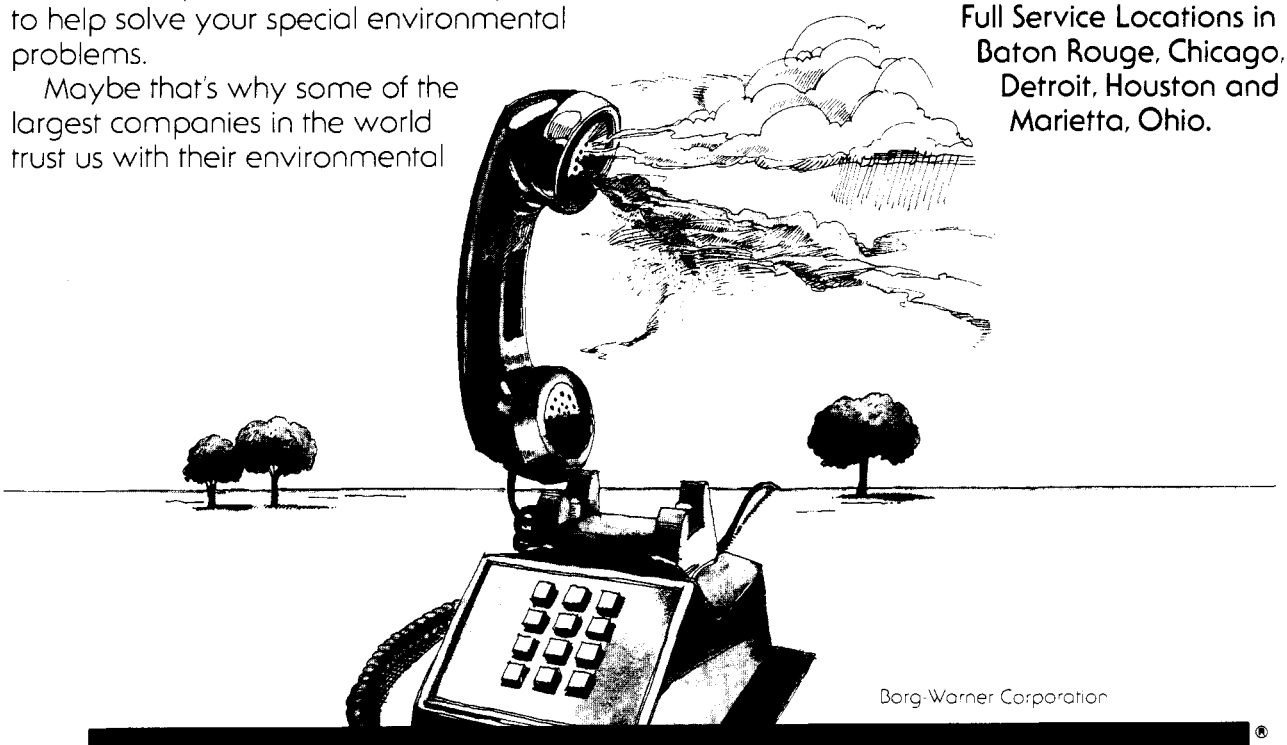

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lease. Processed wastes can be disposed of in containers or in mass cell liners, and can be used as effective mass liners, themselves, Sludgemaster says.

Magnetic air cleaning at EPA

Could *magnets* control air pollution? They could filter out fine particles, says Dennis Drehmel of EPA (Research Triangle Park). The trick is to fill a canister with stainless steel wool surrounded by electromagnets, which, in turn, magnetize the wires. Magnetization increases the area from which the wires can collect particles. That, in turn, allows higher gas volumes to be run through the filter, thereby reducing energy needs. This type of air cleaner would apply to the iron/steel industry. Iron particles in streams from such industries are attracted to the steel wires. Attempts are being made to develop a continuous process, and field tests are to begin next summer.

Biodegradation of phenol in water from 800–1000 mg/L to less than 1 mg/L can be accomplished with Liquid Live Microorganisms (LLMO), according to General Environmental Science Corp. (Beachwood, OH). A detention time of 10–14 days is needed, and, while initial degradation is slow, it soon accelerates markedly. Biodegradation involves an oxidase enzyme that cleaves the aromatic ring to form muconic acid, initially. This process will work in high phenol concentrations, although care should be taken to keep a constant pH and nutrient atmosphere for the *Pseudomonas* bacteria that furnish the enzyme.

Extracting copper from ore without SO_2 emission and with energy saving is the object of a new process devised by the University of Utah and Envirotech Corp. (Salt Lake City, UT). The development was sponsored by the National Science Foundation. This "ElectroSlurry" process combines leaching the copper from ore and plating it onto metal in one step. Extremely fine ore grinding is needed, but university scientists have taken a new, less expensive approach from the paint industry. Since the ore is not heated, no SO_2 can escape. The technique may also have uses in precious metal recovery.

INDUSTRY

Solar-generated electricity could become much less expensive if a new type of silicon material, for which DOE granted a $7.7-million contract to Solarex Corp. (Rockville, MD), fills the bill. This material would first be put into molds and cast, before being cut into the thin Si wafers needed for photovoltaic cells. Normally, photovoltaics require laboriously grown cylindrical crystals of pure Si; such painstaking processes raise expenses. But the Solarex "semicrystalline" Si can cut costs sharply, because of molding and slicing. The firm believes the process could lead to power costs of 43¢/peak watt by 1986; DOE's near-term goal is 70¢/peak watt.

Phthalate esters have an essentially low acute toxicity, a senior industrial toxicologist told *ES&T*. For rats, the oral LD_{50} is 1.5–30 g/kg of body weight, for dermal, 3.4–20 g/kg, according to experimental results going back as far as the 1940s. As for subacute/chronic toxicity, high doses, such as 3% in the diet, are found to produce liver enlargements and other organ effects. Some esters, such as di-2-ethylhexyl phthalate (DEHP) and dimethoxyethyl phthalate (DMEP), showed lethal effects under mutagenicity tests, while dibutyl and diallyl esters were negative. EPA disapproved several premanufacturing notifications for certain phthalate esters in April.

A period for comment prior to a Health Hazard Alert (HHA) issuance by OSHA is the subject of an Occupational Safety and Health Act amendment proposed by the Dye, Environmental and Toxicology Organization (DETO, Scarsdale, NY). What prompted this action was an HHA for benzidine, *o*-tolidine, and *o*-dianisidine-based dyes. DETO Chairman Roderick Horning told OSHA that there is no scientific basis to conclude that these dyes present a human hazard. DETO calls for a 30-day review/comment period, before an HHA is made public, unless the Secretary of Labor or of Health and Human Services finds that a shorter period is warranted.

While pesticide laws and regulations are generally supported by the National Forest Products Association (NFPA, Washington, DC), certain issues should be included in Congressional oversight, NFPA believes. Among them are utilization of impartial scientists to assess health risk problems and dosage limits. Also called for is a federal program to educate the public concerning risks/benefits of forest pesticide use, imposition of use restrictions only after determination by technically qualified experts that they are needed, and procedures for determining "minor use" status, e.g., at tree nurseries and greenhouses.

Larson of 3M Co.

"Energy and environmental goals need not conflict," Clair Larson, executive director, Central Engineering for 3M Corp. (St. Paul, MN), told a corporate planners' meeting. As an example, he cited 3M's Pollution Prevention Pays (3P) program, which he said saved his company more than $32 million since 1973. That money would otherwise have gone for "end-of-pipe" control equipment, with commensurate operating and energy costs. An example Larson gave was reformulating an adhesive to eliminate odor, thereby dropping the need to install a $1-million thermal oxidizer and to spend $50 000/y for fuel and operating costs to run the oxidizer.