SPECIAL REPORT

EPA's Secret Role in Toxic Sludge

By Sheila R. Cherry

Relying on scientific research conducted in the 1970s, the Environmental Protection Agency has concluded that sewage sludge is safe to fertilize food crops.

The Environmental Protection Agency, or EPA, as well as state environmental officials, are reacting defensively to questions raised by federal and state legislators about the safety of spreading sewer sludge as fertilizer near residential land and where crops are grown.

Since **Insight**'s first reports on the potential dangers inherent in the practice — and the possibility that two people died as a result of exposure to sludge — the EPA and its supporters in the sewage industry have insisted that the EPA-recommended method of land application of low-grade sewage sludge, otherwise know as biosolids, is safe.

EPA responds to criticism of its biosolids-disposal program with the claim that the agency has conducted more than 25 years of scientific research that proves treated sewer sludge is safe to use as fertilizer.

But new documents obtained by **Insight** suggest that these claims are not as sound as officials profess. Moreover, the independent studies touted by EPA aren't quite as independent as claimed based on the magazine's review of this overlooked but potentially serious biohazard and the sometimes cozy ties between the regulators and the regulated. And despite EPA claims that sludge "fertilizer" is safe, a new report being finalized by occupational-health experts at the Centers for Disease Control and Prevention is expected to argue — strongly — that indeed, such biosolids could pose serious health hazards to workers.

Depositions taken from EPA officials in two sludge-related legal cases — one concerning whistle-blower retaliation, the other a wrongful-death lawsuit — suggest that the federal scientific standards used by the EPA to justify land application may be 20 years out of date. Alan B. Rubin, now a senior scientist in the EPA's Office of Water, acknowledged in an April 1999 deposition in the whistle-blower retaliation lawsuit that carcinogens are present in sludge, although he added that the EPA had settled on a risk assessment it believed was realistic.

But is that so? EPA officials have relied heavily on allies in the industry they are meant to be regulating to help them market the nonhazardous benefits of low-grade sludge. And they have turned to such allies and funded them to come up with the science that justifies the agency's position on using biosolids as a safe fertilizer. For example, the EPA has provided grant money to the Water Environmental Federation, or WEF, to research 19 complaints of alleged sludge-related illness or property damage. What has not been revealed by EPA, however, is that its own scientists sit on WEF boards along with industry representatives and then present any findings by WEF as independent research.

Hauling sludge from water-treatment plants is a multibillion-dollar per year industry, but its actual disposal can be costly. Compared with the expense of incineration, landfills and pasteurizing processes, finding landowners willing to accept low-grade sewage sludge as cheap, or free, fertilizer is a bonus. In response to the Clean Water Act of 1972, the EPA endorsed using treated low-grade, or Class B, sludge — a by-product from the nation's 16,000 wastewater treatment facilities — as a fertilizer.

Part 503 of EPA regulations detail four permissible ways to dispose of sludge, but only spreading waste on fields was considered by EPA bureaucrats to be environmentally beneficial. Their position was supported by local officials — as well as an industry that knew it was the cheapest disposal method.

EPA took the line that human expo-

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Hazardous waste sites: *Farmers say sewer sludge contaminates drinking water, crops and grazing animals.*

sure to sludge was safe after 30 days, despite the fact that the World Health Organization believes it may not be safe until after 180 days. The European Union is wary of its use and follows strict regulations. Critics of using biosolids as fertilizer frequently have been characterized by the EPA as NIMBY (or not-in-my-backyard) activists who just don't like the smell of human sewage in their neighborhoods.

And the EPA has supporters. The WEF is an avid defender of biosolids. So, too, is the Association of Metropolitan Sewerage Agencies, or AMSA, which represents the interests of municipal wastewater-treatment agencies. The EPA, WEF and AMSA have joined forces to promote the line that biosolids are good for the environment, and all three organizations refer to officials within each group to defend their pro-sludge positions.

But some scientists even within the EPA are worried about the potential hazards of sludge, including microbiologist David L. Lewis, a highly respected professional lauded for his work on the human immunodeficiency virus. In April 2000, Lewis and another microbiologist shared EPA's Science Achievement Award for their outstanding contributions in aquatic biology/ecology. Lewis responded to the award notification with a letter to EPA Administrator Carol Browner. "I would like to express my sincere hope that the pendulum in the battle of environmental activism versus objective science will soon return to center," Lewis wrote. "I believe that our people need an administration that more fully comprehends that scientifically unsound policies do not solve problems — they create them."

The lawsuit depositions unearthed by **Insight** provide some evidence for critics' fears about sludge. In the depositions, EPA officials admitted a significant potential for individuals who are exposed to sludge to develop cancer from the carcinogens found in biosolids even when the EPA guidelines on spreading it are followed rigorously.

During his 1999 deposition, Rubin — who was the lead scientist on Part 503 — admitted there are carcinogens in sludge. "There is no question about it, in biosolids, that our analysis showed the levels that were in there, and the way these materials move from the biosolids out to the environment to create a dose, you have to have a certain dose to create the incident," he testified. Rubin added, though, "That analysis showed that we would not expect a large number of cancer patients."

But also, according to Rubin, the EPA knows considerably less about the health risks of pathogens such as E. coli, salmonella and hepatitis in sludge. "We did not do a risk assessment, a quantitative risk assessment for pathogens," he admitted under oath.

In *A Guide to the Biosolids Risk Assessment for the EPA Part 503 Rule*, officials acknowledged "any exposure to a carcinogen produces a measurable risk" of developing cancer. As the Part 503 Rule was being drafted, officials had the option of establishing safety levels. They could have chosen as acceptable one incident of cancer in 10,000, 100,000 or 1 million. The cost-minded municipalities and waste-management industry, however, lobbied for the lowest ratio. The EPA agreed, and decided one individual in a population of 10,000 was an "acceptable degree of cancer risk." The EPA opted for that ratio based on science that was done in the 1970s for a risk assessment concerning alternatives to dumping sludge at sea.

Deposed in a federal whistle-blower lawsuit, Rubin detailed how the one-in-10,000 cancer-risk assumption for the land application of sludge was chosen. "We are told to develop regulations to adequately protect public health and the environment with an adequate margin of safety. That is the language that Congress gave us," he said.

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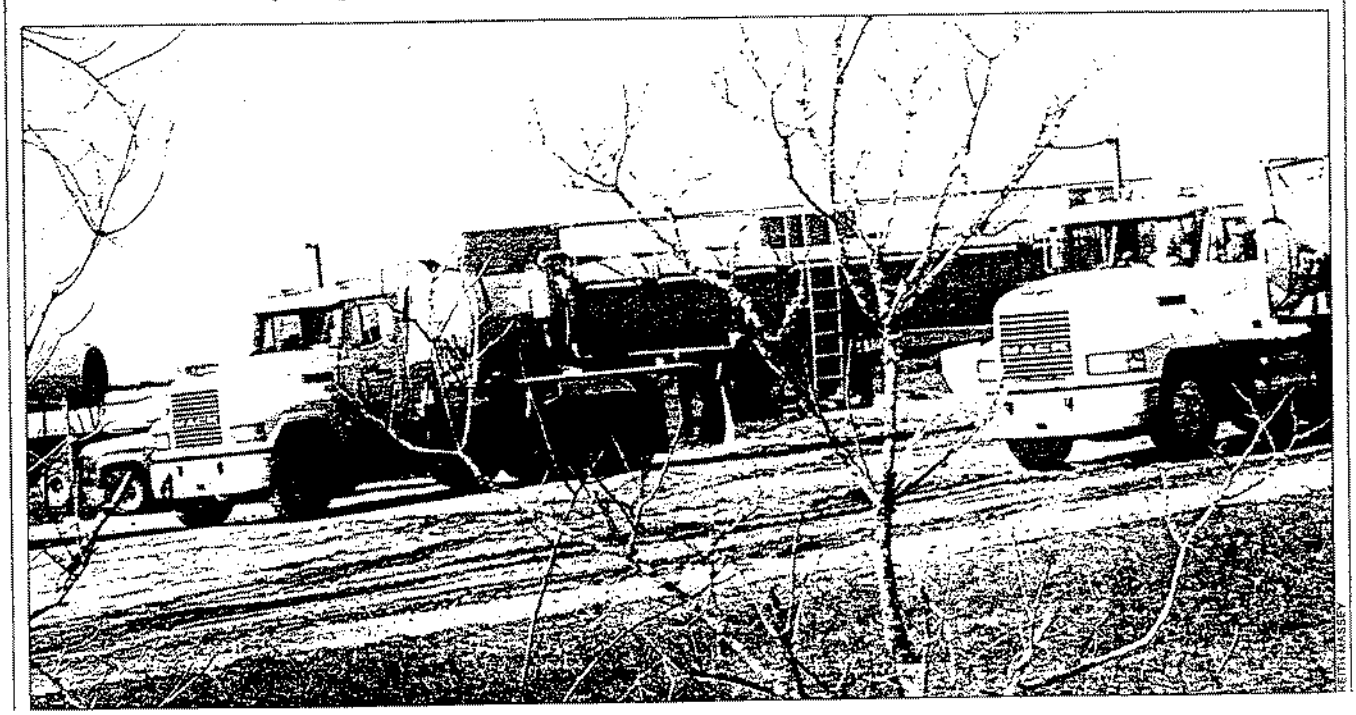
Lewis: *The EPA microbiologist insists viruses can survive in sludge longer than the EPA has indicated.*



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"When you are dealing with carcinogens, the issue is at what risk level do you establish the exposure, what levels in biosolids and therefore what levels of exposure do you allow to highly exposed individuals, to give them a specific risk. There is no prescribed risk level in the agency across the board. Each program has its own targeted risk level. So the selection of that risk is really what we call risk management, and it is usually left to the people fairly high up in the chain of command in each office," Rubin continued. The EPA administrator selected the ratio, he says.

In justifying the ratio, Rubin insisted: "If somebody passed away from cancer or any other ailment, there is no way, no way to determine whether that person passed away from exposure to biosolids." He then was asked about more acute deaths, such as from bacteria, that otherwise might be attributed to food poisoning. Again Rubin noted, "It is very difficult, particularly if there is a very, very small number of incidences reported, to be able to establish a causal effect, particularly if a period of time goes by where whatever the exposure might have been has long since passed. It is very difficult to determine the cause."

Rubin admitted he considers the Part 503 Rule as the high point in his career. "I think my professional reputation, to a large extent, is based on my association with biosolids, [Part] 503 and its technical basis. So I feel my reputation would be somewhat disparaged if the basis of the rule and the scientific findings were shown to be in error."

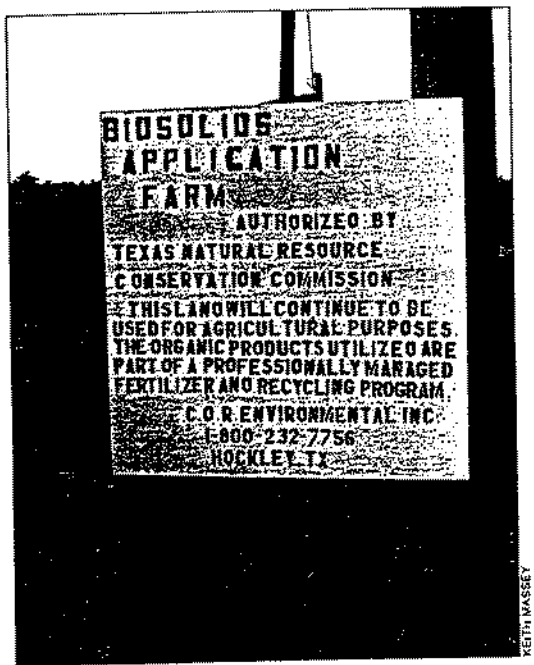
In fact, virtually no U.S. laboratory studies were conducted to test the safety of using sewage sludge as a commercial fertilizer. The EPA used statistical models to reach their conclusions instead.

And back even in the 1970s when the Part 503 Rule was adopted, there were disagreements between scientists about risk factors. In 1975, officials in the EPA's Office of Solid Waste Management Programs, or OSWMP, found similarities between the heavy-metal content in municipal sewage and industrial waste. Because of the similarities, William Sanjour, then chief of OSWMP's Technology Branch, said, "It would be impossible to write guidelines or regulations for one without taking into account EPA's policy for the other."

If municipal sewage sludge had been deemed as potentially dangerous as industrial waste, it would have been regulated as hazardous and subject to the Resource Conservation and Recovery Act, or RCRA.

But in 1978, after heated jurisdictional exchanges, officials in EPA's Office of Water coaxed their colleagues at OSWMP to exempt sewage from RCRA regulations on the grounds that "it contains nutrients and organic matter which have considerable benefit for land and crops." There would be safeguards, OSWMP officials were assured. Once the transfer was completed, however, the promise of parallel standards quickly was forgotten, says Sanjour.

According to John Walker, who was then in EPA's Municipal Technology Branch, "The application of some low levels of toxic substances to land for food-crop production should not be prohibited; rather, it should be controlled by proper rates of sludge/toxic application, soil management, etc. The potential risks of permitting some low levels of most potentially toxic metals and persistent organics to land just have not been demonstrated as being that great."



Site restrictions: *The EPA says its warning signs are adequate to protect the public.*

But of primary concern to Sanjour were EPA tests that conclusively showed that crops grown in sewage sludge could absorb toxic carcinogenic substances such as cadmium from the soil, giving them a direct pathway into the human body.

The EPA argues that decades of research on biosolids have failed to demonstrate negative health or environmental impacts from the use of sludge as a fertilizer. However, a recent report from the General Accounting Office, or GAO, casts doubt on some of the science used by the EPA to justify this position.

Responding to separate congressional inquiries, the GAO released in May *Toxic Chemicals: Long-Term Coordinated Strategy Needed to Measure Exposures in Humans*. The GAO was asked to determine the extent to which state and federal agencies collect human-exposure data on potentially harmful chemicals and to identify the main barriers hindering further progress in such efforts. Unlike the EPA, the GAO concluded: "The nation has a long way to go in measuring human exposures to potentially harmful chemicals."

GAO officials noted, "While federal efforts are increasingly covering chemicals of potential concern, there are substantial gaps in current information on exposure levels, the health risks that result and those who may be most at risk."

Overseas, other scientists are questioning using sludge as fertilizer. In 1995, the World Health Organization, or WHO, investigated the use of wastewater and sewage sludge in agriculture and aquaculture. The conclusions of WHO scientists seem to contradict EPA's assertions that pathogens in land-applied sludge die off in 30 days. Louis Schwartzbrod, a wastewater microorganism specialist at France's Université de Nancy, noted: "Survival times for viruses in soil vary considerably (from 11 to 180 days) and depend essentially on the nature of the soil, the degree of humidity and temperature."

With the science still up in the air and health-risk concerns mounting, some critics argue that EPA officials and the state authorities charged with environmental protection are just too cozy with the waste industry they are supposed to be regulating. Coalitions, partnerships and public-sector/private-sector collaborations do seem to have blurred the lines between EPA, local environmental regulators, organizations within the industries they regulate and academic research designed to aid in the independent evaluation process.

Insight found instances of EPA and local environmental regulators, including division and section chiefs, serving as paid consultants for the WEF and its research affiliate, the Water Environment Research Foundation, or WERF, at the same time they were charged

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with regulating fellow WEF members. It is not uncommon to find EPA officials, who also were WEF members, promoting sludge to state and congressional legislatures in their official roles while minimizing any health concerns that were raised.

"WEF is a not-for-profit technical and educational group of almost 40,000 water-quality professionals, including environmental, civil and chemical engineers; academics; biologists; students; treatment-plant managers and operators; equipment manufacturers and distributors," writes public-information director Nancy Blatt in a recent letter to **Insight**. "WEF has provided technical and educational information through meetings, publications, and new media ... to environmental professionals for more than 70 years."

James Smith, a senior environmental engineer in the EPA's National Risk Management Research Laboratory, was asked in a whistle-blower case recently if he sat on any WEF committees. He admitted he had in the past asked to be placed on the WEF's Biosolids Committee. When asked why, Smith responded, "Well, they kept asking my opinion of various things and wanting me to be involved. And I thought, well, if I'm going to be involved I might as well be on the committee, and as a paid member of WEF I might as well, you know, be included."

During 1995, Rubin drew a salary as an EPA official for one half of the year and as an "intergovernmental" consultant to the WEF for the other half before returning to his full-time post regulating WEF's members.

And even as EPA officials complain to Congress of limited financial resources for enforcement and oversight of the sludge industry, federal money to help market the benefits of sludge as fertilizer is being spent.

On March 22, J. Charles Fox, the EPA assistant administrator for water, defended the EPA's interpretation of the Clean Water Act mandate as justification for its biosolids program. He concluded his testimony before the House Science Committee with the declaration, "The agency used the best available science.... The agency has followed a deliberative and open process to develop national regulations for biosolids use or disposal, which are protective of health and environment."

House Science Committee Chairman James Sensenbrenner of Wisconsin, however, is not so sure. "The EPA just doesn't get it," he tells **Insight**. •

Cancer From Sludge Kills, but Can Bacteria Kill Faster?

Cancer can take years to kill, according to Frank Hearl, a respiratory-disease expert at the Centers for Disease Control and Prevention in Atlanta. In a recent interview, Hearl suggested that the period between exposure to a carcinogen and the onset of cancer can be as long as 10 to 15 years.

But infectious diseases are a more immediate threat. A deadly bacteria can kill its host in a matter of days — or hours — depending on the immune system of an exposed individual.

The family of Shayne Conner, a 26-year-old New Hampshire man who died shortly after sludge was spread in his neighborhood, isn't buying Environmental Protection Agency, or EPA, assurances that sludge is safe. Conner's family moved to Texas when he was an infant. His mother, Joanne Marshall, explains that her son was a healthy baby until he suddenly developed severe bacterial pneumonia at age 10 months. Fearing an infant-choking accident when their baby started to gag, his parents rushed him to the hospital.

The diagnosis was that the baby was severely allergic to something in the air. His symptoms were so serious that the illness left him with minor brain damage, causing mild impairment. His parents subsequently moved to New Hampshire.

But when the boy was 3 years old, his grandfather died and the family briefly returned to the same small Texas town for the funeral. Despite the short stay, the child again went into respiratory distress. It became so severe the family rushed him back to the safety of New Hampshire. Shayne never returned to that town and the attacks subsided — until 1995.

According to Marshall, that October truckload after truckload of sludge passed through her neighborhood, dumping tons of sewer sludge on a farm next door. When the sludge was spread, strong vapors seeped through the neighborhood. Marshall, her husband and Conner's 8-year-old sister, Kelly, soon developed severe flulike symptoms, including nausea, abdominal cramps and diarrhea. Their neighbors complained of similar symptoms.

Conner's bedroom window was the closest to the field. On Nov. 23, Thanksgiving Day, he had brunch with his girlfriend and her family, returning home with an uncharacteristic low appetite. Despite a bout with laryngitis, he was in high spirits. During the night Conner again went into severe respiratory distress. By morning he was dead.

As mysterious as Conner's death was, it was paralleled by what transpired afterward. Acting Chief Medical Examiner James Kaplan performed an autopsy on Conner's body the next day. But on the death certificate, the coroner was unable to determine the cause or manner of death, nor describe how, when or where the injury occurred.

Yet on Nov. 27, 1995, Kaplan drafted a postmortem opinion letter about Conner's death to Edward Schmidt, the director of the state of New Hampshire's Division of Water Supply and Pollution Control for the Department of Environmental Services. Kaplan would have been prohibited by law from giving Schmidt Conner's autopsy report without the family's knowledge or permission. The family released it to **Insight**.

In his letter to Schmidt, Kaplan noted, "Initial investigation revealed that there was some concern on the part of family members that Mr. Conner's death might have been associated with the use of fertilizer of human-waste origin which had been distributed on nearby fields." Then Kaplan wrote, "It is my opinion after review of the investigation into the circumstances of Mr. Conner's death, as well as the initial findings at autopsy, that Mr. Conner's death was not the result of possible environmental conditions created by the use of such fertilizer, nor did such materials contribute to his death."

It is unclear what Kaplan was referring to by "after review of the investigation into the circumstances." Equally curious is why he was compelled to send a letter to Schmidt in the first place. But phone logs obtained by **Insight** indicate that earlier on Nov. 27, the same day his letter was sent to Schmidt, Kaplan had multiple discussions with interested