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By Michelle Conlin

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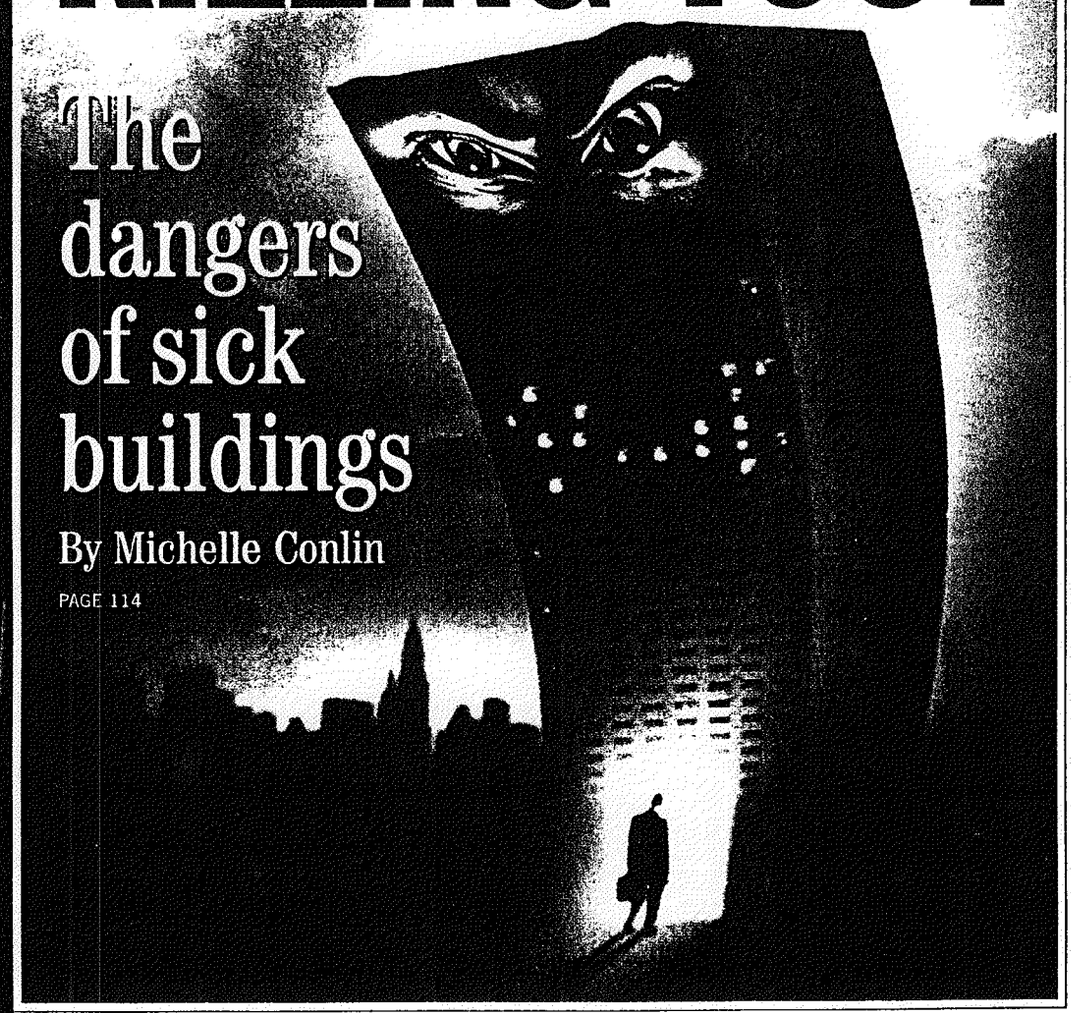

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Exhibit 1707
State of Minnesota v. 3M Co.,
Court File No. 27-CV-10-28862

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CHEMICALS

3M'S BIG CLEANUP

Why it decided to pull the plug on its best-selling stain repellant

At first, Dr. Larry R. Zobel and other researchers at 3M Co. figured the findings had to be a mistake. Investigators from Cornell University, using a powerful new technique to scan the blood of 3M's factory workers, were testing some serum they bought from commercial blood banks to establish base lines for the machines. The highly sensitive devices kept turning up the same odd result: Tiny amounts of a chemical 3M had made for nearly 40 years were showing up in blood drawn from people living all across the country, even in places far from 3M factories. "It took months before all the chemists were convinced that it was there," recalls Zobel, 3M's medical director. "There was disbelief."

For 3M, the late 1997 test results were troubling. If they held up, it meant that virtually all Americans—and folks far beyond the U.S.—may be carrying some minuscule amount of a 3M chemical, called perfluorooctane sulfonate (PFOS), in their systems. How PFOS got there, whether it could pose a health risk and, more important, what should be done about it, were questions that 3M executives felt driven to ask. Although they have yet to come up with definitive answers—and they insist that there's no evidence of danger to humans—the Minnesota company's research led it to a drastic decision. On May 16, 3M decided to phase out PFOS and products containing related chemicals, first and foremost among them its ubiquitous Scotchgard fabric protector. Since there is no replacement chemical as yet, that means a potential loss of $500 million in annual sales, out of total corporate revenues of $16 billion, and one-time restructuring charges of up to $200 million.

The news caused a rush to stockpile Scotchgard by the clean and the careless. Heloise, author of the syndicated "Hints from Heloise" housekeeping column, says everyone from clothes-conscious TV hosts to flight attendants have fretted to her about the loss of Scotchgard. Even she, an expert at stain-removal, admits: "When my husband gets a new tie I spray it on right away."

"GUTS." Scotchgard's popularity makes its removal particularly noteworthy, given that 3M was under no mandate to act. "3M deserves great credit for identifying this problem and coming forward voluntarily," says Environmental Protection Agency Administrator Carol M. Browner. Even environmental activists like Linda E. Greer, senior scientist at the Washington-based Natural Resources Defense Council, gives plaudits to the company. "It took guts," she says, even if they did it out of fear of government action. "The fact is that most companies, when faced with government nudging, go into anger, denial, and the rest of that stuff. What we are accustomed to seeing is decades-long arguments about whether a chemical is really toxic."

The long and tortuous trail that led 3M to its decision highlights the growing concern within the chemical industry over persistent chemicals, a relatively recent environmental worry. There are scores of these chemicals, woven into the very fabric of modern life, that resist natural processes of decay and can linger in the environment for decades. Some have already been banned—most prominently DDT, PCBs, and CFCs—but no one is quite certain what damage, if any, the rest might be causing. The

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THE PROBLEM WITH SCOTCHGARD

It contains POSF, an organic fluorine that repels water and oil. It can turn into a second fluorine, PFOS, when it gets into mammalian cells.

▶ **DANGER** The chemicals persist in the environment for decades, and PFOS shows up in trace amounts in human blood.

▶ **EFFECT** At very high daily doses, PFOS has killed monkeys and new born rats in lab tests.

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EPA is pressing the chemical industry to reduce the manufacture of these substances, however, and is currently negotiating international conventions with Canada aimed at reducing their presence in the Great Lakes.

PFOS is not on environmentalists' list of the most worrisome persistent chemicals. But 3M, which is responsible for most of the world's supply of the substance, decided not to wait until all the scientific cards fell into place. It took its costly step based on scientific detective work that has built up incrementally over the past 30 years—and far more damningly in the past two years. Its choice threatens the jobs of some 1,500 3M workers in Alabama, Minnesota, even Belgium. It also discomfits scores of industrial customers, chiefly papermakers and textile mills, who apply the 3M chemicals to goods as far-ranging as pet-food bags, candy wrappers, and carpeting.

BLOOD TESTS. The first big twist in the tale took place in 1968, with a physician at the University of Rochester. Dr. Donald R. Taves was studying the effects of water fluoridation when he found tiny quantities of an unusual form of fluorine—a kind that didn't come from fluoridated water—in human blood. Just how it got there and what its presence meant were unclear. But scientists familiar with the organic fluorines, known as POSF, took note. The finding drew still more attention when Taves, working with colleagues at the University of Florida, confirmed the results in a 1976 study. Chillingly, Taves even found the fluorine in his own blood, though he lived far from any potential factory source.

Researchers at 3M, which says it is vigilant about chemical exposure of its workers, were paying particular attention. They quickly launched programs to test employees at plants in Cottage Grove (Minn.), Decatur (Ala.), and later Antwerp (Belgium), to see if fluorine exposures were high. While they found that fluorines were registering at higher levels in workers' blood than in the general population, the medical evidence suggested that they posed no problem. Researchers found no unusual ailments in the living workers and, after scanning death records, nothing unusual in the deaths of former workers. "Physicians who were seeing the employees generally found no significant health problems, no health problems that would be unexpected in a typical population like this," says Zobel.

For 3M veterans, the cheerful medical results were not surprising. Although unusually hardy, organic fluorines for decades were thought to be inert. PFOS, a 3M product used in fire-fighting foams and industrial acid-suppression products, is also produced in animals and humans when certain precursor chemicals get into the cells. These precursors are part of the chemical makeup of Scotchgard fabric protector and are valued precisely for their hardiness. They repel water and oil like nothing else, making them potent stain-resisters. Indeed, 3M has long revered the in-house scientists who developed the man-made chemicals, after a lab staffer in the early 1950s chanced on them. The staffer had spilled one of the chemicals on her sneaker, found it impossible to wash out with either water or solvents, and started investigating its repelling powers.

While routine employee monitoring continued throughout the 1980s, the company had little reason to worry. Even when blood tests grew more sophisticated in the early 1990s—and 3M could screen for specific fluorines such as PFOS or related chemicals—the lack of any damning health effects kept concerns to a minimum. Repeated medical reviews seemed to clear the chemicals of any problems.

Then, in 1997, powerful new detection techniques changed everything. The new tests turned up evidence of the chemicals in levels as low as 0.5 parts per million in human blood. "That is not much," says Zobel drily. "It's like 50 seconds in 32 years." It was by using the new techniques that the Cornell University lab, working for 3M, found the PFOS in blood from the scattered blood banks. 3M promptly launched an international testing program, screening blood from 18 U.S. blood banks along with samples from Europe and Asia. It even scanned old, stored blood samples from Korean War veterans. The result: tiny amounts of contamination in the U.S. and Europe, except in the veterans' blood, which predated the Scotchgard chemical.

3M regularly updated the EPA on all of its research. For their part, EPA officials were particularly concerned by the persistence of PFOS. It is so hardy that no one knows when, if ever, it will break down. Worse, it accumulates in human and animal tissues. "With things that are persistent, the only way for

THE PATH TO A PAINFUL CHOICE

1968 A researcher at the University of Rochester finds organic fluorine in human blood samples from the general population. Publishes finding in *Nature*.

1976 Academic researchers refine the earlier find, and the Rochester investigator, D.R. Taves, discovers the chemical in his own blood.

1978 3M reviews 30 years of death records among factory workers exposed to organic fluorine on the job but finds nothing unusual.

EARLY 1990s 3M uses enhanced mass spectrometry to scan workers' blood. Reliably detects contamination down to the level of 0.5 parts per million.

1993 Researchers at University of Minnesota report finding no increased mortality in workers exposed to an organic fluorine. Elsewhere, it is linked to cancer in rodents and changes in reproductive hormones in humans.

1996 University of Minnesota researchers publish study finding no toxicity to the liver in 115 3M workers from PFOS exposures.

1997 Researchers at Michigan State University and 3M report that organic fluorine chemicals are appearing in water, air, and soil.

MAY, 1998 3M advises EPA that it found organic fluorine in blood-bank samples in tiny amounts. Company decides to move away from this chemistry.

SEPTEMBER, 1998 Company tells EPA of disturbing animal-test findings. The offspring of rats heavily dosed with organic fluorine die within days.

SEPTEMBER, 1999 3M researchers find no adverse health effects from on-the-job exposure to PFOS.

FEBRUARY, 2000 Researchers alert 3M that PFOS is found in tissue of birds from the Pacific Ocean to the Baltic.

MARCH, 2000 3M and EPA discuss latest findings, including the deaths of heavily dosed monkeys.

MAY 16, 2000 3M and EPA announce that the company will voluntarily phase out the organic fluorines.

DATA: 3M, EPA, BUSINESS WEEK

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"3M deserves great credit for identifying this problem and coming forward voluntarily," says the EPA's Browner

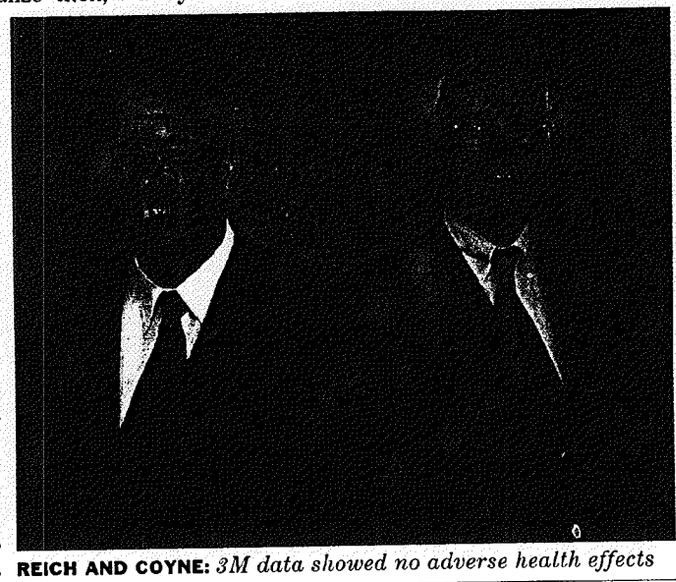
the concentrations to go is up—in our bodies and in wildlife," says the Natural Resources Defense Council's Greer. "And pretty much every chemical in the world is toxic at some dose."

Because PFOS is both enduring and widespread, 3M made some crucial choices in mid-1998. Company executives decided they would—eventually—abandon such formulations and find replacements for the troublesome fluorines. "We began to realize then, and came to realize more later, that this would be a chemical that would constantly be involved in environmental debate," says Charles Reich, a chemist in charge of Scotchgard as the company's executive vice-president for specialty-material markets.

NO SURE THING. Still, 3M's top executives argued over just how long they could continue. Could they wait until replacements for the chemicals were found? That might take seven years or more, and was not a sure thing. And what about the effect on corporate customers, who valued the 3M products for their ability to repel water or oil? Shouldn't 3M keep the supplies coming, since there was no hint of human danger. "All the data we had on health...pointed toward no health effect," says William E. Coyne, senior vice-president for research and development.

But then 3M took a couple of crucial steps that sped up its decision to chuck the product: It ordered up studies on rats, monkeys, and other animals to see what heavy doses of PFOS might do. And it commissioned more research, forking over $800,000 for an investigator at Michigan State University to test wildlife samples to see just how pervasive the chemicals were. The results of both sets of tests, though preliminary, proved fatal for the chemicals.

The wildlife tests confirmed the initial fears of the 3M executives. Michigan State University researcher John P. Giesy, a zoologist and a faculty member of the school's National Food Safety & Toxicology Center, found PFOS in some very odd places. Scanning samples of animal tissue from all across the globe, which he keeps on hand in lab freezers, Giesy found the chemical in "various animals from various places." While he won't list the animals or locations—for fear of preempting scientific publication—3M executives say PFOS turned up in flesh-eating birds in the Pacific Ocean and the Baltic regions. Giesy is now halfway through tests on 2,000 tissue samples drawn from as far away as the Arctic and Antarctic.



REICH AND COYNE: *3M data showed no adverse health effects*

When Giesy started presenting his initial results to 3M officials in February, the concern level at the company rose sharply. He was summoned back to repeat his presentation for Chief Executive Officer Livio D. DeSimone and his most senior executives. "This was very important to 3M," recalls the researcher.

Since neither Giesy nor in-house scientists could say just how PFOS got into the far-flung animal tissues, the 3M scientists now plan a global research effort aimed at tracking the chemical's sources and destinations. Says Katherine E. Reed, a chemist who is 3M's executive director of environmental technology: "We believe that our responsibility for materials continues... into disposal. It's a concept we call life-cycle management."

The most damning evidence against PFOS began emerging in September, 1998. That's when 3M got the results of animal tests in which heavy doses of PFOS were administered to rats—10,000 to 100,000 times what humans would ever likely be exposed to. The investigators found that the rats' offspring were dying within days of birth. Then, this past March, they reported that two monkeys that were also dosed heavily died, after suffering severe gastrointestinal problems and convulsions. The company promptly notified the EPA of the results.

Those animal tests got the agency's attention. Although 3M had kept the EPA informed of all its PFOS studies, the animal mortality data—and especially the rat fatalities—sparked a steady series of "no lunch, no refreshments... roll-up-your-sleeves" meetings in March at EPA headquarters in Washington, one top EPA official recalls. Says the official: "The seriousness of the issues grew over time."

When the 3M executives finally decided to pull the plug on PFOS and related products, they didn't need the heavy hammer of an EPA ruling—but that possibility hung heavily in the background. "They could see the writing on the wall," argues the senior EPA official. "They could see we were going to continue our assessment of this and it would get more detailed and at the end of the day we would make some kind of decision... 3M decided that the better course of action was to get out of it early." For their part, 3M officials say they would have made the same decision whether the EPA pushed them or not.

Just how quickly 3M can adapt to its far-reaching decision isn't clear. It intends to be out of production on most, if not all, PFOS-related products by yearend. With a few products, such as fire-fighting foams, it may take longer to adjust. With over $1 billion pouring in each year from all sorts of new products that don't use the chemicals, the company feels sure it can come up with substitutes—ideally, nonpersistent ones. And it expects it will find jobs elsewhere or will pay separation benefits to affected workers. Meanwhile, the worries about PFOS are not yet over. For years to come, 3M will be keeping track of the stuff it has already put out there.

By Joseph Weber in St. Paul, Minn.

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