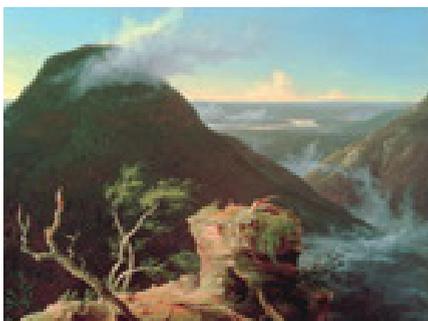


THE GENERAL ELECTRIC SUPERFRAUD

Why the Hudson River will never run clean
By David Gargill

On the shoulder of Mount Marcy, New York's highest peak, it rises. From lofty yet humble beginnings at Lake Tear of the Clouds, the river winds through the Adirondacks, coursing 300 miles south to the harbor at the foot of Manhattan. Henry Hudson, an Englishman lost on the way to Cathay, arrived at the estuary's mouth in 1609, following its path until declining depth and salinity disqualified it as a potential northwest passage to "the islands of spicery," the ultimate prize of a cartographically challenged age. His Dutch sponsors, hoping to emulate French success in the fur trade, founded New Amsterdam beside what they termed the "North River." In 1664, the English seized all of New Netherland, rechristening New Amsterdam "New York" and the North River the "Hudson."

A century later, the river became a symbol of national pride: the spine of a young republic that the British sought to break, only to be thwarted by George Washington's shrewd labors along its shores. With characters like Rip Van Winkle and Ichabod Crane, Washington Irving cultivated a native lore in the valley's fertile soil. Thanks to



Thomas Cole, the area's dramatic scenery came to stand for the American landscape; its wildness evocative of a spiritual sublimity suffused with an

ethereal light. Soon steamboats debuted on the river, making efficient transit a reality, and with the opening of the Erie Canal, the engine of commerce quickened. America awakened to a new economy of scale. Quarries, foundries, cement plants, and brickyards replaced tanneries and gristmills.

As early as 1833, Cole regretted his romanticizing of the valley, which proved so effective the area risked ruin at the hands of tourism and industry, concerns reflected in *The Course of Empire*, his five-canvas chronicle of civilization's advance and decay. In the next century, General Electric, an emblem of American capitalism founded by Thomas Edison, joined other manufacturers on the Hudson, establishing its Industrial and Power Capacitor Division at two plants in Hudson Falls and Fort Edward, adjacent towns stacked along the river's eastern bank fifty miles north of Albany. By the 1970s, the Hudson was an open sewer and fodder for Johnny Carson—its fish, poison; the eggs laid by its birds of prey, toxic waste.

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The picture downstream of Hudson Falls was ghastly. Heavy metals, DDT and dioxins, tailings from pulp and paper mills, municipal sewage, and other contaminants presented a frightening scene. At Rogers Island, a tiny residential cloister in the river off Fort Edward, one could sit and watch a ceaseless stream of bloated wastepaper float by, colored whatever hue Hercules pigments was blending up in Glens Falls that day. But it was polychlorinated biphenyls, or PCBs, that environmental regulators identified as the chemicals of chief concern.

Before these “probable human carcinogens” were banned in 1977, PCBs were wantonly spewed from GE’s plants, and they continue to be detected at high levels in riverbed sediments and fish. For years, the New York State Department of Environmental Conservation had abrogated its enforcement authority, unofficially

sanctioning GE’s malfeasance. But pressure from several national NGOs headquartered in New York, as well as from Hudson-centric groups downriver from the plants, furnished a fresh impetus to act.

Environmentalists had seized upon dredging the riverbed as the surest cure for the Hudson’s ills, and by the early 1980s the DEC warmed to the idea of doing its job, pushing for a dredging remedy to be paid for by GE. When the corporation and its unlikely allies in Fort Edward and Hudson Falls—company towns distrustful of bureaucracies—proved immovable objects for the state, the EPA stepped in, bringing the full force of the federal government to bear. In 2002, the agency issued a formal decision that called for dredging, ending GE’s overt resistance and getting the ball rolling (albeit in the manner of Rube Goldberg) toward the \$780 million project that commenced this past spring. Over the next six years, some 1.8 million cubic yards of sediment containing roughly 250,000 pounds of PCBs will be removed from 490 acres of riverbed.¹

“We hope to have the shot, the moment, the picture,” Bonnie Bellow, the EPA’s regional public-affairs director, told me in early May; and so it was that a

¹ According to activist shareholders, GE invested \$122 million between 1990 and 2005 to waylay dredging (by lobbying and retaining the likes of constitutional lawyer Laurence Tribe). Since 1990, GE has contributed \$17.4 million to political campaigns, and its current CEO, Jeffrey Immelt, sits on President Obama’s Economic Recovery Advisory Board.

week later old allies and adversaries gathered to reaffirm their kinships and animosities as the first dredgeful of PCB-ridden silt was plucked from the Hudson River. The factions in this struggle conformed to geographical divisions that intersected social vectors: upriver, the farmers and GE pensioners were adamant that the PCBs were best left alone, lest the toxins be stirred up by dredging; whereas the white-collar partisans of the lower Hudson demanded the PCBs’ removal. The debate escalated into class warfare, with one side tarred as yokels shilling for GE and the other as condescending liberals advocating for fish over people. Whether these foot soldiers’ deeds represented democracy in action or the machinations of larger interests was unclear. The EPA’s collaboration with dredging proponents smacked of collusion: the agency steered a “technical assistance grant” to Scenic Hudson, which then helped to found Citizens Along the River’s Edge (CARE), the only pro-dredging group upriver. GE, for its part, cooperated with Citizen Environmentalists Against Sludge Encapsulation (CEASE), stalwarts of the local opposition, with the company supplying scientific ammunition for the obstructionists’ arguments, and CEASE members lending their voices and visages to GE’s anti-dredging campaign. The sole point of consensus among the combatants was that once work began, one side would be vindicated, so everyone would be watching to see who had spent all those years being right or wrong.

Accordingly, there was some doubt as to what was being celebrated here at the old Georgia-Pacific site, a desolate expanse of gravel and ballast, hard hats and hi-vis clothing just across the river from Fort Edward, where a glimmering white tent was pitched atop a concrete slab. Under its taut, ad hoc shelter sat rows of folding chairs and a lectern backed by three flags, which were leaden even in the light breeze that was kicking up the abundant dust. Masses of cement blocks squatted amid gray mountains of backfill bound for the river. Journalists, civil servants, and local residents milled about as a procession wafted beneath the grim din of whatever was powering Channel 10’s news truck and their monotonous sound check: “Testing, one-two, testing, EPA, normal voice, about eight inches away.”

The removal of what the EPA calls “the most studied toxin” from “the most studied body of water” is the culmination of “the most exhaustive review of a hazardous-waste site ever conducted,” according to Ned Sullivan, president of Scenic Hudson and former DEC deputy in charge of such cleanups. But if the EPA’s models are to be believed, the ultimate benefit achieved by dredging—that is to say, reduced PCB concentrations in fish, the metric used to justify the

BEFORE THESE “PROBABLE HUMAN CARCINOGENS” WERE BANNED IN 1977, PCBs WERE WANTONLY SPEWED FROM GE’S PLANTS ON THE HUDSON

project—is indistinguishable from the result of *not* dredging over the long term. “Source control,” the stanching of known leaks at GE’s plants upstream of the dredging area, is taken as a given in these calculations, and the projected outcomes of source control both with and without dredging converge sixty years out, when fish consumption would remain harmful.² In other words, even given the EPA’s assumptions, it is hard to justify the dredging. Furthermore, because of GE’s resistance to any action save source control, the

phase be deemed ineffective, leaving a bankrupt Superfund to complete the remaining 90 percent of the work while suing for treble damages.

The scuttlebutt that May morning concerned a spike in GE’s in-river monitoring results, which measure PCBs in the water column (a crude cross-section of what’s flowing downstream) and gauge the project’s compliance with a performance standard that requires the resuspension of PCBs to remain below 500 parts per trillion. Soon Mark Behan, GE’s paunchy veteran press flack, walked



government made the novel concession of splitting the dredging into two phases, the second of which GE has the right to reject should the first

past the port-a-potties and toward the tent, wearing his neon work vest. “I didn’t think you were gonna be here!” a reporter yelled at him.

² Regulators have long warned that fish in the Hudson are contaminated with a wide array of harmful pollutants, including PCBs and mercury, and consumption recommendations vary depending on species and the particular stretch of river. Anglers are advised not to eat more than one meal per month of striped bass, for example, and Hudson river eels should never be eaten. Fishing piers in New York City are posted with signs saying that women of childbearing age and children under fifteen should not eat any local fish. Commercial fishing, with narrow exceptions, has been banned for decades, though poaching is relatively common. Official contamination levels are hard to come by, especially now that PCB levels in the river are about three times normal due to the dredging. In 2008 the average PCB level in smallmouth bass was 188 parts per million; the average in striped bass was 22 ppm. The maximum allowable exposure level for humans is 2 ppm.

“I never like to miss a party,” he replied, ambling on. Although GE’s investigation of the spike was just getting started, they were fairly certain the sampling equipment was tainted during installation, which generated a reading of 949 ppt the previous afternoon. The EPA gave GE permission to start dredging even though this result was nearly twice the 500 ppt level that would trigger a shutdown once operations began. Behan, almost buoyant as he held forth on the subject, seemed freed by the absurdity of the situation. The incident registered as a shot across the bow for pessimists leery of the company’s legacy on the river, who believe that an intentional “whoops” in the first stage of

“Hudson River Landscape 10.15.09 (GE Plant, Hudson Falls),” by Susan Wides, whose work will be on view this spring at the Kim Foster Gallery, New York City, and this summer at the Hudson River Museum, Yonkers, New York. Photograph © Susan Wides/Kim Foster Gallery

dredging might allow GE to claim infeasibility and walk away.

I left Behan in his rehearsed technical ecstasy, as he recounted to a reporter the thousands of satellite-assisted scoops the dredges would make between now and November. Then Bonnie Bellow stepped to the lectern. “We’re gonna begin in just a minute,” she warned. “After the remarks, we’re going to give people time to move where we’ll have a better or clearer view of the dredge operating.” The crowd complied, migrating to their seats overlooking the sandpit as it sloped down, past its cautionary orange barrels, to meet a shallow, toxic reach of the river.

trial complex that helped build this nation, and now it is our turn to return it to a cleaner state. Today the healing of the Hudson River begins.”

After modest applause the onlookers scurried to vantage points along the site’s makeshift fence. Cameras freed from pockets and purses glinted in the midday light. In scarcely two feet of water, a yellow, 94-ton CAT 385 excavator was perched on a barge, its bright-blue clamshell dredge dangling expectantly. Between the crowd and the barge, two tugs had positioned a large scow, ninety-plus feet long and twelve feet high. The clamshell dipped with grave assurance down behind the scow and out of sight, lingering



As the processional faded, George Pavlou, the EPA’s acting regional administrator, spoke. “The dredging of the Hudson River is a symbol of victory for the environment,” he began, “and for the river communities as well.” After a nod to Henry Hudson’s arrival in 1609, Pavlou harkened back to 1982, when the late Senator Daniel Patrick Moynihan called him to request that the river be placed on the National Priorities List, the precursor to Superfund designation, and the federal action required to go forward after CEASE obstructed the DEC’s efforts to site a landfill.

“The river has seen its fair share of history,” Pavlou continued, “and today we begin to write its next chapter. It has played host to the indus-

there for several breathless seconds before rising back into view, deftly depositing its harvested muck as the rejoicing began onshore.

Self-consciousness soon gripped the celebrants, and with an eye toward posterity they separated into clusters of enviros and regulators for group photos. This glad-handing episode was just the opening Tim Havens, CEASE president for fifteen of his forty-seven years, needed, and the TV cameras encircled him instantly.

“We were told this was going to be done in a surgeon-like fashion,” he barked from under his NO DREDGING cap. “There’s nothing surgical about a clamshell dredge. They’ve been digging farm ponds with ’em for a hundred years. A well-

qualified operator, operating at a snail's pace with every camera in the state on him—he's not gonna spill anything into that river right now. You wait till three o'clock in the morning, when they've gotta fill those scows. You're gonna see a travesty committed on the river."

But Havens's harangues cut decidedly against the grain, muted by a near unanimity of smiles and triumphal sound bites, and with the day's momentous work done, the crowd thinned. On-camera correspondents, natty aside from their functional footwear, stood by the port-a-potties and taped segments with their backs to the river. Channel 10's groaning news truck was losing the decibel war to the model-plane operators at an adjacent landfill.

Doug Garbarini, the EPA's regional remedial chief, passed by with a jubilant claque of colleagues, and I asked if he'd enjoyed the reunion. "So many folks working on this over the years," he said through a broad grin. "It's a happy day for a lot of people."

That evening, a dispatch from the ceremony appeared on the *New York Times* website with a photo by Suzanne DeChillo. The enterprising photographer had made her way to the opposite bank, and without the scow's obstruction she had caught the dredge bucket just as it surfaced, spewing gallons of water and God knows what else from its supposedly sealed jaws. The shot, the moment, the picture Bonnie Bel-

PCBs are synthetic oils made up of one to ten chlorine atoms bound to a biphenyl ring. The varieties used along the Hudson were amber in color, with the viscosity of maple syrup, but slipperier. The oils were long hailed as miraculous for allowing electricity to flow without altering the charge or being altered themselves, and for their non-flammability and resilience. Chemical anthropologists will be finding them thousands of years from now, assuming we're still around. Their toxicity was well established by the 1930s, and no safe level of exposure has been set for cancer or non-cancer health risks; all that's known is, more is worse. This is unfortunate, because until they were outlawed in 1977, PCBs were of use nearly everywhere electricity could be found, especially in wire, transformers, and capacitors. The oils were therefore ubiquitous, effective in preventing electrical fires and other disruptions, enabling much of modern life's ease, particularly the portion abetted by General Electric.

With confounding reliability, media accounts of the Hudson River imbroglio begin as follows: *From 1947 to 1977, GE legally discharged 1.3 million pounds of PCBs into the river from its plants at Hudson Falls and Fort Edward.* No fewer than four major fallacies are thus perpetuated, but for brevity's sake, let's

address the most egregious. The 1.3 million figure appears as a high-end estimate in the EPA's 2002 Record of Decision, the document in which the agency establishes the problem's scope, details its attendant risks, and selects a remedy. When I asked John Haggard, GE's chief remedial engineer, where the number came from, he laughed awkwardly. "Yeah, well, we've never actually done an estimate," Behan, his handler, interjected. "That's a regulator's number." Unfortunately, the regulator's answer was no better. "That was before I got here," said EPA Hudson River project manager Dave King. "So I have no idea. I don't even know how you would come up with that."

What we do know, however, suggests that dredging 250,000 pounds of PCBs from the Hudson will barely scratch the surface of the catastrophe. Given that 1.6 million pounds of pure Pyranol—GE's trade name for PCBs—were discovered under a single parking lot at the southeastern corner of the Fort Edward plant, the 1.3 million figure is grossly inadequate, and the idea that GE's discharges were discrete, controlled acts (or that they've in fact ceased) is a fiction that downplays the company's crimes and exaggerates regulators' grasp of the situation.³

An internal GE memo from 1969 entitled "PCB: An Industry Problem?" states that the capacitor division used 10 million pounds of the chemicals annually, "probably more than the rest of the company combined," and discloses that only 9 million could be "accounted for in terms of products shipped." Beginning in the 1940s, GE received bulk shipments of PCBs by rail from Monsanto's chemical works in Anniston, Alabama, a place beyond blight. The tanker trucks were drained in the offload areas of both GE plants in an oily frolic of hoses and spillage. Fuller's earth, a kitty-litter-like substance, was used to refine the PCBs, then given away to local residents as "clean, non-combustible" fill. Thousands of scrap capacitors were tossed in area landfills. And, according to Robert LeFebvre, a former manager of the Defiance

³ *To this day, GE affirms the legality of its effluent releases, in seeming ignorance of the federal Rivers and Harbors Act of 1899, intended to prohibit impediments to navigation, and the Refuse Act, passed in the same legislative swoop, which outlawed the very discharges GE carried out daily. In 1973, after the Water Pollution Control Act became federal law, GE sought a permit to discharge PCBs, but none was granted until 1975. After that, GE repeatedly exceeded its allowances until 1977, when the chemicals were banned. Of course, the DEC was thoroughly aware of these breaches and accepted joint culpability in a 1976 sweetheart deal between the parties, negotiated by Jack Welch, that required each to pony up \$3 million, with GE pledging an additional million for in-house research.*

DUE TO SHODDY RECORDKEEPING, THE TOTAL AREA AFFECTED BY GE'S MISCONDUCT IS A MYSTERY, AND IT WILL LIKELY REMAIN SO

Asphalt Company, waste PCBs were sprayed on unpaved roads in three surrounding counties for the purpose of dust abatement.

Due to shoddy recordkeeping, the total area affected by GE's misconduct is a mystery, and it will likely remain so. Even the known sites, most of which are hydrologically connected to the river, have received only superficial fixes. The river has garnered all the attention, and the EPA, having carefully limited its authority to the territory between the riverbanks, is getting its high-profile shot at saving the Hudson.

From up close, however, culling forty sediment "hot spots" looks extremely inadequate, and is unlikely to result in the type of permanent solution Superfund law requires, because the valley holding the river in its palm is saturated with untold tons of migrating toxins that threaten to nullify the EPA's nearly \$1 billion cure.

It was Walter Hang who first alerted me to the subterranean reservoirs of PCBs that dredging would fail to address. Hang's interest in the Hudson is long-standing. He coauthored an early study on regulatory controls of wastewater discharges to the river in 1977. A New York Public Interest Research Group veteran, Hang spent twelve years directing the group's toxics project before joining the private sector, where he's generated \$90 million in remedial efforts, largely pro bono, mostly in the area surrounding his hometown of Ithaca. Toxics Targeting, the environmental-data company he founded in 1990, aggregates every hazardous release in New York, coalescing local, state, and federal information into thoroughly unsettling maps commissioned by real estate firms doing due diligence.

"I really care about cleaning crap up," Hang explained when we first spoke on the phone last winter. "I want to set the policy back to what it originally was: source removal. They've gotta dig till they don't find the contamination anymore, extract this stuff from the environment, and permanently sequester it. The entire remedial program from coast to coast has really been more akin to what I call interim remedial measures—the letter and spirit of the law never fulfilled."⁴

I asked Hang whether he considered dredging an adequate remedy. There was silence on the other end of the line for a time.

"Now here's the trick," he began in his quick, nasal locution. "You have to promise not to tell, is that okay?"

⁴ "Sometimes the perfect is the enemy of the good, and the law gives us mechanisms where we can choose to fall short," said Walter Mugdan, the regional Superfund director, when we discussed the feasibility of source removal at GE's plant sites. "And there certainly might not be enough money on earth to do it."

I assured him I wouldn't, and that it was.

"No one really knows how the Hudson got polluted, and I do," Hang said, aiming for cryptic but unraveled by excitement. "There's a half-mile underground lake of raw PCBs leaking into the bottom of the goddamn river."

Hang had been sitting on this information since 2002, when a client he declines to name paid him to train his eye on the Hudson once again. A tip from the New York Attorney General's office alerted him to a dot on a map warranting further attention, which led to a state Freedom of Information Law request yielding thirty Bankers Boxes of data, among which was a single document suggesting the existence of a "free-floating product plume." Hang's mystery client failed to make use of the information, and nothing came of his discovery. Now Hang saw the stars aligning: all the attention trained on the river with dredging in the quadracentennial year of Henry Hudson's voyage; the rumors of his old NYPIRG comrade, Judith Enck, as the favored candidate for regional administrator of the EPA; Lisa Jackson, a former hazardous-waste remedial engineer, running the agency; a Democratic Congress that might reinstate excise taxes on oil and hazardous waste, allowing for an adequately resourced Superfund. But Hang's data was old and needed updating. He believed another FOIL request in his name might set off alarms in Albany. I offered to coax data from the DEC so that he could determine what was going on beneath the plants.

These cloak-and-dagger precautions soon proved unnecessary, however. The DEC, fielding all enquiries, was not only candid but blasé about the massive scale of contamination at Hudson Falls and Fort Edward. Hang's revelation was public knowledge, yet it was largely unreported, and I found that those charged with oversight didn't much care.

“What do you smell?” asked Kevin Farrar, the DEC point man for GE's plant sites, as we drove along Lower Allen Street in Fort Edward after the dredging ceremony. My olfactory nerves were silent, but a glance from Farrar, a genial and gesticulating exploratory geologist, confirmed that a gust of PCB had passed through the open windows of his minivan.

"Half the people I know are sensitive to that odor and half aren't. I can smell it like *that*," he said, snapping his fingers. I asked him to characterize it.

"It's hard to describe a sense," Farrar opined. "What's the color red look like, right? People say it smells like geraniums, but to me it's halfway between bitter and sweet with a flat metallic aftertaste." Following this *Wine Spectator* flourish, Farrar suggested his faculties could de-

termine not only piquancy but relative toxicity as well: "What's easily noticeable to me is a very, very low concentration in terms of exposure, so it has to smell really bad to me before it's actually bad for people in the neighborhood. Which is good, I suppose."

We headed north on Broadway, the main drag of this dying town, where veterans of the First World War had once returned to find affordable homes and honest work at a decent wage, the trappings of the American dream. The dwellings lining the road evinced a certain frankness regarding the requirements of their hardscrabble lives, with propane tanks, generators, and depressurization systems for blocking GE's industrial toxins from basements gathered in concentric circles signifying various stages of operability and rust. Indoor furniture rotted outdoors, bloated with rain. The odd restored Victorian or shingle-style gem served only to amplify the general dereliction.

Farrar was blunt about the DEC's shambling efforts to clean up the plant sites, freely discussing the subject for hours, responding promptly to fusillades of emails, and passing along reams of data. He claimed the department had "stopped the bleeding at the site years ago," and he believes that even if there are pools of PCBs in the bedrock, he's going after "the last little bit, which is always the hardest." Neither GE nor the regulators seemed panicked by the Pyranol under the plants, because the water-column data indicated PCB levels rose further downstream; both parties took this to mean that the plants were contributing negligible amounts to the pollution of the lower river.

But theirs was a curious consensus. Using water-column samples that stop over a foot shy of the riverbed (thus excluding anything seeping up from or rolling along the bottom) to assess the presence of a hydrophobic, generally insoluble compound seemed specious and self-fulfilling. "The only thing you can do is base it on the data you've got," said Dave King, the EPA project manager, in response to these concerns. Farrar conceded that "it could be difficult indeed to capture the hypothetical droplet moving along the river bottom. . . . If someone can develop a better understanding of how to measure PCB [transport] in this system, I would be pleased to hear from them." Everyone acknowledged the technique's limitations, but they still professed faith in its results, whether out of temerity or necessity.

"I grew up eating fish from the river, and I drink the water, so I've already got a lifetime dose—nothing I can do about it," said Farrar, whose fa-

ther was foreman at the waterworks in nearby Waterford, which, until the dredging began, drew its municipal supply from the Hudson. "People who've worked in this business for a long time, we get jaded because other people don't have the experience or training we have, so things frighten them. To me it's all in a day's work." Farrar was equally comfortable explaining the Taconic orogeny or chatting about his thirty years' service as a volunteer fireman. When he finished school he'd hoped to hunt crude, but as the oil industry struggled in the mid-Eighties he "went the opposite direction," joining the DEC in 1986. A few years later, Farrar's "Great NAPL Hunt" began.

PCBs are 35 percent heavier than water, and, due to their relative insolubility, they are found in fluid form as either non-aqueous phase liquids—fresh as the day they were made—or partially dissolved in water, often with other contaminants. In Hudson Falls and Fort Edward, dense NAPL, or DNAPL, is uncovered with alarming frequency.

It's Farrar's job to push GE to keep searching, peering over its shoulder all the while, as looking for PCBs is expensive, and finding them even more so.

The local geology hasn't helped, with the superficial soil, sand, and clay giving way to hundreds of feet of highly fractured Snake Hill Shale.

"This is where I like to stand and wave my arms," Farrar joked from a crumbling outcropping of shale overlooking the Hudson Falls plant, where pure PCBs were first observed leaking into the river through the fragmented bedrock in 1991. He thought silently for a moment, wondering where to begin, grabbing a handful of chin as his shades reflected the glare.

Farrar itemized the fruits of his labors: hundreds of exploratory wells dug, several miles of rock core collected, and over a hundred tons of PCBs removed. "But is that most of it?" he asked. "I can't tell you. How much oil's under Hudson Falls or Fort Edward? I don't know. It's just lots. We'll never know. We're never gonna get all the oil out. I'm certain there's pooled NAPL under there," he said, pointing at Building 1, a former mill built by the Union Bag and Paper Co. "Can I tell you how many individual pools there are?" Farrar continued. "Fuck, no! Okay? No. It can't be done!" The original structure was designed to draw hot air and moisture below the factory floor to keep a necessarily balmy work environment a little less so. The condensation drained to a sub-basement, or plenum, that was essentially a pit carved out of the bedrock, lacking a true founda-

"THEY'VE GOTTA DIG TILL THEY DON'T FIND THE CONTAMINATION ANYMORE," HANG SAID, "AND PERMANENTLY SEQUESTER IT"

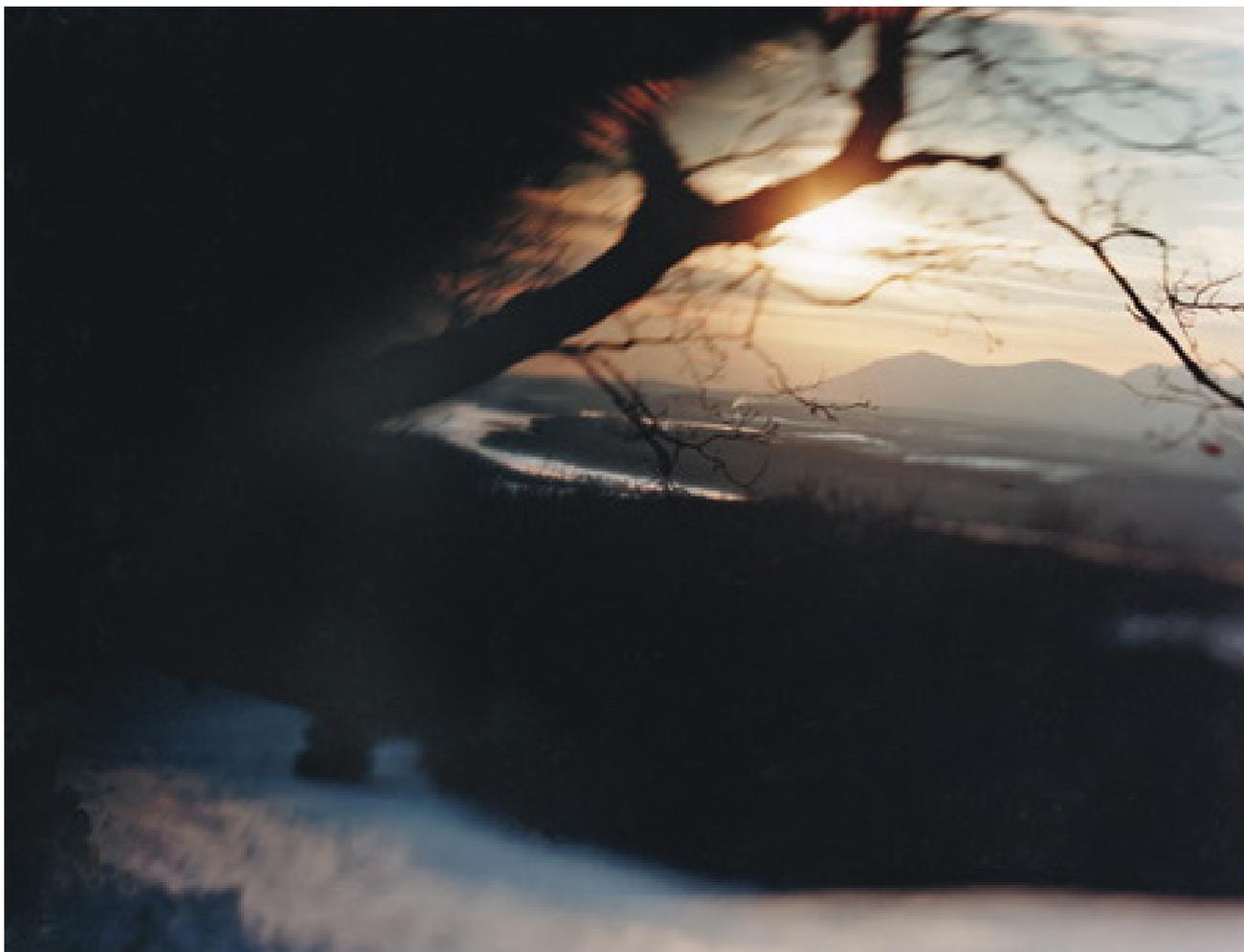
⁵ "That doesn't sound right at all," said Dr. David Carpenter of SUNY Albany's Institute for Health and the Environment, an expert on the subject of PCB toxicity, referring to Farrar's assertion. "When something causes disease, there's no threshold where it doesn't perturb the body's function and have some harmful effect."

tion. When GE began operations there in 1952, the basement, directly above the plenum, became the primary PCB handling area, which allowed the oils to pool, permeate, and eventually saturate the underlying shale.

After years of drilling individual extraction and monitoring wells, GE proposed something more robust: a novel \$40 million tunnel-and-drain collection system in the bedrock adjacent to the

under the flagpole, it doesn't matter, because I'm going to treat it like the whole thing's nuked, which it is."

From the data furnished by Farrar, Hang concluded that the area of bedrock saturated with NAPL at Hudson Falls was nearly a half-mile long, 1,100 feet wide, and roughly 400 feet deep. Furthermore, Hang established that the plume of partially dissolved PCBs, several acres in size,



site—a network of wells manipulating groundwater levels and drawing mobile contaminants to collection points, then pumping them to the surface for treatment—to prevent the migration of PCBs to the river. Work began in 2007 and was largely completed last summer. After monitoring of the tunnel's influence over the course of the annual hydrologic cycle is complete, its adequacy will be evaluated, at which point it will either be pressed into permanent service or reconfigured.

"The remedy's designed to address the entire mass of rock between the source and the river," Farrar said. "So whether there's a pool under the pump house, under the smokestack, or another

far surpassed the tunnel's reach. When I suggested this might be the case, Farrar got defensive. "I don't want to call it nitpicking," he said, "but it's not important for us to know the plume's size to the foot, because the scale of this problem is much larger than that. Could the plume be fifty feet further than we thought? Sure! Absolutely!" According to Hang, it's nearly a thousand.

The Moreau Industrial Park, a low-slung office building backed by a labyrinth of dirt roads given over to motocross, was our last stop. Down one of the warren's neglected arteries we

parked before a chain-link fence with signage warning, THIS SITE CONTAINS BURIED PCB MATERIAL. Farrar announced that he'd forgotten his keys, and when I expressed a willingness to hop it, he chuckled. "I'm too fat to hop," he said, leading the way. "We can go around."

The fence extended mere feet into the brush, and we soon emerged at Remnant Site Two, on the Hudson's western bank. In 1973, Niagara Mohawk Power removed the Fort Edward Dam, releasing the vast tonnage of sundry contaminants tenuously embargoed behind it and lowering the water level by fourteen feet. The result was five such remnants—erstwhile riverbed that is no longer submerged. "What's left behind is former river bottom immediately downstream from GE's factories," Farrar said. "Probably not that great."

At the Fort Edward plant, runoff and spillage was intended to flow to the southwestern corner of Building 40, go down a drain, and run underground a few hundred yards farther west before spitting from an outfall pipe on the river's eastern bank. Fifteen years ago, the DEC asked GE to investigate the shale and associated oil lying on the riverbank, then design and implement a remedy. GE demurred. In 2003, Farrar was forced to clean up the outfall area, at \$9 million in taxpayer expense. His team diverted the Hudson with cofferdams and, while removing 23,000 tons of contaminated material from 1,350 feet of shoreline, discovered PCBs bubbling up into the riverbed. "It was easy to see we had a much bigger problem than we thought, oilwise," Farrar recalled. The surrounding area would require a separate investigation, which began in 2007 with the designation of yet another "Operable Unit" for him to mool in. At first, GE cooperated with the investigation. "We negotiated an agreement, issued a work order, asked GE to sign on the dotted line. They said no. I guess they thought we were bluffing, because I issued a work assignment to my consultant and at the very last minute GE said, 'We think it would be a good idea if we did the work.'"

The current theory is that "a baby version of Hudson Falls" happened here, with the fragmented shale under the rusted outfall pipe serving as a point of ingress for PCBs. According to Hang, the contamination has traveled hundreds of feet north, hundreds of yards south and southwest, and four hundred feet down, with a worrisome shallow plume and a larger, deeper one Farrar claims isn't harming the Hudson, even though groundwater from below is free to pass through the plume on its way to the river, delivering partially dissolved PCBs. The wells around the outfall generate samples so pure they beggar even the parts-per-million scale, just as the lone

well here at Remnant Site Two, across the river and quite a ways south of the outfall, produces samples near the PCB saturation level.

"NAPL can go where it wants to go," Farrar mused. "There's NAPL around here somewhere. We don't know where—we're still working on it. We have a fairly large area to define."

Birds trilled, blending playful and plaintive notes as the light turned the exposed riverbed's abundant green a radiant yellow. Downstream, just around the bend, bobbed a water-monitoring buoy, upon which so much depended. GE has long argued that source control—stanching its known leaks—was sufficient, and that the work is nearly done. From what I had seen, however, it appeared that the work had only just begun. The EPA, for its part, considers shoring up the plants crucial to the dredging's permanence and the river's ultimate recovery, and Farrar concedes that "if there was a significant release of PCBs from these sites or any site above the dredging, there could be recontamination." Odd, then, that neither party seemed concerned that their historic, precedent-setting cleanup will steadily be undone

by these submerged lakes of toxic chemicals. And curious, as well, that no one even brings up the possibility, as Hang put it, of digging until there's no more contamination.⁶

"We'll probably get a fix sooner for the shallow stuff," Farrar said, walking back to the meager fence and his minivan beyond it. "We won't wait to chase the deep stuff, because it's gonna be a long chase. It took at least four years to figure out what was going on." Perhaps it was the separation of the problem into EPA and DEC-led areas, Operable Units and Certification Units, that encouraged his big-picture blindness and allowed him to say that circumstances were intelligible with one

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⁶No one I spoke to was willing to hazard an estimate of what such a permanent solution might cost. One environmental consultant with knowledge of the situation, who requested anonymity, suggested that source removal for the plants would cost "orders of magnitude more" than the near billion-dollar dredging effort, and would transform the Hudson Falls site into a quarry four hundred feet deep, several thousand feet long, and a thousand feet wide—with a similar, but smaller moonscape to be fashioned in Fort Edward. As early as 1991, this consultant said, the costs associated with source removal were considered so great that GE entertained the possibility of permanently diverting the Hudson above Bakers Falls and blasting a new channel through the town of Moreau. Given that GE has posted \$132 billion in profits since the EPA's 2002 dredging order, feasibility in such matters appears to be a function of how much money polluters are willing to spend.

breath and utterly baffling with the next. Maybe the regulatory agencies, adept at preventing the perfect from stymieing the good, had irreparably diminished their own notion of the possible—always settling for compromised compromises, the only sort they could wrest from industry.

From Remnant Site Two, the Hudson River epic appeared to be a confidence game in which the EPA loudly demanded dredging in an attempt to retain the public trust while settling for a half-measure. GE ably played the foil, then acquiesced, passing itself off as a good corporate citizen without rectifying its remarkably thorough poisoning of a national treasure. Everyone could keep up the act as long as no one found Farrar, keeper of the Hudson's dirtiest open secret, overmatched by an elusive reservoir of PCBs that ensures the river will never run clean.

One hundred and twenty years of Bringing Good Things to Life has created scores of similar locales. General Electric is fully or fractionally responsible for 175 Superfund sites, and PCBs have been identified at a quarter of the areas gracing the National Priorities List, with GE the third most prolific contributor behind DuPont and General Motors. Pittsfield, Massachusetts—the Berkshire County seat where the Housatonic River glides past GE's mothballed transformer division—is a stark warning of what awaits the Hudson Valley.

"It's not that we believe the EPA are bad people," said Tim Gray, director of the Housatonic River Initiative (HRI), when we met in Pittsfield late last winter. "This site just got so out of control they didn't know how to handle it. It was scary. Everybody around here is living an experiment conducted by General Electric."

As an undergrad at the University of Massachusetts in 1976, Gray received a grant to study PCBs in the river. "Lo and behold, no PCBs above the plant," he recalled, "and chock-full below." Gray submitted his findings to the EPA, which judged them lacking in quality control. "About two years later," said Gray, "front page of the *Berkshire Eagle*: EPA Finds PCBs in the Housatonic."

But the river remained an open sore. Most in town drew paychecks or pensions from "the GE," and the company assured the community that Pittsfield wasn't in harm's way, all the while finding PCB oil hither and yon, quietly identifying plumes up to six acres in size. In 1997, as HRI campaigned fruitlessly for the Housatonic's restoration, PCBs were discovered at Dorothy Amos Park, a playground in an African-American neighborhood. Fuller's earth, thirteen tons of which GE used annually to soak up PCBs, was to blame. Residents familiar

with the facility's daily operations began buzzing about contaminated fill. Then soil at a home in the Lakewood neighborhood across the river from the plant tested out at 44,000 parts per million. "All of a sudden there's freakin' remediation trucks all over the place, there's people walking around in moon suits," said Gray, surveying the area from his Dodge Caravan with NOPCBs plates. The residents had to claw and scrape to get their properties tested, and of the roughly 300 evaluated, more than half required excavation.

The discovery at Dorothy Amos Park made the Housatonic's plight sexy enough for the evening news, engendering sufficient resolve to dredge two of the river's 149 miles in 2001, with GE springing for the first half a mile. The EPA's "Rest of River" webpage reads like an *Onion* story to the initiated, who are well aware that the agency long ago wrote off Connecticut, where the river meanders for 82 miles before draining into Long Island Sound. Meanwhile, the dredged portion remains imperiled by all the toxins the EPA allowed GE to "cap"—by removing a few feet of contaminated soil, slapping down a layer of plastic, then covering with clean fill—and leave in place.

A bitter February wind came rushing off the river toward Dave Gibbs's yard in Lakewood. Gibbs, onetime GE employee and current HRI president, stood beside Gray as their arms traced broad arcs conveying the general lay of the land. At the edge of Gibbs's property on Newell Street, massive power lines overhung a lowland marsh, traversing the Housatonic to East Street Area 1, a particularly hazardous portion of GE's 254-acre plant. Gray and Gibbs believe that Lakewood is riddled with PCB dumps tidily bulldozed into residential real estate. In the 1940s, the Army Corps of Engineers buried the river's oxbows to control flooding. GE provided much of the backfill for the project, and today the old oxbows make up one of the ten Pittsfield sites designated Tier-1 (the most pernicious environmental problems). The routine manner in which PCBs found their way from the plant and into the wider world is illustrated by a 1948 memo between GE staffers: "Today I had a complaint from one of our neighbors on Newell St. . . . This is the last section anywhere near the plant where we can dump most anything that comes out of the factory. I would hate to have them take it away from us." Sixty years later, the air in Gibbs's house has significant levels of PCBs in it, as does his blood.

"This whole side of the river is all contaminated," said Gray, "and the way they clean it up is they blacktop it." The Newell Street parking lot by the Gibbs place was a former barrel field, but since it was already paved over, the EPA

preferred to let it lie. After Gray's persistence brought about the installation of an exploratory well on the lot, he inquired about the results. "The EPA said they found a small pocket of oil," Gray recalled. "So I asked what 'small' meant. They said, 'Well, we pumped out 36,000 gallons in the last six weeks.' I said I didn't consider that a small pocket of oil, and their response was, 'Tim, you have to remember we've been pumping NAPL on the other side of the river for over a decade, and we've easily pumped a million gallons.'"

Throughout much of the struggle over the Housatonic, regulators tried to downplay and distort revelations in Pittsfield, but they were always a step behind the residents, who were mobilized, not paralyzed, by the scale of the problem. State regulators told townspeople that PCBs didn't evaporate into a gas, which they readily do. They swore there were no PCB barrels in the Pittsfield landfill—then a bulldozer capping the site struck one, and more than 800 were subsequently uncovered. The state Department of Environmental Protection maintained that the Housatonic held 40,000 pounds of PCBs; a decade later, the EPA revised the estimate to 500,000. The agency told Gray, "Nothing gets under the river," but then an HRI consultant sank a well into the riverbed and produced evidence to the contrary. The EPA now claims the two dredged miles won't be recontaminated, even though loose toxins saturate the riverbanks and every storm drain in the vicinity contributes PCBs to that particular stretch of the Housatonic. But what really angers Gray is Hill 78.

"So, this is the outrage," he said as we pulled into Allendale Elementary's parking lot. "Well, one of the biggest outrages." Pittsfield's premier ski resort, as Gray calls Hill 78, is an unlined five-acre ravine filled entirely with PCB-contaminated material that looms over the schoolyard at a height of forty-five feet. The school sits on a former swamp that was filled with PCB-laden material provided by GE. Samples from deep within Hill 78 register levels of 120,000 ppm. The soil surrounding the school has been excavated several times, capped and recapped, and on the day we visited, air monitors in wire cages far outnumbered playing children. The Hill was draped in a patchwork of blue tarps held down by old tires, doing their inert best to keep the wind from whipping up what lay beneath.

PCBs have been a grave concern at Allendale for years due to positive test results in the gym and the schoolyard. The EPA repeatedly pledged that Hill 78 was a priority for cleanup, but when they settled on a remedy in 2000, it was clear the agency's negotiations with GE had taken a turn.

Hill 78's toxic hoard wouldn't be exhumed; it would be expanded.

"We were sick to our stomachs," Gray recalled. "The risk assessments say kids growing up along the river have a much greater chance of getting cancer and non-cancer affects, and we're gonna haul all the PCBs out of the river and we're gonna put 'em on top of Hill 78? *Excuse me?* Fifty feet from Allendale?" The EPA sought to placate critics by announcing that the really problematic stuff would be housed in a brand-new toxic-waste repository, which also abutted Allendale Elementary.

"There's a state law that says you can't build a solid-waste dump within 1,000 feet of a school," said Gray, still incredulous. "But you can build a toxic dump there? To us it was the biggest thing EPA gave up at the table.

Why are they letting GE get away with this?"

The process by which a perfectly valid question is reduced to a rhetorical one has played out across the country in forgotten places still paying the toll levied by progress, towns that persist as emblems of industry's missteps and noxious byproducts. The Hudson cleanup is itself furthering the creation of another such place in Andrews County, Texas, where the river's dried sediments are being shipped by rail to a landfill that already houses nuclear waste. Environmentalists worry that the dump is dangerously near the Ogallala Aquifer, one of the world's largest, which stretches all the way to South Dakota and supplies 30 percent of the groundwater used for irrigation in this country. GE and the EPA dismiss those concerns. The local Sierra Club's objections to the plan are duly noted. But the county residents are, by all accounts, grateful for the employment opportunities and tax revenue the landfill provides.

In Pittsfield the grassroots forces pushed hard, demanding that regulators act to protect the public and the environment. For want of political will, the EPA allowed GE not only to leave its poisonous legacy intact but to build a monument to it at Allendale Elementary. Thirty miles to the west, well-placed interests called for a cleanup of the Hudson and fared little better, embracing a solution unworthy of the name that gives false comfort to the public while ignoring the mother lode of Pyranol still oozing out of the bedrock.

The river that once stood for a New World and a fledgling republic founded on freedom's premise stands for us still. Although we've changed, the Hudson's capacity to reflect our likeness remains, and in this mirror our corruption, greed, and ignorance are plainly visible. ■