

Beyond Poison Poles

Elected officials say no to toxic utility poles in their communities

by Nichelle Harriott

Some of the most toxic pesticides known to humankind are widely used as wood preservatives to treat utility poles that line the streets of communities across the U.S. Now, a group of residents on Long Island, New York (Long Island Businesses for Responsible Energy (LIBFRE)), joined by local elected officials in the Town of North Hempstead (population over 226,000) and state legislators, are shining a light on human health exposure risks and environmental contamination associated with their use. Efforts underway will require notification signs to warn of the toxic hazard of treated poles, and state legislation seeks to ban the use of one wood preservative, pentachlorophenol (penta or PCP).

In September, North Hempstead's Council passed a new law requiring warning labels on utility poles treated with PCP. Labeling for treated poles in the town is now required to have the following warning: *"This pole contains a hazardous chemical. Avoid prolonged direct contact with this pole. Wash hands or other exposed areas thoroughly if contact is made."*

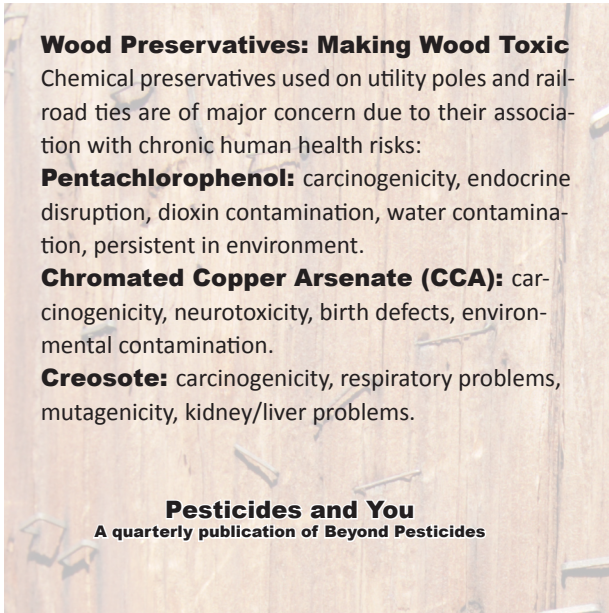
Following the town's action, a bill to ban PCP was introduced in the New York State Legislature by State Senator Kenneth LaValle and Assemblyman Fred Thiele. This legislation would be the first in the nation to do so.

Utility poles are typically treated with pentachlorophenol, chromated copper arsenate (CCA), or creosote. The chemicals, also used to treat railroad ties and some outdoor structures, had their previous residential uses pulled from the market ten years ago following decades of controversy on health effects and environmental contamination associated with their use. Penta and creosote are persistent chemical mixtures that contain dioxins, furans, and hexachlorobenzene, which are linked to cancer, neurological effects, reproductive disorders, and endocrine system disruption, and their production and use contaminate soil and water. CCA-treated wood leaches out arsenic, a known human carcinogen.

History

It has been close to two decades since Beyond Pesticides raised concerns surrounding the use of PCP and other wood preservatives used to treat utility poles

across the country. The organization's publication of the 1997 investigative report, *Poison Poles*, and a follow-up in 1999, *Pole Pollution*, drew critical attention to the highly toxic nature of these chemicals and their use patterns. Prior to the focus on utility poles, these chemicals were widely used on decks and playgrounds. The residential uses of these chemicals have been gradually phased out, but the treatment of utility



Wood Preservatives: Making Wood Toxic

Chemical preservatives used on utility poles and railroad ties are of major concern due to their association with chronic human health risks:

Pentachlorophenol: carcinogenicity, endocrine disruption, dioxin contamination, water contamination, persistent in environment.

Chromated Copper Arsenate (CCA): carcinogenicity, neurotoxicity, birth defects, environmental contamination.

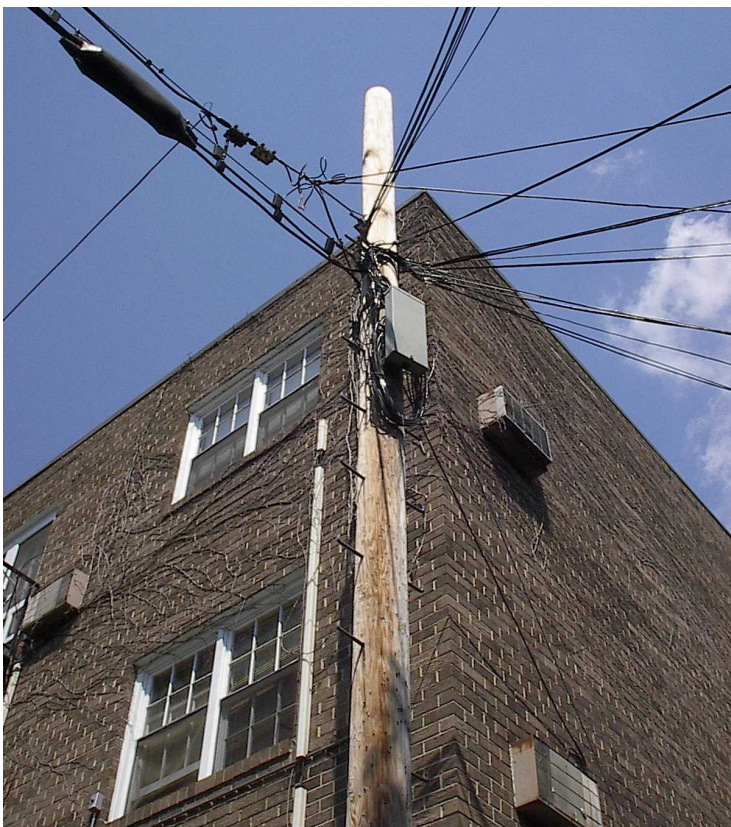
Creosote: carcinogenicity, respiratory problems, mutagenicity, kidney/liver problems.

poles with PCP and other wood preservatives continues across the country.

What is Pressure Treated Wood?

In order to combine wood with the chemical preservative, it undergoes a process known as *pressure treatment*, whereby the wood is placed into a closed cylindrical pressure chamber under high pressure and vacuum. These conditions force the chemical deep into the core of the wood instead of the surface. This treatment ensures that the wood can endure decades of moisture and insect pressures without decay. The chemical preservative over this period, however, leaches to the surface of the wood.

Even though the availability of PCP products has drastically reduced over the years, it remains a restricted use pesticide only for sale and use by certified applicators. PCP is currently banned in all European Union member states, China, India, New Zealand, Indonesia, and Russia, and has been recommended by a United Nations committee for listing under the Stockholm Convention as a persistent organic pollutant for worldwide phase-out. The signatories to the convention will make its decision in May, 2015. Meanwhile, alternative materials used for utility poles exist, including recycled steel, concrete, and composite, and lines can be buried.



International Scrutiny: Persistent Organic Pollutants (POPs)

The Persistent Organic Pollutants Review Committee (POPRC) of the United Nations' Stockholm Convention adopted recommendations for the global elimination of PCP in November 2014. The Convention is an international treaty established to control highly hazardous chemicals. Previously, the Committee decided that the "pentachlorophenol and its salts and esters is likely, as a result of its long-range environmental transport, to lead to significant adverse human health and/or environmental effects such that global action is warranted and that the Committee should proceed with the development of a risk management evaluation for that chemical."¹ This recent recommendation says that PCP, its salts and esters, should be added to Annex A of the Convention.² The Annex A entry would specifically ban the production and use of PCP for utility poles and cross-arms. In its recommendation for the Stockholm Convention, the Committee again cited PCP's persistence, bioaccumulation, long-range transport, and its toxic impacts. The Committee also found wide availability of non-chemical alternatives that were much safer than PCP. Governments around the world will decide on the recommendation in May 2015, but typically accept the recommendations of its expert committees. If adopted, this would lead to a ban on its production and use in countries that are parties to the Convention. Despite overwhelming evidence of the harms posed by PCP, the U.S. led a campaign to oppose international efforts to ban the use of PCP. While the Stockholm Convention's decision would impact PCP production and use around the world, it would have no binding effect on the U.S. which has not ratified the convention.

Watch Out! That Treated Pole Can Be Dangerous to Your Health

Pentachlorophenol is a chlorinated aromatic hydrocarbon closely related to other chlorophenols, and is typically contaminated with hexachlorobenzene, polychlorinated dibenzo-p-dioxins, and furans. All of these substances can be found in technical grade PCP. There is extensive documentation of the acute and chronic toxic effects of PCP. Inhalation and dermal exposures are to be expected with use of PCP as a wood preservative for utility poles, and people who live or work near treated poles have an elevated risk of being exposed. Skin, eye, and respiratory irritation are typical acute exposure symptoms.³

Studies find that long-term low and elevated exposures to PCP can cause damage to the liver, kidneys, blood, and nervous system. Laboratory animal studies suggest that the endocrine and immune systems can also be damaged following long-term exposure to low levels of PCP.⁴ The U.S. Environmental Protection Agency (EPA) has classified PCP as a 'probable human carcinogen' and the International Agency for Research on Cancer (IARC) has classified it as 'possibly carcinogenic to humans.' In 2014, PCP was added to the National Toxicology Program (NTP) 13th Report on Carcinogens as "reasonably anticipated to be a human carcinogen," citing that the chemical is associated with an increased risk of non-Hodgkins lymphoma in studies in humans and the incidence of tumors in the liver and other organs in mice.⁵

Even though specific inhalation and dermal studies have not been conducted for PCP, EPA has determined that PCP is readily ab-

sorbed via all routes of exposure, including oral, inhalation, and dermal. Based on the observance of systemic tumors following oral exposure, and in the absence of information to indicate otherwise, EPA has also assumed that exposures/residues throughout the body will be achieved regardless of the route of exposure. Accordingly, the agency believes that PCP can be considered “likely to be carcinogenic to humans” by all routes of exposure.⁶

Other animal studies on reproductive toxicity in rats show that exposure to PCP is associated with decreased fertility, delayed puberty, testicular effects, decreases litter size, decreased viability, and decreased pup weights.⁷ PCP acts as an endocrine disruptor by affecting the levels of circulating thyroid hormones.^{8,9} One 2011 study found that PCP significantly decreases production of the hormones testosterone and 17 β -estradiol, and may inhibit steroidogenesis (production of steroid hormones).¹⁰ The Centers for Disease Control and Prevention’s *National Report on Human Exposures to Environmental Chemicals* notes that acute, high dose exposure to PCP can “induce a hypermetabolic state and excessive heat production” in the body, with effects that include hyperthermia, hypertension, and metabolic acidosis. These have been observed in adults and children highly exposed to PCP through ingestion, inhalation, or skin absorption. This CDC report, which measures levels of environmental chemicals in the human body, finds that while PCP levels in adults and children are lower than they have been in the past (mostly due to regulatory restrictions), residues are still measurable in the U.S. population.¹¹ Human biomonitoring studies find PCP in umbilical cord blood plasma and breast milk, with the risk of exposure to developing fetus and infants.¹²

Off-Pole Migration

In addition to human health concerns, PCP can migrate from treated poles into the air and soil. As used as a wood preservative treatment for utility poles, human and environmental exposures can occur. PCP is released into the air from treated wood surfaces. While this phenomenon (off-gassing or volatilization) would not result in large ambient concentrations of PCP in the atmosphere, residues quickly bind to soil and can make their way into surface water and groundwater,¹³ where they can persist and accumulate in fish and other organisms. Increased temperature and leaching from rain will contribute to PCP migration from utility poles to the surrounding soil. PCP’s major metabolite, pentachloroanisole (PCA), is also highly toxic. According to data compiled by NTP there is evidence of the carcinogenic activity of PCA.¹⁴

PCP is also a common contaminant in water,¹⁵ and studies with fish find that PCP’s endocrine disrupting effects eventually result in abnormal fish development.^{16,17} In one study, field soil samples were collected around six PCP-treated wooden poles (in clay, organic matter, and sand) and found concentrations of polychlorodibenzo-p-dioxins and furans the highest in organic matter and clay soils. The study also found that high levels of polychlorodibenzo-p-dioxins and furans can be found in the first two meters below the surface.¹⁸

A study published in the *American Journal of Public Health* finds that treated utility pole placement on roadway rights-of-way near private water sources increases the likelihood of drinking water contamination, especially in areas with high water tables.¹⁹ According to this study, which was conducted in Vermont, tested water samples had a PCP concentration of 2.06 milligrams per liter, and 1.15 milligrams per liter, about 2000 and 1000 times the EPA maximum contaminant level (0.001 mg/L). In this case, treated poles were eventually replaced with non-treated cedar poles.

New York Residents Take Action!

Residents of East Hampton, NY, first raised concerns about PCP when they objected to the installation of 200 60-foot poles in village neighborhoods earlier this year by the electric company Long Island Power Authority (LIPA), operated by Public Service Enterprise Group (PSEG). Water tests requested by the residents detected PCP. Soon thereafter, residents of East Hampton filed a lawsuit against LIPA and PSEG Long Island, charging that the new utility poles in their neighborhood not only lowers property values, but threatens groundwater and their health. The suit charges LIPA and PSEG with negligence, fraud, violation of environmental law, and trespass.

The local organization, Long Island Businesses For Responsible Energy, Inc. (LIBFRE), born out of residents’ concern about the use of PCP-treated poles, is now working to ensure that in the future Long Island utilities focus on a safe and responsible energy infrastructure that does not include PCP-treated poles. LIBFRE is seeking the removal of all newly installed toxic PCP-treated wood utility poles and advocates for the rerouting of transmission lines underground along major public corridors away from residential neighborhoods.

Neighboring North Hempstead, NY also saw the installation of new utility poles in its neighborhoods, when the town board unanimously passed a law requiring that all newly-installed poles must have a permit, and that utility companies must place warning signs on all PCP-treated utility poles installed after January 1, 2014. The Board notes that the intent of the law is to alert people that the poles have been treated with a hazardous chemical and that anyone coming into contact with a pole should wash their hands immediately. Penalties for noncompliance with the law include a fine of \$500 for the first conviction and \$1,000 for the second. The law requires every fourth pole to have the warning sign placed at adult eye level.

These neighboring communities have enacted the first law in the nation to require treated utility poles to be labeled. Meanwhile, the legal challenge by LIBFRE seeks to require the electric provider to protect the community’s health and the environment.

Toxic Playgrounds?

Children, who face unique dangers from pesticides due to their developing bodies and elevated proportional intake of pesticide residues via oral, dermal and inhalation routes, are at greater risk from exposure to treated wood. Prior to 2004, wooden playground equipment, patios, decks and other residential wood sites were treated with PCP, CCA, and other toxic preservatives. Children who play on these surfaces, as well as on the soil into which these chemicals can leach, face elevated hazards from exposure. A study investigating the potential exposures of 257 preschool children, ages 1 1/2-5 years found that potential exposures to PCP were predominantly through inhalation, where the estimated exposures to PCP (based on urine analysis), exceeded their estimated maximum potential intake. This led the researchers to conclude that "further research on the environmental pathways and routes of PCP exposure, investigation of possible exposures to other compounds that could be metabolized to PCP, and on the human absorption, metabolism, and excretion of this phenol.." should be done.²⁰

While many wood preservatives like PCP, CCA and creosote are no longer registered to be used on residential sites such as patios, decks, picnic tables or playground equipment, wood treated with these chemicals may still be found in homes and playgrounds across the country.



Treated Wood and Its Dioxin Legacy

PCP formulations include technical-grade pentachlorophenol, which usually contains toxic impurities such as polychlorinated dibenzo-p-dioxins and dibenzofurans. In addition, a number of other environmental contaminants, including hexachlorobenzene, pentachloro-benzene, pentachloronitrobenzene, and hexachlorocyclohexane isomers, are also associated with pentachlorophenol manufacture and use. While modern manufacturing processes have reduced the levels of these contaminants, they still pose risks to human and environmental health. The scientific database has linked these chemicals with carcinogenicity, teratogenicity and endocrine disruption.²¹ Dibenzo-p-dioxins in particular are known to be human carcinogens that are extremely persistent and bioaccumulative.²² Hexachlorobenzene has also been classified as a 'probable human carcinogen.' Continued use of PCP on utility poles presents an opportunity for these dangerous chemicals to enter into the environment, despite measures to mitigate risks.

Disposal of Treated Wood

Many may find that their old deck was once treated with a wood preservative (CCA, creosote or PCP), and may want to dispose of the treated wood. According to EPA, treated wood should be disposed of in either construction and demolition landfills, municipal solid waste landfills, or industrial non-hazardous waste landfills. Treated wood should NOT be burned (i.e. fireplace or outdoor fire), as particulate matter and toxic gases released during burning can cause eye and nose irritation, breathing difficulty, coughing, and headaches. Treated wood should also not be used to make compost or mulch, nor should it

be recycled in gardens to create raised beds, since leaching from the wood can contaminate crops. Unfortunately, treated railroad ties have been known to end up in garden sites.

Contact your county solid waste office for information on how to dispose of treated wood as some County waste sites do not accept treated wood of any kind.

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Have a Home Improvement Project?

Alternatives to chemically-treated wood

There are non-wood alternatives to treated-wood, including recycled steel, concrete, and composites, that can be used for utility poles, along with plastic and cement for railroad ties. There are, however, other chemical alternatives that have been used to treat wood in residential settings, but their long-term safety is still under debate. To be on the safe side, here are some options for consideration:

- **Recycled plastic and wood-plastic lumber.** These would not leach toxic chemicals into soil or water and costs less to maintain.
- **Redwood, cedar, and cypress.** These woods are naturally resistant to insects and rot. Be sure to purchase wood products that come from responsibly-managed forests.
- **Reclaimed wood.** This typically has been recycled from old barn structures, and river-recovered ("sinker") logs from the days of river-based log drives. However, be sure to know where the wood originated from.
- **Stone or metal.** Stone and landscape blocks can be used for gardens and landscaping, while metal can be used in place of some treated wood applications.

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