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Pentachlorophenol

Final Registration Review Decision
Case Number 2505

December 2021

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I. INTRODUCTION

This document is the Environmental Protection Agency's (the EPA or the Agency) Final Registration Review Decision (FD) for pentachlorophenol (PC Code 063001, case 2505). In a registration review decision under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Agency determines whether a pesticide continues to meet FIFRA's registration standard.[1] For more information on pentachlorophenol, see EPA's public docket (EPA-HQ-OPP-2014-0653) at www.regulations.gov.

FIFRA[2] mandates the continuous review of existing pesticides. All pesticides distributed or sold in the United States must be registered by EPA based on scientific data showing that they will not cause unreasonable risks to human health or to the environment when used as directed on product labeling. In 2006, the Agency began implementing the registration review program. EPA will review each registered pesticide every 15 years. Through the registration review program, the Agency intends to verify that all registered pesticides continue to meet the registration standard as the ability to assess and reduce risk evolves and as policies and practices change. By periodically re-evaluating pesticides as science, public policy, and pesticide-use practices change, the Agency ensures that the public can continue to use products in the marketplace that do not present unreasonable adverse effects. For more information on the registration review program, see http://www.epa.gov/pesticide-reevaluation.

The Agency is issuing a FD for pentachlorophenol so that it can (1) conclude the registration review of pentachlorophenol and (2) implement risk mitigation (see Appendix A). EPA is currently working with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (the Services) to improve the consultation process for national threatened and endangered (listed) species for pesticides under the Endangered Species Act (ESA).[3] The Agency has not yet fully evaluated pentachlorophenol's risks to federally listed species. Similarly, the Agency has not completed an Endocrine Disruptor Screening Program (EDSP) screening for pentachlorophenol pursuant to section 408(p) of the Federal Food, Drug, and Cosmetic Act (FFDCA). However, as detailed in this FD, the Agency is requiring the cancellation of all pesticide products containing pentachlorophenol and a phase-out of the use of all pesticide products containing pentachlorophenol. Therefore, EPA has concluded that a full evaluation of the risks of pentachlorophenol to listed species and EDSP screening for pentachlorophenol are not necessary.

Pentachlorophenol has been used as a wood preservative since 1936; however, the first pesticidal product containing pentachlorophenol was registered by the U.S. Department of Agriculture (USDA) on December 1, 1950. Pentachlorophenol is a heavy-duty wood preservative and is classified as a restricted use pesticide (RUP) for sale and use by or under the direct supervision of certified applicators only. Registered products containing pentachlorophenol may be used in the pressure or thermal treatment of lumber, timber, posts, poles, and other wood members intended for exterior use. Although labels have listings for various American Wood Protection

[1] Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) § 3(g), 7 U.S.C. § 136a(g); 40 C.F.R. § 155.57.
[2] As amended by the Food Quality Protection Act (FQPA) of 1996, Pub. L. No. 104-170, 110 Stat. 1489.
[3] Endangered Species Act (ESA) § 7, 16 U.S.C. § 1536.

Association (AWPA) use categories, a Life Cycle Assessment (LCA) that was written for the Treated Wood Council in 2012 states that pentachlorophenol is used in the U.S. only on utility poles and cross-arms.[4]

This document is organized in five sections:

- *Introduction* (summarizing the FD and responding to public comments);
- *Use and Usage* (discussing how and why pentachlorophenol is used);
- *Scientific Assessments* (summarizing EPA's risk and benefits assessments, updating or revising previous risk assessments, and discussing risk characterization);
- *Final Registration Review Decision* (presenting EPA's decision, regulatory rationale, and any mitigation measures to address risks of concern); and
- *Next Steps and Timeline* (discussing actions that registrants must take in response to this FD).

A. Updates Since the Proposed Interim Decision (PID) was Issued

In March 2021, EPA published the PID for pentachlorophenol. The Agency has made changes to to timing of the 5 year phase out of pentachlorophenol. In the PID, the Agency required registrants to submit voluntary cancellation requests no later than 2 years following the publication of the FD, followed by a 3 year period in which the Agency would allow for the use of existing stocks. In this FD, the Agency is requiring that registrants with pentachlorophenol product registrations submit a voluntary cancellation request no later than 60 days after the publication of the pentachlorophenol FD. The voluntary cancellation request must indicate an effective cancellation date of February 29, 2024. Until the effective cancellation date of February 29, 2024, the registrants may continue production, sale, and distribution of pentachlorophenol products while the Agency processes the cancellation requests. The effective cancellation date will be followed by a 3 year period in which the Agency would allow for the use of existing stocks. During the 3 year period during which the use existing stocks is permitted, registrants may not produce, sell, or distribute pentachlorophenol products. After February 28, 2027, the use of pentachlorophenol will not be allowed.

EPA has not updated the Draft Risk Assessment (DRA) for pentachlorophenol. This final decision finalizes the Agency's proposed interim decision and draft supporting document *Registration Review Draft Risk Assessment for Pentachlorophenol*, which are available in EPA's public docket (EPA-HQ-OPP-2014-0653).

B. Summary of Pentachlorophenol Registration Review

Pursuant to 40 CFR § 155.50, the EPA formally initiated registration review for pentachlorophenol with the opening of the registration review docket for the case. The following

[4] Bolin, C. A., & Smith, S. T. (2011). Life cycle assessment of pentachlorophenol-treated wooden utility poles with comparisons to steel and concrete utility poles. *Renewable and Sustainable Energy Reviews*, *15*(5), 2475-2486.

summary highlights the docket opening and other significant milestones that have occurred thus far during the registration review of pentachlorophenol.

- December 2014 - The *Pentachlorophenol Preliminary Work Plan* (PWP*)* was posted to the docket for a 60-day public comment period.

- July 2015 - The *Final Work Plan* (FWP) for pentachlorophenol was issued. The Agency received 20 public comments during the public comment period following the PWP, which resulted in changes to the anticipated timeline for the registration review of pentachlorophenol and anticipated data requirements in the FWP.

- March 2016 – A Generic Data Call-In (GDCI) for pentachlorophenol, GDCI-063001-1575, was issued for data needed to conduct the registration review risk assessments. All requirements called for in the 2016 GDCI have been fulfilled. In addition, the Agency has evaluated data submitted in response to two DCIs issued on September 21, 2011. Following the publication of the Reregistration Eligibility Decision (RED) on September 28, 2008, the Agency issued a post-RED GDCI and a Product-Specific-Data Call-In (PDCI). In both DCIs, all data requirements have been satisfied.

- January 2020 - The Agency announced the availability of the *Registration Review Draft Risk Assessment for Pentachlorophenol* (DRA) for a 60-day public comment period. Comments were received from 11 sources. These comments and the Agency's responses were summarized in Appendix D of the *Pentachlorophenol Proposed Interim Registration Review Decision* and in the memorandum *Response to Public Comments Regarding the Pentachlorophenol Draft Risk Assessment* dated August 3, 2020, available in the public docket at www.regulations.gov under docket ID EPA-HQ-OPP-2014-0653. The comments did not change the risk assessments or registration review timeline for pentachlorophenol.

- March 2021 - The Agency completed the *Pentachlorophenol Proposed Interim Registration Review Decision* and announced its availability in the Federal Register in the docket for a 60-day public comment period. Along with the PID, the Agency also completed *A Qualitative Assessment on the Use, Usage, and Benefits of Pentachlorophenol (PC# 063001) as a Wood Preservative.* Both documents are available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653. At the request of commenters, the Agency granted a 15-day extension of the public comment period, bringing the total comment period to 75 days.

- December 2021 – The Agency has completed the *Pentachlorophenol Final Registration Review Decision* (FD) and will announce its availability in the Federal Register. The Agency also completed the memorandum "*Response to Public Comments on the Pentachlorophenol Proposed Interim Decision (PID)*" dated November 3, 2021, available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

C. Summary of Public Comments on the Proposed Interim Decision and Agency Responses

During the 75-day public comment period for the *Pentachlorophenol Proposed Interim Registration Review Decision*, which opened on March 5, 2021 and closed on May 19, 2021, the Agency received public comments from 15 sources. Comments were submitted by KMG-Bernuth, Inc., Chuck Idol, Mariann Dalimonte, the Oeser Company, Western Wood Preservers Institute, the North American Wood Pole Council, Beyond Pesticides, Stephanie Wozniak, Wood Preservation Canada, Stella-Jones Corporation, US Department of Agriculture's Forest Service, Washington State Department of Agriculture, the Treated Wood Council, Utility Solid Waste Activities Group and Nisus Corporation. Substantive comments of a regulatory nature and the Agency's responses to those comments are summarized in Appendix B-1. Substantive comments of a scientific nature and the Agency's responses to those comments are summarized in the memorandum titled *Response to Public Comments on the Pentachlorophenol Proposed Interim Decision (PID)* available in Appendix B-2 of this document and in the public docket at www.regulations.gov under docket ID EPA-HQ-OPP-2014-0653. The Agency thanks all commenters for their comments and has considered them in developing this FD.

II. USE AND USAGE

As of November 29, 2021, there are four registered antimicrobial products containing pentachlorophenol as an active ingredient (ai) (PC Code 063001, CAS No. 87-86-5). One product is a technical/formulation intermediate with 86% ai and the other three products are end-use products with 34-86% ai. A Life Cycle Assessment (LCA) written for the Treated Wood Council (Bolin and Smith, 2012) states that pentachlorophenol is only used to treat utility poles and cross-arms, but products containing pentachlorophenol are approved for use in the pressure or thermal treatment of lumber, timber, posts, poles, and other wood members intended for exterior use. There are no registered residential uses of pentachlorophenol, including home and farm use or for treated logs used in the construction of log homes. Laminated beams or building components that are in ground contact and are subject to decay or insect infestation require two coats of an appropriate sealer in order to be treated with pentachlorophenol.

Pentachlorophenol is classified as a restricted use pesticide (RUP) for sale and use by or under the direct supervision of certified applicators only. Indoor applications of pentachlorophenol are prohibited, as is application to wood intended for use in interiors or for use in contact with food, feed, or drinking water. These restrictions were imposed on pentachlorophenol registrations as part of the Agency's Special Review process as indicated in the *U.S.EPA Position Document 4 for Wood Preservative Pesticides: Creosote, Pentachlorophenol and Inorganic Arsenicals (1984, amended 1986)*[5].

[5] U.S.EPA Position Document 4 for Wood Preservative Pesticides: Creosote, Pentachlorophenol and Inorganic Arsenicals (1984, amended 1986) is available on EPA's Archive

III. SCIENTIFIC ASSESSMENTS

A. Human Health Risks

A summary of the Agency's human health risk assessment is presented below. The Agency used the most current science policies and risk assessment methodologies to prepare a risk assessment in support of the registration review of pentachlorophenol. For additional details on the human health assessment for pentachlorophenol, see the *Registration Review Draft Risk Assessment for Pentachlorophenol,* which is available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

Pentachloroanisole, and other chlorinated aromatics, have been identified as potential degradates/metabolites of pentachlorophenol. Pentachloroanisole has higher persistence than pentachlorophenol in the environment and higher bioaccumulation concern and forms during the degradation of pentachlorophenol in soil. Therefore, exposures of pentachloroanisole are not expected to occupational handlers, and pentachloroanisole was not assessed in the human health risk assessment but was included in the environmental risk assessment (Section III.B).

1. Risk Summary and Characterization

A summary of the Agency's human health risk assessment was presented in the PID.

Dietary (including drinking water) and residential risks are not expected because pentachlorophenol has no uses that are expected to result in dietary (including drinking water) or residential exposures.

Risks of concern were identified for dermal and long-term inhalation exposures to occupational handlers, with average inhalation margins of exposure (MOEs) ranging from 200 to 230, depending on facilities and job activities, and a target MOE of 300. The cancer risk for occupational handlers is 1 x 10^{-3}. A cancer risk level of 10^{-3} falls outside EPA's generally acceptable risk range of 10^{-6} to 10^{-4} as discussed in the National Contingency Plan (NCP), 40 CFR 300.430.[6] Risks of concern were not identified for short-term exposures to occupational handlers.

For post-application exposures, risks of concern were not identified for short, intermediate, or long-term post-application dermal and inhalation exposures. The cancer risk for occupational post-application exposures is 1 x 10^{-4}, and therefore falls within EPA's acceptable risk range as explained above.

[6] https://www.epa.gov/risk/regional-removal-management-levels-rmls-users-guide#:~:text=A%2010%2D4%20risk%20level,range%20for%20non%2Dcarcinogenic%20risks.

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There are no aggregate non-cancer or cancer risks of concern for long-term exposures. The aggregate cancer risk is 1.0 $x10^{-5}$, and therefore falls within EPA's acceptable risk range as explained above.

EPA has not made a common mechanism of toxicity finding as to pentachlorophenol and any other substance and pentachlorophenol does not appear to produce a toxic metabolite produced by other substances. Therefore, the EPA has not assumed that pentachlorophenol has a common mechanism of toxicity with other substances.

Since the PID, there have been no changes to the Agency's previous human health risk conclusions. For additional details on the human health assessment for pentachlorophenol, see the *Registration Review Draft Risk Assessment for Pentachlorophenol*, which is available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

2. Human Incidents

Since the publication of the Final Work Plan for pentachlorophenol in 2015 there has been one human health incident reported to the Incident Data System (IDS). The reported incident from 2017 occurred when a contractor applied pentachlorophenol to a wood deck attached to a home. The resident of the home reported a severe headache and exhaustion following exposure. Pentachlorophenol is a restricted-use pesticide and is only registered for pressure or thermal treatment of wood and is not registered for roll-on applications. Therefore, this was a misuse of the registered uses of pentachlorophenol.

The Agency will continue to monitor the incident information. Additional analyses will be conducted if ongoing human incident monitoring indicates a concern.

3. Tolerances

For the active ingredient pentachlorophenol, EPA has not established tolerances or exemptions from tolerances in raw agricultural commodities or processed food and feed products under FFDCA Section 408 because there are no registered food uses of pentachlorophenol, and therefore no pesticide chemical residues resulting in/on food are expected.

Pentachlorophenol has been cleared as a food additive by the US Food and Drug Administration (US FDA) under FFDCA Section 409, for use as a component in adhesives in 21 CFR 175.105, and is also a component in wood preservatives in 21 CFR 178.105. However, there are no pesticide products containing pentachlorophenol that are registered for use in adhesives and no existing food uses for pentachlorophenol pesticide products.

4. Human Health Data Needs

No additional human health data are required to support this registration review decision.

B. Ecological Risks

The Agency used the most current science policies and risk assessment methodologies to prepare a risk assessment in support of the registration review of pentachlorophenol. For additional details on the ecological assessment for pentachlorophenol, see the *Registration Review Draft Risk Assessment for Pentachlorophenol,* which is available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

1. Risk Summary and Characterization

Although pentachlorophenol is very highly toxic to aquatic non-target organisms, exposure to pentachlorophenol in the water column is expected to be reduced (i.e., less bioavailable) given its propensity to bind to sediment.. Given that pentachlorophenol strongly binds to the sediment reducing its bioavailability to benthic invertebrates, potential exposure and associated risk is assumed to be negligible. The chemical is slightly toxic to avian species and highly toxic to honeybees.

Degradates of pentachlorophenol include pentachloroanisole and trichlorophenol. In general, exposure will primarily be to pentachlorophenol, with only some exposure to pentachloroanisole from degradation in soil and trichlorophenol in aquatic environments. Pentachloroanisole has higher persistence in the environment and higher potential bioaccumulation concern than pentachlorophenol. However, because of the limited mobility of pentachlorophenol and pentachloroanisole in soil and moderately rapid degradation in the environment, bioavailability of the compounds will be limited, and exposure to nontarget terrestrial and aquatic organisms is expected to be minimal.

In conclusion, no risks to aquatic and terrestrial organisms, including pollinators, are expected due to the limited exposure potential. For more information on the ecological risk assessment, refer to the document "*Registration Review Draft Risk Assessment for Pentachlorophenol"* available at www.regulations.gov in docket ID EPA-HQ-OPP-2014-0653.

2. Ecological Incidents

As of October 20, 2021, there were fifteen incidents of pentachlorophenol use causing the death of nontarget aquatic organisms found in IDS. Ten of the incidents were classified as being from a registered use or the legality of use was undetermined. All of these incidents were associated with accidental downstream releases from wood treatment plants (primarily in the 1970s and 1980s) and were not from the use of the chemical on treated wood. Therefore, these incidents would not be representative of the wood treatment uses.

The Agency will continue to monitor reported ecological incident information. Detailed analyses of these incidents are conducted if reported information indicates concerns for risk to non-target organisms.

3. Ecological and Environmental Fate Data Needs

The ecological and environmental fate databases are complete, and no additional ecological or environmental fate data are required to support this registration review decision.

C. Benefits Assessment

A detailed discussion of pentachlorophenol's benefits and alternatives is presented in the memorandum titled, "*A Qualitative Assessment on the Use, Usage, and Benefits of Pentachlorophenol (PC# 063001) as a Wood Preservative,*" available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

The Office of Pesticide Program's Biological and Economic Analysis Division (BEAD) assessed the use, usage and benefits of pentachlorophenol. There are three categories of heavy-duty wood preservatives, which include oil borne (pentachlorophenol), oil-like (coal tar creosote or simply, creosote), and waterborne (which are most often copper-based). The oil or water reflects the type of carrier in the pressure cylinder when preservatives are applied to wood.

Pentachlorophenol is the most-used oil borne wood preservative and one of the most used wood preservatives. Pentachlorophenol's main uses are the preservation of wooden utility poles and sawn crossarms. At most, ten wood preservative chemicals are available for use in utility poles and 12 are available for sawn crossarms. Non-preserved-wood alternative materials such as steel, concrete, and fiberglass reinforced composite are also used to make utility poles.

Pentachlorophenol uses an oil carrier, and the benefits of the oil relative to a water carrier are shared with other oil borne preservative systems and oil-like creosote. An important benefit of oil is that it inherently repels water, which reduces decay and prevents freezing. Oils lubricate wood, which keep it soft, thus preventing checking[7] and splitting, increasing flexibility, and allowing linemen to climb poles more easily. Metal hardware is not corroded when poles are treated with oil borne preservatives. Finally, utility poles survive fires better when preserved with oil borne and oil-like creosote versus waterborne preservatives. Pentachlorophenol is also important in utility pole crossarms as the oil carrier prevents differential drying and warping, which otherwise would lead to strain on transmission lines.

Three benefits of pentachlorophenol compared to creosote and the other oil borne systems (*e.g.,* copper naphthenate [CuN] and 4,5-dichloro-2-n-octyl-4-isothiazolin-3-one [DCOI]) were identified: 1) its long-estimated service life; 2) its history of effective performance; and 3) its wide availability compared to other preservative systems. Pentachlorophenol-treated poles have a long life of up to 70 years while in service. Field trials with posts estimate that wood treated with creosote and CuN may have shorter lifespans. However, the actual failure rate of CuN-treated poles while in service is no different than other chemicals. Pentachlorophenol has been in use longer than other oil borne preservatives, effectively preserving poles in the United States since the 1950s, thus demonstrating not only longevity in the field but providing consistent and

[7] Water is lost from the surface of poles as they dry. Below a certain level of moisture, poles shrink. This shrinking occurs more along than across growth rings, and small v-shaped checks form in the surface of the pole.

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reliable performance for 70 years. DCOI lacks a track record as a preservative for utility poles, and the early history of CuN-treated poles was marred by premature failures. Finally, pentachlorophenol appears to be widely available from treating facilities, though there is little comprehensive information regarding the availability of some oil borne and waterborne preservative systems relative to pentachlorophenol.

In the absence of pentachlorophenol, users may switch to treating utility poles and sawn crossarms with another oil borne preservative, most likely CuN. Although CuN appears to be a good substitute for pentachlorophenol at similar cost, pentachlorophenol has a much larger market share for reasons that are not clear. Available information indicates that utility pole purchasers have a strong preference for poles treated with pentachlorophenol compared to poles treated with alternative oil borne preservatives, even for new installations. Some of this preference may be associated with the history of premature failures of CuN-treated utility poles, even though these issues have been resolved and current failure rates of CuN-treated poles are equivalent to pentachlorophenol-treated poles. The Agency does not expect pentachlorophenol to be replaced with waterborne preservatives or creosote for use in utility poles. Potential alternatives to pentachlorophenol include oil-borne carriers such as copper naphthenate and 3(2H)-isothiazolone, 4,5-dichloro-2-octyl (DCOI).

Utility pole purchasers who switch from wood preserved with pentachlorophenol to wood preserved with other oil borne wood preservatives such as CuN may see price increases due to supply constraints and the fixed costs of converting plants to treat with new preservatives. In the long run, it is uncertain whether alternative oil borne preservatives would be more expensive than pentachlorophenol. Price differences in the cost of preservatives is not expected to be the driving factor when companies choose to purchase pentachlorophenol-preserved wood utility poles. If users are unwilling or unable to replace their pentachlorophenol poles with wood treated with another oil borne preservative, they may be forced to switch to poles made of non-preserved wood alternative materials such as steel and concrete, at potentially much higher prices.

IV. FINAL REGISTRATION REVIEW DECISION

A. Risk Mitigation and Regulatory Rationale

As discussed in Section III of this document, the Agency has concluded that there are risks of concern to mitigate for dermal and inhalation exposures to occupational handlers during the pressure treatment of wood with pentachlorophenol. Long-term inhalation and dermal risks of concern were identified for workers in addition to a cancer risk of $1x10^{-3}$.

Accordingly, the Agency is requiring the cancellation and phase-out of all registered products containing pentachlorophenol.

During the development of the PID, the Agency considered requiring additional interim risk mitigation measures during the period prior to the cancellation of all products containing pentachlorophenol. While risk mitigation measures would reduce worker exposures to pentachlorophenol during the phase-out period, many mitigation requirements, including

additional personal protective equipment (PPE), engineering controls, ventilation requirements, or other measures, may take several years to adopt and require significant financial resources in order to implement. As such, the Agency is not requiring additional interim mitigation measures during the phase-out period.

1. Rationale for Cancellation and Phase-Out of Pentachlorophenol as a Wood Preservative Pesticide

EPA is requiring the cancellation and phase-out of pentachlorophenol as a wood preservative pesticide for the reasons outlined in this section.

i. Weighing Risks Versus Benefits

Following the publication of the 2008 Reregistration Eligibility Decision (RED) for pentachlorophenol, registrants were required to implement mitigation measures designed to reduce occupational handler exposures, including additional PPE, engineering controls, and changes to treatment procedures. An observational occupational exposure study was conducted to evaluate treatment plant worker exposures following the implementation of the mitigation actions required by the RED.

In the DRA for pentachlorophenol, the Agency concluded that, even taking into account the effect of the mitigation measures required by the 2008 RED, significant risks of concern remained for occupational handlers of pentachlorophenol. Long-term inhalation and dermal exposures were identified, as well as a cancer risk of $1x10^{-3}$.

In weighing the benefits of pentachlorophenol versus the risks identified in the DRA, EPA cannot make the finding that the benefits of pentachlorophenol outweigh the risks. Therefore, pentachlorophenol does not meet the FIFRA registration standard. EPA considered both the significant risks to occupational handlers as well as the emergence of alternatives as discussed below.

ii. Emergence of Potentially Viable Alternatives

As discussed in Section III.C., there are several alternatives to pentachlorophenol that can be used to treat utility poles, although buyers have historically expressed a preference for pentachlorophenol treated utility poles. These alternatives include potentially viable, safer alternatives with oil-borne carriers such as copper naphthenate[8] and 3(2H)-isothiazolone, 4,5-dichloro-2-octyl (DCOI).[9] Other wood preservatives for use in treating utility poles include well-established wood preservatives such as chromated arsenicals (such as chromated copper arsenate [CCA], and ammoniacal copper zinc arsenate [ACZA]), alkaline copper quaternary -B (ACQ-B), and copper azole -B and C. A detailed discussion of pentachlorophenol's benefits and potential alternatives is presented in the memorandum titled, "*A Qualitative Assessment on the Use, Usage, and Benefits of Pentachlorophenol (PC# 063001) as a Wood Preservative,*" available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

[8] The Copper Naphthenate Registration Review Preliminary Risk Assessment is available at https://www.regulations.gov/document/EPA-HQ-OPP-2010-0455-0009.

[9] The Registration Review Draft Risk Assessment for 3(2H)-isothiazolone, 4,5- dichloro-2-octyl (DCOIT) is available at https://www.regulations.gov/document/EPA-HQ-OPP-2014-0403-0009.

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EPA expects that transitioning away from pentachlorophenol in favor of other alternatives may pose certain challenges. However, given the availability of alternatives, as well as time to transition to alternative wood preservatives, the utility pole preservative industry will be able to adapt to the cancellation of pentachlorophenol. Although the utility pole industry has shown reluctance to use available alternative wood preservatives, EPA is allowing a phase-out period to allow the industry to transition to these alternatives. During the phase-out and eventual cancellation of pentachlorophenol, a variety of wood preservative chemistries that are presently standardized are expected to provide necessary stability in the utility pole market while wood treatment facilities make operational changes to adopt new preservative chemistries. For more information on the phase-out period for pentachlorophenol, refer to section V.A of this FD.

2. Other Considerations

The Agency's justification for its decision to cancel pentachlorophenol registrations are based on the weighing of risks versus benefits and the emergence of potentially viable alternatives to pentachlorophenol. There are, however, several additional factors that were taken into consideration and are explained in this section.

First, the uncertain future of pentachlorophenol production is a supporting consideration in the Agency's decision to require cancellation. In 2019, KMG-Bernuth, the sole producer of pentachlorophenol in North America, announced plans to cease production by early 2022.[10] KMG-Bernuth will close both a facility in Mexico that produces pentachlorophenol, as well as a facility in Alabama that formulates and stores registered wood preservative products containing pentachlorophenol. With these plans to cease production and distribution, it is unclear whether there will be a viable source of pentachlorophenol for sale on the market after early 2022. Although KMG-Bernuth intends to sell its registrations before ceasing production of the chemical in early 2022, a buyer of the registrations has not been publicly announced as of December 22, 2021. The Agency acknowledges that regulatory uncertainty regarding pentachlorophenol could be contributing to the fact that there is no new buyer.

Second, in early 2020, Gulbrandsen Chemicals announced plans to construct a pentachlorophenol plant in Orangeburg, South Carolina, in order to continue the production and sale of pentachlorophenol in the United States.[11] Several members of the South Carolina House of Representatives, lobbied by local community organizing groups, drafted legislation to prevent the production of pentachlorophenol in South Carolina. Gulbrandsen Chemicals withdrew the proposal in March 2020.[12] To EPA's knowledge, no other company has publicly indicated plans to purchase KMG-Bernuth's registrations of pentachlorophenol or maintain pentachlorophenol on the market following KMG-Bernuth's withdrawal from pentachlorophenol production in early 2022.

[10] https://cen.acs.org/business/specialty-chemicals/Pentachlorophenol-way-utility-pole-preservative/98/i14
[11] https://beyondpesticides.org/dailynewsblog/2020/03/as-the-world-bans-highly-toxic-wood-preservative-pentachlorophenol-a-low-income-u-s-community-may-be-home-to-the-last-production-plant/
[12] https://thetandd.com/news/local/gulbrandsen-won-t-make-controversial-wood-%20preservative-at-orangeburg-plant/article_6c1165c2-713f-5144-8c00-fda458400660.html

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Third, in July 2020, Health Canada's Pesticide Management Regulatory Agency (PMRA) announced a proposal to cancel registered uses of pentachlorophenol in Canada in a consultation document titled *Special Review of Pentachlorophenol and Its Associated End-use Products.*[13] No new scientific information was presented by PMRA in this 2020 proposal, as conclusions were partially based on EPA's own DRA for pentachlorophenol; however, it is worth noting that cancellation in the U.S. would align with regional partners. PMRA has requested public comments on this proposal and has not released a final decision as of December 2021.

Fourth, EPA's action to cancel all pesticide registrations containing pentachlorophenol aligns the U.S. with the 172 countries that are signatories of the UN's Stockholm Convention on Persistent Organic Pollutants (POP), which banned the use of pentachlorophenol in 2014.[14]

B. Final Registration Review Decision

In accordance with 40 CFR §§ 155.57 and155.58, the Agency is issuing the pentachlorophenol *Final Registration Review Decision*, thus concluding the registration review of pentachlorophenol. The Agency has made the following decision: (1) additional data are not required; (2) pentachlorophenol causes unreasonable adverse effects on the human health and therefore does not meet the FIFRA registration standard; and (3) the Agency is requiring the cancellation and phase-out of all registered products containing pentachlorophenol, as described in Section IV. A, Section V, and Appendix A.

In this FD, the Agency is making no human health or environmental safety findings associated with the EDSP screening of pentachlorophenol, nor is it making a complete endangered species finding. However, as detailed in this Final Decision, the Agency is requiring the cancellation of all pesticide products containing pentachlorophenol and a phase-out of the use of all pesticide products containing pentachlorophenol. Therefore, EPA has concluded that a full evaluation of the risks of pentachlorophenol to listed species and EDSP screening for pentachlorophenol are not necessary.

C. Data Requirements

The human health and ecological databases for pentachlorophenol are sufficient to support a decision under registration review.

V. NEXT STEPS AND TIMELINE

This registration review decision closes out the registration review for pentachlorophenol. The Agency is implementing a phase-out of pentachlorophenol over a period of 5 years in order to provide stability to the utility pole market as wood treatment facilities change operations from

[13] https://www.canada.ca/en/health-canada/services/consumer-product-safety/pesticides-pest-management/public/consultations/proposed-special-review-decision/2020/pentachlorophenol.html
[14] https://beyondpesticides.org/dailynewsblog/2014/11/united-nations-committee-recommends-global-elimination-of-toxic-wood-preservative/

pentachlorophenol to alternative chemistries (see discussion above regarding alternatives). Therefore, the Agency is requiring that registrants submit a voluntary cancellation request pursuant to FIFRA Section 6(f) no later than 60 days from the publication of the pentachlorophenol Final Registration Review Decision. The voluntary cancellation request must indicate an effective cancellation date of February 29, 2024. Until the effective cancellation date of February 29, 2024, the registrants may continue production, sale, and distribution of pentachlorophenol products while the Agency processes the cancellation requests. The effective cancellation date will be followed by a 3 year period in which the Agency would allow for the use of existing stocks. During the 3 year period during which the use existing stocks is permitted, registrants may not produce, sell or distribute pentachlorophenol products. After February 28, 2027, the use of pentachlorophenol will not be allowed. Therefore, the wood preservative uses of pentachlorophenol must cease approximately 5 years after the publication of the pentachlorophenol FD.

When the FIFRA Section 6(f) voluntary cancellation requests are submitted, the Agency will begin the process of cancelling the registrations for pentachlorophenol products for which voluntary cancellation requests have been submitted by publishing a notice of receipt of such requests in the Federal Register and providing a 30-day public comment period. The Agency will then publish a cancellation order in the Federal Register if the requests for voluntary cancellation are approved. In the event that registrants are unwilling to submit voluntary cancellation requests for their registrations within 60 days as required by this FD, the Agency may proceed with an involuntary cancellation of the pentachlorophenol registrations.

At the request of public comments received on the PID, EPA is clarifying three points related to the requirement to cancel product registrations containing pentachlorophenol and phase-out of the use of existing stocks. First, this FD only requires the cancellation of pesticide registrations containing pentachlorophenol. Consistent with the treated article exemption in 40 C.F.R. § 152.25(a), utility poles and cross arms treated with pentachlorophenol may still be transported, sold, and installed without interruption after the supply of pentachlorophenol pesticide product stock is exhausted and after the 3-year existing stocks period has expired. Second, pentachlorophenol-treated wood poles and cross-arms that are installed in existing transmission and distribution networks do not need to be replaced with alternatives. Third, trace amounts of pentachlorophenol will be permitted in treating systems and tanks during the transition from pentachlorophenol to alternative chemistries.

A. Implementation of Cancellation

The Agency is requiring that registrants with pentachlorophenol product registrations submit a voluntary cancellation request no later than 60 days after the publication of the pentachlorophenol FD. The voluntary cancellation request must indicate an effective cancellation date of February 29, 2024. Until the effective cancellation date of February 29, 2024, the registrants may continue production, sale, and distribution of pentachlorophenol products while the Agency processes the cancellation requests. The effective cancellation date of February 29, 2024 will be followed by a 3 year period in which the Agency would allow for the use of existing stocks. During the 3 year period during which the use existing stocks is permitted,

registrants may not produce, sell or distribute pentachlorophenol products. After February 28, 2027, the use of pentachlorophenol will not be allowed.

In determining whether to allow the continued sale and use of existing stocks of a pesticide that has been cancelled, and what conditions to put on such sale or use, EPA considers whether the benefits of allowing such continued sale or use outweigh the risks. Factors such as the significant risks to occupational handlers from the use of pentachlorophenol and emergence of alternatives to pentachlorophenol weighed against allowing the continued sale and use of existing stocks of pentachlorophenol products after the registrations are cancelled. However, the Agency recognizes that allowing the continued use of existing stocks of pentachlorophenol products after the registrations have been cancelled also has benefits, such as allowing wood-treating facilities time to transition to alternative chemistries and allowing existing stocks to be used for wood treatment instead of being disposed of as hazardous waste. The Agency therefore maintains that providing a phase-out period of approximately 5 years (2 years to continue production, sale, and distribution of pentachlorophenol products, and an additional 3 years following cancellation to use existing stocks) represents an appropriate balancing of these risks and benefits.

The Agency does not, however, support a phase-out period of less than 5 years due to the potential disruption in the utility pole market. In discussions with the Utility Solid Waste Activity Group (USWAG) in June 2021, the Agency received feedback from utility companies in support of a 5-year phase-out period. USWAG indicated that a 5-year phase-out period would allow sufficient time for utility companies to transition to alternative wood preservative chemistries without disruption to the utility pole market. Utility companies are the primary users of pentachlorophenol-treated wood; therefore, their confidence that a 5-year phase-out period will provide adequate time for transition was important feedback for the Agency in finalizing this FD.

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Appendix A: Summary of Required Actions for Pentachlorophenol

Affected Population(s)	Source of Exposure	Route of Exposure	Duration of Exposure	Potential Risk(s) of Concern	Required Actions
Occupational handler (during pressure-treatment of wood commodities at ambient or elevated temperature)	Air (respirable particles, vapor from volatiles)	Inhalation	Chronic	Cancer Long-term inhalation	Cancellation of all pentachlorophenol product registrations
	Dermal contact	Dermal	Chronic	Cancer Long-term dermal	

Appendix B-1: Summary of Public Comments on the Pentachlorophenol Proposed Interim Registration Review Decision and Agency Responses

During the 75-day public comment period for the *Pentachlorophenol Proposed Interim Registration Review Decision*, which opened on March 5, 2021 and closed on May 19, 2021, the Agency received public comments from 15 sources. Comments were submitted by KMG-Bernuth, Inc., Chuck Idol, Mariann Dalimonte, the Oeser Company, Western Wood Preservers Institute, the North American Wood Pole Council, Beyond Pesticides, Stephanie Wozniak, Wood Preservation Canada, Stella-Jones Corporation, US Department of Agriculture's Forest Service, Washington State Department of Agriculture, the Treated Wood Council, Utility Solid Waste Activities Group, and Nisus Corporation. Substantive comments of a regulatory nature, and the Agency's responses to those comments are summarized in this appendix (B-1). Substantive comments of a scientific nature, and the Agency's responses to those comments are summarized in the memorandum titled *Response to Public Comments on the Pentachlorophenol Proposed Interim Decision (PID)* available in Appendix B-2 of this FD and in the public docket at www.regulations.gov under docket ID EPA-HQ-OPP-2014-0653. The Agency thanks all commenters for their comments and has considered them in developing this FD.

Comments Submitted by KMG-Bernuth in EPA-HQ-OPP-2014-0349-0024[15]

KMG-Bernuth Comment 1: KMG-Bernuth submitted comments stating that the proposed cancellation is not based on risks that could not be mitigated by mandating improvements to the pentachlorophenol label, many of which were discussed in a series of extensive dialogue between EPA and the registrants of and treaters who use pentachlorophenol. KMG-Bernuth asserts that the risks to occupational handlers are not substantially higher than those for chromated arsenicals, for which EPA proposed additional occupational handler risk mitigation measures and label changes.

Agency Response: KMG-Bernuth is correct that EPA had engaged in extensive dialogue with registrants of and treaters who use pentachlorophenol and discussed potential mitigation measures aimed at reducing exposures to occupational handlers working in treatment facilities. However, in weighing the benefits of pentachlorophenol versus the risks identified in the DRA, EPA decided that it cannot make the finding that the benefits of pentachlorophenol outweigh the risks, even after potential mitigation measures are considered. EPA considered both the significant risks to occupational handlers as well as the emergence of safer, potentially viable alternatives discussed above. While the risks to occupational handlers using pentachlorophenol may not be substantially higher than those of chromated arsenicals, EPA concluded that chromated arsenicals provide greater niche benefits than pentachlorophenol. Wood treated with chromated arsenicals (*i.e.*, CCA and ACZA) has greater benefits than other preservatives because CCA and ACZA are approved for use in marine environments, a niche use particularly in southern latitude coastal water in the United States.

[15] KMG-Bernuth's public comments were submitted to the docket for the registration review of creosote but are relevant to pentachlorophenol and are therefore included in this response to comments section.

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KMG-Bernuth Comment 2: KMG-Bernuth stated that Canada's unfinalized proposal to cancel penta is not justification for the PID and is based off of the calculated half-life of pentachlorophenol in air, which is a consideration unique to Canada's Toxic Substances Management Policy (TSMP).

Agency Response: The Agency did not propose to cancel pentachlorophenol because of Canada's proposal to cancel pentachlorophenol, which was not a part of the basis for the Agency's decision to cancel pentachlorophenol. While KMG-Bernuth is correct that Canada has not yet finalized its proposal to cancel pentachlorophenol, EPA's action to cancel all pesticide registrations containing pentachlorophenol is pursuant to the Agency's legal authority under FIFRA.

KMG-Bernuth Comment 3: "In our view the overriding consideration that led to the proposed PID is the decision by KMG-Bernuth to exit the penta market by early 2022, and the fact that no company has surfaced willing to take over the registrations. In light of KMG-Bernuth's decision to cease penta operations we have no objection to the proposal that KMG-Bernuth submit a voluntary cancellation request two years from the publication of the penta ID. We would oppose any suggestion that the voluntary cancellation be submitted before that point."

Agency Response: The Agency does not agree that the overriding consideration that led to the proposed PID is the decision by KMG-Bernuth to exit the pentachlorophenol market by early 2022. As explained in section IV.A.1, subsections i-ii of this document, EPA is requiring cancellation of pentachlorophenol based on the Agency's determination that the benefits of pentachlorophenol—in particular in light of the emergence of newer, safer alternatives like copper naphthenate and DCOI—do not outweigh the high occupational handler risks. The Agency also considered the growing international support to ban the use of pentachlorophenol.

As described in this FD, the Agency is requiring that registrants with pentachlorophenol product registrations submit a voluntary cancellation request no later than 60 days after the publication of the pentachlorophenol FD. The voluntary cancellation request must indicate an effective cancellation date of February 29, 2024. Until the effective cancellation date, the registrants may continue production, sale, and distribution of pentachlorophenol products while the Agency processes the cancellation requests. The effective cancellation date will be followed by a 3 year period in which the Agency would allow for the use of existing stocks.

KMG-Bernuth Comment 4: KMG-Bernuth expressed concern that the three years proposed to allow wood treaters to use up existing stocks following the voluntary cancellation request is too short, citing logistical challenges of transitioning to alternative chemistries and the disposal of F027-listed hazardous waste at wood treatment facilities under the Resource Conservation and Recovery Act (RCRA). The commenter cited several pesticides as examples that extended the period in which registrants were allowed to sell and use existing stocks, including azinphios-methyl (AZM) and fenamiphos. KMG-Bernuth urged EPA to signal that the Agency is receptive to extending the phase-out period irrespective of whatever deadline EPA selects for the exhaustion of existing stocks.

Agency Response: While several comments were submitted in agreement with KMG-Bernuth's position for a longer phase-out period, several comments were also submitted in support of a phase-out period of shorter than 5 years. FIFRA Section 6(a)(1) (7 U.S.C. § 136d(a)(1)) gives EPA discretion to allow the continued sale and use of existing stocks of a cancelled pesticide, and to define the conditions (including the timeframe(s)) for this sale and use, if EPA determines that allowing such sale and use is not inconsistent with the purposes of FIFRA. FIFRA does not require the Agency to follow specific timeframes with respect to the sale and use of existing stocks.

In determining whether to allow the continued sale or use of existing stocks of a pesticide that has been cancelled, and what conditions to put on such sale or use, EPA considers whether the benefits of allowing such continued sale or use outweigh the risks. Factors such as the significant risks to occupational handlers from the use of pentachlorophenol and emergence of alternatives to pentachlorophenol weigh against allowing the continued sale or use of existing stocks of pentachlorophenol products after the registrations are cancelled. However, the Agency recognizes that allowing the continued sale and use of existing stocks of pentachlorophenol products after the registrations have been cancelled also has benefits, such as allowing wood-treating facilities time to transition to alternative chemistries and allowing existing stocks to be sold and used for wood treatment instead of being disposed of as hazardous waste. The Agency therefore maintains that providing a phase-out period of approximately 5 years (2 years to continue production, sale, and distribution of pentachlorophenol products, and an additional 3 years following cancellation to use existing stocks) represents an appropriate balancing of these risks and benefits.

While KMG-Bernuth is correct that EPA has in the past allowed end users to sell and use existing stocks of some pesticide products after cancellation until such stocks were exhausted, the Agency's determination of the appropriate disposition of existing stocks is made on a case-by-case basis, considering the risks and benefits associated with allowing the continued sale or use of existing stocks of each product. Therefore, EPA may allow the sale and use of existing stocks of a pesticide product until such stocks are exhausted in some circumstances, for example where registrants have chosen to voluntarily cancel their pesticide product registrations prior to the Agency finding that the benefits of such products do not outweigh the risks (such as in the examples cited in KMG-Bernuth's comments). Similarly, in other circumstances—such as for pentachlorophenol, where the Agency has determined that the pesticide products no longer meet the FIFRA registration standard—the Agency may limit the sale and use of existing stocks of a pesticide product.

The Agency does not, however, support a phase-out period of less than 5 years due to the potential disruption in the utility pole market. In discussions with the Utility Solid Waste Activity Group (USWAG) in June 2021, the Agency received feedback from utility companies in support of a 5 year phase-out period. USWAG indicated that a 5-year phase-out period would allow sufficient time for utility companies to transition to alternative wood preservative chemistries without disruption to the utility pole market. Utility companies are the primary users of pentachlorophenol-treated wood; therefore their confidence that a 5-year phase-out period will provide adequate time for transition was important feedback for the Agency in finalizing this FD.

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Therefore, the Agency is requiring that registrants with pentachlorophenol product registrations submit a voluntary cancellation request no later than 60 days after the publication of the pentachlorophenol FD. The voluntary cancellation request must indicate an effective cancellation date of February 29, 2024. Until the effective cancellation date, the registrants may continue production, sale, and distribution of pentachlorophenol products while the Agency processes the cancellation requests. The effective cancellation date will be followed by a 3 year period in which the Agency would allow for the use of existing stocks.

Comments Submitted by Mr. Chuck Idol in EPA-HQ-OPP-2014-0653-0053 and EPA-HQ-OPP-2014-0653-0054

Chuck Idol Comment 1: Mr. Idol notes that the PID was released in a Federal Register Notice (FRN) dated March 5, 2021, and that the FRN gives a May 4, 2021 due date for public comments on the PID. Mr. Idol states that "This is one day before the notice was sent out."

Agency Response: Mr. Idol is correct that public comments were originally due on May 4, 2021. May 4 is 60 days after March 5 and is not 1 day before the FRN was published announcing availability of the PID. The Agency believes Mr. Idol misread May 4 for March 4. The Agency allowed the customary 60-day public comment period following the PID, which was extended an additional 15 days at the request of a commenter.

Chuck Idol Comment 2: Mr. Idol asserts that creosote is not a "safer alternative" to pentachlorophenol. "Your EPA web has Creosote listed as RED**.** It is not safe! Creosote has well documented history of birth defects and cancer impacts to humans and all animals."

Agency Response: In the PID, the Agency listed copper naphthenate and DCOI as potentially safer alternatives and listed creosote and chromated arsenicals as well-established alternatives. This statement was not meant to imply that creosote is a safer alternative. The Agency has adjusted the language in this FD so other members of the general public do not interpret these statements to conclude that creosote is a safer alternative to pentachlorophenol.

"RED" is an acronym that stands for Reregistration Eligibility Decision and does not indicate that creosote is listed as "red". The publication of a Reregistration Eligibility Decision (RED) in 2008 was issued at the conclusion of the reregistration of creosote. The Reregistration Eligibility Decision included a human health and ecological risk assessment as well risk mitigation measures intended to reduce risks associated with the use of creosote as a wood preservative pesticide. This decision outlined in the RED was updated in the Creosote Interim Registration Review Decision, and is available at www.regulations.gov in docket ID EPA-HQ-OPP-2014-0823. Furthermore, the Agency wrote in the PID and ID that EPA "does not expect pentachlorophenol to be replaced with waterborne preservatives or creosote for use in utility poles."

Chuck Idol Comment 3: "The Utility Pole and Cross Arm industry has heavily turned to NON-CHEMICAL solutions which you do not list. Please list those as alternatives such as Fiber Reinforced Polymer (FRP), Cement, Steel and Undergrounding."

Agency Response: Alternatives to pentachlorophenol-treated utility poles and cross-arms, including steel, concrete, and FRP are discussed in the memorandum titled, "*A Qualitative Assessment on the Use, Usage, and Benefits of Pentachlorophenol (PC# 063001) as a Wood Preservative,*" available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

Chuck Idol Comment 4: The proposed label changes related to ensuring poles are dry and not wet using double vacuumed to stop leaching and dripping will in fact not stop the well-known issues of centrifugal force that causes all PentaChloroPhenol (PCP) to leach down the utility pole.

Agency Response: The Agency expects that the labeling changes previously implemented will reduce the potential for excess preservative to "weep" from utility poles treated with pentachlorophenol. Furthermore, in this FD the Agency is requiring the cancellation of pesticide registrations containing pentachlorophenol, which will eliminate the treatment of new utility poles with pentachlorophenol.

Chuck Idol Comment 5: Mr. Idol points to several articles and reports detailing environmental impacts resulting from the use of pentachlorophenol as a wood preservative.

Agency Response: Incidents of environmental contamination resulting from the future use of pentachlorophenol will be eliminated once the cancellation and phase-out of pentachlorophenol products is complete, as required by this FD.

Chuck Idol Comment 6: Canada is also listing all of the serious health and human risks and is proposing [the cancellation of] "Pentachlorophenol and Its Associated End-use Products."

Agency Response: Although Canada has its own laws and regulatory processes that govern the review of wood preservative pesticides, EPA's Draft Risk Assessment aligns with much of the risks to human health and the environment outlined in Health Canada's Pesticide Management Regulatory Authority (PMRA) *Proposed Special Review Decision PSRD2020-03, Special Review of Pentachlorophenol and Its Associated End-use Products*. Like PMRA's proposed decision, the Agency's FD for pentachlorophenol also requires the cancellation of pentachlorophenol pesticidal products citing concerns over risks to human health as one of the factors informing this decision.

Chuck Idol Comment 7: PentaChloroPhenol (PCP) should be canceled as there are many non-chemical alternative solutions. Creosote should NOT be used as an alternative to PentaChloroPhenol (PCP).

Agency Response: In this FD, the Agency is requiring the cancellation of all registrations containing pentachlorophenol. Creosote is a potential alternative to pentachlorophenol, but as stated in section III.C of this document, EPA does not expect pentachlorophenol to be replaced with waterborne preservatives or creosote for use in utility poles.

Chuck Idol Comment 8: During the public comment period following the publication of the pentachlorophenol PID, Mr. Idol re-submitted public comments originally submitted following the pentachlorophenol DRA in 2020.

Agency Response: These comments, originally submitted in 2020, were addressed in the *Pentachlorophenol Proposed Interim Registration Review Decision* and in the memorandum titled *Response to Public Comments Regarding the Pentachlorophenol Draft Risk Assessment* dated August 3, 2020. Both documents are available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

Comments Submitted by Councilwoman Mariann Dalimonte, Town of North Hempstead, New York, and Residents Forward in EPA-HQ-OPP-2014-0349-0021[16]

Mariann Dalimonte Comment: Ms. Dalimonte commented that she is in support of the cancellation of pentachlorophenol, but is not in agreement that creosote is a safe alternative wood preservative to pentachlorophenol.

Agency Response: The Agency thanks Ms. Dalimonte for her comments. Creosote is a potential alternative to pentachlorophenol, but as stated in section III.C of this document, EPA does not expect pentachlorophenol to be replaced with waterborne preservatives or creosote for use in utility poles.

Comments Submitted by the Oeser Company in EPA-HQ-OPP-2014-0653-0061

Oeser Company Comment 1: The Oeser Company expressed opposition to the phase-out of pentachlorophenol as a wood preservative, citing the preservative's proven, reliable role in preserving utility poles used in electrical infrastructure. The Oeser Company expressed concerns that the proposed 5-year phase-out period is too short and should be replaced with an 8- or 9-year phase-out period.

Agency Response: The Agency thanks the Oeser Company for its comments. While several comments were submitted in agreement with the Oeser Company's position for a longer phase-out period, several comments were also submitted in support of a phase-out period of shorter than 5 years. Please refer to the Agency's response to comment 4 submitted by KMG-Bernuth for EPA's rationale for a phase-out period of 5 years.

Oeser Company Comment 2: The Oeser Company requested guidance for how to deal with treating solutions during the phase-out period once inventories drop below operating levels of ~20,000 gallons of pentachlorophenol solution and requested a temporary variance to allow for the proper transfer of pentachlorophenol between licensed applicators during the phase-out period.

[16] Councilwoman Dalimonnte's Bernuth's public comments were submitted to the docket for the registration review of creosote but are relevant to pentachlorophenol and are therefore included in this response to comments section.

Agency Response: Consistent with its authority under FIFRA Section 6(a), the Agency intends to allow the sale (including distribution) and use of currently registered pentachlorophenol products for 2 years after the publication date of this Final Decision for pentachlorophenol. After that, the Agency will allow use of existing stocks for another 3 years.

The distribution or sale of diluted pentachlorophenol solution is permitted only to the extent allowable under FIFRA or EPA regulations relating to the sale or distribution of an unregistered pesticide. The Agency considers diluted pentachlorophenol solution distributed for the purpose of being used as a wood preservative to be a pesticide because it meets the definition of a "pesticide" in FIFRA Section 2(u) (7 U.S.C. § 136(u) (defining "pesticide" in relevant part as "any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest") and in EPA regulations (40 C.F.R. § 152.15(b)-(c)) (further providing that a substance is a "pesticide" if it "consists of or contains one or more active ingredients and has no significant commercially valuable use as distributed or sold other than (1) use for pesticidal purpose (by itself or in combination with any other substance), (2) use for manufacture of a pesticide" or the person who distributes or sells it "has actual or constructive knowledge that the substance will be used, or is intended to be used, for a pesticidal purpose." Specifically, the Agency understands that diluted pentachlorophenol solution would be shipped either for "use for pesticidal purpose" or for the manufacture of a pesticide. Therefore, such solution may only be distributed for the purpose of being used as a wood preservative if it has been separately registered under FIFRA. The distribution or sale of unregistered diluted pentachlorophenol solution is prohibited under FIFRA Section 12(a)(1)(A), subject to exceptions outlined in the statute and its implementing regulations.

FIFRA Section 2(gg) (7 U.S.C. § 136(gg)) defines "to distribute or sell" broadly: "to distribute, sell, offer for sale, hold for distribution, hold for sale, hold for shipment, ship, deliver for shipment, release for shipment, or receive and (having so received) deliver or offer to deliver." 7 U.S.C. § 136(gg). The statute contains an exclusion from the scope of sale and distribution for the "holding or application of registered pesticides or use dilutions thereof by any applicator who provides a service of controlling pests," so long as such applicator does not deliver "any unapplied pesticide to any person so served." Similarly, EPA regulations (40 C.F.R. § 152.30) allow for the sale or distribution of unregistered pesticides under limited circumstances—such as between registered pesticide production establishments operated by the same pesticide producer, or for disposal. The Agency does not intend to either restrict or expand the scope of these exceptions to the registration requirement with respect to diluted pentachlorophenol solution. Thus, except as provided in FIFRA or its implementing regulations, the shipment of diluted pentachlorophenol solution would constitute the "distribution" of an unregistered pesticide, which is prohibited under FIFRA Section 12(a)(1). Unused diluted pentachlorophenol solution must be disposed of in accordance with RCRA and in consultation with the facility's authorized state or EPA Region.

The Agency notes that current pentachlorophenol product labels do not permit for the addition of concentrated pentachlorophenol to the diluted solution. Instead, the use directions on the labels state "*Add one part of this product to 20 parts of petroleum solvent and mix well*," and do not direct users to add concentrated pentachlorophenol to augment the concentration of the pesticide

solution. Thus, adding additional pentachlorophenol concentrate to the diluted solution may represent a use violation according to current product labels.

Oeser Company Comment 3: The Oeser Company requested guidance and assurances that:

- The ongoing use of utility poles treated with pentachlorophenol throughout their lifecycle will not be impacted
- Utilities will remain able to purchase utility poles treated with pentachlorophenol throughout and after the phase-out
- The Agency will permit treaters that switch from pentachlorophenol preservative systems to alternative chemistries to still detect traces of pentachlorophenol for a period of time.

Agency Response: The Agency thanks the Oeser Company for raising these important clarifications surrounding the cancellation and phase-out of pentachlorophenol. EPA can confirm that the FD only requires the cancellation of pesticide registrations containing pentachlorophenol. Once the 5-year phase-out period is complete, registrants and treaters will no longer be allowed to treat wood with pentachlorophenol; however, utility poles and cross arms previously treated with pentachlorophenol will still be allowed to be transported, sold, and installed without interruption after. The Agency can also confirm that pentachlorophenol-treated wood poles and cross-arms that are installed in existing transmission and distribution networks do not need to be replaced with alternatives. EPA also confirms that trace amounts of pentachlorophenol will be permitted in treating systems and tanks during the transition from pentachlorophenol to alternative chemistries. These items have been added to section V of this FD.

Comments Submitted by Western Wood Preservers Institute (WWPI) in EPA-HQ-OPP-2014-0653-0062

WWPI Comment 1: Comments submitted by WWPI state that the rationale to cancel pentachlorophenol registrations is based on "questionable findings and unsupported conclusions that the preservative poses significant human health risks to workers" given that pentachlorophenol has been used as a wood preservative for tens of millions of utility poles throughout North America.

Agency Response: WWPI is correct that pentachlorophenol has been used for decades as a wood preservative in the preservation of utility poles; however, its longevity of use is not an argument against the conclusion that pentachlorophenol poses significant human health risks to workers. During the re-evaluation of pentachlorophenol, the Agency periodically conducts reviews using the best available data. In the Draft Risk Assessment for pentachlorophenol, the Agency evaluated a worker exposure study conducted in 2018 and determined that risks of concerns remain for occupational handlers treating with pentachlorophenol. Therefore, the rationale to cancel pesticide registrations containing pentachlorophenol is based off of the most up-to-date, scientifically rigorous Draft Risk Assessment published in 2020.[17]

[17] The Draft Risk Assessment for Pentachlorophenol is available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

WWPI Comment 2: The commenters stated that the alternative preservatives listed as potential replacements for pentachlorophenol have been "available for decades during previous EPA registration approvals for penta[chlorophenol]," and that only one preservative, DCOI, has been approved for the treatment of utility poles since the publication of the RED in 2008.

Agency Response: WWPI is correct that alternatives to pentachlorophenol have been available for decades in the wood preservative market. The Agency expects that these well-established alternatives, including DCOI, copper naphthenate, chromated arsenicals and dichromic acid, and creosote,will provide stability in the wood preservation market during the phase out of pentachlorophenol over a period of 5 years as identified in Section V of this document.

WWPI Comment 3: The commenters assert that EPA's decision to propose the cancellation of pesticide registrations containing pentachlorophenol is based on commercial and political factors. WWPI states that EPA relied on the uncertain future of pentachlorophenol in the wood preservation market, aligning the US with the 2014 Stockholm Convention on Persistent Organic Pollutants (POP) which banned pentachlorophenol in 172 countries, and Health Canada's proposal to cancel pentachlorophenol as rationale for the Agency's proposal to cancel pentachlorophenol.

Agency Response: The Agency thanks WWPI for their comments. The Agency does not agree that the factors that led to the proposed cancellation of pentachlorophenol are commercial or political. As explained in section IV.A.1 subsections i-iii of this document, EPA is requiring cancellation of pentachlorophenol based on the Agency's determination that the benefits of pentachlorophenol—in particular in light of the emergence of newer, safer alternatives like copper naphthenate and DCOI—do not outweigh the high occupational handler risks. The Agency also considered the growing international support to ban the use of pentachlorophenol.

Comments Submitted by the North American Wood Pole Council (NAWPC) in EPA-HQ-OPP-2014-0653-0063

NAWPC Comment 1: NAWPC submitted comments indicating concerns with the EPA's 5-year phase-out period, including a 2-year period for the voluntary cancellation of registrations by registrants of pentachlorophenol and a 3-year period for the use of existing stocks, suggesting that the proposed timeline is arbitrary and contrary to EPA's past practices. NAWPC recommended that EPA allow for the use of existing stocks of pentachlorophenol for a minimum of 10 years following the voluntary cancellation of pesticide products containing pentachlorophenol, which will allow the treating industry to transition to alternative wood preservatives while maintaining a steady supply of wood poles.

Agency Response: The Agency thanks NAWPC for their comments. While several comments were submitted in agreement with WWPI's position for a longer phase-out period, several comments were also submitted in support of a phase-out period of shorter than 5 years. Please refer to the Agency's response to comment 4 submitted by KMG-Bernuth for EPA's rationale for a phase-out period of 5 years.

Comments Submitted by Beyond Pesticides in EPA-HQ-OPP-2014-0653-0056 and EPA-HQ-OPP-2014-0653-0067

Beyond Pesticides Comment 1: On April 12, 2021, Beyond Pesticides requested a 30- to 60-day extension of the public comment period, citing the need to ensure maximum public opportunity for participation in the reevaluation of pentachlorophenol.

Agency Response: Upon review of the extension request, the Agency granted a 15-day extension of the public comment period, changing the closing date of the public comment period from May 4 to May 19, 2021.

Beyond Pesticides Comment 2: Beyond Pesticides submitted public comments pertaining to the reevaluation of creosote, chromated arsenicals, and dichromic acid in the docket for the reevaluation of pentachlorophenol.

Agency Response: Please refer to the ID for creosote, available at www.regulations.gov in docket ID EPA-HQ-OPP-2014-0823 and the ID for chromated arsenicals and dichromic acid available in docket IDs EPA-HQ-OPP-2015-0349 and EPA-HQ-OPP-2010-0243 for EPA's response to comments submitted by Beyond Pesticides that are specific to creosote, chromated arsenicals, and dichromic acid.

Beyond Pesticides Comment 3: Beyond Pesticides commented that it is in favor of EPA's decision to cancel and phase-out all registered products containing pentachlorophenol, citing that the "long overdue action will now bring the U.S. into conformance with the Stockholm convention banning pentachlorophenol." Given the high risks associated with pentachlorophenol, the commenters recommended an immediate cancellation and should not rely on an extended phase-out period of five years. Furthermore, the commenters assert that EPA should not rely on registrants to voluntarily cancel their registrations to proceed with the phase-out period. Instead, Beyond Pesticides commented in favor of an immediate cancellation of pentachlorophenol product registrations.

Agency Response: The Agency thanks Beyond Pesticides for its comments and considered them in the development of this FD. While several comments were submitted in agreement with Beyond Pesticides' position for a short or nonexistent phase-out period, several comments were also submitted in support of a phase-out period of longer than 5 years. With the cancellation of pentachlorophenol expected to potentially disrupt the utility pole market, the Agency designed the phase-out period as a strategy to ensure stability throughout the wood preservative industry and to give wood treaters time to switch to alternative wood preservatives, and, as discussed in EPA's response to KMG-Bernuth Comment 4, the Agency believes that this phase-out period represents an appropriate balance of the risks and benefits associated with the use of pentachlorophenol. Therefore, the Agency is providing a 5-year phase-out period which includes 60 days for the registrants to submit voluntary cancellation requests, 2 years for registrants to continue production, sale, and distribution of pentachlorophenol products and another 3 years during which existing stocks can be used.

In the event that registrants are unwilling to voluntarily cancel their registrations within 60 days as required by this FD, the Agency may proceed with an involuntarily cancellation of the pentachlorophenol registrations.

Beyond Pesticides Comment 4: The commenter stated that the Agency should not base its decision to cancel pentachlorophenol on the "uncertain future of pentachlorophenol production." Instead, EPA should rely on the statutory requirements for registration under FIFRA and demonstrate that pentachlorophenol poses an unreasonable risk as a rationale for cancellation of registered products containing pentachlorophenol.

Agency Response: The Agency does not agree that it based the decision to cancel pentachlorophenol on the uncertain future of pentachlorophenol production. This explanation was included in the PID for pentachlorophenol in an effort to provide additional context surrounding the cancellation of pentachlorophenol to the reader. As explained in section IV.A.1 subsections i-iii of this document, EPA is requiring cancellation of pentachlorophenol based on the Agency's determination that the benefits of pentachlorophenol—in particular in light of the emergence of newer, safer alternatives like copper naphthenate and DCOI—do not outweigh the high occupational handler risks. The Agency also considered the growing international support to ban the use of pentachlorophenol. EPA expects that industry's decision to cease production of pentachlorophenol is a reflection, not a cause, of these same factors.

Beyond Pesticides Comment 6: Beyond Pesticides states that utility poles are recycled and used in various outdoor structures with potential for broader human and environmental exposures to toxic residues. Such recycling should be prohibited as part of the use cancellation decision going forward.

Agency Response: The Agency is aware of railroad ties treated with creosote that are reused after their intended life cycle for use as landscaping timbers but is not aware of utility poles treated with pentachlorophenol used in a similar manner. Although pentachlorophenol pesticide products are not approved for residential use, or approved to treat wood for residential use, the reuse of pentachlorophenol-treated wood is not subject to regulation by FIFRA or under pesticide laws. Landscape retaining walls are not expected to be areas of frequent contact, and any contact with landscaping timbers is expected to be episodic in nature. Additionally, old utility poles would likely have significantly less transferable pentachlorophenol than freshly treated wood. As a result, the Agency does not anticipate significant exposure to occur from this exposure scenario.

Beyond Pesticides Comment 7: The commenters stated that, in the pentachlorophenol DRA, EPA did not make a common mechanism of toxicity to humans finding as to pentachlorophenol and any other substance and it determined that pentachlorophenol does not appear to produce a toxic metabolite produced by other substances. Therefore, in the DRA, the EPA did not assume that pentachlorophenol has a common mechanism of toxicity with other substances. The commenters assert, however, that the principal mode of action for pentachlorophenol is by uncoupling oxidative phosphorylation, which is shared by many other organochlorine compounds. Also, pentachlorophenol has recently been recognized as an emerging disinfectant byproduct in wastewater treatment arising from varied sources multiplying potential exposures.

Therefore, the commenters argue, cumulative risks from exposures to compounds with similar mode of action and added exposures from complex origins should be considered.

Agency Response: Beyond Pesticides is correct that EPA did not make a common mechanism of toxicity to humans finding for pentachlorophenol in the DRA. However, even if a common mechanism of toxicity to humans finding was made for pentachlorophenol, the Agency's decision to require the cancellation of all pesticide registrations containing pentachlorophenol would remain unchanged.

Beyond Pesticides Comment 8: In its human health risk assessment of pentachlorophenol, the Agency concluded, taking into account the effect of the mitigation measures required by the 2008 RED, that significant risks of concern remain for occupational handlers of pentachlorophenol. Beyond Pesticides commented that long-term inhalation and dermal exposures were identified that pose serious risks of carcinogenic, renal, and neurological effects.

Agency Response: The Agency agrees with Beyond Pesticides in their statements that long-term inhalation and dermal exposures of concern were identified for occupational handlers working in wood treatment facilities. These human health risks are the basis of the Agency's determination that pentachlorophenol presents unreasonable risks of adverse effects, and therefore the Agency's decision to require the cancellation and phase-out products containing pentachlorophenol.

Beyond Pesticides Comment 9: Although the PID for pentachlorophenol states that "No human health or environmental safety findings associated with the Endocrine Disruptor Screening Program (EDSP) or an endangered species assessment were made in the PID," Beyond Pesticides commented that the Agency "should not wait for such determinations and move forward immediately with cancellation."

Agency Response: The Agency agrees with Beyond Pesticides and will not wait for an ESDP or ESA assessment to be conducted before finalizing the cancellation of product registrations containing pentachlorophenol.

Beyond Pesticides Comment 10: In August 2021, Beyond Pesticides submitted an additional comment to the Agency summarizing field data on discharge of contaminants from wooden utility poles treated with pentachlorophenol. Samples were taken from stormwater and soil present at utility service centers where stacks of freshly treated wood is stored. Beyond Pesticides stated that the sampling data showed elevated levels of dioxins, pentachlorophenol, and various metals (copper, arsenic, iron, and zinc) at levels that exceed the applicable regulatory benchmarks established by EPA and state regulatory agencies under a state National Pollutant Discharge Elimination System (NPDES) permit or under the Clean Water Act. For these reasons, the commenters support the PID's proposed decision to cancel all registered products containing pentachlorophenol, and requested that the cancellation be effective immediately.

Agency Response: The Agency thanks Beyond Pesticides for submitting additional monitoring data demonstrating elevated levels of dioxins, pentachlorophenol, and various metals in stormwater and soil sampling taken from a utility service center. The Agency agrees that the data

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show that pentachlorophenol and its degradates are present at concentrations above many regulatory benchmarks. These data support EPA's requirement to phase-out pentachlorophenol over a 5-year period. While the Agency received several comments suggesting that phase-out periods should be extended beyond 5 years, the submitted monitoring data serves as additional evidence that the phase-out period should not be extended beyond 5 years.

While Beyond Pesticides strongly urged EPA to cancel registrations effective immediately, the Agency does not support a phase-out period of less than 5 years due to the potential disruption in the utility pole market. In discussions with the Utility Solid Waste Activity Group in June 2021, the Agency received feedback from utility companies in support of a 5-year phase-out period. USWAG indicated that a 5-year phase-out period would allow sufficient time for utility companies to transition to alternative wood preservative chemistries without disruption to the utility pole market. Utility companies are the primary users of pentachlorophenol-treated wood; therefore, their confidence that a 5-year phase-out period will provide adequate time for transition was important feedback for the Agency in finalizing this FD.

Additionally, based on the data, the Agency cannot determine if the high concentrations found in the water and soil are a result of (a) large quantities leaching from each pole, (b) very little leaching from a large quantities of poles, (c) persistence in the soil or water, (d) a history of improper storage at the sampled utility service centers, or (e) contamination coming from other sources. Without additional information, the Agency cannot conclude that immediate cancellation of pentachlorophenol registrations would improve sample concentrations significantly faster than a slower phaseout and cannot determine if the contamination identified would decrease over a period of months, years, or decades. Therefore, as explained above, the Agency believes that a phase-out period of up to 5 years represents an appropriate balancing of the risks and benefits associated with allowing the continued sale and use of pentachlorophenol.

Comments Submitted by Stephanie Wozniak in EPA-HQ-OPP-2014-0653-0060

Ms. Wozniak Comment 1: The commenter voiced support for the proposal to cancel all product registrations containing pentachlorophenol, citing the "diabolical nature of this chemical" and the fact that "most of the world's nations have already banned this chemical."

Agency Response: The Agency thanks Ms. Wozniak for her comments and agrees that the proposal to cancel all product registrations containing pentachlorophenol is warranted given the risks to workers in wood treatment facilities.

Ms. Wozniak Comment 2: The commenter recommended that all facilities that have treated with pentachlorophenol be investigated for possible placement on the National Priorities List (NPL) under the Superfund program. Ms. Wozniak recommends that funding for remediation projects be acquired from the same companies who have profited from the use of pentachlorophenol and that these same companies provide compensation for any communities that have been impacted by the effects of pentachlorophenol.

Agency Response: Placement of facilities that have treated with pentachlorophenol on the NPL is outside the regulatory jurisdiction of the Office of Pesticide Programs. However, EPA's Office

of Land and Emergency Management is aware of the Office of Pesticide Programs' cancellation of pentachlorophenol and can take additional action if warranted. Compensation for communities potentially impacted by the effects of pentachlorophenol is outside the scope of the registration review of pentachlorophenol.

Comments Submitted by Wood Preservation Canada in EPA-HQ-OPP-2014-0653-0055

Wood Preservation Canada Comment: Wood Preservation Canada commented to strongly encourage the Agency to consult with the US treated wood industry to evaluate if the proposed five year phase-out period will allow for a smooth transition so as to avoid potential adverse impacts to North America's industrial infrastructure and economy.

Agency Response: The Agency thanks Wood Preservation Canada for their comment. EPA solicited and received several comments regarding the feasibility of the proposed phase-out period and has engaged the US treated wood industry in conversation to determine a phase-out period that would provide stability in the treated wood industry while also protecting human health and the environment. As a result of received comments and discussions, EPA has made changes to its its proposal and is now requiring all registrants to submit voluntary cancellation requests no later than 60 days following the publication of this FD. Voluntary cancellation requests must indicate an effective cancellation date of February 29, 2024. Therefore, pentachlorophenol registrations will be cancelled 2 years following the issuance of this FD. The Agency will allow the use of existing stocks for an additional 3 years after the Agency finalizes the cancellation order for these products.

Comments Submitted by Stella-Jones Corporation (SJC) in EPA-HQ-OPP-2014-0653-0064

SJC Comment 1: The commenter acknowledged EPA's decision to cancel and phase-out all registered products containing pentachlorophenol and recommended that EPA does not place a specific time-limit on the use of existing stocks so as to not turn existing inventories, which are large enough for several years of operation of pentachlorophenol treating facilities, into large quantities of hazardous waste that must be disposed. Stella-Jones Corporation estimates that existing stocks could take 5-10 years to use depending on a variety of factors. The commenter requests that if a specific time-limit must be enforced for the use of existing stocks that EPA allow at least 10 years to ensure no disruptions in the treated utility pole market.

Agency Response: The Agency thanks Stella-Jones for its comments and acknowledgement of EPA's decision to cancel and phase-out all registered products containing pentachlorophenol. While several comments were submitted in agreement with SJC's position for a longer phase-out period, several comments were also submitted in support of a phase-out period of shorter than 5 years. Please see the Agency's response to KMG-Bernuth's Comment 4. EPA has determined not to change its proposal and is requiring all pentachlorophenol registrations will be cancelled no later than 2 years following the issuance of this FD. The Agency is requiring that registrants with pentachlorophenol product registrations submit a voluntary cancellation request no later than 60 days after the publication of the pentachlorophenol FD. The voluntary cancellation request must indicate an effective cancellation date of February 29, 2024. The Agency will allow

the use of existing stocks for an additional 3 years after the Agency issues the cancellation order for these products. Once the 5-year phase-out period is complete, no one will be allowed to treat wood with pentachlorophenol; however, utility poles and cross arms previously treated with pentachlorophenol will still be allowed to be transported, sold, and installed without interruption after. The Agency can also confirm that pentachlorophenol-treated wood poles and cross-arms that are installed in existing transmission and distribution networks do not need to be replaced with alternatives.

SJC Comment 2: SJC commented that alternative wood preservatives such as copper naphthenate and DCOI are not viable alternatives to pentachlorophenol given their limited adoption as utility pole preservatives by utility companies and unknown supplies of the preservatives present in today's market. Furthermore, SJC noted that chromated arsenicals, a potential alternative to pentachlorophenol, cannot be used to treat Douglas fir or for poles in cold climates.

Agency Response: A detailed discussion of alternatives to pentachlorophenol is presented in the memorandum titled, "*A Qualitative Assessment on the Use, Usage, and Benefits of Pentachlorophenol (PC# 063001) as a Wood Preservative,*" available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653. The Agency acknowledges in this assessment that oilborne preservatives exclude water from wood, which is a benefit in colder environments so that poles do not freeze. Also in its benefits assessment, the Agencystates that it does not expect pentachlorophenol to be replaced with waterborne preservatives, among which is CCA, a chromated arsenical. In its review of likely alternatives to pentachlorophenol, the chemicals listed by the American Wood Protection Association for use in utility poles were reviewed, and it was noted that CCA was not recommended to treat Douglas fir. An assessment of alternatives by specific wood species was not examined. Rather, the focus of the assessment was to identify potential alternatives within the oilborne preservatives.

SJC is correct in their assertion that pentachlorophenol is the preferred wood preservative for the preservation of utility poles due to its long estimated service life, its history of effective performance, and its wide availability compared to other preservative systems. In the absence of pentachlorophenol, EPA expects that users will switch to treating utility poles and sawn crossarms with another oil borne preservative, most likely copper naphthenate. Although CuN appears to be a good substitute for pentachlorophenol at a similar cost, pentachlorophenol has a much larger market share for reasons that are not clear. Although DCOI lacks the history of effective performance of other preservatives, it is also approved for use as an alternative to pentachlorophenol in the treatment of utility poles. EPA expects that the phase-out period of 5 years will provide opportunities for wood preservative facilities to adapt to the changing market conditions and maintain a steady supply of utility poles available for use by utility companies to provide electricity and telecommunication services to customers.

SJC Comment 3: The commenters stated that any interruption in the supply of treated Douglas fir utility poles would result in negative impacts to the nation's efforts to increase renewable energy sources, expand broadband services to underserved locations, harden transmission systems for fire, ice storms, and hurricanes, and facilitate 5G cellular deployment, as each of

these initiatives rely on a stable supply of utility poles that are currently treated with pentachlorophenol.

Agency Response: The Agency thanks SJC for this information. EPA has received feedback from the utility industry that the phase-out period of 5 years will provide opportunities for wood preservative facilities to adapt to the changing market conditions and maintain a steady supply of treated Douglas fir utility poles available for use by utility companies to provide reliable transmission of renewable electricity, broadband, 5G services to customers across the nation.

SJC Comment 4: The commenters state that treated wood poles, including those treated with pentachlorophenol, have a significantly smaller carbon footprint than the alternatives listed by EPA on page 13 of the PID such as steel and concrete. By not allowing sufficient time for the treated wood industry to adapt to this change and forcing users to purchase these alternative products, the PID will increase the carbon footprint for these necessary products.

Agency Response: The Agency thanks SJC for this information. The carbon footprints of various alternatives to pentachlorophenol, including steel and concrete, were not taken into account in the memorandum titled, "*A Qualitative Assessment on the Use, Usage, and Benefits of Pentachlorophenol (PC# 063001) as a Wood Preservative,*" available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

Comments Submitted by the United States Department of Agriculture Forest Service (USDA) in EPA-HQ-OPP-2014-0653-0057

USDA Comment: The USDA Forest Service (FS) indicates that pentachlorophenol is still widely used and in some regions, pentachlorophenol is considered to pose fewer potential risks to aquatic environments than creosote or copper-based preservatives, and thus has continued to be used for FS bridges, particularly on the West Coast. The FS Forest Products Laboratory (FPL) is not conducting any new research with pentachlorophenol but reports that it is still evaluating some specimens (*i.e.,* stake tests) in Mississippi, where previously initiated testing for durability of wood in ground-contact is ongoing. That said, the FS is aware that the registrant intends to cease production of pentachlorophenol and is preparing to transition to alternative products, such as copper naphthenate and DCOIT.

As noted in comments previously submitted to EPA on the reevaluation of several isothiazolinones, DCOIT may be used in combination with other common wood preservatives (*e.g*., copper azole) to treat lumber sold by big box retailers. It is the primary fungicide in an oil-based formulation that was recently standardized by the American Wood Protection Association and it is viewed as a viable alternative to pentachlorophenol and copper-based treatments in maintaining FS bridges. The FPL is further evaluating the potential for isothiazolinones to be used as moldicides in the protection of military wood packaging materials. We appreciate EPA's recognition of the value of DCOIT as a pentachlorophenol replacement and would be pleased to provide additional information on its uses and benefits, if needed.

Agency Response: The Agency thanks USDA for their comments and agrees with the statements that copper naphthenate and DCOI are potentially viable replacements for pentachlorophenol.

Comments Submitted by the Utility Solid Waste Activities Group (USWAG) in EPA-HQ-OPP-2014-0653-0069

USWAG Comment 1: The commenters voiced support for a phase-out period that would provide their members – electric utilities, power producers, utility operating companies, and utility service companies – with sufficient time to identify and implement the use of alternative treated wood preservatives. Commenters identified that existing stocks should be permitted to be sold and used for five years so as to provide sufficient time to switch to alternatives.

Agency Response: The Agency thanks USWAG for their comments and agrees that a phase-out period is necessary to provide stability in the treated utility pole market as treaters are switching to alternative preservatives. As USWAG clarified in further discussions with the Agency, the utility industry expects that a 5-year phase-out period is sufficient to provide stability to the wood utility pole market.

USWAG Comment 2: USWAG detailed the operational challenges associated with switching from utility poles treated with pentachlorophenol to a different preservative, including evaluating whether alternative preservatives will be acceptable to members of the public, participating in independent studies on the effectiveness of alternative preservatives, addressing potential production limitations in the supply chain associated with alternatives, and training of electric utility workers that will install, maintain, or work on or near wood poles treated with alternative preservatives.

Agency Response: The Agency agrees that a phase-out period is necessary to provide utility companies with sufficient time to evaluate each of the operational challenges outlined in the comment. In consideration of these challenges, the Agency initially proposed a phase-out period of 5 years and received contradictory feedback from different commenters that this phase-out time period was both longer and shorter than needed, The Agency has decided to finalize the phase-out period of 5 years as identified in section V of this document.

USWAG Comment 3: USWAG requested clarification from EPA that the registration review decision to cancel all registered products containing pentachlorophenol does not impact wood poles and cross-arms that are treated with pentachlorophenol prior to the cancellation of registrations. The commenters presume that the Agency intends to allow for the installation of wood treated with pentachlorophenol after the phase-out period. In addition, the commenters did not believe that the Agency intends for utilities to replace the millions of pentachlorophenol-treated wood poles and cross-arms already installed in existing transmission and distribution networks. The commenters state that the wood treated with pentachlorophenol is a treated article and therefore is not subject to regulation under FIFRA as codified at 40 CFR § 152.25(a).

Agency Response: EPA can confirm that the FD only requires the cancellation of pesticide registrations containing pentachlorophenol, and that utility poles and cross arms treated with pentachlorophenol will still be allowed to be transported, sold, and installed without interruption after the 3-year existing stocks period has expired. EPA can also confirm that, consistent with the treated article exemption in 40 C.F.R. § 152.25(a), pentachlorophenol-treated wood poles and

cross-arms that are installed in existing transmission and distribution networks do not need to be replaced with alternatives. These items have been added to section V of this FD.

Comments Submitted by Washington State Department of Agriculture (WSDA) in EPA-HQ-OPP-2014-0653-0068

WSDA Comment: WSDA provided the Agency with a summary of data collected by WSDA's Surface Water Monitoring Program, the Agricultural Land Use Mapping Program, and the Pesticide Usage Data Collection Program for the Agency's consideration.

Agency Response: The Agency thanks WSDA for these comments and will consider incorporating these data into future risk assessments for antimicrobial pesticides.

Comments Submitted by the Treated Wood Council (TWC) in EPA-HQ-OPP-2014-0653-0065

TWC Comment 1: TWC suggests that a 5-year period may not be adequate for the use of existing stocks and the transition to alternative preservative systems, citing the large volume of existing stocks present in block and liquid concentrate form, which may need to be transferred between facilities to maintain the 20,000 gallons of treating solution needed to fill the treatment cylinder voids in one cylinder. There is an uncertain amount of time needed to use the entire existing inventory at treatment facilities, and a rapid change in the utility market away from pentachlorophenol could present challenges to treaters and utility companies if only a few utilities continue to specify pentachlorophenol-treated poles. TWC is uncertain if 5 years is sufficient time for the last remaining stocks to be exhausted.

Agency Response: The Agency thanks the Treated Wood Council for their comments. EPA solicited and received several comments regarding the feasibility of the proposed phase-out period and has engaged with the US treated wood industry in conversations to determine a phase-out period that would provide stability in the treated wood industry while also protecting human health and the environment. As a result of received comments and discussions, EPA has determined not to change its proposal and is requiring all registrants to submit voluntary requests for cancellation no later than 60 days following the issuance of this FD. The Agency will process the cancellation order to be effective on February 29, 2024 and will allow the use of existing stocks for an additional 3 years after the Agency issues the cancellation order applicable to these registrations. Please see the Agency's response to KMG-Bernuth's Comment 4 for additional information on the Agency's rationale for maintaining the 5-year phase out proposal.

TWC Comment 2: TWC requested confirmation from the Agency that concentrate and blocks can be sold and transported to other wood treatment facilities without a pesticide registrant and even if the seller is not a registrant. Existing stocks of pentachlorophenol that will need to be transferred and sold include used solutions that have been diluted to a using strength concentration. Used solutions repeatedly travel between the gauged work tank and the treatment cylinder for active use at the treatment facility and are replenished with small volumes of new solution as the concentration of pentachlorophenol decreases due to use. Used solutions do not meet label descriptions under existing pentachlorophenol product labels. TWC requested

clarification from the Agency as to whether these solutions can be sold without an accompanying label and can be shipped not as a FIFRA-labeled pesticide but as some other generic United States Department of Transportation (DOT) description. TWC is seeking from EPA that the transport of these materials between facilities for use as an ingredient in a product is acceptable and to further characterize how those shipments could be made.

Agency Response: Consistent with its authority under FIFRA Section 6(a), the Agency intends to allow the sale (including distribution) and use of currently registered pentachlorophenol products for 2 years after the publication date of this Final Decision for pentachlorophenol. After that, the Agency will allow use of existing stocks for another 3 years. The Agency will require the sale, distribution, and use of such existing stocks to be consistent with the terms of the previously approved labeling on, or that accompanied, the cancelled products. Thus, distribution of existing stocks of cancelled pentachlorophenol products by persons (including the registrant) will be permitted under the cancellation order consistent with the terms of the cancellation order and existing law.

The distribution or sale of diluted pentachlorophenol solution is permitted only to the extent allowable under FIFRA or EPA regulations relating to the sale or distribution of an unregistered pesticide. The Agency considers diluted pentachlorophenol solution distributed for the purpose of being used as a wood preservative to be a pesticide because it meets the definition of a "pesticide" in FIFRA Section 2(u) (7 U.S.C. § 136(u) (defining "pesticide" in relevant part as "any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest") and in EPA regulations (40 C.F.R. § 152.15(b)-(c)) (further providing that a substance is a "pesticide" if it "consists of or contains one or more active ingredients and has no significant commercially valuable use as distributed or sold other than (1) use for pesticidal purpose (by itself or in combination with any other substance), (2) use for manufacture of a pesticide" or the person who distributes or sells it "has actual or constructive knowledge that the substance will be used, or is intended to be used, for a pesticidal purpose." 40 C.F.R. § 152.15(b)-(c). Specifically, the Agency understands that diluted pentachlorophenol solution would be shipped either for "use for pesticidal purpose" or for the manufacture of a pesticide. Therefore, such solution may only be distributed for the purpose of being used as a wood preservative if it has been separately registered under FIFRA. The distribution or sale of unregistered diluted pentachlorophenol solution is prohibited under FIFRA Section 12(a)(1)(A), subject to exceptions outlined in the statute and its implementing regulations.

FIFRA Section 2(gg) (7 U.S.C. § 136(gg)) defines "to distribute or sell" broadly: "to distribute, sell, offer for sale, hold for distribution, hold for sale, hold for shipment, ship, deliver for shipment, release for shipment, or receive and (having so received) deliver or offer to deliver." 7 U.S.C. § 136(gg). The statute contains an exclusion from the scope of sale and distribution for the "holding or application of registered pesticides or use dilutions thereof by any applicator who provides a service of controlling pests," so long as such applicator does not deliver "any unapplied pesticide to any person so served." Similarly, EPA regulations (40 C.F.R. § 152.30) allow for the sale or distribution of unregistered pesticides under limited circumstances—such as between registered pesticide production establishments operated by the same pesticide producer, or for disposal. The Agency does not intend to either restrict or expand the scope of these exceptions to the registration requirement with respect to diluted pentachlorophenol solution.

Thus, except as provided in FIFRA or its implementing regulations, the shipment of diluted pentachlorophenol solution would constitute the "distribution" of an unregistered pesticide, which is prohibited under FIFRA Section 12(a)(1). Unused diluted pentachlorophenol solution must be disposed of in accordance with RCRA and in consultation with the facility's authorized state or EPA Region.

The Agency notes that current pentachlorophenol product labels do not permit for the addition of concentrated pentachlorophenol to the diluted solution. Instead, the use directions on the labels state "*Add one part of this product to 20 parts of petroleum solvent and mix well*," and do not direct users to add concentrated pentachlorophenol to augment the concentration of the pesticide solution. Thus, adding additional pentachlorophenol concentrate to the diluted solution may represent a use violation according to current product labels.

TWC Comment 3: The pentachlorophenol-using segment of the industry needs assistance with another important issue associated with the potential cancellation of the pentachlorophenol label. This issue is the deletion of the F032 waste code from process wastes generated at plants once they transition to another preservative chemical. The RCRA regulations contain provisions at 40 CFR 261.35 for deletion of the F032 waste code. This provision was added during the rulemaking that added the F032, F034, and F035 wastes. The provisions at 261.35 are unworkable because they either require replacement of all process equipment, drip pads, piping, trams, and handling equipment, or they require that the process equipment and all other equipment that may have contacted pentachlorophenol be decontaminated until the final rinsate has non-detectable levels of dioxins and dibenzofurans. Replacement of all equipment is not a financially viable option. Given the ubiquitous nature of dioxins and furans, it would be impossible to meet the 0.01 parts per trillion decontamination standards in 261.35. Routine environmental samples at sites not associated with pentachlorophenol often contain levels far exceeding this value. Some of the alternative preservative systems would generate process wastes that would not be considered hazardous waste, so some reasonable mechanism needs to be found that would allow facilities to not have to manage their waste as F032 hazardous waste in perpetuity. The Agency could establish a performance metric such as requiring facilities to manage wastes as F032 for a period of time, such as six months after changing to another preservative, after which the wastes would no longer be considered F032 waste. Six months of use with a different preservative system should be more than adequate to ensure that the equipment has been adequately decontaminated through use. Another potentially workable alternative would be to analyze a process waste sample after a period of use of a different preservative and if the waste does not test as a characteristic hazardous waste for pentachlorophenol in accordance with 40 CFR 261.24, then the facility could enter this in the operating records and not have to manage the wastes as F032 in the future.

Agency Response: As has been discussed in meetings between OPP and the Office of Land and Emergency Management's (OLEM) Office of Resource Conservation and Recovery (ORCR) and the TWC, the three options described in the 09.24.2003 EPA memo (RCRA Online Number 14681) remain in effect: complete closure, continued operation, or phased closure.

The Agency notes that the three options described in the 2003 memo were available during the 2003 closure of facilities that used products containing chromated arsenicals and dichromic acid,

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with the exception of the dioxin decontamination standard of 0.01 ppt under §261.35. Although TWC has indicated that the decontamination standard of 0.01 ppt of dioxins is challenging to implement, the standards in §261.35 remain in effect. Further details can be found in the 05.19.1998 EPA memo (RCRA Online Number 14197). Changes to the decontamination standards would require the Agency to undertake a rulemaking action, which ORCR is not considering at this time.

EPA recommends that individual wood treaters work closely with their state implementing agencies (or Regional EPA offices if in Iowa or Alaska) to determine the appropriate compliance strategy.

TWC Comment 4: Another issue associated with changing to a preservative that does not generate hazardous waste concerns closure of the 40 CFR Part 265 Subpart W drip pad. In 2003, the Agency provided guidance to the industry on a similar issue when the registrants of chromate copper arsenate (CCA) voluntarily cancelled residential uses of this preservative which caused several hundred wood treatment facilities to change to another preservative. Changes made to the RCRA hazardous waste generator rules in 2016 appear to allow generators to defer closure of their drip pads until facility closure. The Agency should confirm the applicability of this provision at 40 CFR 262.17(a)(8)(iii) or provide additional guidance similar to that provided in 2003.

Agency Response: As discussed in the response to TWC question three, the 09.24.2003 EPA memo (RCRA Online Number 14681) remains active Agency policy and the options it presents may be used as applicable, and in consultation with state implementing agencies (or Regional EPA agencies if in IA or AK). Also, the 2016 Hazardous Waste Generator Improvements Rule added requirements for hazardous waste generators to notify their authorized state or EPA Region of closure. added requirements for hazardous waste generators to notify their authorized state or EPA Region of closure.

TWC Comment 5: Another critical aspect of the Agency's stated objective, to provide stability to the utility pole market, will be to assure the utilities that the proposed or actual cancellation of the pentachlorophenol registration will have no impact on the ability of the utilities to continue to install and use poles treated with pentachlorophenol. The treated pole meets the definition of a treated article and the treated article is not subject to FIFRA regulation. Utilities stock substantial quantities of treated poles and included are many poles in sizes that are used only infrequently. It is not unusual for these sizes to remain in stock for five years or more before they are actually installed. It is expected that a properly maintained pole may last 70 years in service. The Agency should clearly state that this cancellation does not impact a utility's ability to continue to use pentachlorophenol-treated utility poles in their existing lines or new lines that may be constructed in the future, and does not impact the ability of a wood treater to continue to sell pentachlorophenol-treated poles after the phase-out period if they were treated before the end of the phase-out period.

Agency Response: EPA can confirm that the FD only requires the cancellation of pesticide registrations containing pentachlorophenol, and that utility poles and cross arms treated with pentachlorophenol will still be allowed to be transported, sold, and installed without interruption

after the 3-year existing stocks period has expired. EPA can also confirm that, consistent with the treated article exemption in 40 C.F.R. § 152.25(a), pentachlorophenol-treated wood poles and cross-arms that are installed in existing transmission and distribution networks do not need to be replaced with alternatives. These items have been added to section V of this FD.

Comments Submitted by Nisus Corporation in EPA-HQ-OPP-2014-0823-0027

Nisus Comment: Nisus Corporation commented on the benefits of copper naphthenate, the leading alternative to pentachlorophenol. With respect to service life, Nisus Corporation stated that the copper naphthenate has been shown to have a predicted service life as long or longer than pentachlorophenol, and that early failures of wood treated with copper naphthenate were the result of improper treatment, not failures inherent to the use of copper naphthenate. The commenters assert that copper naphthenate is widely available and may decrease in price in the future as it increases its use in the wood preservative industry. Furthermore, in response to concerns of the supply capacity of copper naphthenate, the commenters state that there is an adequate capacity of copper naphthenate manufacturing in the United States to supply all current pentachlorophenol users. Finally, Nisus Corporation stated that the cost of conversion from pentachlorophenol to copper naphthenate has been overstated as an argument against cancellation of pentachlorophenol and may cost $25,000 as in the case of a wood treatment facility that recently transitioned from pentachlorophenol to copper naphthenate.

Agency Response: The Agency thanks Nisus Corporation for its comments in support of the benefits of copper naphthenate. The Agency agrees that copper naphthenate is a viable alternative for pentachlorophenol, a view that is reinforced by the submitted evidence of long service life, adequate supply capacity, and low cost of transitioning between preservative systems.

Appendix B-2: Summary of Science Public Comments on the Pentachlorophenol Proposed Interim Registration Review Decision and Agency Responses

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

MEMORANDUM **November 03, 2021**

SUBJECT: Response to Public Comments on the Pentachlorophenol Proposed Interim Decision (PID)

PC Code(s): 063001	DP Barcode(s)/No(s): 462687
Decision No.: 576853	Docket No(s).: EPA-HQ-OPP-2014-0653
Petition No(s).: NA	Regulatory Action: RTC
Risk Assessment Type: Draft	Case No(s): 2505
TXR No.: NA	CAS No(s): 87-86-5

From: Kathryn Korthauer, Biologist
Sophia Hu, Chemist
Jacqueline Meadows, Ph.D., Toxicologist
Timothy Dole, CIH., Industrial Hygier
Risk Assessment Branch 1 and 2
Antimicrobials Division (7510P)

Thru: Elizabeth Donovan, M.S., Branch Chief
Judy Facey, Ph.D., Risk Assessment Process Leader
Tim McMahon Ph.D., Senior Science Advisor
Risk Assessment Branch 2
Antimicrobials Division (7510P)

To: Dan Halpert, Chemical Review Manager
Tara Flint, Acting Team Lead
Jose Gayoso, Acting Branch Chief
Reevaluation Branch
Antimicrobials Division (7510P)

INTRODUCTION

The Agency completed a draft risk assessment for Pentachlorophenol in 2019 (U.S. EPA, 2019) that has been posted on www.regulations.gov in docket number EPA-HQ-OPP-2014-0653. Subsequently, the Agency completed a proposed interim decision (PID) in 2020 (U.S. EPA, 2020). The Agency received comments on the PID related to science described in the draft risk assessment from Beyond Pesticides. The comments submitted on the PID and the Agency's responses to the science comments are provided below.

Comments Submitted by Beyond Pesticides in EPA-HQ-OPP-2014-0653

Beyond Pesticides Comment 1: The commenters submitted several reports written by Beyond Pesticides detailing the history of human health and environmental exposures and risks associated with pentachlorophenol and pentachloroanisole, the primary degradate of pentachlorophenol, as well as other degradates (*i.e*., chlorinated aromatics). While the DRA (U.S. EPA, 2019) states that exposures to pentachloroanisole were not expected because pentachloroanisole is formed by degradation of pentachlorophenol in soil where exposure to occupational handlers would be limited. Beyond Pesticides asserted that EPA did not adequately assess the exposures to children, adults, and wildlife exposed to contaminated soil near treated poles from digging, playing, foraging, and similar activities.

Agency Response: By enforcing the cancellation of product registrations containing pentachlorophenol, the Agency expects that potential exposures to pentachlorophenol, and therefore its degradate pentachloroanisole will decline over a period of time and eventually be eliminated.

Beyond Pesticides Comment 2: The commenters stated that the Agency ignores exposures and risks resulting from toxic impurities and contaminants in pentachlorophenol, including polychlorinated dibenzo-p-dioxins (CDDs), polychlorinated dibenzofurans (CDFs), polychlorinated biphenyls (PCBs), and hexachlorobenzene (HCB). Although there are many sources of CDDs, CDFs, PCBs, and HCBs in the environment, the commenters state that pentachlorophenol can be presumed to be a "significant if not major contributor" to the environmental concentrations of these chemicals.

Agency Response: The Agency received similar comments during the public comment period following the publication of the *Draft Risk Assessment for Pentachlorophenol* and responded to these comments in the memorandum *Response to Public Comments Regarding the Pentachlorophenol Draft Risk Assessment* dated August 3, 2020, available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653. The NTP study[1] used to quantify the cancer risk from exposure to pentachlorophenol was based on evaluation of two different types of pentachlorophenol products, a technical grade and a formulation (Dowicide EC-7). Both of these products were analyzed for the presence of contaminants and the analysis showed the presence of various levels of contaminants in both pentachlorophenol products tested. Therefore, the quantitative cancer risk assessment was performed using pentachlorophenol products that contained various contaminants. The dioxin/furan and hexachlorobenzene contaminants have separate cancer slope factors; these were not included in the pentachlorophenol DRA. However, they were assessed in the pentachlorophenol RED (EPA-HQ-OPP-2004-0402-0075), and since these contaminant levels in manufactured pentachlorophenol have decreased since the RED was conducted, the cancer slope factors published in the RED are still applicable for registration review.

[1] NTP (National Toxicology Program). (1989) NTP toxicology and carcinogenesis studies of two pentachlorophenol technical-grade mixtures (CAS No. 87-86-5) in B6C3F1 mice (feed studies). Public Health Service, U.S. Department of Health and Human Services; NTP TR 349. Available from the National Institute of Environmental Health Sciences, Research Triangle Park, NC.

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Furthermore, environmental fate studies indicate that contaminants were not formed during the degradation of pentachlorophenol and pentachloroanisole (see the pentachlorophenol DRA for more details). Environmental exposure to the contaminants from the use of pentachlorophenol is therefore unlikely.

In addition, by enforcing the cancellation of product registrations containing pentachlorophenol (including toxic impurities and contaminants), the Agency expects that potential exposures to these chemicals will decline over a period of time and eventually be eliminated.

Beyond Pesticides Comment 3: In the Draft Risk Assessment for Pentachlorophenol, EPA stated that because pentachlorophenol is prohibited for use in wood products that come into contact with food, feed, or drinking water, dietary risks are not of concern and no drinking water exposure assessment was performed. The commenters note, however, that monitoring data contradict such claims, citing known concentrations of pentachlorophenol, pentachloroanisole, CDDs, CDFs, PCBs, and HCBs present in waters that could be used as drinking water sources.

Agency Response: The Agency received similar comments during the public comment period following the publication of the *Draft Risk Assessment for Pentachlorophenol* and responded to these comments in the memorandum *Response to Public Comments Regarding the Pentachlorophenol Draft Risk Assessment* dated August 3, 2020, available in the public docket at regulations.gov under docket ID EPA-HQ-OPP-2014-0653.

The Agency believes that due to limited mobility in soil and moderately rapid degradation in the environment (half-lives < 47 days), pentachlorophenol and pentachloroanisole are unlikely to result in significant groundwater contamination from usage of utility poles. The Agency had conducted a search in the Water Quality Portal (WQP)[2] on June 17, 2019 prior to the release of the DRA and obtained nationwide monitoring data in water for pentachlorophenol. No pentachlorophenol was detected in groundwater; it was far more commonly found in bottom sediment (detected in 27% of samples, estimated concentration range of 21-510 µg/kg with one at 6,600 µg/kg); this is consistent with the ubiquitous presence of pentachlorophenol-treated wood and some localized aquatic exposure from wood treatment sites. The presence of pentachlorophenol in bottom sediment is consistent with its relatively low water solubility and strong sorption. While some transport to groundwater can take place, concentrated levels of pentachlorophenol are not expected to occur because of strong sorption to soil, very high runoff from impervious surfaces[3] (such as pavement and concrete adjacent to storm drains), possible sorption to other solids during runoff, and further dilution by rain or floods during runoff. In addition, utility poles are placed far apart from one another, reducing the potential for any concentrated environmental exposure to pentachlorophenol. Risks to aquatic organisms would therefore be minimized.

CDDs and CDFs have low vapor pressures, low water solubilities, and high adsorption to soils. Therefore, they are highly unlikely to move away from the point of deposition and result in groundwater contamination. Though they have the potential to bioaccumulate in benthic

[2] https://www.waterqualitydata.us/portal/

[3] Purdue University. (n.d.). SCS Curve Number Method. Retrieved June 15, 2020, from https://engineering.purdue.edu/mapserve/LTHIA7/documentation/scs.htm

organisms, environmental fate studies (conducted up to 120 days) indicate no formation of the CDDs or CDFs during the breakdown of PCP. In addition, the levels of the contaminants in the PCP products are very low (2,3,7,8-TCDD was undetected (<0.001 ng/mg) and HxCDD was 0.554 ng/mg). Exposure to CDDs and CDFs from PCP-treated wood itself is therefore expected to be low.

Beyond Pesticides Comment 4: The commenter stated that pentachlorophenol is more bioavailable than indicated in the DRA and that the long service life of pentachlorophenol-treated wood indicates that pentachlorophenol is a persistent source of leaching of pentachlorophenol and associated contaminants and impurities to nearby soil and water and can be expected to increase due to constant leaching to soils and water over time. The commenters assert that long-term and continuing exposures to aquatic organisms and wildlife can be expected to pose serious risks to aquatic and terrestrial organisms.

Agency Response: The Agency does not agree that the DRA understated the risks to land and aquatic organisms. However, even if pentachlorophenol were more bioavailable than indicated in the DRA and there were long-term and continuing exposures and risks to land and aquatic organisms, the outcome of cancellation of all pesticide registrations containing pentachlorophenol would remain unchanged. By enforcing the cancellation of product registrations containing pentachlorophenol, the Agency expects that potential environmental exposures to pentachlorophenol, and therefore its degradate pentachloroanisole, will decrease moving forward.

REFERENCES:

U.S. EPA, 2019. Registration Review Draft Risk Assessment for Pentachlorophenol. June 27, 2019. D452036. Antimicrobials Division. Office of Pesticide Programs. Washington, D.C.

U.S. EPA, 2020. Pentachlorophenol Proposed Interim Registration Review Decision, Case Number 2505. December 2020. Antimicrobials Division. Office of Pesticide Programs. Washington, D.C.