ecojustice

Lindsay Beck
1910-777 Bay Street, PO Box 106
Toronto, ON M5G 2C8
Tel: 416-368-7533 ext. 551
Fax: 416-363-2746
Email: lbeck@ecojustice.ca
File No.: 2161

Daniel Cheater
390-425 Carrall Street
Vancouver, BC V6B 6E3
Tel: 604-685-5618 ext. 282
Fax: 604-685-7813
Email: dcheater@ecojustice.ca

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Sent via e-mail

Plan of Priorities Team, Chemicals Management Division
Environment and Climate Change Canada
Place Vincent Massey, 351 St. Joseph Blvd
Gatineau, QC K1A 0H3
substances@ec.gc.ca

Dear Sir/Madam,

Re: Comments on the Proposed Plan of Priorities

We write on behalf of Raincoast Conservation Foundation and Watershed Watch Salmon Society to provide comments on the Proposed Plan of Priorities for Chemical Management. These groups are British Columbia-based non-governmental organizations whose work centres on defending salmon populations and the ecosystems in which they thrive. In February 2024, along with Pacific Salmon Foundation, they submitted a request pursuant to section 76 of the *Canadian Environmental Protection Act, 1999* ("**CEPA**" or the "**Act**")[1] to request an assessment of 6PPD to determine whether it is toxic or capable of becoming toxic (the "**Request**").[2]

The Request was granted in May 2024. We were pleased to see 1,4-Benzenedimamine, N-(1,3-dimethylbutyl)-N'-phenyl- ("**6PPD"**), its transformation products, and related p-phenylenediamines ("**PPDs"**) listed as substances to be prioritized for assessment. As you are aware, 6PPD is used to prevent tire degradation, but breaks down with tire wear and enters the environment as 6PPD-quinone ("**6PPD-q"**), which can cause mass deaths of coho salmon when they spawn in waterways adjacent to roads, bridges and parking lots.

The addition of related PPDs to the Plan of Priorities will be important to avoid the problem of 'regrettable substitution', where a chemical known to be toxic is replaced with one that turns out

[1] *Canadian Environmental Protection Act*, SC 1999, c 33 [CEPA].

[2] Ecojustice, "Request to assess 6PPD under s 76 of the *Canadian Environmental Protection Act, 1999*" (6 February 2024), online at: https://ecojustice.ca/wp-content/uploads/2024/02/2024-02-06-Request-to-Assess-6PPD-under-Section-76-of-CEPA.pdf.

to be equally or more toxic than the one it was replacing. As the rationale document notes, related PPDs have similarities to 6PPD in chemical structure and the potential to form harmful transformation products. Any regulatory action in respect of 6PPD and its transformation products must avoid the possibility that tire manufacturers will replace it with another PPD that causes ecological harm and delays the recovery of salmon populations.

We were also glad to see in the Workplan that the start date for assessment activities is Fall 2024. However, pursuant to section 73(1) of CEPA, the plan is to be published "with timelines." A start date is just that. To be compliant with the Act, the Workplan must specify "activities or initiatives in relation to assessing, controlling, or otherwise managing the risks to the environment or to human health posed by the substances that are or will be undertaken…".[3]

We request that the final Workplan be updated to better meet the requirement for timelines under CEPA, including not only the start date for assessment but a timeline setting out steps to the completion of the assessment and regulatory action being considered. This is particularly imperative in a case like 6PPD, where:

- It has been four years since the seminal study identified 6PPD-q in Seattle runoff waters as a cause of the repeated mass mortality events in urban coho salmon populations (a phenomenon known as "urban runoff mortality syndrome");[4]
- Urban run-off mortality syndrome has been observed in waterways in British Columbia, and ongoing sampling there is finding 6PPD-q at levels toxic to coho salmon,[5] an ecologically, economically and culturally significant species found across BC's rivers, streams and coastal areas;[6]
- Emerging research is identifying impacts of 6PPD-q on other aquatic species, with these effects compounded by co-occurring contaminants in runoff or wastewater;
- Tire wear contaminants are also a concern not only while they are in use, but at end-of-life. Increasingly, tires are disposed of by recycling them into turf for sports fields and children's playgrounds, where they may continue to shed 6PPD and its toxic breakdown product;
- Regulatory action is already being taken in other jurisdictions, including the states of Washington and California, and at the federal level in the United States.

The evidence with respect to 6PPD's harmful effect on the environment is clear. There is no legal impediment to listing 6PPD, its transformation products and related compounds under

[3] CEPA, *supra* note 1 at s 73(b).

[4] Tian et al. (2021), A ubiquitous tire rubber-derived chemical induces acute mortality in coho salmon, *Science* 371 (6525), 185-189, online at: https://www.science.org/doi/10.1126/science.abd6951 (**Tian et al., 2021**).

[5] Monaghan et al. (2023), "Automated, High-Throughput Analysis of Tire-Derived p-Phenylenediamine Quinones (PPDQs) in Water by Online Membrane Sampling Couples to Ms/MS". *ACS ES&T Water* 3(10), 3293-3304.

[6] COSEWIC (2016), "COSEWIC assessment and status report on the Coho Salmon Oncorhynchus kisutch, Interior Fraser population, in Canada. Committee on the Status of Endangered Wildlife in Canada", online at: https://publications.gc.ca/collections/collection_2017/eccc/CW69-14-289-2017-eng.pdf (**COSEWIC Fraser Coho Report**).

Schedule 1 of CEPA prior to the Plan of Priorities being finalized, so that immediate steps can be taken toward regulatory action.

To support your next steps on initiating the assessment itself, and creating a timeline to its completion, we provide details on (i) emerging research on 6PPD that has been published since the time the Request was sent in February 2024; and (ii) regulatory steps being taken in other jurisdictions since the Request. We conclude by recommending immediate regulatory action.

Emerging Research on 6PPD since February 2024

As set out in the Request, the lethal effects of 6PPD on coho salmon have been clear for several years. Since the Request was submitted, emerging research continues to be published relating to (i) impacts of PPDs on other species, (ii) sub-lethal effects, (iii) the mechanism of toxicity, (iv) cumulative impacts, and (v) new estimated exposure within Canada and elsewhere.

This evidence further demonstrates the urgency to assess 6PPD and create the opportunity to regulate, whether by requiring manufacturers to identify and use less-toxic alternatives, through stormwater management, limits on tire particle emissions, or other appropriate means.

1. *Impacts to other salmonids and sub-lethal effects*

The initial research conducted from 2020-2023 confirmed that 6PPD and its quinone is the primary causal agent for mass deaths of coho salmon in urban streams and waterways adjacent to roads, a phenomenon referred to as "urban runoff mortality syndrome".[7] As set out in our February 2024 request, 6PPD-q did not seem as toxic to other salmonids, though some species, including rainbow trout and chinook, also appeared to be vulnerable.

Throughout this year, more research has been published about both sensitive species and sub-lethal effects. While other salmonids appear less sensitive than coho, 6PPD-q is proving to have debilitating effects on some species that undermine long-term survival, including impacts on juvenile lake trout and rainbow trout.

The Toxicology Centre at the University of Saskatchewan has been a leader for 6PPD-q toxicity research within Canada. Their research team has examined the acute and sub-chronic toxicity of 6PPD-q to early-life stage lake trout, concluding that both lake trout alevins (young, newly-hatched trout) and fry (juvenile trout) are sensitive to 6PPD-q.[8] The researchers found a Lethal Concentration at which 50% of a test population dies (LC_{50}) for fry at 0.50 µg/L, and for alevins at 0.39 µg/L, and observed deformities during development including "spinal curvature, yolk sac edema, and pooling of blood in the caudal fin and eye."

[7] See e.g. Mahoney et. al. (2022), Exposure to the Tire Rubber-Derived Contaminant 6PPD-Quinone Causes Mitochondrial Dysfunction In Vitro. *Environmental Science & Technology Letters* 2022 9(9), 765-771; Tian et. al. (2021).

[8] Roberts, Catherine et al. "Acute and sub-chronic toxicity of 6PPD-quinone to early-life stage lake trout (Salvelinus namaycush)" *bioRxiv* (3 April 2024) online at: biorxiv.org/content/10.1101/2024.03.26.586843v2.full.

Another study considered the sublethal toxicities of 6PPD-q exposure in lake trout, focusing on swimming capability and metabolic function.[9] Researchers found that exposure impaired the lake trout's swimming performance and decreased its active metabolic rate, suggesting that environmentally relevant concentrations of 6PPD-q disrupt aerobic metabolic capacity in juvenile lake trout.

In addition to lake trout, the Saskatchewan research team has assessed the acute and sub-chronic toxicity of 6PPD-q in early-life stage rainbow trout, again finding a low LC_{50} of 0.47 µg/L for fry.[10] Deformities were also observed in rainbow trout that were similar to those observed in lake trout, including pooling of blood in the caudal fin. A second study compared the effects of a 48-hour exposure on both rainbow trout and a more tolerant species, Arctic char, finding that only rainbow trout experienced a decrease in end systolic volume and an increase in passive ventricular filling, cardiac output, and PR interval length.[11] This is the first study of its kind to consider impacts on the cardiorespiratory system of salmonids. More studies on this topic can be expected.

2. *Impacts on other aquatic and terrestrial species*

Given the clear lethal effects on coho salmon, most research to date has focused on salmonids. However, research is emerging on other animals and plants. One study examined the effects of 6PPD-q exposure on mice, finding that long-term and repeated exposure potentially resulted in inflammation and fibrosis in the lung by affecting certain molecular signals.[12] These findings raise concerns about the potential for impacts in mammals, with the researchers noting that their observations "implied the possible risks of long-term 6-PPDQ exposure to human health".

[9] Selinger, Summer Jane et al. "Sublethal 6ppd-Quinone Exposure Impairs Swimming Performance and Aerobic Metabolism in Juvenile Lake Trout (Salvelinus Namaycush)" (2024) [unpublished] online at: *SSRN*, papers.ssrn.com/sol3/papers.cfm?abstract_id=4955622.

[10] Roberts, Catherine et al. "Sub-chronic and acute toxicity of 6PPD-quinone to early-life stage rainbow trout (Oncorhynchus mykiss)" *bioRxiv* (26 September 2024) online at: biorxiv.org/content/10.1101/2024.09.25.614982v1.

[11] Selinger, Summer Jane et al. "Acute Cardiorespiratory Effects of 6ppd-Quinone on Juvenile Rainbow Trout (Oncorhynchus Mykiss) and Arctic Char (Salvelinus Alpinus)" (2024) [unpublished], online at: papers.ssrn.com/sol3/papers.cfm?abstract_id=4955622. A prolonged PR interval represents a delay in the time it takes for the signal to move across the atria at the top of the heart, which receive blood flowing in from the veins, into the ventricles at the bottom of the heart, which pump blood out into the arteries.

[12] He, Wenmiao et al. "Evaluation of 6-PPD quinone toxicity on lung of male BALB/c mice by quantitative proteomics" (2024) 922 *Sci of Total Environ* 171220, online at: https://www.sciencedirect.com/science/article/abs/pii/S0048969724013597.

Additional studies have confirmed toxic impacts to roundworms,[13] water fleas,[14] and aquatic vertebrates.[15]

In another study, researchers used existing evidence of toxic effects on aquatic species and mammals to provide an overview of human internal exposure, potential adverse effects, and a prediction of human health risk from 6PPD-q.[16] Their conclusion was that "Human exposure to 6-PPDQ in the environment is inevitable and may lead to adverse health effects, including hepatotoxicity, enterotoxicity, pulmonary toxicity, neurotoxicity, reproductive toxicity, and cardiotoxicity." A related study used two human liver cell models to investigate the potential different effects of 6PPD and 6PPD-q. The results suggested a higher risk of 6PPD-q than 6PPD to human liver cells. Researchers noted the study would provide basic data for future human health studies and risk assessments of 6PPD-q.[17]

Finally, initial research is underway on impacts to plants. One study examined the toxicity of 6PPD and 6PPD-q on agricultural plants, using pakchoi as the model plant.[18] It confirmed that 6PPD and 6PPD-q induces phytotoxicity in pakchoi and inhibits seed germination. Another study that used a common species of algae as the model plant, concluded that high concentrations of 6PPD and 6PPD-q inhibited growth within aquatic plants.[19]

3. *Mechanism of toxicity*

Researchers are also examining the mechanism of toxicity, to answer why certain species are more sensitive than others.

In a paper published this year, researchers attempted to assess why 6PPD-q is significantly less toxic to other salmonids, including brown trout, as compared to Coho.[20] Their initial conclusions

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[13] Liu, Zhengying, Qian Bian, & Dayong Wang. "Exposure to 6-PPD quinone causes ferroptosis activation associated with induction of reproductive toxicity in Caenorhabditis elegans" (2024) 471 *J Hazardous Materials* 134356, online at: https://www.sciencedirect.com/science/article/abs/pii/S030438942400935X.

[14] Shi, Chaoli et al. "Effects of environmental concentrations of 6PPD and its quinone metabolite on the growth and reproduction of freshwater cladoceran" (2024) 948 *Sci of Total Env* 175018 (forthcoming), online at: https://www.sciencedirect.com/science/article/abs/pii/S0048969724051684.

[15] Song, Zehua et al. "Distinct Species-Specific and Toxigenic Metabolic Profiles for 6PPD and 6PPD Quinone by P450 Enzymes: Insights from In Vitro and In Silico Studies" (2024) *Envirotoxicology & Pub Health* (forthcoming), online at: https://pubs.acs.org/doi/abs/10.1021/acs.est.4c03361.

[16] Wan, Xin, Geyu Liang, & Dayong Wang. "Potential human health risk of the emerging environmental contaminant 6-PPD quinone" (2024) 949 *Sci of Total Enviro* 175057, online at: https://www.sciencedirect.com/science/article/abs/pii/S0048969724052070.

[17] Qi, Yunqing et al. "Effects of 6PPD-Quinone on Human Liver Cell Lines as Revealed with Cell Viability Assay and Metabolomics Analysis" (2024) 12:6 *Toxics* 389, online at: https://www.mdpi.com/2305-6304/12/6/389.

[18] Liu, Jinzheng et al. "Phytotoxicity of 6PPD and its oxidized product 6PPD-Q on pakchoi (Brassica rapa L. ssp. chinensis)" (2024) *Land Degradation & Development* (forthcoming), online at: https://onlinelibrary.wiley.com/doi/abs/10.1002/ldr.5243.

[19] Liu, Jinzheng et al. "Comparative toxic effect of tire wear particle-derived compounds 6PPD and 6PPD-quinone to Chlorella vulgaris" (2024) 951 *Sci of Total Environ* 175592 (forthcoming), online at: https://www.sciencedirect.com/science/article/abs/pii/S0048969724057486.

[20] Phillip J Ankley et al, "Xenometabolome of Early-Life Stage Salmonids Exposed to 6PPD-Quinone" *bioRxiv* (14 June 2024), online at: biorxiv.org/content/10.1101/2024.06.12.598661v1.

indicate that sensitivity may have to do with each species' ability to biotransform and detoxify 6PPD-q upon exposure.

Another review concluded that existing research suggests that 6PPD-q may share a common mechanism of toxicity to salmonids, based on commonly observed toxic effects: abnormal behaviour, respiratory difficulty, and acute mortality.[21]

6PPD-q may also just be one metabolite of concern from 6PPD, with some research suggesting that other transformation products may be equally or even more toxic. One forthcoming paper investigated the further metabolites of 6PPD and 6PPD-q, with the researchers finding two novel coupled metabolites identified for 6PPD and predicted to exhibit elevated toxicity compared to 6PPD-q.[22]

4. *Cumulative impacts*

6PPD-q is just one of many toxic substances derived from road runoff and tire wear in particular. Scientists are beginning to study the cumulative effects of 6PPD-q in the environment with other contaminants. One recent study examined the joint toxicity of 6PPD and 6PPD-q alongside other commonly used tire additives on coho salmon.[23] The report's conclusion was that 6PPD has the highest binding energy value of the additives surveyed, which increases its harmful activity within the species.

Tire wear is not the only source of cumulative pollutants. In a paper examining the combined effects of nanoplastics and 6PPD-q exposure on adult zebrafish,[24] researchers found that nanoplastics enhanced the toxicity of 6PPD-q, resulting in behavioral changes and impacts to the metabolic pathways of the liver and intestines.

5. *New evidence of exposure*

Finally, sampling work is deepening our understanding of likely exposure. This includes the water sampling conducted by streamkeepers on Vancouver Island and in the Lower Mainland, by teams at the University of British Columbia and Vancouver Island University, and work done by our client, Raincoast Conservation Foundation.

The BC Conservation Foundation ("**BCCF**"), in partnership with Vancouver Island University, has been working with local citizens on Vancouver Island to collect samples and rapidly assess

[21] Li, Yi et al. "A Review of N-(1,3-Dimethylbutyl)-N′-phenyl-p-Phenylenediamine (6PPD) and Its Derivative 6PPD-Quinone in the Environment" (2024) 12:6 *Toxics* 394, online at: https://www.mdpi.com/2305-6304/12/6/394.
[22] Song, Zehua et al. "Distinct Species-Specific and Toxigenic Metabolic Profiles for 6PPD and 6PPD Quinone by P450 Enzymes: Insights from In Vitro and In Silico Studies" (2024) *Envirotoxicology & Pub Health* (forthcoming), online at: https://pubs.acs.org/doi/abs/10.1021/acs.est.4c03361.
[23] Li, Xixi et al., "Tire additives: Evaluation of joint toxicity, design of new derivatives and mechanism analysis of free radical oxidation" (2024) 465 *J Hazardous Materials*, online at: https://www.sciencedirect.com/science/article/abs/pii/S0304389423025049.
[24] Varshney, Shubham et al. "Mixture toxicity of 6PPD-quinone and polystyrene nanoplastics in zebrafish" (2024) 348 *Environmental Pollution* 123835, online at: https://www.sciencedirect.com/science/article/pii/S0269749124005499.

concentrations of 6PPD-q.[25] Their first year of results was published in April 2024, covering a total of 1,922 grab samples over six rain events between September 2023 and March 2024 for 56 waterways and 123 sample sites.[26] The project team was able to identify preliminary trends from this data, including that peak concentrations most often occurred during the first one or two rainfalls of the season. At most locations the concentrations continued to decrease as the season progressed, unless there was a significant period of dry weather. Systems in larger urban population centres see greater concentrations of 6PPD-q when compared to systems in smaller population centres and rural environments.[27]

The three largest concentrations detected were 335.1 ng/L, 248.6 ng/L, and 220.9 ng/L, which were collected in the Vancouver Island cities of Duncan, Colwood, and Nanaimo, respectively.[28] 475 of the 1,434 creek samples collected before, during, and after rain events had 6PPD-q detected (33.1%), though many samples were below the limit of detection for this sampling method (6 ng/L).[29]

The sampling data from BC is particularly significant given the impacts to West Coast salmon including coho. However, as set out above, we now know 6PPD-q is toxic (both lethally and sub-lethally) to freshwater salmonids, including lake trout and rainbow trout. One study from March 2024 assessed urban streams entering Lake Ontario and waters adjacent to Toronto and Hamilton for 6PPD-q, concluding that concentrations may pose a risk in urban streams and nearshore waters of the region to fish and ecosystem health.[30]

A forthcoming study conducted in the United States sampled surface waters across the U.S. from 94 sites with varying land use (urban, agricultural, and forested) and streamflow to understand stream exposure to 6PPD-q.[31] As has been found in BC, 6PPD-q was frequently detected in stormwater and urban impacted sites, with the highest concentrations (above lethal levels for coho salmon) found during stormwater runoff events.

6. Conclusion on New Research

Our understanding of 6PPD-q's toxic effects and exposure within Canada will deepen as research continues. But this further research, and deeper understanding of the toxicity of this substance and other PPDs, is no reason for delay. The process for listing under Schedule 1 of

[25] BC Conservation Foundation, "Mitigating Inputs of Tire Wear Toxins to Protect Salmonid Habitat on Vancouver Island: Pilot Year & Year 1 Summary Report" (April 2024), online at: https://www.tireweartoxins.com/wp-content/uploads/2024/07/BCCF_Tech-Report-6PPDq_2023-2024-final_compressed.pdf [**BCCF Sampling Report**].

[26] BCCF Sampling Report, *supra* note 25 at p 36.

[27] BCCF Sampling Report, *supra* note 25 at p 65.

[28] BCCF Sampling Report, *supra* note 25 at p 39.

[29] BCCF Sampling Report, *supra* note 25 at p 40.

[30] Helm, Paul A et al. "Assessment of Tire-Additive Transformation Product 6PPD-Quinone in Urban-Impacted Watersheds" (2024) 4:4 ACS EST Water 1422, online at: https://pubs.acs.org/doi/10.1021/acsestwater.3c00589.

[31] Lane, Rachael F et al. "Tire-derived contaminants 6PPD and 6PPD-Q: Analysis, sample handling, and reconnaissance of United States stream exposures" (2024) 363 *Chemosphere* 142830 (forthcoming), online at: https://www.sciencedirect.com/science/article/pii/S0045653524017247.

CEPA must be initiated as soon as possible. Even if regulatory action with respect to 6PPD in tires was taken tomorrow, the lifespan of existing tires means that the effects of 6PPD will continue to be felt in the Canadian environment for years to come.

Regulatory Action in Other Jurisdictions

Regulatory steps being taken in other jurisdictions are relevant as a model for what Canada can achieve.

CEPA mandates that "[t]he Minister shall, to the extent possible, cooperate and develop procedures with jurisdictions, other than the Government of Canada, to exchange information respecting substances that are specifically prohibited or substantially restricted by or under the legislation of those jurisdictions for environmental or health reasons".[32] CEPA further provides that where the Minister is notified of decisions taken in another jurisdiction to restrict or prohibit a substance for environmental or health reasons, the Minister shall review it, to determine whether the substance is toxic or capable of becoming toxic.[33]

The Request outlined a number of regulatory steps that had been taken or proposed to be taken at the federal level in the United States, by Washington and California, and in the European Union.

Action in response to the threat posed by 6PPD has continued, as detailed below.

1. *The United States*

The US Environmental Protection Agency ("**EPA**") plans to propose a rule under section 8(d) of the *Toxic Substances Control Act*[34] that would require manufacturers of the substance to report to the EPA certain information, including unpublished health and safety studies. The rule is expected to be finalized by 2025, with reporting required within 90 days thereafter.

Through a peer-reviewed research process, in May 2024 the EPA published screening values for aquatic life in freshwater for both 6PPD[35] and 6PPD-q.[36] The screening value concentration for 6PPD-q was set at 0.011 ug/L, which is expected to be protective of 95 percent of freshwater species exposed to 6PPD-q for short durations (one hour or less), including coho salmon.[37] The

[32] CEPA, *supra* note 1 at s 75(2).
[33] CEPA, *supra* note 1 at s 75(3).
[34] *Toxic Substances Control Act*, (15 U.S.C. 2601-2692) s 8(d), online at https://www.govinfo.gov/content/pkg/COMPS-895/pdf/COMPS-895.pdf.
[35] "Acute Aquatic Life Screening Value for 6PPD in Freshwater", US EPA, Office of Water, Health and Ecological Criteria Division, Ecological Risk Assessment Branch, Washington, DC, (May 2024), online at: https://www.epa.gov/system/files/documents/2024-05/6ppd-screening-value-2024.pdf.
[36] "Acute Aquatic Life Screening Value for 6PPD-quinone in Freshwater", US EPA, Office of Water, Health and Ecological Criteria Division, Ecological Risk Assessment Branch, Washington, DC, (May 2024), online at: https://www.epa.gov/system/files/documents/2024-05/6ppd-q-screening-value-2024.pdf. The document notes that the screening value is expected to be updated as additional data become available, given that research on this contaminant is still emerging.
[37] *Ibid*., p xiv.

intention of the research setting the screening values is to provide information for states and authorized Tribes to consider in their own water quality protection programs.

The United States is providing funding to implement stormwater management through its Clean Water State Revolving Fund, which addresses emerging contaminants, including 6PPD.[38] This is another example of an immediate mitigation step that can be taken while 6PPD is still in use.

2. *Washington*

Stormwater management is also being pursued in the state of Washington, where the Department of Ecology has proposed adding requirements to address 6PPD through municipal and industrial stormwater permits to manage and control runoff and prevent downstream pollution.[39] The updated permits, effective for the five years from August 1, 2024, include changes aimed at preventing pollutants, including 6PPD, from reaching waterways, among them:[40]

- Requiring new development projects to incorporate run-off treatment and flow control best management practices;
- Increasing the stormwater retrofits required for existing development to address areas without adequate stormwater treatment; and
- Adding a street sweeping requirement to collect pollutants before they are washed into downstream waters.

The changes are based on research showing that interventions including slowing runoff and reducing runoff volumes by holding stormwater back with ponds, infiltration basins and the like, as well as removing 6PPD-q runoff through filtration or chemical sorption, are effective mitigation measures.[41]

3. *California*

California introduced the *Saving Aquatic Life from Manufactured Oxidized Nanochemicals Act* (*SALMON Act*) earlier this year.[42] The *SALMON Act* provides for the development of an environmental review process to prevent 6PPD and 6PPD-q from entering waters that contain salmon and steelhead trout, with assistance from neighbouring states Washington and Oregon. The review process is meant to inform sampling frequency and timing, monitoring and reporting protocols and project locations.[43]

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[38] Clean Water State Revolving Fund (26 July 2024), online at: https://www.epa.gov/cwsrf/clean-water-state-revolving-fund-emerging-contaminants.
[39] *Focus on: Municipal Stormwater and 6PPD* (Washington State: Department of Ecology, 2024) at 1, online at: https://apps.ecology.wa.gov/publications/documents/2410045.pdf.
[40] *Ibid*., p 2.
[41] *Ibid*.
[42] Assembly Bill-1798, Department of Transportation: contaminated stormwater runoff: salmon and steelhead trout bearing surface waters, 2023-2924 Reg Sess, California Legislature, online at: https://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=202320240AB1798&showamends=false.
[43] *Ibid*., at article 3.6.

The *SALMON Act* further mandates five pilot projects to compare the effectiveness of bioretention and biofiltration systems at eliminating the discharge of 6PPD and 6PPD-q into surface waters. The study must also measure effectiveness at controlling the discharge of microplastics, including tire wear particles.[44]

4. European Union

In April 2024, the Council of the European Union adopted the Euro 7 regulation to reduce vehicle emissions.[45] While not aimed explicitly at 6PPD, the regulation establishes rules for emissions of tire and brake particles, going beyond tailpipe exhaust as a target for vehicle emissions for the first time. The assessment accompanying the regulation showed that due to electrification, by 2050, non-exhaust particles are anticipated to comprise 90% of all particles emitted by road transport.[46] As a result, the regulation demands that tires test below specified abrasion rates, pursuant to phased-in requirements.[47]

The Need for Regulatory Action Without Delay is Clear

The initial evidence is clear: 6PPD-q is entering the environment in quantities, concentrations and under conditions that are having an immediate harmful effect on coho salmon and other aquatic species. This alone supports the need for urgent assessment and regulation, particularly in light of the precautionary principle that guides work under CEPA pursuant to section 2.

The workplan states that the assessment of 6PPD, 6PPD-q and related PPDs is underway as of "Fall 2024". We welcome confirmation of the timeline for completion of the assessment, to be in compliance with the requirements of section 73 of CEPA. As the evidence set out above makes clear, 6PPD and 6PPD-q are toxic substances that may be listed pursuant to the criteria set out in s 90(1) of the Act.

The need for action is even clearer when considering 6PPD and its transformation products is just one of many emerging contaminants of concern from road run-off. The impacts from contaminants in road run-off will only become more pronounced as heavier electric vehicles replace fuel transmission cars, and as climate change brings cycles of drought and flooding that wash more roadway contaminants into rivers and streams.

Given Canada's goal to phase out the sale of new gasoline cars by 2025, the European Union is an example that should be emulated in moving to regulate non-tailpipe emissions, notably from tire wear and brake wear.

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[44] *Ibid*.

[45] Regulation of the European Parliament and of the Council on type-approval of motor vehicles and engines and of systems, components and separate technical units intended for such vehicles, with respect to their emissions and battery durability (Euro 7), (3 April 2024), online at: https://data.consilium.europa.eu/doc/document/PE-109-2023-INIT/en/pdf.

[46] *Ibid*., at para 20.

[47] *Ibid*.

Other jurisdictions are experimenting with bioretention and filtration systems to capture road runoff contaminants before they are washed into waterways. These are actions that can be taken straight away, to mitigate harms while tires containing 6PPD continue to be produced.

There is no excuse for Canada to fall behind other jurisdictions in addressing PPDs, particularly when the harm from 6PPD-q to coho salmon is so stark, and when emerging research points to more wide-ranging effects on other salmonids, including lake trout and rainbow trout.

CEPA is dedicated to sustainable development through pollution prevention. But pollution can only be prevented with timely action. Where evidence of toxicity pursuant to the definition in s 64(a) of CEPA is clear, and where a suite of actions is being taken in the United States and the European Union that Canada can draw on to inform its own regulatory approach, there is no reason to delay a listing of 6PPD and its transformation products under Schedule 1.

The Plan of Priorities is a roadmap for how to sequence the study and potential regulation of chemicals of concern. It must not, however, act as a further bureaucratic hurdle to delay a Schedule 1 listing in the case of substances like 6PPD, where the evidence of toxicity is so manifest.

Please confirm the timelines for initiating this assessment as required by CEPA, and how our clients may participate in this process. We would be pleased to have a call to discuss this further, and look forward to hearing from you.

Respectfully,

Lindsay Beck
Barrister & Solicitor

Daniel Cheater
Barrister & Solicitor

cc: The Honourable Steven Guilbeault, Minister of Environment and Climate Change