BEYOND PESTICIDES
701 E Street, SE ▪ Washington DC 20003
202-543-5450 phone ▪ 202-543-4791 fax
info@beyondpesticides.org ▪ www.beyondpesticides.org

August 27, 2020

Patty Kouyoumdjian, Executive Officer
Russell Norman, P.E.
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

Joanne Marchetta, Executive Director
Dennis Zabaglo, Aquatic Resources Program Manager
Tahoe Regional Planning Agency
128 Market Street
Stateline, NV 89449

Re: Draft Environmental Impact Report (EIR) in accordance with the California Environmental Quality Act (CEQA) and a TRPA Environmental **Impact Statement (EIS) for the proposed Tahoe Keys Lagoons Aquatic Weed Control Methods Test**

Dear Ms. Kouyoumdjian, Ms. Marchetta, Mr. Norman, and Mr. Zabaglo:

These comments are submitted on behalf of Beyond Pesticides and the Toiyabe Chapter of the Sierra Club. Founded in 1981 as a national, grassroots, membership organization that represents community-based organizations and a range of people seeking to bridge the interests of consumers, farmers and farmworkers, Beyond Pesticides advances improved protections from pesticides and alternative pest management strategies that reduce or eliminate a reliance on pesticides. Our membership and network span the 50 states and the world. Sierra Club's Toiyabe Chapter is the region's largest volunteer, grassroots conservation organization, working in Nevada and eastern California to protect our public lands, wildlife refuges, forests, parks and wilderness for all.

We are writing in response to the call for comments on the draft EIR/EIS for the proposed Tahoe Keys Lagoons Aquatic Weed Control Methods Test. In general, we find the draft EIR/EIS fairly detailed and thorough. The historical background and scope of the aquatic weed infestation in Lake Tahoe and the Tahoe Keys lagoons specifically are well described. Details of the various control alternatives to be considered for testing are also well explained, except the final location of the anticipated test plot locations may be adjusted based on the results of spring macrophyte surveys to ensure that target weed infestations are dominant in

treatment areas. In addition, it is not certain that the herbicide florpyrauxifen-benzyl will be included as it is pending approval for use in California and the herbicide triclopyr would be its declared substitute. A subjective choice of exact plot based on perceived level of infestation and/or pesticide used could introduce some degree of experimental bias in the test program and impact interpretation of the results.

We agree with the draft EIR/EIS authors that the Action Alternative 1: Testing of Non-Herbicidal Methods Only is the environmentally superior choice and recommend that the TRPA/LRWQCB select this alternative for the proposed weed control test program. The herbicides chosen for consideration in this program pose risks of potential health and environmental harm not fully assessed in the EIR/EIS and the non-herbicidal methods alone may prove sufficiently effective for the weed control sought.

Herbicide risks not fully considered in the EIR/EIS

Florpyrauxifen-benzyl (ProcellaCOR EC liquid) is a recently registered systemic herbicide in the U.S. that is a member of a new class of synthetic auxins (plant growth hormones), the arylpicolinates.[1] The herbicide differs in binding affinity compared to other currently registered synthetic auxins and is effective at substantially lower concentrations than existing aquatic herbicides. Synthetic auxins at herbicidal rates overstimulate plant growth and cause excessive elongation of plant cells that ultimately kills the plant.[2] Susceptible plants will show a mixture of atypical growth (larger, twisted leaves, stem elongation) and fragility of leaf and shoot tissue. Conceivably, an indirect environmental impact of a synthetic auxin used in spot treatments, as its use is proposed in the weed control test program, is stimulation and excessive weed growth in untreated areas adjacent to the treatment plots due to diluted dispersal of the synthetic plant growth hormone—hence, potentially exacerbating an aquatic weed problem in untreated areas.

This herbicide has not presently been approved for use by California and may not be included in the test program unless approved. EPA has identified no risks of concern to human health since no adverse acute or chronic effects, including carcinogenicity or mutagenicity, were observed in the submitted toxicological studies for florpyrauxifen-benzyl regardless of the route of exposure.[3] However, the European Food Safety Authority (EFSA) determined that the endocrine disruption potential for this compound has to be addressed with regards to the occurrence of mammary gland tumors observed in males in a 2-year rat study. It was recommended that the underlying mode of action needs to be investigated with at

[1] Wisconsin Department of Natural Resources. 2018. Florpyrauxifen-benzyl Chemical Fact Sheet. Florpyrauxifen-benzyl_ProcellaCOR_Fact-Sheet.pdf

[2] Ibid.

[3] EPA. 2017. Florpyrauxifen-benzyl: New Active Ingredient, First Food Use. Human Health Risk Assessment for the Establishment of Permanent Tolerances on Rice, Fish, and Shellfish and Registration for Uses on Rice and Freshwater Aquatic Weed Control. EPA-HQ-OPP-2016-0560-0013.pdf.

least *in vitro* studies (e.g. estrogen receptor binding and transduction assay).[4] For ecological effects, no toxicity of concern to terrestrial non-plant wildlife was identified in the submitted studies. However, although risks to aquatic animals were deemed minimal by EPA, a deeper examination of the data do raise some uncertainties and legitimate concerns. A key confounder is that florpyrauxifen-benzyl is a difficult-to-test substance with maximum native solubility of ~ 15 µg/L and only around 50 µg/L with use of a cosolvent.[5] Although no mortalities to aquatic animals were observed up to solubility limits in acute exposures, certain sublethal effects were recorded. In chronic exposures, the mysid (*Americamysis bahia*) and midge (*Chironomus dilutus*), toxic effects were recorded at the lowest concentrations tested (LOAEC 1.1 µg/L and LOAEC 4 µg/L respectively) such that NOAEC values could not be determined. Therefore, statistically significant effects below concentrations of 1 to 4 µg/L can be expected.[6] Albeit the maximum label rate for the PorecellaCOR EC liquid is 50 µg/L, the maximum proposed rate for the project is listed as 3 µg/L which would indicate a potential threat to aquatic invertebrates with similar sensitivities, such as the mysid *Mysis relicta* which can be found in the Tahoe Keys lagoons.

Although the mysid *M. relicta* is a non-native species introduced into Lake Tahoe in the early 1960s and considered somewhat invasive and detrimental to Lake Tahoe clarity,[7,8] toxicity of florpyrauxifen-benzyl to mysids is nonetheless relevant as a surrogate for other potentially susceptible aquatic invertebrate taxa. Toxicity data reported in EPA's risk assessment[9] were for only seven species to represent literally thousands of aquatic invertebrate species, and two of these tested species (a mysid and a midge) demonstrated sensitivity below the expected exposure concentrations. Therefore, the use of florpyrauxifen-benzyl in the Tahoe Keys weed control test program would likely impact invertebrate populations and community with uncertain long-term consequences.

Triclopyr (Renovate liquid or granular) is in the carboxylic acid chemical family and another, though structurally different, synthetic auxin that, similar to other herbicides with this mode of action, causes the growing tips of the plant to elongate, followed by distortion, withering, and the death of the plant.[10] The most common breakdown product of triclopyr in

[4] European Food Safety Authority (EFSA), Arena, M., Auteri, D., Barmaz, S., Brancato, A., Brocca, D., Bura, L., Carrasco Cabrera, L., Chaideftou, E., Chiusolo, A. and Civitella, C., 2018. Peer review of the pesticide risk assessment of the active substance florpyrauxifen (variant assessed florpyrauxifen-benzyl). *EFSA Journal*, *16*(8), p.e05378.
[5] EPA. 2017. Florpyrauxifen-benzyl: Environmental Fate and Ecological Risk Assessment for the Section 3 New Chemical Registration. EPA-HQ-OPP-2016-0560-0011.pdf.
[6] EPA. 2017. Florpyrauxifen-benzyl: Environmental Fate and Ecological Risk Assessment for the Section 3 New Chemical Registration. EPA-HQ-OPP-2016-0560-0011.pdf.
[7] Morgan, M.D., Threlkeld, S.T. and Goldman, C.R., 1978. Impact of the introduction of kokanee (Oncorhynchus nerka) and opossum shrimp (Mysis relicta) on a subalpine lake. *Journal of the Fisheries Board of Canada*, *35*(12), pp.1572-1579.
[8] Richards R, Goldman C, Byron E, Levitan C. 1991. The mysids and lake trout of Lake Tahoe: a 25-year history of changes in the fertility, plankton, and fishery of an alpine lake. Am Fish Soc Symp 9:30-8.
[9] EPA. 2017. Florpyrauxifen-benzyl: Environmental Fate and Ecological Risk Assessment for the Section 3 New Chemical Registration. EPA-HQ-OPP-2016-0560-0011.pdf.
[10] Ware, G.W. 2000. The pesticide book. Fifth edition. Fresno CA: Thompson Publications. p. 190

mammals, as well as in soil and water, is 3,5,6-trichloro-2-pyridinol (TCP)[11] and also, of note, the highly toxic and controversial organophosphate insecticide chlorpyrifos which is banned in California. The most significant health hazard identified for TCP is that it may be especially hazardous to children. Researchers studied the ability of TCP to disrupt the development and maturation of the nervous system that occurs in fetuses, infants, and children.[12] Using a laboratory test system (a cell culture), the researchers showed that exposure to TCP inhibits neurons (nervous system cells) from undergoing normal growth. Concentrations of only 0.2 ppm were sufficient to disrupt growth.[13] Concentrations equal to this level have been measured in the brains of fetal laboratory animals whose mothers were exposed to pesticides. In addition, when researchers compared TCP concentrations in brains of fetal laboratory animals with those in their mothers' brains, the fetal concentrations were between two and four times greater than those in maternal brains, suggesting that TCP accumulates in fetal brains.[14] TCP also poses an environmental hazard as it is "very mobile" in a variety of soil types and is also often more persistent than triclopyr itself.[15] The Renovate product for aquatic weed control contains the triclopyr triethylamine salt. Triethylamine is damaging to eyes and can cause abnormal vision and irreversible eye damage, it is extremely destructive to skin and the upper respiratory tract with symptoms of exposure that include coughing, wheezing, headache, and nausea.[16,17]

Endothall (Aquathol K liquid) is a currently-registered herbicide that is used for direct application to water (primary use) to control exotic and invasive plants. Endothall acid is the active ingredient in all of the endothall-containing herbicide formulations but is only formed as a degradation product. The endothall formulations consist of one of two endothall acid salts, either a dipotassium salt (Aquathol K) which is proposed for use in the weed control methods test or an N,N-dimethylalkylamine salt. The dissociation constants of both of the endothall salts indicate that at most environmental pH levels, the endothall salt, endothall acid, and the corresponding cation (potassium or coco-alkylamine) will all be present. In addition, there are significant differences in toxicity to certain organisms between the endothall dipotassium salt and the endothall N,N-dimethylalkylamine salt, the dipotassium salt being less toxic. Persistence (half-life) of the endothall acid (active ingredient) is expected to be <10 days in treated areas, however in EPA's exposure assessment[18] for direct application of Aquathol K to

[11] U.S. EPA. Prevention, Pesticides and Toxic Substances. 1998. Reregistration eligibility decision (RED): Triclopyr. Washington, D.C., Oct. Pp.2-5

[12]Das, K.P. and S. Barone. 1999. Neuronal differentiation in PC12 cells is inhibited by chlorpyrifos and its metabolites: Is acetylcholinesterase inhibition the site of action? Toxicol. Appl. Pharmacol. 160:217-230

[13] Das, K.P. and S. Barone. 1999. Neuronal differentiation in PC12 cells is inhibited by chlorpyrifos and its metabolites: Is acetylcholinesterase inhibition the site of action? Toxicol. Appl. Pharmacol. 160:217-230.

[14] Hunter, D.L., T.L. Lassiter, and S. Padilla. 1999. Gestational exposure to chlorpyrifos: Comparative distribution of trichloropyridinol in the fetus and the dam. Toxicol. Appl. Pharmacol. 158:16- 23.

[15] U.S. EPA. Prevention, Pesticides and Toxic Substances. 1998. Reregistration eligibility decision (RED): Triclopyr. Washington, D.C.

[16] U.S. EPA. Integrated Risk Information System. 1993. Triethylamine. www.epa.gov/iris

[17] Sigma Chemical Co. 2000. Material safety data sheet: Triethylamine. St. Louis, MO. http://info.sial.com.

[18] EPA. 2005. Environmental Fate and Ecological Risk Assessment of Endothall – Revised. EPA-HQ-OPP-2004-0370-0005.pdf.

an impoundment with an initial target exposure of 5 mg/L, the Estimated Exposure Concentration (EEC) at subsequent time intervals post-application was:

- 4-day = 4.7 mg/L
- 21-d = 3.8 mg/L
- 60-day = 2.4 mgL
- 90-day = 1.8 mg/L.

These concentrations would be expected to represent the upper bounds for endothall concentrations in the immediate vicinity of the weed control project endothall treatment sites. These concentrations pose a severe risk to finfish as significant reductions in survival, length, and wet weight were reported in a 28-day fathead minnow early life stage test at 2.6 mg/L for endothall acid which exceeds the relevant EEC.[19] Early life stage data are not available for Aquathol K or endothall acid for coldwater salmonid species that are prevalent in Lake Tahoe. Likewise, no life-cycle or reproduction toxicity data are available to assess chronic risk of endothall dipotassium salt or acid to fish. Additionally, there are insufficient data to assess potential endocrine disrupting effects of endothall in aquatic organisms.

The target endothall treatment rate of 5 mg/L and maximum concentrations that may be expected for several weeks in the Tahoe Keys test plots and adjacent lagoons exceed the Maximum Contaminant Level (MCL) for endothall in drinking water established by EPA of 0.1 mg/L. This will pose a significant risk to drinking water drawn from the Tahoe Keys waters and precautions/mitigation considered in the EIR/EIS may not be sufficient to prevent contaminated water supplies.

Conclusions and Recommendation

The EIR/EIS listed the following topics as areas of controversy:

- Potential environmental and health effects of using aquatic herbicides
- The need to act quickly on the environmental threat of the spread of aquatic weed
- Maintaining beneficial uses of the Tahoe Keys.

By proceeding with the Action Alternative 1: Testing of Non-Herbicidal Methods Only, the TRPA/LRWQCB would avoid valid environmental and health concerns arising from use of herbicidal chemicals. The non-herbicidal methods, including ultraviolet light, laminar flow aeration [LFA], bottom barriers, and diver-assisted techniques can be quickly implemented to reduce and curb the spread of current weed infestation. Such action is considered the environmentally superior choice for the weed control test program and it maintains the beneficial uses of the Tahoe Keys. If these methods prove effective, then a large-scale

[19] EPA. 2005. Environmental Fate and Ecological Risk Assessment of Endothall – Revised. EPA-HQ-OPP-2004-0370-0005.pdf.

implementation of these methods can begin and avoid any future consideration or use of herbicidal products and their inherent risks.

We disagree with the general conclusion in the EIR/EIS that "all effects for the Proposed Project and Action Alternatives have been reduced to less than significance". The Proposed Project, Action Alternatives, and the No Action Alternative all could have potentially significant effects to water quality issues (water temperature, turbidity, dispersal of aquatic fragments, changes in pH, dissolved oxygen, total phosphorus, and total nitrogen concentrations) and aquatic community stability (species diversity, species dominance, seasonal succession). The limited herbicide spot-treatment usage as part of the Proposed Project poses substantial localized risks to human health and environment as earlier detailed. A full-scale herbicide use throughout the Tahoe Keys lagoons would be seriously detrimental to the Keys and potentially to the broader Lake Tahoe. We believe that the Action Alternative 1: Testing of Non-Herbicidal Methods Only would have the least potential for any serious and unwanted effects. Action Alternative 1 is the environmentally superior choice and will likely demonstrate the effectiveness of non-herbicidal methods in controlling the aquatic weed problem. We recommend that the TRPA/LRWQCB select this alternative for the proposed weed control test program.

Nutrient inputs into the Tahoe Keys, separate from the weed test control program, from residential and landscape fertilizer use and vehicular (auto and boat) exhaust emissions[20] contribute to the eutrophication and weed problem in the Keys and Lake Tahoe in general. We also recommend that TRPA/LRWQCB continue and expand existing efforts limiting nutrient inputs that aggravate aquatic weed proliferation in the Tahoe Keys lagoons and will continue to hinder weed control efforts.

Respectfully,

Leslie W. Touart, Ph.D.
Senior Science and Policy Analyst

[20] Lee, G. F. and Jones-Lee, A. 1992. Role of Vehicular Exhaust NOx and Lawn-Shrubbery Fertilizers as a Cause of Water Quality Deterioration in Lake Tahoe, Report of G. Fred Lee & Associates, El Macero, CA.