INITIAL STATEMENT OF REASONS AND PUBLIC REPORT
DEPARTMENT OF PESTICIDE REGULATION

Title 3. California Code of Regulations
Amend Section 6147
Pertaining to Exempted Pesticide Products

This is the Initial Statement of Reasons required by Government Code section 11346.2(b) and the public report specified in section 6110 of Title 3, California Code of Regulations (3 CCR). Section 6110 meets the requirement of Title 14, CCR section 15252 and Public Resources Code section 21080.5 pertaining to state regulatory programs certified under the California Environmental Quality Act (CEQA).

SUMMARY OF PROPOSED ACTION/PESTICIDE REGULATORY PROGRAM ACTIVITIES AFFECTED

The Department of Pesticide Regulation (DPR) proposes to amend 3 CCR section 6147(a)(5)(A). This proposal will affect pesticide regulatory program activities pertaining to pesticide registration. In summary, the proposed action will add chitosan to the list of active ingredients permitted in exempted pesticide products. This proposed action will mirror the U.S. Environmental Protection Agency's (U.S. EPA) recent action adding chitosan to Title 40, Code of Federal Regulations (40 CFR) section 152.25(f)(1) that was published in the Federal Register Vol. 87, No. 67364 on November 8, 2022.

SPECIFIC PURPOSE AND FACTUAL BASIS

Background

Both U.S. EPA and DPR have regulatory authority over the registration, sale, and use of pesticide products in California. With certain limited exceptions that do not pertain to this regulatory action, pesticide products must be registered with U.S. EPA before being registered and authorized for sale in California.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) authorizes U.S. EPA to exempt certain products from pesticide registration if "the Administrator determines [the pesticide] either: (1) to be adequately regulated by another Federal agency; or (2) to be a of a character which is unnecessary to be subject to this Act in order to carry out the purposes of the Act." (FIFRA 25(b), 7 U.S.C. § 136w(b).) Per this authority, the U.S. EPA has designated certain active ingredients as "minimum risk pesticides" because they pose little or no risk to human health or the environment. Pesticide products containing these active ingredients that meet the additional composition and labeling requirements specified in federal regulation are exempt from regulation under FIFRA. (See 40 CFR § 152.25.) The composition and labeling requirements that these "minimum risk pesticide" products must meet include the following six conditions: (1) the active ingredients must only be those listed in 40 CFR § 152.25(f)(1); (2) the product may

only include inert ingredients listed in 40 CFR § 152.25(f)(1), commonly consumed food commodities, animal feed items, and edible fats and oils as described in 40 CFR § 180.950(a), (b), and (c), and certain chemical substances listed in 40 CFR 180.950(e); (3) all active and inert ingredients must be listed on the label by label display name along with the percentage by weight of the active ingredient(s); (4) the product must not bear claims either to control or mitigate organisms that pose a threat to human health, or insects or rodents carrying specific diseases; (5) the name of the producer or the company for whom the product was produced and the company's contact information must be displayed prominently on the product label; and (6) the label cannot include any false or misleading statements.

Food and Agricultural Code (FAC) section 12803 authorizes DPR, by regulation, to exempt from all or part of the requirements of FAC Division 7, including registration, a pesticide exempted pursuant to FIFRA section 25(b). In order for a substance to be exempt from FAC Division 7, including registration, the Director must individually evaluate each substance and concur with U.S. EPA's exemption decision. In addition, the Director must exclude from the exempting regulation those specific requirements of FAC Division 7 that "may otherwise be applicable and that are necessary to protect the public health or the environment." FAC section 12803 also states that "Notwithstanding any other provision of law, the Director shall retain authority to regulate any substance exempted pursuant to this section whether registered or not." In 2000, DPR adopted 3 CCR section 6147 to exempt certain pesticide products from the requirements of FAC Division 7, including those "minimum risk pesticides" U.S. EPA determined pose little to no risk to human health or the environment.

In November 2022, U.S. EPA revised its list of active ingredients in 40 CFR section 152.25(f)(1) by adding a substance commonly referred to as chitosan (also known by its chemical name: poly-D-glucosamine) (CAS No. 9012-76-4). The U.S. EPA listing also includes chitosan salts that are only formed when chitosan is mixed with the acids listed as active or inert ingredients eligible for use in minimum risk pesticide products. Chitosan is a naturally occurring substance found in the cell walls of many fungi. Chitosan also occurs in the shells of all crustaceans (e.g., crab, shrimp, and lobster) and in the exoskeletons of most insects. Microorganisms in nature produce enzymes that break down chitosan, resulting in sugars that are metabolized as a carbon and nitrogen source.

By policy, U.S. EPA considers the following seven factors before an active ingredient is added to the list of exemptions from FIFRA requirements in 40 CFR § 152.25(f)(1). However, these factors are not meant to be absolute criteria.

1) Whether a pesticide product is widely available to the general public
2) If it is a common food or a constituent of a common food
3) If it has a nontoxic mode of action
4) If it is recognized by the US Food and Drug Administration (FDA) as safe
5) If there is no information showing significant adverse effects
6) If its use pattern will result in significant exposure
7) If it is likely to be persistent in the environment

U.S. EPA's exemption decision indicated that the agency reviewed available information on chitosan and chitosan salts and determined that chitosan (including chitosan salts) met these criteria and would not pose any risks to human health and the environment if they were classified as minimum risk pesticides (Pesticides, 2022).

Following U.S. EPA's exemption decision, DPR evaluated chitosan and its salts to determine whether chitosan (including chitosan salts) should be added to the list of active ingredients permitted in exempted pesticide products in 3 CCR section 6147(a)(5)(A) pursuant to FAC section 12803. After a thorough investigation of existing data in DPR's database and the open scientific literature, DPR concurs with U.S. EPA's decision. DPR does not expect this designation to pose unacceptable risk to the environment. The available evidence consistently suggests chitosan and its salts show low human health toxicity. Although there are uncertainties associated with factors such as molecular weight and degree of deacetylation of chitosan and its influence on the toxicity of chitosan, using chitosan manufactured for food or biomedical use will limit these uncertainties. In addition, the open scientific literature does not contain enough information to ascertain how the molecular weight or degree of deacetylation will influence the toxicity of chitosan salts formed by combining chitosan with acids currently listed on inerts list and those acids that might be added to this list by the U.S.EPA in the future. However, the limited data available suggests these salts are of low toxicity. The standard method for solubilizing chitosan uses acetic acid, and the toxicity data for chitosan acetate correlates to the human toxicity data available for chitosan (Pesticides, 2022). Overall, DPR's review of the current data supports adding chitosan and chitosan salts to 3 CCR section 6147(a)(5)(A).

Proposed Changes

DPR is proposing to amend 3 CCR section 6147(a)(5)(A) to add chitosan to the list of active ingredients allowed in minimum risk pesticide products exempted from FAC Division 7, including registration. Additionally, DPR is proposing to add a footnote specifying that chitosan also includes chitosan salts that are only formed when chitosan is mixed with the acids listed as active or inert ingredients eligible for use in minimum risk pesticide products. DPR determined that pesticide products containing chitosan (including its salts) and meeting the conditions specified in the regulation pose minimal risks to users.

The available evidence (Pesticides, 2022) consistently suggests chitosan and its salts generally show low toxicity and DPR has not received adverse effects or illness reports to show otherwise. Some formulated products containing chitosan and its salts that DPR evaluated showed a potential to pose minimal eye irritation hazard. However, open literature data for pure chitosan shows that eye irritation tests in rabbits did not show irritating effects (Rao & Sharma, 1997). The eye irritation potential of a formulated product is a combined result of the active and inert ingredients in a formulation. Considering open literature data for pure chitosan shows that chitosan by itself is not irritating to the eye, the inert ingredients in these formulations could have contributed to the eye irritation potential of these products. DPR did not find conclusive evidence that pure chitosan can be irritating via the ocular route.

Overall, DPR concurs with U.S. EPA's determination that chitosan and chitosan salts, when used under the conditions specified in proposed subsection (a)(5)(A), do not need to be subject to pesticide regulatory requirements. Exempting pesticides that contain chitosan from the requirements of FAC Division 7, including registration, means that manufacturers, importers, and dealers of such products will no longer need to obtain a certificate of registration from DPR before selling the products for use in California. In addition, such products will no longer be subject to other requirements of FAC Division 7, such as the payment of mill assessment on sales of the products. DPR concludes that the exemption of these pesticides as proposed will not pose unreasonable risks to public health or the environment.

CONSULTATION WITH OTHER AGENCIES

At the September 15, 2023, meeting of DPR's Pesticide Registration and Evaluation Committee (PREC), DPR staff from the Pesticide Registration and Human Health Assessment Branches made a presentation titled "Proposal to Add Chitosan to List of Active Ingredients Allowed in Minimum Risk Pesticides." In their presentation, staff discussed adding chitosan to the list of pesticidal active ingredients permitted in exempted pesticide products according to 3 CCR section 6147(a)(5)(A). Staff also presented findings that support DPR's concurrence with U.S. EPA that chitosan and its salts pose minimum risk to humans. This committee includes representatives from public agencies who have jurisdiction over activities or resources that may be affected by the use of pesticides. A copy of the PREC minutes is contained in the rulemaking file.

ALTERNATIVES TO THE PROPOSED REGULATORY ACTION [GOVERNMENT CODE SECTION 11346.2(b)(4)]

DPR has not identified any feasible alternatives to the proposed regulatory action that would achieve the purpose of the regulation with less possible adverse economic impacts, including any impacts on small businesses, and invites the submission of suggested alternatives. The proposed regulations will add chitosan to the list of active ingredients permitted in exempted pesticide products.

ECONOMIC IMPACT ON BUSINESSES [GOVERNMENT CODE SECTION 11346.2(b)(5)(A)]

The proposed regulations will not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states. The proposed regulations will add chitosan to the list of active ingredients permitted in exempted pesticide products. DPR has determined that the proposed regulatory action will not result in any increased costs. Without this exemption, an applicant would be required to register the chitosan product(s) which entails generating supporting data and paying registration and annual renewal fees. Applicants for new products would save the initial cost of $1,500

(application processing fee) and existing registered products would save in annual fees of $2,300 (renewal fee).

ECONOMIC IMPACT ASSESSMENT PURSUANT TO SECTION 11346.3(b)

The proposed action will not create or eliminate jobs in California; result in the creation of new businesses or the elimination of existing businesses within the State of California; or result in an expansion of businesses currently doing business with the State of California. Exempting pesticides that contain chitosan from the requirements of FAC Division 7, including registration, means that manufacturers, importers, and dealers of such products will no longer need to obtain a certificate of registration from DPR before selling the products for use in California, which will result in a savings in registration and renewal fees. In addition, such products will no longer be subject to other requirements of FAC Division 7, such as the payment of mill assessment on sales of the products.

This proposed action will benefit the health and welfare of California residents, worker safety, and environment by increasing alternatives to conventional pesticide products. Adding chitosan to the list of active ingredients will reduce regulatory burden on manufacturers who sell and distribute chitosan products in California. This may lead to increased production of chitosan pesticidal products. In turn, consumers may see lower costs for chitosan-based pesticidal products, and potentially a wider availability of these products.

IDENTIFICATION OF ANY SIGNIFICANT ADVERSE ENVIRONMENTAL EFFECT THAT CAN REASONABLY BE EXPECTED TO OCCUR FROM IMPLEMENTING THE PROPOSAL

The Secretary of Natural Resources determined that DPR's pesticide regulatory program, including the adoption, amendment, and repeal of pesticide regulations, qualifies as a certified regulatory program under Public Resources Code section 21080.5 and title 14, California Code of Regulations (14 CCR) section 15251(i). This determination means DPR's pesticide regulatory program is functionally equivalent to the California Environmental Quality Act's (CEQA) requirements for preparing environmental impact reports (EIRs), negative declarations, and initial studies, and is therefore exempt from such requirements. This initial statement of reasons serves as the public report required under 3 CCR section 6110 and satisfies the requirements of DPR's CEQA certified regulatory program for rulemakings at 3 CCR sections 6110–6116.

DPR's public report, as the substitute document satisfying CEQA functional equivalency requirements, must include a description of the proposed activity, and either (A) alternatives to the activity and mitigation measures to avoid or reduce any significant effects that the project might have on the environment, or (B) a statement that DPR's review of the project showed that the project would not have any significant effects on the environment and therefore no alternatives or mitigation measures are proposed to avoid or reduce any significant effects on the environment. (3 CCR section 6110.) DPR shall not adopt a regulation that would cause a

significant adverse environmental impact if there is a feasible alternative or mitigation measure that would substantially lessen those significant adverse environmental impacts. (3 CCR section 6116.)

Pursuant to FAC section 12803, DPR, by regulation may exempt a pesticide that is exempt pursuant to FIFRA section 25(b) from all or part of FAC Division 7 subject to specified conditions. In 2000, DPR adopted 3 CCR section 6147 to exempt certain pesticide products from registration, including those "minimum risk pesticides" U.S. EPA determined pursuant to FIFRA section 25(b) pose little to no risk to human health or the environment. In November 2022, U.S. EPA added chitosan to its list of active ingredients eligible for use in minimum risk pesticides exempt from registration and other requirements of FIFRA. The U.S. EPA listing also includes chitosan salts that are only formed when chitosan is mixed with the acids listed as active or inert ingredients eligible for use in minimum risk pesticide products.

Following the federal exemption decision, DPR has conducted an independent review of the toxicity profile of chitosan and chitosan salts to determine whether they should be added to the list of California state-exempted pesticide products or whether such an exemption would pose unacceptable risks to human health and the environment (3 CCR section 6147(a)(5)(A)). Existing data in DPR's database shows that eight chitosan-related products have previously been evaluated by DPR. Chitosan is added as an active ingredient for various purposes across these products (e.g., as a fungicide, a plant growth regulator, an anti-microbial agent, and an adjuvant).

In addition to exposure to humans and the environment via intentional uses of chitosan-containing products, naturally-occurring chitosan, as well as its sole natural source, chitin, are widespread in the environment in the form of shells of aquatic organisms (e.g., marine and freshwater crustaceans and mollusks), soil microorganisms, and insect exoskeletons. Chitosan exhibit high biocompatibility and biodegradability making it environmentally nontoxic (Alves & Mano, 2008). A search of the EPA's Incident Data System database did not reveal any human health or ecological incidents pertaining to the use of chitosan as a pesticide. No adverse effects are expected when non-target organisms are exposed to chitosan. Intentional applications of chitosan as a pesticide likely would not persist in the environment due to ubiquitous presence of chitosan-degrading microorganisms. Therefore, DPR concurs with U.S. EPA's determination that based on all of the information available, there are no risk concerns for the environment if chitosan is intended for use as a minimum risk pesticide.

DPR's database contains acute studies for eight formulated products containing chitosan. In the areas of acute oral and dermal toxicity, acute inhalation toxicity, and skin sensitization potential, chitosan was mostly classified as U.S. EPA Toxicity Category IV (i.e., the lowest toxicity rating which indicates the product is practically non-toxic and not an irritant) across various products. For a few previously evaluated formulated products that contain chitosan as an active ingredient, primary eye and skin irritation hazards were given a classification of U.S. EPA Toxicity Category III (i.e., moderately irritating) (US EPA, 2018). DPR could not find conclusive evidence that pure chitosan irritates the eye or skin. The open literature data shows that eye irritation tests in rabbits and skin irritation tests in guinea pigs using pure chitosan did not show any irritating effects (Rao & Sharma, 1997) which indicates that the ingredients in these

formulations could have contributed to the irritation potential of these products and supports DPR's conclusion that pure chitosan poses a minimal risk to consumers.

DPR's database did not contain any products where chitosan salts were listed as an active ingredient, so an open literature search was conducted. DPR found that available toxicity data from open technical literature suggests that in its pure form, these salts show minimal acute and subchronic toxicity, is not a sensitizer or an allergen, and is not genotoxic, mutagenic, or carcinogenic. Available scientific literature indicates that chitosan and chitosan salts are used in many biomedical products, such as wound dressings, hair and skin care products, and dietary supplements (National Toxicology Program, 2017). Multiple studies conducted by various parties concluded that chitosan and chitosan salts did not cause any adverse effects (Gades & Stern, 2003; Gades & Stern, 2005; Rao & Sharma, 1997; De Jesús Valle et al., 2008; Xia et al., 2022).

Chitosan was first registered as a pesticide with DPR in 2001. In more than 20 years since its registration, DPR has not received any adverse effects or illness reports for chitosan or its salts. An open literature search focused on incidences or cases reporting allergic reactions to chitosan yielded seven such cases (Peng et al., 2022). Chitosan has been a popular weight loss supplement for many years and is widely used in a myriad of biomedical applications. With its widespread use, the seven known cases of allergic response to chitosan containing products highlight the rarity of such reactions. Therefore, allergic reactions to chitosan and its derivatives are unlikely and will be further limited by using chitosan manufactured for food and biomedical use.

FAC section 12803(b) requires DPR to exclude from the exempting regulation any specific requirements that are necessary to protect public health and the environment. Therefore, even after a product is listed as being exempted, DPR requires the submission of reports of any adverse effects that result from the use of these exempted products. Section 6147(b) establishes that manufacturers, importers, and dealers of exempted products are required to report any factual or scientific evidence of any adverse effect or risk to human health or the environment to DPR within 60 days of learning of the information. Requiring adverse effects reporting allows DPR to obtain information on exempted products and, if necessary, reassess its decision to exempt such products from the requirements of FAC Division 7. As such, no significant environmental impact is expected to occur, either directly or indirectly, from implementing the proposal.

EFFORTS TO AVOID CONFLICT OR DUPLICATION OF FEDERAL REGULATIONS

The proposed regulatory action does not duplicate or conflict with the Code of Federal Regulations, and makes DPR's handling of certain pesticides or classes of pesticides more consistent with current U.S. EPA regulations.

DOCUMENTS RELIED UPON

1. Pesticides; Addition of chitosan (including chitosan salts) to the list of active ingredients permitted in exempted minimum risk pesticide products, 87 F.R. 67364 (proposed November 8, 2022) (to be codified at 40 C.F.R. § 152).

2. Jones, R.S. (2019, August 23). *Science review in support of the addition of Chitosan (Poly-D-Glucosamine) to the list of minimum risk pesticides (MRPs) contained in 40 CFR 152.25(f)* [Memorandum]. Environmental Protection Agency.

3. Cooper, H., Thomas, N., Steele, B., Gonzales, A., & Sinclair, G. (n.d.). *Addendum to the science review in support of the addition of chitosan (Poly-D-Glucosamine) to the list of minimum risk pesticides (MRPs) contained in 40 CFR 152.25(f)* [Memorandum]. Environmental Protection Agency.

4. Environmental Protection Agency. (2007). *Chitin and chitosan summary document registration review: initial docket* (EPA-HQ-EPA-2006-0566).

5. Environmental Protection Agency. (2008). *Chitin and chitosan final registration review decision case 6063* (EPA-HQ-OPP-2007-0566).

6. Environmental Protection Agency. (2018). Label Review Manual, Chapter 7, Precautionary Statements. US Environmental Protection Agency, Office of Pesticide Programs, Washington, DC. Revised March 2018. https://www.epa.gov/sites/default/files/2018-04/documents/chap-07-mar-2018.pdf.

7. Alves, N.M., & Mano, J.F. (2008). Chitosan derivatives obtained by chemical modifications for biomedical and environmental applications. *International Journal of Biological Macromolecules, 43*(5), 401-418.

8. National Toxicology Program. (2017). *NTP technical report on the toxicity study of chitosan (CASRN 9012-76-4) administered in feed to Sprague Dawley [Crl:CD (SD)] rats* (Report No. Toxicity Report 93).

9. Gades, M.D., & Stern, J.S. (2003). Chitosan supplementation and fecal fat excretion in men. *Obesity Research, 11*(5), 683-688.

10. Gades, M.D., & Stern J.S. (2005). Chitosan supplementation and fat absorption in men and women. *Journal of the American Dietetic Association, 105*(1), 72-77.

11. Rao S.B., & Sharma C.P. (1997). Use of chitosan as a biomaterial: studies on its safety and hemostatic potential. *Journal of Biomedical Materials Research*, *34*(1), 21-28.

12. De Jesús Valle, M.J., Dinis-Oliveira, R.J., Carvalho, F., Bastos, M.L., & Sánchez Navarro, A. (2008). Toxicological evaluation of lactose and chitosan delivered by inhalation. *Journal of Biomaterials Science, Polymer Edition*, *19*(3), 387-397.

13. Xia, Y., Wang, D., Liu, D., Su, J., Jin, Y., Wang, D., Han, B., Jiang, Z., & Liu, B. (2022). Applications of chitosan and its derivatives in skin and soft tissue diseases. *Frontiers in Bioengineering and Biotechnology, 10*:*894667*. 10.3389/fbioe.2022.894667

14. Department of Pesticide Regulation. (2023, September 15). *Pesticide Registration and Evaluation Committee (PREC) Meeting Minutes – September 15, 2023*. Retrieved from https://www.cdpr.ca.gov/docs/dept/prec/2023/091523minutes.pdf

15. Peng S., Liang Y., Xiao W., Liu Y., Yu M., and Liu L. (2022). Anaphylaxis induced by intra-articular injection of chitosan: A case report and literature review. *Clinical Case Reports, 10.1002/ccr3.6596*