DEPARTMENT OF ECOLOGY
Toxics Cleanup Program

April 18, 2017

TO: Rich Doenges
Water Quality Program, Southwest Regional Office (SWRO)

FROM: Barry Rogowski, Section Manager
Toxics Cleanup Program (TCP)

SUBJECT: Willapa-Grays Harbor Oyster Growers Association (WGHOGA) Sediment Impact Zone Application (SIZ) for Willapa Bay, complete determination

Thank you for the opportunity to review the revised WGHOGA Sediment Impact Zone (SIZ) application (February 13, revised submission March 21, 2017, which included the draft monitoring plan) for the use of imidacloprid to control burrowing shrimp in Willapa Bay. It is our understanding that the TCP has been requested to review the permit application only to make a determination as to whether the application is complete as required by the Sediment Management Standards (SMS) in WAC 173-204. Finding an application to be complete means that TCP has the information necessary to begin processing the SIZ application. If while processing the application, TCP discovers deficiencies, TCP may request additional information from WGHOGA to clarify, modify, or supplement the information in the application. *See* WAC 173-204-415(2)(c). Furthermore, if TCP determines that the discharge as detailed in the application will not comply with applicable SMS requirements, the SIZ authorization may be denied.

Ecology has reviewed the most recent SIZ application submittal and has determined it is complete. Please note, a determination that the application is complete means TCP can begin reviewing the SIZ application to determine whether a sediment impact zone may be authorized. A complete SIZ application does not constitute Ecology agreement of the applicant's statements within the application.

Ecology required two applications for SIZ authorizations under WAC 173-204-415(2)(a): one for Willapa Bay and one for Grays Harbor. This memo is in reference to the Willapa Bay SIZ application. It is the opinion of Ecology that, as a result of the proposed effluent discharge (i.e., the pesticide application), the permit applicant will violate or create a substantial potential to violate the sediment quality standards of WAC 173-204-320 through -340 in Willapa Bay.

Ecology's opinion is based on factors detailed in WAC 173-204-400(6), including the experimental trials conducted with imidacloprid on sediments and the benthic community of Willapa Bay by the WGHOGA and WSU. Ecology's evaluation of these studies show the potential for the application of imidacloprid to create a sediment impact that would violate or create a substantial potential to violate the sediment quality standards.

We have compared the information requested in previous Ecology letters to the revised and most current version of the SIZ application. We have noted a number of areas where the SIZ application has been adequately updated, and is now complete. Those comments and comparisons are provided below (April 15, 2016 memo text in bold):

1. **SIZ monitoring must be conducted by the discharger to evaluate compliance with Ecology's SIZ authorization and the standards of WAC 173-204-400 through -420. To review and determine the adequacy of the SIZ application, Ecology is requiring a general description of the discharger's proposed sediment monitoring and reporting. As an example, the draft NPDES permit from 2014 has a good description of the sediment monitoring and reporting requirement on pages 8-17. Sections of the text from the draft permit could be used to expedite completion of this requirement in the SIZ application.** Ecology is pleased to hear that WGHOGA believes constructive meetings have been held with WGHOGA and its representatives. These meetings have highlighted Ecology's need for a robust, consistent monitoring plan which is a critical component in making a SIZ authorization decision. Ecology has clearly stated the need, at a minimum, for a proposed monitoring plan that is consistent in concept to the monitoring agreement agreed to for NPDES permit # WA0039781.

   On March 21, 2017, WGHOGA provided Ecology with a draft monitoring plan as part of a revised SIZ application submission. A cursory review of the monitoring plan has determined that the applicants have addressed Ecology's request for a, "general description of the discharger's proposed sediment monitoring and reporting." This March 21, 2017 submission is considered complete for purpose of determining a complete SIZ application. However, Ecology does not approve the monitoring as a final plan that is ready for implementation. Ecology will review the monitoring plan in detail and expects further cooperative discussions with the grower's representatives.

2. **Information on the areas where pesticide will be applied in Southern Willapa Bay is now complete. A map showing those parcels would be ideal, or at a minimum a list with the GPS coordinates. The applicant is also required to provide the legal location and landowner(s) of property proposed for use as, or potentially affected by, a SIZ. Ecology also requires the name and contact information for all lessees of land proposed for use as, or potentially affected by, the SIZ.**

Ecology appreciates the inclusion of Exhibit A representing oyster beds in Willapa Bay and correlating the figure with the application's text. This section is complete.

3. **On page 12 of the SIZ application, the statement is made that "research conducted by WGHOGA, WSU, UW, and PSI over the past eight years demonstrates conclusively that imidacloprid is not persistent, does not migrate off-plot, and has no detectable long term impacts to epibenthic or benthic invertebrate communities or mega fauna". This conclusory statement does not provide enough specificity for Ecology to determine the adequacy of the SIZ application. Ecology requests a summary and copy of the research papers of the last eight years by WGHOGA, WSU, UW, and PSI which support such a statement. If such a statement cannot be supported with documentation, then Ecology requests the statement be removed.** Revisions to the document adequately address this comment. This section is complete.

4. WAC 173-204-415(3) identifies a minimum of eleven locational considerations which must be included in any SIZ application. The Willapa application has failed to identify and appropriately catalogue several important criteria to be analyzed. An important component of each of the eleven locational considerations is knowing the exact areas where pesticide will be applied. As requested previously, a map showing those parcels would be ideal or, at a minimum, a list with the GPS coordinates. Other missing information includes:

   a. **Identification of shellfish harvest areas. Although it is clear that the applicants are applying for authorization to apply pesticides to *privately owned* shellfish beds, the SIZ application fails to identify public shellfish harvesting areas and their proximity to proposed spray locations as required in WAC 173-204-415(3)(d).** The recently submitted map (Exhibit F) adequately addresses this comment. This section is complete.

   b. **Any identification of recreationally and commercially important species such as Dungeness crab. As required in WAC 173-204-415(3)(e), areas used by species of economic importance must be identified. Dungeness crab is an economic resource to the state averaging nearly $40 million (at the dock, i.e. pre-processing), however no mention or description of this resource was made in Section 15 of the SIZ application.** For the purposes of a SIZ completeness determination, Ecology has determined that enough information has been provided for the application to be deemed complete. However, Ecology does not agree with the applicants conclusions regarding potential impacts to Dungeness crab.

Juvenile crab are an important contingent of commercial and recreational crab fisheries as juveniles recruit to recreational and commercial fisheries. Considering the economic importance of Dungeness crab to the state, and the significant proportional mortality identified in previous Field Investigation reports, Ecology considers review of potential crab impacts as a critical part of meeting application requirements (WAC 173-204-415 (3e)). This will be further discussed during SIZ review process.

c. **Other public recreation areas must be identified as required in WAC 173-204-415(3)(i), which includes state recreation areas as well as national areas. These would include (but are not limited to) the Nemah River, Niawiakum River, Bone River, and Smith Creek in Willapa Bay. Information on these sites is readily available through the WDNR and WDFW websites and should be included in the application to properly identify state lands which may be impacted by the SIZ.** This section is complete.

d. **Although waterfowl are identified in the SIZ applications, the information presented appears to conflict itself as is not sufficient meet the requirements of WAC 173-204-415(3)(c). For example, in the Willapa Bay SIZ application the applicants highlight a limited high intertidal feeding area, then identify numerous species which feed on mudflats lower in the intertidal area. The applicants should include the latter, remove the former, and the applicants should provide a more thorough review of the full range of shorebirds that use the area. The applications should not artificially limit feeding to only a limited portion of the tidal range and use only one citation, especially as this citation itself is tailored towards one specific area for which it is promoting a restoration activity. The applicant's should examine a broader range of published literature, including but not limited to, WDFW's Management Recommendations for Washington's Priority Species – Volume IV: Birds (www. http://wdfw.wa.gov/publications/00026/wdfw00026.pdf). For example, in the Management Recommendations, WDFW identifies specific species presence during the application's proposed spraying times (page 158) and associated habitat. A minimum of 18 species are identified using habitat potentially targeted for spraying and within the proposed SIZ. The applications discussion of waterfowl feeding areas must be updated to reconcile information from WWDFW's Management Recommendations and WGHOGA's own publication noting shorebirds feeding on tetanied invertebrates in field studies.** This section is deemed complete for the purposes of a complete SIZ application. The applicants have addressed several concerns identified in Ecology's last letter (January 3, 2017).

However, there are several areas in which Ecology believes statements remain missing or cannot be factually supported with the information present.

WDFW identifies fall migration as occurring from June to late October, occasionally to November. Exhibit E references imidacloprid concentrations of 150 mg/kg, without referencing lower values, as low as 3 mg/kg exposure identified in the risk assessment and Audubon letter. These inconsistencies will need to be addressed through the SIZ review process.

5) **The 2014 efficacy information presented in the SIZ application states a range of efficacy from 65% to 84% reduction in shrimp burrows. This information appears to contradict the efficacy information presented in the Final 2014 Field Investigation Report (1/8/16). The Final 2014 report indicates an efficacy range of a reduction of 91.4% to an increase of 67.3% in shrimp burrows for those sites monitored in 2014. For the sites monitored in 2015, the efficacy range appears to even greater with one location reported an increase of 478% in shrimp borrows and second an increase of 16.7 %. This information must be corrected and/or explained prior to the SIZ application being considered complete.** The efficacy information section has been improved as the applicants have attempted to address Ecology's comments in previous incompleteness letters. Ecology's conclusion is that efficacy is highly variable based on a number of factors. For the purposes of determining a complete application, Ecology has concluded that enough information has been provided to begin processing the application.

Inconsistencies exist in the Final 2014 Field Investigation Report. Efficacy estimates are based upon the potentially faulty assumption that edge-of-plot counts accurately represent on-plot pre-application burrow estimates. Proper pre- and post-treatment burrow counts will need to be incorporated into monitoring if a SIZ is authorized. Ecology cautions against broad sweeping statements being made by the applicants based only upon compiled tables in Dr. Patten's review. Presenting only summary tables does not show the variability of individual studies and would therefore also mask any gradients in efficacy that would inform BMP development and SIZ review in general. Dr. Patten, in the appendix to the 2 September 2016 letter states, "Field efficacy of imidacloprid applied by the shellfish industry, however, has been variable and not consistent." As the applicants own supporting research identifies inconsistent efficacy, the SIZ application should not gloss over this. Further, Ecology does not agree with the applicant's contention that although the only a portion of entire 2014 spray area was surveyed, crab mortality estimated from only this subsection could be averaged across the entire area.

6) **The SIZ application indicates that applicants will be using a granular/pellet form of imidacloprid in addition to the liquid form. However, there is limited information on the effectiveness of the granular/pellet form and this information is necessary as part of the design requirements under WAC 173-204-415(4) and so determinations can be made about the possible on and off plot effects of granular/pellet application.**
Data about how well the granular/pellet form of the pesticide controls ghost shrimp or burrowing shrimp should be included in the application, so a determination about whether the application of this form of pesticide will have an effect to control shrimp populations. It should also be noted that sediment monitoring and reporting will be tailored to ensure that any unanticipated negative environmental effects of using this form of imidacloprid do not occur. This section is complete. Ecology would like additional work to be conducted on the BMPs and efficacy of the granular form of the pesticide during implementation of the NPDES permit, if issued.

7) **Whether WGHOGA is applying for experimental or commercial use, the incomplete application did not provide any information regarding sub-surface injectors.** This section is complete. WGHOGA has confirmed that subsurface injectors will be a component of the permit application.

8) **New comment - page 13, section D:** Integrated Pest Management Plan: Ecology endorses and supports the statements on page 13 that IPM will be used and that a customized approach (per plot) will be used and required to be submitted to Ecology on an annual basis in the Draft NPDES permit. The stated goal and policy of Ecology under WAC 173-204-410(a) is to manage source control activities to reduce and ultimately eliminate adverse effects on the biological resources. WAC 173-204-410(b) only authorizes SIZ to be used by Ecology with the intent to eliminate the existence of such zones. Inclusion and documentation of IPM criteria will be codified into the SIZ authorization, if approved. This section is complete.

9) **New Comment - pages 2 – 3, section 4:** The applicants propose two differing estimates of relative areal coverage of Willapa Bay, 1.15 and then 0.7% of Willapa Bay. This section has been updated and is considered complete.

New Comment - page 9, Section 12: The applicants list a series of screening values, citing references over 25+ years old. The latest SIZ application acknowledges this. Updated regulatory information for the recent Preliminary Aquatic Risk Assessment to Support the Registration Review of Imidacloprid[1] information including revised

[1] USEPA. (2016, December). *Preliminary Aquatic Risk Assessment to Support the Registration Review of Imidacloprid* (Publication No. 129099). Washington, D.C.: US Environmental Protection Agency, Office of Pesticide Programs