RESPONSE TO COMMENTS
NPDES PERMIT WA0040975
WILLAPA BAY/GRAYS HARBOR OYSTER GROWERS ASSOCIATION
AND
FARM AND FOREST HELICOPTER SERVICE

A thirty-day public comment period for the draft permit began March 10, 2002, and ended April 10, 2002. Public notices were published in the *Aberdeen Daily World* on March 10, 2002, and in the *Chinook Observer* and the *Willapa Harbor Herald* on March 13, 2002. All public comments received are made part of the official record of decision and are available to review in the Southwest Region public files. Please contact Ms. Sherri Greenup at (360) 407-6365 or SWAL461@ecy.wa.gov if you wish to schedule a time to review the public file for this permit.

Two public hearings regarding this permit were held. The first hearing was held on March 8, 2002, in South Bend and the second on April 10, 2002, in Lacey.

All comments received were evaluated and a summary of the comments and responses follows:

Comment 1:
Carbaryl is toxic to humans.

Response:
Carbaryl can be acutely toxic to humans. According to a Department of Health (DOH) document *Carbaryl use in oyster beds, summary review for DOH, Shellfish Program, by Barbara Morrissey, DOH Pesticide Program, dated 2/14/02,* human illnesses have occurred following over-exposure to carbaryl used on other crops in Washington. These incidents include some in which carbaryl drifted from the site of application to nearby workers. With respect to use on oyster beds, this document states:

> "Carbaryl is an insecticide used at low concentrations (low parts per million) to kill burrowing shrimp on tide flats in two oyster-growing regions of Washington State. Human exposure to aerial drift during application could be of health concern so it is important that the label be strictly followed to minimize potential for drift accidents. Sampling data available do not indicate a human health hazard for people who consume oysters, clams, and legally harvestable crabs from treated and adjacent areas (i.e., carbaryl residues are not likely to exceed the tolerance for oysters)."

Ecology believes that the label restrictions and permit provisions will prevent significant human exposure to carbaryl.

Label protections include:

- Personal protective equipment required for applicators, mixers, and loaders.
- No applications if wind speed exceeds 10 mph.
- Buffers required between treated area and nearest shellfish harvest site (200 feet for aerial application, 50 feet for hand application).
- One year pre-harvest interval for oysters from treated beds.

- Maximum concentration of carbaryl allowed in oysters is 0.25 ppm.

Permit provisions include:

- Aerial drift prevention measures.
- Compliance with the label.
- Monitoring.

As for long term effects, Ecology relies on EPA to assess the overall safety of carbaryl use, including any potential long-term impacts to health. Ecology is aware that EPA is currently re-registering carbaryl. This process may update human health and ecological health risk assessments for carbaryl. Re-registration can result in changes in a chemical's approved uses and additional label precautions to protect health. This state permit is contingent on EPA's continued approval of carbaryl for use on oyster beds as described in this permit. If EPA makes a final change to the label requirements, this permit would have to be evaluated to ensure continued compliance with the label.

Comment 2:
Carbaryl is toxic to all life.

Response:
Carbaryl applied in Willapa Bay and Grays Harbor is toxic to shrimp, crabs, small fish, and certain worms. The limited area treated each year (600 acres in Willapa Bay and 200 acres in Grays Harbor) is considered acceptable at present.

Comment 3:
Carbaryl is persistent in water and sediments.

Response:
Scientific studies have not shown carbaryl to be significantly persistent in water or sediment. Under some conditions carbaryl has been detected in sediment 60 days after application, but not after one year.

Comment 4:
Carbaryl is bio-accumulative.

Response:
No scientific study has shown carbaryl to be bio-accumulative either in a single organism or in moving up the food chain.

Comment 5:
Alternative methods are successful and should be employed or considered.

Response:
Off-bottom culture is employed successfully at the present time to satisfy the market for oysters served in the shell. The cost of producing these oysters is higher than the market price for shucked oysters. The permit Condition S5 requires examination of non-traditional approaches to

oyster culture. Studies assessing alternative methods of burrowing shrimp control are required in a compliance schedule in special condition S5 of the permit.

Comment 6:
Permit limits should consider the needs of those suffering from multiple chemical sensitivity.

Response:
Limits set by this permit are based on water quality standards. Considerations for human health are addressed in response to comment #1. Additional limits set to aid persons suffering from multiple chemical sensitivity cannot be made by Ecology.

Comment 7:
Limits should consider potential ESA listings.

Response:
Permits can only be written enforcing those listings that are current. Ecology has received comments from the U.S. Fish and Wildlife Service (letter to Kathleen Emmett, received April 9, 2002) regarding issues between the permit and the Endangered Species Act. The letter does not recommend denial of the permit on the basis of ESA impacts and recommends "that it be issued for a shorter time frame due to the uncertainties surrounding this issue as well as the number of outstanding studies yet to be conducted". In response to USFWS and EPA input, Ecology has subsequently shortened the permit to four years, which coincides with completion of the studies to be conducted as part of this permit.

Comment 8:
Salmon in Grays Harbor and Willapa Bay are threatened by carbaryl application.

Response:
Impacts to salmonid populations from the application of carbaryl on the oyster beds are not known at this time. The Fate and Transport Study required in S5 will be designed to help Ecology assess impacts to non-target aquatic species and update the documentation contained in the 1992 SEIS.

Comment 9:
Permits that support business profits are not justified.

Response:
Comment noted. The permit is issued in compliance with Washington State laws.

Comment 10:
The proposed permit violates the Clean Water Act. The permit violates the intent of the Clean Water Act.

Response:
This permit is prepared using the laws and regulations of the State of Washington. The Environmental Protection Agency of the federal government delegates the NPDES program to the Department of Ecology (see Chapter 173-220-010 WAC). The EPA has reviewed all the applicable regulations of the State of Washington for conformity to the Clean Water Act.

Comment 11:
All known, available and reasonable treatment (AKART) has not been achieved, so that this permit cannot be issued.

Response:
Ecology accepts current practice as being AKART until further studies as required in the Schedule of Compliance are completed. AKART will be reevaluated with the permit reissuance process in 2006.

Comment 12:
The last paragraph in Special Condition S7 is inadequate and offensive.

Response:
Paragraph M, Special Condition S7 is eliminated from the permit.

Comment 13:
Carbaryl is persistent in Oysters.

Response:
Carbaryl is not persistent in oyster flesh according to the information available to this office. See also response to comment #1.

Comment 14:
The permit should not be issued because a wildlife refuge is near.

Response:
Ecology believes the permit requirements will be protective of the wildlife refuge.

Comment 15:
Temporary Modifications are a “loophole” and should not be issued.

Response:
The state water quality standards (WAC 173-201A-110(1)) specifically identify the control of burrowing shrimp as an activity that may be allowed as a short-term water quality modification.

Comment 16:
A build-up of carbaryl must have occurred given the length of time this practice has gone on.

Response:
All studies presently show carbaryl and 1-napthol concentrations in sediment to steadily decline to non-detectable levels at one year after spraying.

Comment 17:
The industry should not be further restrained until further research has been done into alternative controls and culture methods.

Response:
This is precisely what this permit proposes.

Comment 18:
Certain infant health difficulties were discovered on the Shoalwater Indian Reservation. This could be attributed to carbaryl.

Response:
The cause of this health problem has not been established or linked to carbaryl.

Comment 19:
The Ecology study of carbaryl persistence conducted by Cynthia Stonick showed that carbaryl was persistent in the environment.

Response:
This study showed longer (60 days) persistence in the environment than previous studies. It did not establish long-term persistence.

Comment 20:
EPA is currently reevaluating carbaryl using more advanced methods. The preliminary results of this re-assessment will be released soon and promulgated in 2003. This permit should be revisited at this time.

Response:
Ecology will re-evaluate the permit as necessary in response to EPA's assessment.

Comment 21:
Does the pesticide applicator use the spray methods least likely to produce pesticide drift?

Response:
Pesticide spraying is regulated by the Washington Department of Agriculture and done in accordance with the label requirements approved by EPA. The permit includes best management practices to minimize drift.

Comment 22:
Did Ecology consider monitoring for the carbaryl breakdown product 1-napthol?

Response:
The Special Condition S2 in the permit requires monitoring of 1-napthol.

Comment 23:
Carbaryl is washed off the spray site and into adjacent areas where it is not wanted.

Response:
Monitoring required as part of the fate and transport study is intended to identify and quantify the presence and extent of drift. The permit only authorizes treatment on those sites covered by the permit.

Comment 24:
Direct spraying onto water should be banned.

Response:
Spraying onto inter-tidal mud is the only spraying method allowed.

Comment 25:
Has there been a full debate among stakeholders about this practice?

Response:
Several workshops and stakeholder conferences have been held regarding this practice.

Comment 26:
Aren't the oyster growers concerned about loss of market from those who are concerned about pesticides in food?

Response:
Not known.

Comment 27:
Has a cost benefit analysis been done on this practice?

Response:
A form of cost benefit analysis is a part of the ongoing Integrated Pest Management Study currently being done and required in the permit. The studies of alternative methods of shrimp control required in the Schedule of Compliance to determine AKART must include an economic analysis.

Comment 28:
The fact sheet does not mention that EPA established a legal limit for carbaryl in oyster flesh of 0.25 ppm.

Response:
The fact sheet listing of federal requirements for human health is limited to concentrations in water. This permit refers only to concentrations in water and sediment. See also response to comment #1.

Comment 29:
I asked a question of Gary Anderson and am still confused by his multiple responses. I am in the process of drafting my testimony for the April 10 hearing. The draft permit states a date of 3/19/03 as the date by which the growers are required to have completed the Integrated Pest Management Plan. The public did not have a chance to comment on the MOA.

Response:
Comment noted. See also response to comment #30.

Comment 30:
The Memorandum of Agreement is a "fraudulent document, crafted without public input or review, rife with contradictions and blatant in it's (sic) allowance of an industry (for no other reason than monetary gain) to continue practices that have been outlawed in Oregon and California and that were identified in the 1992 EIS as problematic at best and toxic at worst. ……The commenter goes on to insist that the MOA, including the agreed completion dates, be rigidly enforced.

Response:
The Memorandum of Agreement (MOA) was developed as a cooperative tool to move the industry towards the development and completion of an Integrated Pest Management plan (IPM). The MOA has very limited enforceability. By contrast, the permit is enforceable, and includes many relevant portions of the MOA.

Comment 31:
The public interest requires that carbaryl spraying be eliminated.

Response:
One of the stated goals of the Clean Water Act is the eventual elimination of all pollutant discharges to surface waters. Ecology supports this goal. The permit addresses this goal by requiring the oyster growers to evaluate alternative methods to control burrowing shrimp.

Comment 32:
The permit affords special protection for the Shoalwater Tribe that is not extended to others in the bay.

Response:
The Shoalwater Tribe is a sovereign nation receiving consideration as such. This statement is offered as a clarification, not a special privilege.

Comment 33:
The fact sheet states that AKART will be determined in 2005, while at the same time accepting current practice and pesticide label requirements as AKART.

Response:
AKART is not a static determination but one which is intended to achieve better results over time. The acceptance of current practice and adherence to label requirements as AKART is a temporary measure until the studies required in the Schedule of Compliance are completed. See also response to comment #11.

Comment 34:
The permit establishes a mixing zone of 600 meters offset without regulatory authority. This allows the permittees to harm adjacent landowners through pesticide drift and chemical trespass.

Response:
The 600 meter offset in the permit has been deleted. The water quality modification only applies to waters of the state, and does not authorize chemical trespass.

Comment 35:
The statement that errors and omissions in the permit review have been corrected is false since the commenter has attended a number of comment sessions and no significant changes have been made.

Response:
Comment noted.

Comment 36:
The commenter requests that text be inserted to add to the History section of the fact sheet. He makes assertions about 150 years of environmental history unsupported by documentation. He makes broad assertions of wide historical environmental change and human caused damage to the ecosystem. He regards the History Section as biased and incomplete.

Response:
The history portion of the fact sheet is intended to discuss carbaryl use in Willapa Bay and Grays Harbor and cannot address every other facet of environmental history in those waterbodies.

Comment 37:
The permit does not mention that there are a number of oyster farmers who have not yet treated their oyster beds with carbaryl, yet make a living growing oysters.

Response:
The map that accompanied the permit application shows widespread use of carbaryl application, but not universal application. The application also mentions that some beds need more frequent spraying than other beds. This implies that there are site conditions in the two estuaries that are not suitable habitat for burrowing shrimp, while others are. It would also explain why some

growers have never needed to treat their beds with pesticides. The required studies will include an economic analysis to further evaluate this issue.

Comment 38:
The fact sheet wording is confusing. Carbaryl is a pollutant. The statements in the fact sheet were intended to convey that a specific numerical criterion for carbaryl has not been established in regulation.

Response:
Ecology has lists of many chemicals of concern, but the subject to regulation as pollutants are a much smaller list.

Comment 39:
Why isn't the known toxicity of carbaryl to marine organisms used to arrive at a limit.

Response:
The NUMERICAL CRITERIA FOR PROTECTION OF AQUATIC LIFE on page 5 of the fact sheet clearly states that this has been done.

Comment 40:
Why aren't the piles of oyster shells seen at oyster packing plant returned to the water to harden the bottom to support oyster culture?

Response:
Hardening of the bottom is one alternative to be considered in the IPM plan and studies performed under condition S5 of the permit.

Comment 41:
Please send me a listing of the Testing Facility with its location for each spray site shown on a map with geodetic location together with a water quality listing of those locations.

Response:
The testing facility for analyzing the compliance testing is not known at this time. The permit does require that the testing facility be selected from an approved list called the List of Environmental Laboratories Accredited by the Washington State Department of Ecology. This document is available through normal document request procedures. Locations of actual spray sites for the 2002 application season are required to be submitted as part of the annual operations plan required by the permit.

Comment 42:
Please send a list of the proposed spray dates for each location. It is my understanding that there will only be one day for each location or are there three spraying dates for each location?

Response:

The specific locations and dates of spraying will not be known until the annual operations plan is submitted and approved. The permiteess are required by the permit to publish all the information requested. The permiteess are allowed only one spaying event per site.

Comment 43:
Do you plan on a Cam Corder recording for each use of the spray including trucking, unloading from trucks, loading onto aircraft, and application sites to prove the time and locations? Do you plan multi-spectral images to show the location of the applications?

Response:
No.

Comment 44:
What is the time interval for different heights for the carbaryl to reach the surface of the ground or water.

Response:
Not known.

Comment 45:
What is the method to determine the wind is not blowing more than 5 miles per hour during the application?

Response:
The permitted maximum wind velocity for aerial spraying is 10 mph. The permit has been altered to require an approved device be used for monitoring wind velocity at application time.

Comment 46:
In the event of accidental spraying, what is the amount of insurance for coverage, and who are the holders of said policy?

Response:
Farm and Forest Helicopters, the co-permittees, is required by the Department of Agriculture to carry liability insurance in the amount of $50,000 per application and $50,000 per day.

Comment 47:
What are the effects of spraying on humans, and the short term and long term effects?

Response:
The symptoms are muscle weakness, sweating, dizziness, headache, nausea, diarrhea, miosis and in severe cases, CNS and respiratory depression. Carbaryl has been assessed for its potential to cause chronic disease. EPA has set its reference dose for carbaryl at 0.1 mg/kg/day to prevent chronic kidney and liver disease. Evidence of cancer in carbaryl exposed humans is considered lacking, but two recent epidemiological studies have reported small but statistically significant associations between regular use farmers and increased risk of non-hodgkins lymphoma. Also see response to comment #1.

Comment 48:
What are the active ingredients in the spray?

Response:
Carbaryl.

Comment 49:
Are there any Doctors in Pacific County or the area who have been trained in the treatment of carbaryl exposure?

Response:
Not known.

Comment 50:
Which Chemical Company is supplying the spray, and what is the brand name.

Response:
This will not be known until the permittees files the annual operations plan. The supplier in 2001 was Rhone-Poulenc under the brand name Sevin.

Comment 51:
What are the warning labels for toxicity and first aid?

Response:
These are large pieces of paper attached to the container containing first aid instructions and directions to physicians. They are attached to all pesticide containers, even those at local garden stores.

Comment 52:
Please provide a list of the laboratories that are approved for the testing of carbaryl.

Response:
The approved laboratories in Washington, Oregon, Idaho, and British Columbia are listed below.

Analytical Chemistry Inc.	WA	Seattle	404 9th Ave. North	(206) 622-8353
Aquatic Research, Inc.	WA	Seattle	3927 Aurora Ave N	(206) 632-2715
Energy Northwest Environmental Laboratory	WA	Richland	PO Box 968, MD 1025	(509) 377-8462
Friedman & Bruya	WA	Seattle	3012 16th Avenue West	(206) 285-8282
Pacific Northwest Laboratories	OR	Eugene	65 Centennial Loop	(541) 484-

				4493
Philip Analytical Services (BC)	BC	Burnaby	8577 Commerce Court	(604) 444-4808
ALS Environmental	BC	Vancouver	1988 Triumph Street	(800) 665-0243
AmTest, Inc. - Redmond	WA	Redmond	14603 NE 87th St	(425) 885-1664
Analytical Resources, Incorporated	WA	Seattle	333 Ninth Ave North	(206) 389-6152
Anatek Labs, Incorporated	ID	Moscow	1282 Alturas Drive	(208) 883-2839
Boeing A & M Environmental Analysis Lab	WA	Seattle	PO Box 3999, MC 8J-55	(253) 773-5289
CCI Analytical Laboratories, Inc.	WA	Everett	8620 Holly Drive	(425) 356-2600
CH2M Hill Applied Sciences Laboratory -	OR	Corvallis	2300 NW Walnut Blvd	(541) 752-4271
Coffey Laboratories	OR	Portland	12423 NE Whitaker Way	(503) 254-1794
Columbia Analytical Services - Kelso	WA	Kelso	P.O. Box 479	(360) 577-7222
Edge Analytical, Incorporated	WA	Burlington	11525 Knudson Road	(360) 757-1400
King County Environmental Laboratory	WA	Seattle	322 W Ewing Street	(206) 684-2343
Laucks Testing Laboratories, Inc. - Seat	WA	Seattle	940 South Harney St.	(206) 767-5060
Manchester Environmental Lab	WA	Port Orchard	7411 Beach Drive East	(360) 871-8801
North Creek Analytical - Bothell	WA	Bothell	11720 North Creek Parkway N., Suite 400	(425) 420-9223
North Creek Analytical - Portland	OR	Beaverton	9405 SW Nimbus Avenue	(503) 906-9223
OnSite Environmental, Inc.	WA	Redmond	14648 NE 95th Street	(425) 883-3881
PSC Analytical Services Lab		Renton	955 Powell	(425) 227-

(Renton)			Avenue, SW	6106
PSNS Environmental Chem Laboratory	WA	Bremerton	Code 134.03, Building 371, 1400 Farragut Ave	(360) 476-8092
Spectra Laboratories	WA	Tacoma	2221 Ross Way	(253) 272-4850
STL Seattle	WA	Tacoma	5755 8th Street East	(253) 922-2310
Tacoma Science/Engineering Division Labo	WA	Tacoma	2201 Portland Ave	(253) 502-2133
Waste Sampling and Characterization Facility	WA	Richland	PO Box 1000, MS S3-30	(509) 373-7492
Weyerhaeuser Analysis & Testing	WA	Federal Way	WTC 2F25, P.O. Box 9777	(253) 924-6456

Comment 53:
Please provide a certification that there are ***NO HEALTH HAZARDS*** in the proposed activities, together with toxic effects. Please provide a certification that there is ***NO ENVIRONMENTAL HAZARDS*** in the proposed aerial spraying.

Response:
The Department of Ecology does not provide certifications of this sort.

Comment 54:
Please provide the name of the Registered Engineer and Medical Doctor who is responsible and is licensed by the State of Washington for all activities.

Response:
There are no such persons.

Comment 55:
Please provide me with any studies in Willapa Bay, showing residual levels of Carbaryl so I can comment further.

Response:
There have been numerous studies conducted on carbaryl, including two by Ecology to specifically evaluate carbaryl residues (Publication #99-323 by Cynthia Stonick, and #01-03-005 by Art Johnson). These documents are available from Ecology's Publications Office.

Comment 56:
Please provide me with answers before proceeding with issuance of said permit.

Response:

This response to comments document is the formal mechanism in place to provide answers to questions before the permit is issued.

Comment 57:
Carbaryl application should be banned because small children are more vulnerable to pesticide poisoning than adults.

Response:
See response to comment #1.

Comment 58:
No effort has been made to establish permit limits for carbaryl in water.

Response:
The permit includes limits for carbaryl in water. The fact sheet shows how these limits were derived.

Comment 59:
Sediment testing should be required.

Response:
In response to the many comments made on this subject as well as a reconsideration of the mechanics of the checklist in Appendix E, a sediment program to establish conformity to Chapter 173-240 WAC is required.

Comment 60:
How can I be sure that if carbaryl use is banned, illegal use will not take place?

Response:
Ecology and this permit cannot ascertain whether any criminal act will or will not take place.

Comment 61:
What is the name of the toxicologist who authorized the use of carbaryl.

Response:
The application of carbaryl to waters of the state is authorized under this NPDES permit where Ecology's signature authority lies with the Manager of the Southwest Regional Office Water Quality Section.

Comment 62:
What studies have been done over the last 40 years to determine the effects of carbaryl use?

Response:

The bibliography of the Supplemental Environmental Impact Statement issued in 1992 is a good place to start with listing this research (see pages 75 through 82). This document is available through the public disclosure process.

Comment 63:
Why are other countries banning the use of carbaryl?

Response:
This is not known but it has not been banned in Washington state.

Comment 64:
The permit should require a plan for carbaryl application.

Response:
The permit does require a plan for application.

Comment 65:
What is the plan for a spill?

Response:
The permit requires that a spill plan be submitted.

Comment 66:
What is the penalty for a carbaryl spill?

Response:
RCW 90.48 Chapter authorizes Ecology to issue penalties of up to $10,000 per day per violation. In making enforcement decisions, Ecology follows the Washington State Department of Ecology Compliance Assurance Manual (Publication #97-437).

Comment 67:
What is carbaryl. Nobody knows what carbaryl is?

Response:
It is believed that the commenter actually means that carbaryl can be marketed under many names. Application licenses must be granted by the Department of Agriculture whose employees are knowledgeable about such matters.

Comment 68:
The responsibility for carbaryl application may not rest with Ecology, it may rest with the County Commissioners.

Response:
NPDES permit authority is the responsibility of the Department of Ecology.

Comment 69:

You do not know where the Carbaryl is going after it is applied.

Response:
The schedule of compliance requires a fate and transport study to describe carbaryl movement and determine how far from the point of application the carbaryl may be carried.

Comment 70:
Carbaryl use in Willapa Bay is different from pollution caused by manufacturing because it is used in producing food. This makes it excusable.

Response:
Comment noted.

Comment 71:
No one can produce evidence of anyone becoming ill from eating Willapa Bay oysters that can be attributed to carbaryl poisoning.

Response:
Comment noted.

Comment 72:
The permit and fact sheet do not recognize the environmental benefit of carbaryl application to those areas where burrowing shrimp have destroyed all visible life in the bay.

Response:
Comment noted.

Comment 73:
The proposed permit is different from the other permits proposed that have resulted from the Talent Decision.

Response:
The permit explicitly covers treatment of burrowing shrimp in Willapa Bay and Grays Harbor, which is a unique activity.

Comment 74:
The information in the proposed permit is not supported by science.

Response:
Comment noted. Ecology contends that science and law support issuance of this permit.

Comment 75:
This NPDES permit is motivated by political pressure only.

Response:
This NPDES permit is required by federal and state law.

Comment 76:
The excessively costly, onerous and unnecessary limits, monitoring tests and unjustified strictures of the schedule of compliance are not justified by law, but are the result of Ecology surrendering the requirements of the regulations to political pressure.

Response:
Ecology believes that the permit and fact sheet conform to state law and policy. The limits, compliance schedule, and testing requirements have been modified.

Comment 77:
The criminally negligent, environmentally destructive and lax limits, inadequate monitoring tests and inadequate strictures of the schedule of compliance are not justified by law, but are the result of Ecology surrendering the requirements of the regulations to political pressure.

Response:
Ecology believes that the permit and fact sheet conform with state law and policy. The limits, compliance schedule, and testing requirements have been modified.

Comment 78:
Further research should deemphasize carbaryl and emphasize integrated pest management and alternate, no-pesticide controls.

Response:
Comment noted.

Comment 79:
Off bottom culture methods are also affected by shrimp infestations.

Response:
This is true at present. Future research should address non-sinking racks, shrimp proof posts, oyster salvage below suspensions, and other applicable alternatives.

Comment 80:
Based on 303 (D) listings, it might be better to write separate permits for Willapa Bay and Grays Harbor.

Response:
Neither Grays Harbor or Willapa Bay are on the 303(D) list for carbaryl, so a permit covering both waterbodies is permissible. Separate permits may warrant further consideration during the permit renewal process in 2006.

Comment 81:
It seems unfair that the government is spending huge sums of money on spartina control with pesticides while challenging pesticides to control burrowing shrimp.

Response:
Comment noted.

Comment 82:
Writing an IPM plan for an aquatic environment is a great deal more difficult than writing an IPM plan for terrestrial agriculture. One reason for this is the lack of more biorational pesticides such as those that have been formulated and tested by chemical companies. We do not know the reasons for the pest population explosion here. Experimenting between tides is difficult. An estuary is a more complex ecosystem than regular agricultural fields.

Response:
Comment noted.

Comment 83:
No comparison should be made between carbaryl and carbofuran in scientific studies.

Response:
Carbofurans have not been examined in this permit.

Comment 84:
For Example, on page 2, it states that since 1990, 75 studies have been published or are in completed manuscript form. These studies are not referenced or summarized.

Response:
The 75 referenced documents are listed on the permit application which is available for examination at Ecology headquarters.

Comment 85:
In addition, despite continued efforts, Ecology refuses to reference page V-23 of its own 1992 study on Chemicals of Special Concern in Washington State." (92-66, July 1992) which specifically lists carbaryl. …… Please include this information in the NPDES permit and Fact Sheet.

Response:
A fact sheet is not a bibliography of all known documents relating to a permit. Publication 92-66 is not a list of chemicals to be regulated; it is a list of chemicals of concern. To quote the preface: "The 132 chemicals discussed in this manual were selected based on the potential risk they pose to human health and the environment and the likelihood they will be encountered in the environment".

Comment 86:
This section claims that the use of carbaryl complies with the provisions of Washington State Local Need Pesticide Registration No. WA-90013. Such registration can only be given when the use is covered by necessary tolerances or other clearances under the Federal Food Drug and Cosmetic Act (FFDCA). Please identify what shellfish tolerances are issued for carbaryl.

Response:
The EPA in 40 CFR 180.169 has established a legal limit of 0.25 parts per million (ppm) for carbaryl residues in oyster meats.

Comment 87:
Also unmentioned is the background level of carbaryl in Willapa Bay due to decades of carbaryl spraying.

Response:
Sampling for carbaryl residues has shown persistence in sediments up to 60 days (the duration of the test) after treatment. No sampling event has shown carbaryl in water or sediment one year after spraying. The permit requires a fate and transport study that will evaluate the duration of carbaryl persistence in the intervening 10 months. In short, there is no "background level".

Comment 88:
In addition, some oyster growers in Willapa Bay maintain that annual spraying of carbaryl is required for oyster cultivation. However, no carbaryl spraying in Willapa Bay or Grays Harbor was authorized for 2001. This demonstrates that annual carbaryl spraying is not required and far less carbaryl applications could be made.

Response:
A spraying schedule that covers only about 1 % of the total acreage of Willapa Bay and Grays Harbor demonstrates that annual spraying is not absolutely required every year for every acre of oyster ground.

Comment 89:
This section claims that the present carbaryl treatment has shown little deleterious effect on the environment. This is incorrect. The Department of Ecology has issued a Determination of Significance under the state Environmental Policy Act for the use of Carbaryl in Willapa Bay and Grays Harbor (Determination of Significance , May 30, 2001). In addition, carbaryl has an immediate toxic impact to most aquatic life, particularly shellfish.

Response:
The sentence is admittedly a broad one, meaning that there has been no visible, large scale damage to the life in the bay. The immediate area of application does show a kill of small finfish, small crabs, shrimp of course, copepods, and some benthic worms over an area that comprises approximately 1.2 % of the area of the estuaries. The permit and label requirements include a variety of best management practices to minimize short-term impacts.

Comment 90:
There is no information in The Fact Sheet that documents how the acute 3.0 ug/l and chronic 0.06 ug/l were derived, other than a vague statement in this section. Why has Ecology relied on a ten year old EIS to estimate the concentration of 3200 ug/l at the acute edge of the mixing zone and 8450 at the edge of the chronic mixing zone? Why does it state that no mixing zone has

been granted when the effluent limitations are 60 meters from the application site for acute compliance and 600 meters for chronic compliance? If this is not a mixing zone, what is it?

Response:
The permit does state the derivation of the limits. The determination of toxic limits was completed and published by the Department of Ecology in Carbaryl Concentrations in Willapa Bay and Recommendations for Water Quality Guidelines (Art Johnson, March 2001, Washington Department of Ecology, Publication No. 01-03-005, March 2001). The EIS contains the applicable and useful data on dilution at a distance from the application area that has not been refuted by any other evidence.

Comment 91:
Numerical Criteria for the Protection of Human Health. Pesticide manufacturers have succeeded in obtaining a residue tolerance for glyphosate in shell fish for human consumption.

Response:
This permit does not address glyphosate.

Comment 92:
The draft permit establishes an effluent limitation of 3 ug/l 24 hours after application and a chronic limit of 0.06 ug/l 24 hours after application. What margin of safety do these limits include? Why isn't the chronic limit also established at 60 meters?

Response:
The margin of safety in determining permit limits is standard to the EPA method of deriving limits. The chronic limit comes from the National Academy of Sciences and is derived by taking the EC 50 (concentration affecting 50% of the population) of Dungeness crabs and multiplying by a safety factor of 0.01. The acute limit is taken by dividing the criterion maximum concentration for a large mixture of organisms and dividing by a safety factor of 2. The revised limits do not establish a uniform distance for exceedance

Comment 93:
In addition, a discharge limit must be listed. Neither the fact sheet nor the draft permit document that 8 pounds of active ingredient is the least that can be applied. (S7. BMPs H.)

Response:
Limits are now established. The comment reference to special condition S7 does state a maximum application rate of 8 pounds of active ingredient per acre, not a minimum application rate. The total acreage allowed is 800 acres. If the permittees chooses to apply less than the maximum rate, it does not allow an increase in application acreage.

Comment 94:
Under this permit, the permittees are allowed to apply carbaryl year around for 5 years.

Response:

Special Condition S4.H in the permit limits spraying to the period July 1 through September 1. The term of the permit is now limited to 4 years.

Comment 95:
The monitoring schedule is inadequate. A single grab sample at the first high tide after application is not sufficient to detail to ensure that adequate monitoring is taking place. Background sampling should take place weekly. The Sampling and Analytical Procedures are unclear. "Representative of the volume and nature of the monitored parameters" does not provide adequate instructions.

Response:
The Department of Ecology believes that the monitoring schedule is adequate until the sampling provisions of the Water Column Fate and Transport Study required in the Compliance Schedule are implemented. The contents of Section S2B are standard requirements included in all Ecology Water Quality permits. Given the mass of raw data in existing studies, weekly sampling is redundant for the first 60 days after application.

Comment 96:
The commenter takes exception to the previous methods of measuring wind velocity and direction. The commenter speculates on the method (wet finger) without presenting evidence that adequate monitoring has indeed not taken place. The commenter recommends an instrument for measuring wind velocity.

Response:
Ecology observations of carbaryl spray events in the past have been made using a Dwyer Wind Meter. The regulation of pesticide spraying is a Department of Agriculture responsibility. The permit has been amended to include a requirement that approved instrumentation be used during spraying events.

Comment 97:
Annual monitoring reports are not adequate. Discharge monitoring reports must be submitted monthly.

Response:
The commenter does not state any reason why monthly reports should be submitted. The spray application period covers only a two month period.

Comment 98:
Applicants are only required to document a mean burrow count when it is less than ten burrows per square meter. There is no documentation where this number comes from. This permit should require documentation for mean burrow counts that exceed ten burrows per square meter.

Response:
Applicants are required to document and report mean burrow counts for all sites (Special Condition S4.D1.). The 10 burrow count is the result of a pragmatic limit arrived at by years of negotiation and field observation by state agencies and the permittees. This method of

determining the eligibility of a site for spraying may be revised pending the results of studies being done as part of the Integrated Pest Management plan.

Comment 99:
The commenter notes that Ecology prohibits treatment of oyster within one year of harvest. He then asks for a rationale for Ecology allowing treatment of oysters ready to harvest.

Response:
The permit does not allow harvest of oysters treated with carbaryl within one year.

Comment 100:
Notification to US F&WS and Ecology should include the amount of chemical to be applied.

Response:
The permit requires Ecology to be notified.

Comment 101:
The commenter proposes a scenario wherein the permittees decided to apply carbaryl on the weekend, an Ecology employee would not be notified before 5:00 PM on Friday, leaving the spray event essentially unsupervised.

Response:
Special Provision S4.F in the permit draft commented on clearly states that Ecology be notified before 5:00 p.m. on Friday if application is to be on Saturday, Sunday, or Monday. Ecology can inspect spray activities at any time.

Comment 102:
The content of the reports required in S4.G will not be available to Ecology in time to correct any deficiencies.

Response:
Ecology believes the reporting and timeframes are adequate.

Comment 103:
BMP H states that carbaryl application rate shall not exceed 8 pounds active ingredient per acre. But it does not specify per acre of infestation. This means that on a half acre application, eight pounds could be applied (or twice the allowed rate) because it would still be eight pounds per acre.

Response:
The application rate can not exceed 8 pounds per acre. This is a mass per acre limitation that applies to all areas treated regardless of size. The application described in the comment results in an application rate of 16 pounds per acre and would be a clear violation of the permit.

Comment 104:

Ecology should require that the permittees submit to Ecology all records required to be kept by this permit.

Response:
There is no requirement that all of a permittees records are to be submitted.

Comment 105:
The commenter supports the IPM approach to the control of burrowing shrimp. A long term solution to the problem of burrowing shrimp will be aided by an improved understanding of the factors that lead to the economically damaging populations of the shrimp.

Response:
The final IPM plan should examine this problem.

Comment 106:
Available research data shows that carbaryl and 1-napthol residues in oysters and shellfish from areas previously sprayed are temporarily detectable. Concentrations were small and much lower than EPA allowed residues in fruits and vegetables. Further, these concentrations declined rapidly. The studies, however, are old and to some extent incomplete. Further research should be conducted into residues in oysters to confirm that no significant hazard exists.

Response:
The proposed fate and transport study will contain testing results for carbaryl and napthol-1 concentrations in shellfish.

Comment 107:
The proposed spill plan should include immediate testing for pesticide residues in the vicinity of any carbaryl spill in the water.

Response:
Comment noted.

Comment 108:
I want my drinking water tested for contaminants being put into it.

Response:
The testing of drinking water for contaminants is a function of the Washington State Department of Health who may or may not operate in cooperation with the Pacific County Health Department. This permit does not authorize application to drinking water.

Comment 109:
Does the permitting address non-compliance or the revocation of the permit?

Response:

Washington law allows the Department, through due process, to penalize permit violations by penalty or revocation of permit.

Comment 110:
Who determines that the spraying occurs, and are we to be notified of when spraying will occur?

Response:
The permit details the process by which the permiteess are allowed to spray and the public notice requirements required. A copy of the permit and fact sheet can be sent upon request.

Comment 111:
Have safer alternatives been explored as an alternative to spraying?

Response:
A large number of alternatives to spraying have been examined in a more or less satisfactory fashion. Those alternatives are being required to be studied and reported according to the Schedule of Compliance.

Comment 112:
Who will be personally liable for injuries resulting from sprayings? Who will carry the financial loss and liability of sprayings?

Response:
These are questions best left to an attorney if presumptive injuries have occurred. The spray applicator named as permiteess are required to carry liability insurance when licensed by the Washington Department of Agriculture.

Comment 113:
Has spraying oyster beds anything to do with elevated rates of cancer and suicide in Pacific County?

Response:
See response to comment #1.

Comment 114:
S2 B. Sampling and Analytical Procedures: Sampling should be conducted by a third party, funded by the growers association or Department of Ecology to insure that consistent and accurate data is collected.

Response:
Sampling is the responsibility of the permittees. Ecology reserves the right to sample separately as a control test or enforcement process.

Comment 115:

The present limitation on sprayable acreage in the "Letter of Understanding" should be maintained until the IPM plan is complete and approved.

Response:
Both the Memorandum of Agreement and the permit specify a limitation of 800 acres, which is the only limit currently proposed. The permittees can, however, request approval from Ecology to treat additional acreage and provide justification for that change.

Comment 116:
S4 B1 Public Notification - The notification of property owners within 200 feet of treatment site is unrealistic, there will never be a property owner within 200 feet of an oyster bed.

Response:
The property maps of Pacific County show continuous property title over vast areas of Willapa Bay and Grays Harbor tidelands.

Comment 117:
24 hours is an inadequate warning time for notification of spray events, since it would be inconvenient for property owners to arrange to leave the area on such short notice. 72 hours should be used.

Response:
The Annual Operations Plan will be available upon request and will specify the tide range of dates for treatment in advance. Twenty four hours notice is also consistent with other pesticide and herbicide treatment permits.

Comment 118:
The South Beach Bulletin is the newspaper that should be used for public notification, not the Daily World.

Response:
Ecology does not require advertisement in every newspaper in any area. The three newspapers used for advertising are the newspapers of public record in the vicinity of the application area.

Comment 119:
S4 B2 Signage Signs should be posted at the three public boat launches in the South Beach area. ANY TIME there will be a spraying. From Johns River Launch, Marina launch, or Duck Club, the public can easily access most of the oyster areas, inadvertently boating over a treated area.

Response:
It is not practical to post every boat launch in Willapa Bay and Grays Harbor. The condition quoted in the permit is considered adequate.

Comment 120:
S4 B3- States that no bed may be treated with carbaryl if it contains oysters within one year of harvest. After a spraying, what certainty is there that a grower won't decide to harvest early?

Response:
Ecology cannot guarantee that a permittees will not act illegally. However, if oysters are harvested within one year of carbaryl application it would be a permit violation subject to Ecology's enforcement authority under Ch. 90.48 RCW.

Comment 121:
Application of a nerve agent to the environment should never go unsupervised.

Response:
See response to comment #1.

Comment 122:
The commenter identifies himself a former aerial applicator. He states that helicopter pesticide application is fundamentally unsafe and should be forbidden.

Response:
Aerial application is currently an acceptable practice for pesticide treatment and is authorized by the Washington State Department of Agriculture.

Comment 123:
S7M –Who wrote this?

Response:
Ecology wrote the comment, which was subsequently removed from the permit.

Comment 124:
All documents associated with carbaryl application in Willapa Bay are suspect because they were all prepared or filtered by Ecology or the industry. Only one document is trustworthy because it was prepared by an outside agency, WSU. This study shows a background level of carbaryl far in excess of 0.06 ppb.

Response:
Comment noted.

Comment 125:
The Department of Ecology was negligent in 1991 in insuring that best management practices were followed for public notification of spray events. This shows that Ecology cannot manage carbaryl application. Therefore, the permit should be denied.

Response:
Comment noted.

Comment 126:
The wind in Willapa Bay seldom falls below 10 miles per hour, so that spraying can never take place according to the best management practices. Therefore, the permit should be denied.

Response:
Ecology will take steps to insure the conditions of the permit are met.

Comment 127:
Ecology cannot guarantee that carbaryl is not present in finfish and crabs harvested from Willapa Bay.

Response:
The Department of Agriculture administers food purity responsibilities.

Comment 128:
Sediment analysis is needed in the draft permit.

Response:
A sediment section is now included in the permit.

Comment 129:
Who is going to pay for permit preparation and enforcement since the permit fee (originally set at over $30,000) has been set at $300 by the legislature?

Response:
Unrecovered costs for preparing and administering the permit will be borne by Ecology.

Comment 130:
What is the authority for issuing a permit for 5 years?

Response:
WAC 173-220-180 (1) limits permits to a 5 year duration. This permit has been revised to a maximum term of four years.

Comment 131:
A bed which has been rolled is too hard and flat to hold oysters against wave and tide.

Response:
The mechanical studies required in the Schedule of Compliance will evaluate efficacy for compacting oyster beds as an alternative to carbaryl.

Comment 132:
The oyster industry is the first or second or third or fourth or fifth largest employer in Pacific County.

Response:
Unknown.

Comment 133:

Carbaryl should not be sprayed because the bays belong to everyone and not just the oyster growers.

Response:
See response to comment #31.

There is no Comment 134.

Comment 135:
A Ninth Circuit Court decision held that a permit must have limits.

Response:
This permit has stated limits.

Comment 136:
The issuance of the permit should be delayed until EPA makes a health assessment in its current reevaluation of carbaryl. Perhaps a one year permit could be issued.

Response:
See response to comment #20.

Comment 137:
Ecology has ignored the public concerns of local residents.

Response:
Of 123 letters commenting on the proposed permit, ninety came from outside Pacific and Grays Harbor County. Twelve letters were for E-Mail addresses only, thus their origin can only be guessed. Of the 21 letters received from Pacific and Grays Harbor County, 9 were against carbaryl spraying and twelve were in favor of carbaryl spraying. Of all the local letters received, only two were in favor of the draft permit as written. Seven letters favoring carbaryl spraying rejected the permit as too harsh. The concerns of the local citizens were noted and compared to the restrictions of "fact and law".

Comment 138:
Page 4, Summary of report submittals: Please add a date on line S6 to reflect that the spill plan must be submitted prior to the first spray event as stated in the text.

Response:
The spill plan will be required prior to treatment.

Comment 139:
Is the designation of pesticide label requirements as constituting AKART appropriate with regard to what is considered a "reasonable technology." If not, how is it possible that Ecology can allow a mixing zone (a.k.a. compliance distance)?

Response:

No mixing zone is included in the permit. Specific locations for sampling to determine compliance during the first 24 hours following spraying have been included. See also response to comment #11.

Comment 140:
Page 5, Discharge Limitations: A discussion on the derivation of the 600 meter chronic compliance zone requests acknowledgement that the area covered by the mixing zone exceeds the area of application. It asks the question of what happens when mixing zones overlap. It asks questions about monitoring of mixing zones.

Response:
The current permit does not include mixing zones. Limits are applied at specific times following application (24 hours for acute, and 30 days for chronic) and are applicable throughout the estuaries.

Comment 141:
More frequent sampling in the application areas would help determine compliance with the limits.

Response:
Comment noted. The annual sampling plan has been modified as described in Section S.2.B. of the permit.

Comment 142:
Two species of birds in the Willapa Bay/Grays Harbor area are species of concern as threatened by environmental pressure. Extensive studies should be done to determine the effects of carbaryl on these species. Birds migrating through the area may eat carbaryl-killed shrimp and suffer.

Response:
Since carbaryl has been shown in laboratory tests to be quite harmless to birds, no special efforts are indicated for avian species. The commenter on migrating species did not establish that the bird migrations mentioned actually coincided with the spraying season. See also response to comment #7.

Comment 143:
The sampling plan for sampling sites in Grays Harbor is incomplete and the number of samples to be collected is unclear. If only three samples are taken, the concentrations of carbaryl will be inconclusive.

Response:
The primary purpose of sampling and testing is to aid in enforcement of the regulations, such as spraying outside the scope of the permit. The permit has been altered to make this more definitive.

Comment 144:
Chain of custody procedures should be followed in sampling.

Response:
Chain of custody procedures are established in the laboratory certification process conducted by the Ecology Laboratory Services program.

Comment 145:
Please add a discussion of how sites to be sprayed are selected. Is there any concern given the proximity of these areas to sensitive or critical natural resource areas?

Response:
The permit states that the selection of the sites to be treated is limited by the provisions that burrow counts must be considered. No sensitive or critical natural resource areas have been defined in the permit for different treatment.

Comment 146:
Please clarify that the sampling sites mentioned in S4D2 are identical, but not inclusive of the sampling sites in monitoring Schedule S2.

Response:
S4D2 has been eliminated.

Comment 147:
The monitoring samples should also have Global Positioning System Coordinates to facilitate tracking the plume.

Response:
Comment noted.

Comment 148:
Page 14, Best Management Practices- Please clarify statement B to be more precise in terms of "unnecessary damage to the environment".

Response:
The intent of this provision was to ensure the Permittees follows best management practices intended to minimize impacts. This language was unnecessary to the intent of the provision and has been removed.

Comment 149:
Page 22, G24 Other than the Clean Water Act, what is the basis for these notification levels?

Response:
The basis for G24 is derived by reference from 40 CFR 122.42 (a).

Comment 150:

History-A larger discussion about the toxicology of carbaryl, the natural function of burrowing shrimp, and the potential impacts to other resources is warranted in this section. Since the industrial process and economic benefits of the oyster industry are included in the fact sheet, perhaps a more balanced presentation as to the environmental impacts of this practice is warranted. WDFW Habitat Program has provide additional language (See enclosure 1 and references as provided by USFWS) that you may include in the fact sheet.

Response:
The fact sheet has been completed. See also response to comment #36.

Comment 151:
Page 2, General History-Please cite and clarify the third paragraph regarding concepts like "expansive growth". Also provide more information regarding the number of acres historically inhabited by burrowing shrimp prior to the removal of native oysters and subsequent intensive oyster culturing in the estuaries. This may also be the appropriate section to discuss the benefits of these native burrowing shrimp and their natural role in the ecosystem. Finally, in the last paragraph Ecology should include a discussion regarding the fact that salmonids including coastal cutthroat trout utilize burrowing shrimp as prey items.

Response:
WDFW has observed the bay and participated in many of the studies conducted regarding the expansion of burrowing shrimp populations over the past decades. Ecology is not aware of any WDFW areal distribution data describing this expansion and change to the ecosystem. See also response to comment #36.

There is no Comment 152.

Comment 153:
Page 2, History of Carbaryl Control- In the first sentence, please clarify that carbaryl may have a low persistence in the water column but that the environmental persistence in the sediment may be much longer. (Stonick, C., 1999-Ecology publication No. 99-323).

Response:
See response to comment #19.

Comment 154:
Page 2, History of Carbaryl Control: Since the issuance of the Battelle Report in 1997 (An Evaluation of the Feasibility of Using Integrated Pest Management to Control Borrowing (sic) Shrimp in Commercial Oyster Beds),. Does the statement "Carbaryl was identified in the early 1960's as the safest, most cost effective, and reliable burrowing shrimp management tool" still hold true today in 2002?

Response:
Carbaryl appears to remain the most cost effective and reliable method, but the permit and the IPM plan will evaluate alternatives.

Comment 155:
Page 4, Proposed Permit Limitations. Page 4, Technology Based Permit Limitations, Surface Water Quality-Based Effluent Limitations. The commenter professes great confusion about the derivation of permit limits and the derivation of the special mixing zone. These comments will not be quoted in full since the confusion engendered by an error on the permit writer's part makes all this unclear.

Response:
Limits included in permit are water quality based. Development of numeric criteria is described in the Fact Sheet. There is no mixing zone in this permit.

Comment 156:
Page 5, Numerical Criteria for the Protection of Aquatic Life. Please be aware that aquatic criteria are generally promulgated using lethality data. We suggest that Ecology add an explanation in this section as to how the acute a (3g/l)(sic) and chronic (0.06 g/l) (sic) were derived and used as effluent limitations. WDFW Habitat Program is also concerned with sublethal effects which may impact the biological requirements and ecological fitness of trust resources including T/E species.

Response:
It is assumed that the acute and chronic limits quoted here are the product of a typographical error. The limits of acute (3 µg/l) and chronic (0.06 µg/l) were derived in Carbaryl Concentrations in Willapa Bay and Recommendations for Water Quality Guidelines, (Johnson, Art, March 2001, Ecology Publications No. 01-03-005), as reference in Appendix C. See also response to comment #7.

Comment 157:
Page 7, Surface Water Criteria-Under the toxics criteria for this discharge it states "no toxics in toxic amounts". Since many non-target invertebrate and fish species have been documented to be killed by this spray event (discharge), please add rationale on how this discharge meets the criteria.

Response:
See response to comment #15 and #31.

Comment 158:
Page 7, Sediment Quality. Since the spray event……etc.

Response:
The sediments section was revised to include monitoring and assessment of persistence.

Comment 159:
Carbaryl and 1-napthol in sediment should be analyzed within 24 hours upon receipt by laboratory. Pore water should be analyzed within 24 hours after the time of collection and should not be frozen. Alternatively, Manchester Environmental Laboratory should do some analyses to determine proper sample holding times.

Response:
All samples will be tested according to the protocols as set forth in 40 CFR 136 or the Manchester Laboratory. All samples will be analyzed by laboratories whose protocols have been certified by the Manchester Laboratory.

Comment 160:
Monitor water column over sprayed beds before and after application to determine background concentrations.

Response:
Background over beds is assumed to be below detection.

Comment 161:
The requirements for additional fate and persistence testing seem like a step in the wrong direction when the money could be better spent on studies (such as those in the memorandum of agreement). Monitoring here is excessive.

Response:
Monitoring is critical to furthering scientific and credible knowledge about carbaryl, alternatives in the Integrated Pest Management plan, and permit compliance.

Comment 162:
The Johnson study is extremely conservative, unrealistically so.

Response:
Comment noted.

Comment 163:
The Johnson study showed that carbaryl levels fell off rapidly and did not persist in the water column for more than two weeks.

Response:
The monitoring schedule in the permit will confirm or deny this assertion.

Comment 164:
The growers are expected to meet the ultra-conservative limits established by Ecology for chronic toxicity at a distance of 600 feet and for acute toxicity at a distance of 197 feet within twenty four hours.

Response:
The points of compliance and times of testing have been modified.

Comment 165:
The proposed monitoring plan is unreasonably costly.

Response:
The monitoring described in this permit is necessary to document the affects of carbaryl in the water and sediments.

Comment 166:
The word "alternative" should be used instead of "substitute" in the Schedule of compliance.
Response:
Comment noted.

Comment 167:
The Carbaryl Spray results in extensive environmental pollution.

The spray of Carbaryl onto tidelands results in high levels of pollution in water and sediment**.**

1. The draft permit proposed allowing large amounts of carbaryl to be sprayed.
2. The spray results in high concentrations of carbaryl in the water.
3. Carbaryl drifts from the application site into adjacent waters.
4. Carbaryl persists in sediment.

Response:
The permit addresses all of these issues and responses to similar comments have been provided above.

Comment 168:
Spraying Carbaryl in Willapa Bay and Grays Harbor is harmful to the Ecosystem.

Carbaryl is a broad spectrum insecticide, meaning it is harmful not only to the target species, but also to many other organisms. We are concerned about the effects of carbaryl on invertebrates, fish and birds.

1. The carbaryl spray causes immediate death for many organisms.
2. Fish and birds are exposed to carbaryl.
3. Carbaryl poses a threat to fish populations.
4. Carbaryl poses a threat to bird populations.

Response:
See response to comment #7. All these comments have been previously made and responded to above.

Comment 169:
Carbaryl is harmful to Human Health

1. Carbaryl has short and long term toxicity to the nervous system.
2. Carbaryl has been shown to cause reproductive problems.
3. Carbaryl has been linked to cancer.
4. Carbaryl is associated immune system repression

Response:
See response to comment #1.

Comment 170:
The draft permit fails to establish effluent limits necessary to meet water quality criteria.

Response:
The permit does establish limits and complies with the state water quality standards.

Comment 171:
The draft permit fails to require All Known and Reasonable and Reasonable Technology (AKART) before the first carbaryl discharge into Willapa Bay and Grays Harbor.

Response:
See response to comment #11.

Comment 172:
The draft permit inappropriately applies the short term modification provision as justification to violate water quality standards.

A. The discharge of carbaryl into Willapa Bay will kill crabs, fish, and other marine life, resulting in the degradation and interference with existing uses of the water body.
B. The time period of the permit is 5 years, which is not a short term.
C. Allowing a "special; mixing zone "with the short term modification provision as justification does not meet requirements of the water quality rules.

Response:

A. See response to comment #7.
B. The regulation does not set a definition of short term. Each short term modification in this permit is limited to a maximum of three months (2 months for the application and 30 days beyond application).
C. The short term modification will allow the establishment of a compliance zone. See also response to comment #15.

Comment 173:
The sediment management standards, which are an approved water quality standard, apply and must be included in the final permit.

Response:
Sediment management and monitoring provisions have been included in the permit.

Comment 174:
Human health criteria must be included in the final permit because of carbaryl's potential to seriously impact human health, particularly members of the Shoalwater Bay Tribe.

Carbaryl poses a threat to human health the following ways:

- Carbaryl has been shown to cause reproductive problems including effects on sperm production and quality.
- Carbaryl has been linked to cancer. Carbaryl has been listed by USEPA as a possible carcinogen, and epidemiological studies have linked carbaryl specifically to no-hodgkins lymphoma.
- Carbaryl is associated with immune system repression.

Response:
See response to comment #1.

Comment 175:
The permit does not adequately protect endangered species, particularly the cutthroat trout.

Response:
See response to comment #7. The cutthroat trout is not listed as an endangered species.

Comment 176:
Whether accomplished through the draft permit or other means, a mandate to phase out carbaryl should be issued.

Response:
The water quality standards do not mandate a phase-out for the use of carbaryl. See also response to comment #31.

Comment 177:
Instead of continuing to foster an addiction to pesticide through a lenient and illegitimate permit, government should provide technical assistance and financial aide (sic) to support a transition to other control methods.

Response:
Comment noted.

Comment 178:
The Department of Agriculture's Special Local Needs registration is not supported by the required paperwork.

Response:
This issue would be the responsibility of the Department of Agriculture, not Ecology.

Comment 179:
Peer supports two IPM options defined in 1997: (1) The introduction of predatory finfish and (2) the modification of substrate in order to replant strips of eelgrass to provide habitat for predators.

Response:

Ecology has supported these options and others through the requirements in the schedule of compliance.

Comment 180:
The draft permit violates the EPA's current position on pesticide drift:

Response:
See response to comment #10.

Comment 181:
The draft permit relies on a Supplemental EIS that was completed 10 years ago under different environmental conditions and prior to the listing of endangered species.

Response:
See response to comment #7.

Comment 182:
The Draft Permit is mute on the viability of the Special Local Needs Permit issued by the Department of Agriculture.

Response:
See response to comment #178.

Comment 183:
Is unenforceable, given the Department of Ecology's constrained budgetary resources and the permit language which, in places, lacks standards for compliance or discussion of how enforcement will be accomplished.

Response:
Aside from the exemption furnished by the temporary modification, the permit is the standard language which is enforced routinely. See also response t comment #166.

Comment 184:
Was written after the government negotiated an MOA with the industry in which commitments were made to allow continued spraying.

Response:
See response to comment #77.

Comment 185:
Defines a compliance schedule that is mute on requirements for implementation of IPM even though a draft IPM plan was created in 1992. It was never finalized "because the committee could not reach consensus"

Response:

The connection between 1992 IPM plan recommendations and the proposed permit is not established. This permit requires the development and approval of an IPM plan.

Comment 186:
The key deficiencies in the annual plan (S4) include the failure to:

- Address why 800 acres is the minimum amount that can be sprayed:
- Address why the application must be from the air instead of from the air instead of from land.
- Define the methods used or data to be submitted to verify that the burrow count exceeds ten burrows per square meter.

Response:
Other items in this list are answered in other parts of the response to comments, and will not be repeated here.

800 acres is the maximum area that can be sprayed, not the minimum. The 800 acre restriction has been in place for several years as defined in the SEIS. Depending on the results of the economic damage model in the IPM, it is conceivable that the acreage limitation could change.

The SEIS states that the cost of hand spraying would be prohibitive for some of the larger infestations given the short time window of opportunity for spraying. Using a conservative estimate of a production rate of 1.75 acres sprayed per man hour of spraying and a 6 hour period of low tide during which spraying is possible, it turns out that a crew of 58 sprayers would have to be trained and paid for a two month period. Aerial spraying is also done in accordance with label requirements. See also response to comment #187.

Comment 187:
Define the methods used and data to be submitted to verify that the burrow count exceeds ten burrows per square meter.

Response:
It is the responsibility of the permittees to measure and count the burrows, and submit the burrow count information to Ecology.

Comment 188:
The best management practices (BMPS) defined by permit item S7 are inadequate. Core concerns include the following:

> They provide no buffer requirements for sloughs, channels, or oysters which are more than one year away from harvest. Buffer requirements should be mandatory regardless of the age of the oysters.
>
> The BMPs do not define how wind speed will be measured and assume that drift will be adequately minimized if no aerial applications occur if the wind velocity at the treatment

site exceeds ten miles per hour. Under moderate winds of 5-10 miles per hour aerially applied carbaryl has drifted up to two miles.

Response:
Buffer requirements and wind velocity conditions are contained within the label restrictions and the permit. No justification has been provided or evaluated for additional buffers.

The permit has been modified to require the permittees to submit information on the wind measuring device for approval before spraying.

Comment 189:
1. The draft permit violates Washington State's Sediment Standards.
2. The draft permit violates EPA's current position on pesticide drift.

Response:
1. See response to comment # 59.
2. See response to comment #10.

Comment 190:
1. The draft permit should not rely on a Supplemental EIS completed 10 years ago under different environmental and prior to the listing of endangered species.
2. The draft permit does not require adequate precautions and monitoring to prevent and/or assess the impacts of carbaryl spraying to fish crab, or epibentic microorganisms or to measure pesticide drift.
3. The permit should drive an MOA with the regulated parties- not be driven by it.
4. The permit is mute on the viability of the Special Local Needs Permit (SLN) issued by the Department of Agriculture.
5. The permit should define what if any public tidelands are in the vicinity of the proposed action.
6. The draft permit is unenforceable and lacks accountability measures on both the part of the oversight agencies. Accountability measures must be added.

Response:
1. See response to comment #7.
2. The fate and transport study contained in the Schedule of Compliance will document and evaluate the potential impacts identified in the comment.
3. The permit takes legal precedence over the MOA.
4. See response to comment #178.
5. DNR is aware of the permit.
6. NPDES permitting is enforceable.

Comment 191:
There is no definition of the government's role in monitoring or inspecting to assess compliance with the permit conditions. This needs to be defined and not left up to site visits and casual observations.

Response:
The permit requires the permittees to conduct extensive monitoring, which is subject to Ecology review and approval. The permit also provides the regulatory authority necessary for Ecology to conduct and issue enforcement actions as necessary.

Comment 192:
If an NPDES permit is a viable option, the permit oversight should be provided by a person trained in NPDES permit compliance…..

Response:
Ecology is authorized to oversee this NPDES permit.

Comment 193:
The Department of Agriculture's role is not defined.

Response:
The Department of Agriculture does not have a formal role in the permit. Ecology does not regulate the Department of Agriculture with this permit, and compliance with the permit resides solely with Ecology. The permit does not relieve the permittees from requirements of Department of Agriculture or other regulating bodies.

Comment 194:
A WSDA-Endangered Species Program is evaluating the impact of pesticides on endangered species. Results of this program will be forthcoming. Ecology is participating in this program.

Response:
When the results of these studies are available, they should be transmitted to Ecology with recommendations for permit modification if necessary. See also response to comment #7.

Comment 195:
"Suspension" is an inappropriate term. Concentration is more accurate.

Response:
Suspension is taken to be a physical state. Concentration is believed to be the measure. The text will be checked for appropriate use, but the fact sheet text will not be altered.

Comment 196:
The permit should cite FIFRA Section 24(c) rather than attaching a pesticide label to the fact sheet.

Response:
Permit corrected. The label is retained as an example.

Comment 197:

Please add the sentence "we will only allow treatments by applicators with current pesticide applicator licenses that have aquatic endorsements consistent with RCW 15.58 and RCW 17.21".

Response:
This has been completed.

Comment 198:
The commenter requests withdrawal of the SEPA Determination of Non-Significance completion of NEPA, and denial of the validity of the supplementary EIS.

Response:
Ecology believes that it has followed the requirements for SEPA review.

Comment 199:
A comment that seems to imply that the inert ingredients in the pesticide are recycled toxics.

Response:
The nature of the inert ingredients in pesticides is proprietary information which is reviewed by the EPA for toxicity.

Comment 200:
The commenter requests additional time to review the permit due to lack of notice.

Response:
This permit has complied with all public notice requirements.

Comment 201:
Oyster growing techniques that are usable in Mexico demonstrate that AKART is not being met in Washington.

Response:
Techniques that are useable in Mexico may not be applicable to Willapa Bay and Grays Harbors. See also response to comment #33.

Comment 202:
Persons sprayed directly with carbaryl suffer major physical damage.

Response:
This permit only authorizes the spraying of carbaryl onto the tide flats of Willapa Bay and Grays Harbor. See also response to comment #1.

Comment 203:
The commenter should have received a personal notification of the permit comment period without requesting permit information through the normal procedures.

Response:
The regulations regarding notification were followed.

Comment 204:
The Department of Ecology should have conducted a NEPA review.

Response:
The Department of Ecology does not administer NEPA.

Comment 205:
The Determination of Non-Significance for this SEPA review was improperly issued.

Response:
Ecology believes the SEPA determination of non-significance was properly issued.

Comment 206:
Scientific principles were not followed in the preparation of this permit.

Response:
Ecology believes that this permit was developed in accordance with applicable law and science.