

# CASE INLET SHORELINE ASSOCIATION

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Caseinlet.org

***PRESERVING AND PROTECTING PRISTINE CASE INLET FOR FUTURE GENERATIONS, FOCUSING ON COMMUNITY STEWARDSHIP, EDUCATION AND SCIENTIFIC RESEARCH***

October 19, 2010

Mr. Dennis McLerran, Regional Administrator  
Environmental Protection Agency, Region 10  
1200 Sixth Ave, Ste 900  
Seattle, WA 98101

Re: Concerns regarding Industrial Aquaculture's Use of Intertidal PVC as a Violation of Clean Water Act" and request for action.

Dear Mr. McLerran,



The Industrial Aquaculture industry in the Puget Sound is engaging in a widespread practice that my organization believes violates both the letter and intent of the Clean Water Act and the Plastic Pollution Control Act, specifically the embedding of miles of polyvinyl chloride (PVC) pipe into the intertidal shorelines. These violations are ongoing on a vast scale in the Puget Sound. The geoduck industry places 8 miles of PVC pipe per acre, approximately 43,000 pipes placed on one foot spacings.

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The impact of these structures upon salmon migration, food fish, flat fish and other species is largely unstudied. There is a need for a detailed study of these impacts. However, our larger concern is the ongoing introduction of potentially dangerous chemicals and marine plastic debris into the Puget Sound as a result of these practices.

Based on the weights provided by Peter Downey, an Industry spokesperson at the recent Washington Department of Natural Resources Aquaculture Forum, whereby he actually weighed the tubes himself; one acre contains about 40,000 pounds, or 20 tons per acre of PVC pipe. The best estimate is that there are currently about 300 acres of geoduck farms in Puget Sound, with several new applications pending. Not every farm will have tubes out all at the same time, but just based on 100 acres at one time, we're looking at 800 miles, or 2,000 tons of PVC pipe imbedded into the intertidal zones of Puget Sound.

The other thing we know is that the geoduck industry uses and reuses the PVC pipes until they are unusable. In other words, until they are worn down or chipped away so much that they can no longer hold water. PVC was obviously not designed for outdoor use in the marine environment, where it is exposed to temperature fluctuations, UV light, and wave and sand erosion and scouring. This break up of the PVC pipes leaves pieces of PVC behind in the environment and affords an opportunity for this debris to be introduced into the food chain.

Congress enacted the Clean Water Act in 1972 in order to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251; *S. Florida Water Mgmt. Dist. v. Miccosukee Tribe of Indians*, 541 U.S. 95, ----, 124 S.Ct. 1537, 1541, 158 L.Ed.2d 264 (2004). Section 301(a) of the CWA provides that, subject to certain exceptions, "the discharge of any pollutant by any person shall be unlawful." *Id.* § 1311(a).

33 U.S.C. § 1319(7) defines a hazardous substance as follows:

(7) Hazardous substance defined

For the purpose of this subsection, the term "hazardous substance" means (A) any substance designated pursuant to section 1321(b)(2)(A) of this title, (B) any element, compound, mixture, solution, or substance designated pursuant to section 9602 of Title 42, (C) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act [42 U.S.C.A. § 6921] (but not including any waste the regulation of which under the Solid Waste Disposal Act [42 U.S.C.A. § 6901 et seq.] has been suspended by Act of Congress), (D) *any toxic pollutant listed under section 1317(a) of this title, and (E) any imminently hazardous chemical substance or mixture with respect to which the Administrator has taken action pursuant to section 2606 of Title 15.* (emphasis supplied).

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33 U.S.C. §1362 defines “pollutant” in the following manner:

(6) The term “pollutant” means dredged spoil, solid waste, incinerator residue, sewage, **garbage**, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or **discarded equipment**, rock, sand, cellar dirt and **industrial, municipal, and agricultural waste discharged into water**. This term does not mean (A) “sewage from vessels or a discharge incidental to the normal operation of a vessel of the Armed Forces” within the meaning of section 1322 of this title; or (B) water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil or gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the State in which the well is located, and if such State determines that such injection or disposal will not result in the degradation of ground or surface water resources. (emphasis supplied)

33 U.S.C. §1362 defines “toxic pollutant” in the following manner:

(13) The term “toxic pollutant” means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, **either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring.** (emphasis supplied)

PVC is the most common of all chlorinated plastics. It is made up of about 43 percent petroleum and 57 percent chlorine from rock salt. Vinyl chloride, the main chemical in PVC, is a known human carcinogen according to the World Health Organization.

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*"Such plastic poses one of the grave threats to the health of Puget Sound. The particulate plastic from such PVC tubes enters the food web and does untold harm to all the creatures in Puget Sound, including us."*

-Dr. Curtis Ebbesmeyer Ph.D, renowned oceanographer, author, and expert on plastics in the marine environment, in an email response to Case Inlet Shoreline Association members.-

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PVC is one of the most environmentally hazardous consumer materials ever produced. The PVC lifecycle presents one opportunity after another for the formation and environmental discharge of organochlorines and other hazardous substances. When its entire lifecycle is considered, it becomes apparent that this seemingly innocuous plastic is one of the most environmentally hazardous consumer materials produced, creating large quantities of persistent, toxic organochlorines and releasing them into the indoor and outdoor environments. PVC has contributed a significant portion of the world's burden of persistent organic pollutants and endocrine-disrupting chemicals—including dioxins and phthalates—that are now present universally in the environment and the bodies of the human population. Beyond doubt, vinyl has caused considerable occupational disease and contamination of local environments as well.

The hazards posed by the carcinogens vinyl chloride and ethylene dichloride are largely unique to PVC, which is the only major building material and the only major plastic that contains chlorine, requires additives or stabilizers, and leaches dioxins throughout its useable life. PVC building materials therefore represent a significant and unnecessary environmental health risk. At a time when many municipalities around the country are seeking alternatives to PVC in the built environment, it seems incomprehensible that the shellfish industry is placing thousands of tons of PVC directly into the sensitive nearshore aquatic environment of Puget Sound.

At the DNR Forum, Peter Downey mentioned that the shellfish industry uses structural PVC, which according to Downey doesn't contain plasticizers. Without plasticizers, PVC remains brittle and hard. However, all PVC contains additives so that it can be extruded into pipe. One of the most common additives currently being used is organotins. Lead, which may also be used as an additive, is being phased out in the year 2015.

Heat stabilizers are necessary in all PVC formulations to prevent the decomposition of the PVC by heat and shear during processing. They can also enhance the PVC's resistance to daylight, and to weathering and heat aging. In addition heat stabilizers have an important influence on the physical properties of the PVC and the cost of the formulation. The choice of heat stabilizer depends on a number of factors including the technical requirements of the PVC product, regulatory approval requirements and cost. The main heat stabilizers are usually combined with co-stabilizers, which are organic materials, such as polyols, epoxidised esters, and phosphites. They create a synergetic effect between the additives. Lead compounds are the most cost-effective and common forms of stabilizer used for PVC. They are used for around three-quarters of all PVC applications. The lead from PVC has been documented to contaminate water, and to cause nerve damage in people near PVC manufacturing facilities.

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Because PVC catalyzes its own decomposition, metal stabilizers are added to vinyl for construction and other extended-life applications, including structural PVC pipe. Common PVC additives that are particularly hazardous are lead, cadmium, and organotins, with global consumption of each by vinyl estimated in the thousands of tons per year. Metals do not degrade in the environment. All three of the major PVC stabilizers resist environmental breakdown and have become global pollutants. Metal stabilizers are highly toxic. Lead is an exquisitely potent developmental toxicant, damaging brain development and reducing the cognitive ability and IQ of children in infinitesimal doses. Cadmium is a potent neurotoxin and carcinogen, and organotins can suppress immunity and disrupt the endocrine system. Metal stabilizers are released through out the vinyl product lifecycle. Metal stabilizers are released from vinyl products when they are formulated, used, and disposed of. Releases of lead stabilizers from interior vinyl building products have been documented.

We know for a fact that the PVC used by the geoduck industry is hazardous, because all PVC is hazardous. There is no such thing as perfectly safe PVC. The PVC tubes used by the geoduck industry most likely contain organotins or some combination of lead, cadmium and organotins as additives. We're not sure specifically since the shellfish industry uses different types and sizes of PVC pipes. The PVC pipe used by Taylor Shellfish Company at the Stratford aquaculture site in Case Inlet is six inch diameter, Schedule 10 PVC.

Also, ostensibly when tons of PVC pipes are used in industrial aquaculture, the PVC gets ground down by wave and sand scouring into smaller and smaller pieces, the same way that rocks get ground down into sand. PVC starts out as a powder before it's melted down for extrusion. Scholarly articles (one included at the end) suggest that these tiny pieces are taken in by zooplankton, and spread up through the food chain. So we could be eating oysters or fish from Puget Sound containing traces of PVC and its additives. If only 1 percent of the PVC and/or additives were lost into the environment from geoduck tubes wearing down, that would still amount to 20 tons of PVC material discharged into Puget Sound based on the 100 acres estimate mentioned above over the useable life of the PVC tubes.

We also have experienced that many of the tubes used in the industrial aquaculture sites break loose and are washed up on the beach or drift out into the Puget Sound where they are left to erode and decay.

There are some references to very thorough studies on PVC, and the EPA is very familiar with the toxicity or hazards of PVC. Here are the sources for most of the information available on PVC:

[http://www.healthybuilding.net/pvc/Thornton\\_Enviro\\_Impacts\\_of\\_PVC.pdf](http://www.healthybuilding.net/pvc/Thornton_Enviro_Impacts_of_PVC.pdf)

<http://www.cleanwaterpipeCouncil.org>

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<http://www.highcountryconservation.org/pdf/Microsoft%20Word%20-%20PVC.pdf>

This is from the site of PW Eagle, the PVC manufacturer where some of the shellfish industry buys PVC pipe. There were comments from the spokesman from PW Eagle on the DNR Forum (Marcus Galindo). Notice how they do not mention what the stabilizers or additives are. From what we know, these stabilizers or additives are most likely organotins, but possibly also lead or cadmium. The PVC industry will always say that the additives are insignificant by volume, but the fact is, these additives are so toxic that even a small amount is significant.

<http://www.pwpipe.com/literature/tb/tb-s3.pdf>

More information on additives:

<http://www.solvinpvc.com/solvinservices/library/generalinformation/pvcadditives/0,998,3349-2-0,00.htm>

<http://www.solvinpvc.com/solvinservices/library/generalinformation/basics/0,,3346-2-0,00.htm>

[http://www.coalitiontoprotectpugetsoundhabitat.com/uploads/090904-4-Organotin\\_Research.pdf](http://www.coalitiontoprotectpugetsoundhabitat.com/uploads/090904-4-Organotin_Research.pdf)

Article on the persistence of PVC polymers in the environment:

<http://www.orionmagazine.org/index.php/articles/article/270>

The other thing is: the Plastic Pollution Control Act was enacted by Congress to control plastics from entering the environment. I don't see why it shouldn't be applied to this commercial use in the nearshore aquatic environment.

The EPA must consult with the National Marine Fisheries Service to avoid a violation of the Endangered Species Act, 16 U.S.C. § 1536(a)(2), by failing to determine the impact of these PVC pipe installations upon salmon and other marine species. The National Marine Fisheries Service ("NMFS") since 1989 has classified approximately 25 species of salmon and steelheads, collectively known as salmonids, as "endangered" or "threatened" throughout the Pacific Northwest. The NMFS has determined that toxic pollutants may kill or injure salmonids, and may affect future salmonid behavior and reproductive success. *See, e.g.*, 65 Fed.Reg. 42,422, 42,473 (2000).

The EPA should order the immediate removal of all PVC pipe installed by industrial aquaculture in the Puget Sound. Failure to address this issue may result in a citizen suit as provided for under the Clean Water Act. Further, the EPA should use its investigatory

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and enforcement powers to fully document the scope of this problem and preserve evidence relating to the types of PVC pipe used by the industrial aquaculture companies, the volume of such materials purchased and put into use in this fashion, and the identity of manufacturers supplying the product to facilitate remedial actions should one PVC formulation prove to be more toxic or damaging to the environment than another.

Thank you for your attention to this matter and I am interested in hearing from you what actions you intend to take regarding these concerns.

*Respectfully Submitted,*  
CASE INLET SHORELINE ASSOCIATION

Richard H. Wooster, President

Cc: Lisa P. Jackson, National Administrator  
Hon. Jim Moran  
Hon. Nick J. Rahall  
Hon. Jay Inslee  
Hon. Cathy McMorris Rodgers  
Hon. Doc Hastings  
Senator Maria Cantwell  
Senator Patty Murray  
Senator Mike Crapo  
Senator Barbara Boxer  
Senator James Inhofe  
Christine Gregiore, Governor, State of Washington  
Peter Goldmark, Commissioner of Public Lands  
CISA members  
Puget Sound Partnership  
Margaret Pilaro Barrette, Exec. Dir. – Pacific Coast Shellfish Growers Assn.  
Jim Gibbons, Seattle Shellfish  
Paul Taylor, Taylor Resources, Inc. et. al  
Longbranch Shellfish, LLC  
Peter Downey, Discovery Bay Shellfish, Inc.