SB

131

HOUSE COMMITTEE REPORT

(7)

Date referred: 3/11/87

FURTHER REFERRALS: Resources

DATE: 3/24/87

The Labor & Commerce Committee has considered SB 131 am

"An Act regulating the sale and use of TBT-based marine antifouling paints and coatings; and providing for an effective date."

RECOMMENDS:

[ ] replace with ______ [ ] the same title

[ ] attached amendment(s) [ ] a new title

[X] do pass

[ ] do not pass

[ ] no recommendation

[ ] individual recommendations

[ ] additional referral to the ______ Committee

ADOPTS: [ ] ______ letter of intent

ATTACHES NEW FISCAL NOTE(s):

[ ] fiscal impact

[ ] zero fiscal note

[ ] zero with analysis

[ ] same as previous fiscal note published ______

[ ] same as previous zero fiscal note published ______

SIGNING DO PASS:

Ellis

Cliff Davidson

[signature]

[signature]

Dave Donley

SIGNING OTHER RECOMMENDATIONS:

W Furmace no rec

Dave Donley

Chairman's signature

STATE OF ALASKA
THE LEGISLATURE

POUCH Y - STATE CAPITOL
JUNEAU, ALASKA 99811
907-465-3800

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May, 1988

Copies of minutes listed below were originally included in this file. The minutes are available on the STAIRS database CMPR. In order to save space copies of minutes have not been left in the files.

Mary Van Nimwegen

HL+C 3-24-87 1:30 p.m.

(2.)

STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE

REQUEST:

Bill Version :
Publish Date :

Revision Date:
Title : An Act Regulating to the sale and use of TBT-based marine anti-fouling paints & coatings
Sponsor : Senator Zharoff
Requestor : Senator Zharoff

Agency Affected : Environmental Conservation
BRU : Environmental Health
Components : Sanitation

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
PERSONAL SERVICES	-0-	10.7	10.7	5.3	5.3	5.3
TRAVEL	-0-	1.4	1.4	1.0	1.0	1.0
CONTRACTUAL	-0-	2.0	2.0	1.0	1.0	1.0
SUPPLIES	-0-	1.0	1.0	1.0	1.0	1.0
EQUIPMENT	-0-	0.8	0.8	0.5	0.5	0.5
LAND & STRUCTURES	-0-	-0-	-0-	-0-	-0-	-0-
GRANTS, CLAIMS	-0-	-0-	-0-	-0-	-0-	-0-
MISCELLANEOUS	-0-	-0-	-0-	-0-	-0-	-0-
TOTAL OPERATING	-0-	15.9	15.9	8.8	8.8	8.8
CAPITAL	-0-	-0-	-0-	-0-	-0-	-0-
REVENUE	-0-	-0-	-0-	-0-	-0-	-0-

FUNDING: (Thousands of Dollars)

GENERAL FUND	-0-	15.9	15.9	8.8	8.8	8.8
FEDERAL FUNDS	-0-	-0-	-0-	-0-	-0-	-0-
OTHER	-0-	-0-	-0-	-0-	-0-	-0-
TOTAL	-0-	15.9	15.9	8.8	8.8	8.8

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

ANALYSIS : (Attach a separate page if necessary) This fiscal note assumes that the department will only monitor the sale of TBT. This will entail on-site inspection and monitoring of wholesale and retail outlets. It will also involve the investigation and preparation of appropriate enforcement actions.
SEE ATTACHED

Prepared by : Doug Donegan
Phone : 465-2600
Division : Environmental Health
Date : 3-6-87

Approved by Commissioner : Ronn Olson
Date : 3/6/87
Agency : Environmental Conservation

Distribution (by preparer) :
Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)
Senate Secretary

ATTACHMENT

Based on a recent survey, there are approximately 1000 wholesale and retail distributors in the categories likely to be carrying paints and coatings. In FY 88 the Department will conduct a public information campaign directed at these types of outlets.

The Department will also inspect approximately 250 establishments/per year to monitor compliance with the law. This inspection rate will decline in FY 90 to 125 inspections/year.

SENATOR FRED F. ZHAROFF
ALASKA STATE LEGISLATURE
P.O. BLOCK 805 KODIAK, ALASKA 99615 (907) 486-9259
DURING SESSION:
P.O. BOX V, JUNEAU, ALASKA 99811 • (907) 465-3473 • 465-3471
DISTRICT N
ALASKA PENINSULA • ALEUTIAN CHAIN • BRISTOL BAY • KODIAK ISLAND • LAKE CLARK LAKE ILIAMNA • PRIBILOF ISLANDS • SHUMAGIN ISLANDS

MEMORANDUM

TO: Rep. David Donley
Chairman
House Committee on Labor and Commerce

FROM: Senator Fred F. Zharoff

DATE: March 19, 1987

RE: Senate Bill No. 131 am, "An Act regulating the sale and use of TBT-based marine antifouling paints and coatings; and providing for an effective date."

SB 131 amends the Prohibited Acts and Penalties article in the Environmental Conservation chapter of Title 46 by adding a new section to prohibit the sale and use in Alaska of marine paints and coatings that contain the chemical tributyltin (TBT).

TBT is a highly toxic pesticide. It is very effective at killing all the marine organisms that attach themselves to boat hulls painted with TBT paint. Research has shown that it is also poisonous to other forms of life in the marine environment, such as oysters and salmon smolt.

SB 131 was introduced as part of joint effort by legislators in Washington, Oregon, California and Idaho -- coordinated through the Pacific Fisheries Legislative Task Force -- to ban the use of TBT marine paint on the west coast. A companion measure, HB 138, was introduced in the House and is now pending before the House Resources Committee. Bills also are pending in the U.S. Congress and the Maryland legislature. TBT already has been banned or restricted in France, England, Germany, Switzerland, Japan, and the State of Virginia. The alternative to TBT marine paint is copper oxide marine paint, used as the industry standard before TBT products were introduced.

Section 1, part (a) of SB 131 bans the use and sale of TBT.

Part (b) allows people who have already painted their vessel or gear with TBT paint on the effective date of this bill to leave the paint on. They will not, however, be able to apply more TBT paint. Nets treated with TBT may be used for five years, which, on the average, is the life of a net.

Part (c) provides for exemptions for U.S. government vessels (because of lack of jurisdiction), foreign vessels temporarily in Alaska waters, vessels over 5,000 gross tons, and passenger vessels over 3,000 gross tons. The latter three exemptions were included primarily to avoid some of the practical

problems of enforcement. The research indicates that most of the environmental problem is related to its use on small commercial and recreational vessels.

Part (d) lists the definitions.

Attached are additional background materials, as follows:

1. Sectional analysis.
2. Department of Environmental Conservation fiscal note.
3. Department of Environmental Conservation position paper.
4. Pacific Fisheries Legislative Task Force research and position paper.
5. Article from Pacific Coast Federation of Fishermen's Associations newsletter about effects of TBT on salmon.
6. Article from Alaska Fisherman's Journal.
7. Article from San Francisco Chronicle.
8. Guidelines for physical handling of TBT paint from University of Alaska Cooperative Extension Service.
9. List of marine paint containing TBT.

SENATOR FRED F. ZHAROFF
ALASKA STATE LEGISLATURE
P. O. BOX 405, KODIAK, ALASKA 99615 (907) 486-5259
DURING SESSION:
POUCH V, JUNEAU, ALASKA 99811 • (907) 465-3473 • 465-3474 • 465-3844 (Labor and Commerce Committee)
DISTRICT N
ALASKA PENINSULA • ALEUTIAN CHAIN • BRISTOL BAY • KODIAK ISLAND • LAKE CLARK/LAKE ILIAMNA • PRIBILOF ISLANDS • SHUMAGIN ISLANDS

SECTIONAL ANALYSIS

SB 131 -- "An Act regulating the sale and use of TBT-based marine antifouling paints and coatings; and providing for an effective date."

Section 1

46.03.715: SALE AND USE OF TBT-BASED ANTIFOULING PAINT.

(a) Bans the sale and use of TBT-based antifouling paint in the state. Prohibits a person from importing into the state or selling, renting, or leasing in the state, or using in state water, any vessel or fishing gear or other item that is put into the water, if the vessel, gear, or item has already been treated with TBT paint.

(b) Persons who have already applied TBT paint to their boats, gear, or other items before the bill becomes law do not have to remove the paint, but they may not reapply the TBT paint. Fish pen nets that have been treated may continue to be used for five years after the bill becomes law.

(c) Exempts four classes of vessels from the TBT ban: (1) United States government vessels; (2) foreign vessels temporarily in state water; (3) vessels of 5,000 gross tons or more, which covers commercial ships other than commercial fishing and processing vessels; and (4) passenger vessels of 3,000 gross tons, which covers the vast majority of cruise ships. The purpose of these exemptions is to avoid running afoul of federal preemption, in the case of U.S. government vessels, and to avoid the practical problems of trying to prohibit TBT use on foreign vessels and on large commercial and cruise ships. Current statistics indicate that 70 percent of the TBT paint is used on small recreational vessels and 28 percent on commercial ships.

(d) Definition of "TBT-based" and "vessel".

Section 2 Effective date.

The injunction, penalty, and liability provisions of AS 46.03.760, 46.03.765, 46.03.780, and 46.03.790 would automatically apply to violations under this bill because the new statute is a part of AS 46.03 (Water, Air, Energy, and Environmental Conservation).

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

STEVE COWPER, GOVERNOR

February 27, 1987

POSITION PAPER

Bill No: SB 131

Contact: Amy D. Kyle
465-2600

Title: An Act regulating the role and use of TBT-based marine anti-fouling paints and coatings.

Department's Position

The Department supports the intent of the bill to prohibit sale and use of TBT-based paints and coatings. The Department is prepared to enforce a prohibition on the sale of the coatings.

Bill Analysis

The bill would prohibit the sale and use of TBT-based anti-fouling paint. Such coatings have been shown to release TBT into waters. TBT is a harmful and toxic substance. DEC supports the ban on introduction of the substance into waters of the state. (Since 1985, DEC has prohibited use of TBT as an anti-fouling agents in hatcheries, through conditions placed on state certifications of federal permits for hatcheries.)

The bill does not propose a specific role for any agency in enforcing a ban on sale or use of TBT-based coatings. Rather, the bill establishes general prohibitions.

Effect on the Agency

DEC understands that it is the intent of the bill's sponsors primarily to prohibit the sale of TBT in the state. DEC can play an active role in enforcing this prohibition through notification to retail outlets and marketplace inspections to confirm that the ban is complied with. TBT is a pesticide under the federal pesticide laws. The ban would be imposed and enforced as an extention of the state's pesticide program. A fiscal note for resources needed to enforce this aspect of the bill is being prepared.

The Department understands that the bill's sponsors do not intend that any additional activities be undertaken by DEC in response to the legislation in order to detect or take enforcement action under other provisions. In light of this understanding, no resources beyond those required to enforce the ban on sale are included in the fiscal note.

DENNIS D. KELSO
COMMISSIONER

Source: Pacific Fisheries Legislative Task Force

TRIBUTYLTINS/TBT

Tributyltins (TBT) have been called the most toxic compounds ever deliberately introduced by societies into natural waters.[1] A growing body of scientific research indicates that TBT may seriously affect non-target organisms and have unknown effects on humans who eat marine organisms containing TBT or are exposed to it in the workplace.

In the United States, many bodies of water have concentrations of TBT that have reached levels which may cause lethal and sublethal effects in non-target organisms. For example, TBT levels in San Diego Bay have been measured at levels which could cause lethal effects in fish, mollusks, crustaceans. and algae.[2]

TBT is used in antifouling paints and is primarily applied to boat and ship hulls to control the growth of fouling organisms such as barnacles, tubeworms, algae, bacteria, and sponges. These organisms increase hull friction and weight, which in turn increases fuel consumption by reducing vessel speed. The antifouling paints are also used to control fouling organisms on docks, buoys, and other marine structures. TBT has been used in antifouling paints for almost 10 years and replaced the copper-based antifouling paints. The paints with tributyltins last approximately 5-7 years, whereas the copper-based paints last approximately two years.

There are two types of antifouling paints containing TBT: copolymer paints and free association paints. The copolymer antifouling paints contain TBT which is chemically bonded to the paint polymer and is released through a chemical bond breaking process called hydrolysis. New TBT molecules are exposed and released by the gradual erosion of the paint as the vessel moves through the water. The release rate is slow except during the initial one month "conditioning" period and can be controlled by

altering the paint's water absorption characteristics. The free association paints contain TBT which is physically incorporated into the paint matrix; the TBT is released through diffusion as surface paint particles dissolve. This type of paint has a short time period of protection and is characterized by a high initial release.

Antifouling paints containing TBT are registered, in the United States, for use on aluminum, steel, fiberglass, wood and cement hulls.[3] These paints are used on commercial and recreational vessels and some military ships. However, the Navy is the major domestic user of antifouling paints. The Navy is planning to replace the copper-based paints it is currently using on its steelhulled vessels with antifouling paints containing TBT compounds. This Navy conversion would take approximately 5 years and add an additional 90,000 pounds of TBT active ingredients to the environment. Economically, if all the Navy ships are painted, it would annually save the Navy $150 million.[4] However, this cost does not include the cost to the marine environment.

Currently, there are 340 federally registered antifouling paints containing TBT active ingredients. U.S. domestic usage of TBT in antifouling paints range from 250,000 to 300,000 pounds.[5] In addition to antifouling paints, TBT compounds are registered for use as disinfectants, textile biocides, wood preservatives, paper and pulp mills, leather processing and as plastics stabilizers, etc. In the United States, total usage of TBT pesticides (for all uses) ranges from 730,000 to 860,000 pounds of active ingredients.[6]

In 1981 France banned the use of TBT paints on all vessels less than 80 feet in length because of shellfish deformations, particularly in Arcachon Bay.[7]

England researched and then combined their studies with France's experience and banned the use of free association paints and copolymer formulations with more than 7.5 percent TBT on January 1, 1986.[8] Germany and Switzerland have banned TBT paints for fresh water usage. Japan has banned the use of TBT compounds in household products such as house paints and textiles, but has not restricted its use in vessel antifouling paints.[9]

In the United States, Senators Cohen and Trible introduced Senate Resolution 272 in December 1985 calling for "public hearings to determine if further action is warranted with respect to the future use of TBT compounds" and "urging EPA to accelerate its investigation into the environmental and health effects of organotin bearing paints...." The resolution has been referred to the Senate Committee on Environment and Public Works.

On June 11, 1986 Congressman Parris introduced HR 5015, calling for a temporary ban on TBT-based paints on the hulls for commercial and recreational vessels until, " EPA has completed their ongoing studies to determine the safety of such paints and their impact on the aquatic environment.

Currently, only North Carolina has limited the input of TBT into its waters. North Carolina instituted regulations on January 1, 1985 to limit discharges from industries to 2 ppt for salt water and 8 ppt for fresh water.[10] These regulations were initiated because it was determined that hundreds of North Carolina companies were using TBT to control odor-causing bacteria in textiles or to control slime in piping. Some of the discharges from the textile mills were high enough to kill aquatic organisms.

On January 8, 1986, EPA commenced a special review of the nine most common TBT antifoulant paint formulations. EPA's support

document indicates that EPA is concerned about the acute and chronic toxicity potential of tributyltin compounds to nontarget aquatic organisms. Water samples have been found to contain TBT levels that may have direct effects on aquatic organism populations (mollusks). The TBT compounds may bioaccumulate in aquatic habitat and may pose a hazard to the food chain. Absorption of tributyltin compounds to sediment may have long-term toxicity effects on benthic browsing organisms such as crustaceans and snails. Contamination of estuarine areas at sublethal concentrations can influence the reproduction of several aquatic groups from fish to plankton, thus impacting the marine environment. The present use of tributyltin in antifouling paints presents a potential hazard to nontarget aquatic organisms.

The Pacific Fisheries Legislative Task Force, working in coordination with the Pacific Coast Federation of Fishermen's Associations, has passed three task force resolutions offered by Assemblyman Dan Hauser, the Task Force Vice Chairman, regarding TBT. The resolutions:

1. Urged and encouraged the Environmental Protection Agency to take the lead in creating a public information education brochure about TBT that could be distributed to every boat owner in America. The pamphlet concept is based on a similar project done in the United Kingdom entitled, Don't Foul Things Up. Short of a Congressional ban on the use of TBT, a nationwide public information awareness program is thought to be the next best alternative for controlling the amount of TBT introduced into the marine environment. It is thought by some scientists that this type of education program could reduce the amount of active TBT in the marine environment by 50%.[12]

2. Memorializes the Food and Drug Administration, the Environmental Protection Agency and the National Marine Fisheries Service to impose an immediate ban on all salmon imported into or produced in the United States in pens treated with TBT. This is important because TBT levels for safe human consumption have not been established. TBT was found in the flesh of salmon that were pen-reared in TBT-treated pens. Moreover, the study found that cooking does not remove the TBT from the fish.[13]

3. Memorializes Congress to enact an immediate ban on the use of TBT-based bottom paints on all military, commercial, and recreational vessels until such time, and if, methods of use of TBT-based bottom paints or derivatives of organotin paints are developed that pose no threat to the marine environment.

In addition to the resolutions passed by the task force, it is anticipated that the participating states may introduce state legislation to further regulate TBT usages in their states. Currently, efforts are underway to explore legislation to monitor dry docks, set water quality standards, ban or restrict the uses of TBT, or regulate the amount of TBT used in antifouling paints.

REFERENCES

1. Edward D. Goldberg, Environment, Vol. 28, No. 8, Page 17, October 1986.

2. Committee Advisory, U.S. House of Representatives Committee on Merchant Marine & Fisheries, Page 2, September 26, 1986.

3. EPA Tributyltin Support Document, Page III-1, December 1985.

4. Ibid.

5. EPA Tributyltin Support Document, Page III-2, December 1985.

6. Ibid.

7. EPA Tributyltin Support Document, Page II-22, December 1985.

8. Michael A. Champ, Oceans 86 Proceedings, Volume 4, Organotin Symposium, Page 1095, September 1986.

9. Ibid.

10. Peter J. Kuch, Oceans 86 Proceedings, Volume 4, Organotin Symposium, Page 1114, September 1986.

11. EPA Tributyltin Support Document, Page II-21, December 1985.

12. Phone conversation with Michael A. Champ.

13. Jeffrey W. Short & Frank P. Thrower, Oceans 86 Proceedings, Volume 4, Organotin Symposium, Page 1117, September 1986.

Reprinted From: Pacific Coast Federation of Fishermen's Associations newsletter

(5)

TRIBUTYLTIN CONTAMINATION OF PEN-REARED SALMON?*

Pen-reared salmon contaminated with tributyltin (TBT) are entering U.S. seafood markets according to a recent report released by the National Marine Fisheries Service's Auke Bay Laboratory. According to a report by Jeffery W. Short and Frank P. Thrower, salmon reared in sea pens treated with TBT, sold as aquaculture products and purchased in public markets were found to contain concentrations of 0.081-0.20 ug/g of TBT.

TBT has been described as the most toxic compound every deliberately introduced by society into natural waters. TBT, an organotin, is used as a wood preservative, an additive to bottom paints, and to treat netting used in salt water pens for rearing salmon. It can be toxic in levels as low as 5 parts per trillion (see FRIDAY, 17 October, pp. 5-7).

The most common pen-reared salmon products entering the U.S. market are the so-called "pan-sized" or "baby" coho, Oncorhynchus kisutch, harvested as juveniles from pens in places such as Puget Sound, and the Norwegian Salmon, an Atlantic salmon or salmon trout, Salmo salar or Salmo trutta, raised in salt water pens in fjords in Norway. The farmed salmon has proved popular with some restaurants and markets seeking to promote "fresh" fish year-round.

The research of Short and Thrower on TBT contamination of salmon began when they sought to determine the rate of mortality of salmon transferred into TBT-treated marine pens. According to them, TBT compounds "are emerging as the leading compounds in the effective control of marine fouling of sea pens, a serious problem in the salmon farming industry."

In their paper "Tri-N-Butyltin Caused Mortality of Chinook Salmon, Oncorhynchus tshawtscha, on Transfer to a TBT-Treated Marine Net Pen," Short and Thrower reported that, "TBT compounds are widely used in the salmon aquaculture industry....Salmon at aquaculture facilities are raised to market size in marine pens for 1 to 3 years, during which they gain most of their body mass. Nets must be periodically cleaned or chemically coated to retard fouling by marine organisms; fouling will reduce sea water exchange and result in fish kills. Antifoulants are much more economical than manual cleaning and are therefore preferred by the industry. Several antifoulant formulations are used to treat nets, but TBT compounds are among the most effective ingredients. These compounds have low solubility in seawater, are exceptionally toxic to marine fouling organisms, and can be formulated for slow release."

In their study, Short and Thrower used chinook salmon raised for one year in fresh water and acclimated to sea water for four months before testing. The chinook salmon died in all doses of TBT oxide tested, "but none died in the clean water control tank during or immediately after the bioassay. Only five salmon in the lowest exposure dose survived the bioassay; of these, three died within the next 24 hours in clean seawater," reported the researchers.

They went on to say that "juvenile salmon are very sensitive to TBT poisoning in sea water....TBT concentrations in salmon that died during the bioassay were nearly constant for all doses, suggesting that TBT continues to accumulate until a threshold concentration is reached in critical tissues and causes death....low doses of TBT can impair the immune system of rats, which suggests that salmon raised in TBT-treated marine net pens may be more susceptible to disease."

In this first report on TBT, Short and Thrower concluded that "juvenile chinook salmon are very sensitive to TBT poisoning in sea water, that they rapidly accumulate TBT to high concentration in tissues, and that lethal effects are dose and time dependent."

Recognizing that aquaculturists would not likely use high dosages of TBT that may be found in the flesh of pen-reared salmon in the marketplace that was exposed to lower amounts of TBT, (i.e., those that survived the pens). They purchased both Atlantic salmon (e.g., Norwegian) and coho salmon in addition to chinook; all the fish was advertised as farm (pen-reared) raised aquaculture fish. They found no traces of TBT in the chinook but concentrations in the muscle tissue of both coho and Atlantic salmon of organotins as TBT as high as 0.81 ug/g.

The purchases of the fish were from markets in Seattle and Portland. The results were published in their report "Accumulation of Butylins in Muscle Tissue of Chinook Salmon Reared in Sea Pens Treated with Tri-N-Butyltin." The following is Short and Thrower's summary in this report of their research:

> Rearing salmon in sea pens treated with antifoulant containing TBT compounds resulted in the accumulation of organotins in the muscle tissue of salmon. Organotins were detected in several fish from different countries purchased from the marketplace and advertised as products of aquaculture. Additionally, cooking was found to be ineffective in destroying or removing accumulated organotins. We believe this is the first evidence of entry of organotins into the human diet in the United States.

The report of TBT-laced pen-reared salmon is not the first indicating tainting of these aquaculture-bred fish. There have also been reports received by PCFFA that farmed salmon from Norway and Scotland may contain the artificial coloring agent, canthaxanthin, an agent added to the feeding stuffs of the pen-reared fish (see FRIDAY, 16 August 1985, pp. 10-11). Although canthaxathin is banned by the U.S. Food & Drug Administration, there is no evidence that PCFFA has received that the FDA is checking imported pen-reared salmon for traces of this substance used to give the fish their deep-red coloring.

The use of TBT as an additive to bottom paints has already been restricted in both France and Great Britain following the die-offs of shellfish beds attributed to TBT paints on vessel bottoms. The PCFFA Board of Directors at their 9-10 October meeting called for a ban on the use of TBT (see FRIDAY, 17 October, pp. 5-7).

In Great Britain, Environment Minister William Waldergrave announced last year that nation's intent to place new controls on paints with the TBT additive including a proposed ban on the use of those paints on vessels less than 12 meters long, and "free association" paints with high levels of orgontin were banned. The Government action was "prompted by complaints from the fisheries industry that such paints are responsible for declining catches," according to the 13 March 1985 issue of the International Environmental Reporter. France has imposed a complete ban on such paints.

According to that issue of IER, "research carried out by the British Ministry of Agriculture, Fisheries & Food, and the French Institute Scientifique et Technique des Pesches Maritime, the effects of organotin compounds, the active agents in anti-fouling paints, are especially acute where pleasure craft and fisheries share the same waters."

High levels of TBT have been found in most marinas along the California coast, indicating that action similar to that taken by Britain and France should be taken. Fortunately, TBT has a short half-life and, unlike toxics such as DDT, the beneficial affects of a ban could be seen within a short time on the marine environment.

* From PCFFA Friday, October 31, 1986

Toxic Anti-Foulant Under Fire

The Move to Ban TBT

by Peter Kenyon

A fledgling mariculture industry, commercial and recreational fishing groups, aquaculture organizations, and legislators from Juneau to Sacramento are rapidly joining a movement to ban the toxic anti-fouling agent TBT from West Coast waters.

Anti-foulants such as TBT (for trin-butyltin) are proven labor and cost saving devices for boat and net owners. The chemical keeps boat hulls and nets clean of marine foulants such as algae, barnacles, and other organisms. But as scientists investigate mysterious fish and shellfish mortalities up and down the Pacific coast, it's become clear that TBT is doing more than keeping things clean.

"It's one of the most toxic chemicals to marine life we know of," said Rep. John Sund, D-Ketchikan, sponsor of a bill to ban TBT in Alaska. "Research shows it's devastating to shellfish, and can be toxic to salmon and other fish as well. We're not sure of the impacts on humans, but I think it's time to get ahead of the game and prohibit its use until we know more about it."

A few scientists have been raising questions about TBT for several years. Some of the first research on TBT in Alaska was done by Dr. Jeff Short of the National Marine Fisheries Service Lab at Auke Bay. Short said there's no question TBT is an effective anti-foulant.

"Unfortunately the reason it's extraordinarily effective is that it's extraordinarily toxic. We found for example that juvenile chinook salmon are sensitive at about 1.5 parts per billion. And that translates into about twelve drops in an Olympic-sized swimming pool.

The fact that TBT is so toxic in such minute quantities worries Senator Dick Eliason. "There's so many unknowns here. I'm thinking about the herring fishery in my community of Sitka. They're practically fishing right next to the boat harbor some years. We don't really know what's happening to those fish swimming around these boats that may have TBT all over their hulls."

Short's research leaves little doubt about TBT's toxicity. His paper with Frank Thrower on the subject states that "chinook salmon died in all doses of TBT tested, but none died in the control tank... only five salmon in the lowest exposure dose survived... of these, three died within the next 24 hours in clean seawater."

TBT tended to accumulate in the muscle tissue of those fish it didn't kill, leading to Short's next step in the research process: he determined that pen-reared salmon being sold on the market contain the chemical.

"We bought fish in Seattle and Portland that were advertised as products of aquaculture," he said, "and about half of them turned up quantities of TBT... we tried pan frying, micro-waving, and boiling the fish, and we didn't eliminate the TBT."

Short's proof that TBT has entered the human diet for the first time, along with a slew of other data from the U.S. and western Europe about TBT dangers, has provided solid ammunition for the proposed ban on its use. The movement is being coordinated by the Pacific Fisheries Legislative Task Force. Staff Assistant Mary Morgan has been collecting data on the chemical.

"TBT has been called by many scientists the worst chemical ever deliberately introduced into the marine environment," she said. "The concentrations are measured in parts per trillion. And I think any time you have to measure something at that low a level, you're talking about a bad molecule that probably ought to be banned."

Morgan said the Environmental Protection Agency currently limits safe levels of TBT to 50-60 parts per trillion.

"Already several marinas in California have been measured at a thousand parts per trillion or more," she said.

While those kinds of numbers have not been documented in Alaska yet, the newly created Alaska Mariculture Association isn't waiting around to find out. Executive Director Rodger Painter says AMA has endorsed a statewide ban on the chemical.

"We're very concerned by the information presented on the human health hazards of TBT. It would be a real disaster for farm industries in Alaska to be tainted with the possibility that their product carries that stuff," he said.

Painter said the cost savings are insignificant, especially considering the added protections needed for workers who apply the chemical to nets. Health officials say TBT has caused rashes, dizziness and retching; and humans may become sensitized to the chemical, so that increasingly smaller exposures may prove harmful.

That situation also applies to boat owners and shipyard employees using TBT-based bottom paints. For most boats (with the possible exception of aluminum hulls) alternative copper-based paints are available. Boat owners generally like the results of TBT bottom paints: 10 percent greater speed and 40 percent greater fuel efficiency, among other things. (The U.S. Navy, for example, says it can save up to $150 million a year in fuel costs alone; but it's currently abiding by an EPA moratorium on TBT paints.)

The environmental horror stories—which include dead salmon, dead or deformed shellfish, highly toxic harbors and estuaries, and TBT-laden fish in the marketplace—have prodded several groups to agree to voluntary bans on the chemical. The last holdout among the state's private non-profit aquaculture groups, the Southern Southeast Aquaculture Association, agreed to stop using TBT last November. General Manager Don Amend said the risks are just too great.

"We feel the environmental concerns and the public perception of what this might mean might have a real adverse effect on our fisheries resource," he said.

A report on mariculture in British Columbia known as the Gillespie Report also raises questions about the use of TBT. At least one union has called for a ban on the chemical there.

Meanwhile, state legislatures from Juneau to Sacramento introduced bills to ban TBT on March 18th. Senator Fred Zharoff (D-Kodiak), sponsored the Senate companion measure to Sund's House bill.

AMA's Rodger Painter hopes the TBT ban will move quickly up and down the coast, before concern about the chemical spreads to consumers.

"The whole public relations aspect of this thing has everybody worried," he said. "One case of TBT reaching consumers could have the effect of a botulism incident, or mercury in tuna. It's real scary."

Sund thinks there's no need to panic, but it is time to move. "I see this as an opportunity to get a real toxic chemical out of the water, and avoid any economic impact on the industry," he said.□

THE FISHMONGER

Salmon Farming Technique Could Prove to Be Dangerous

BY JAY HARLOW

With aquacultured salmon from various countries showing up in our markets in increasing quantities, there is growing concern over tributyl tin, a chemical used to treat the pens where the salmon are reared.

Tributyl tin compounds (TBTs) are part of a larger group of compounds known as organotins, which combine the metal tin with various organic constituents.

As a group, the organotins are extremely toxic to certain marine organisms, particularly mollusks. In recent years, their most important commercial use has been in "antifoulant" paint for boat hulls. These paints slowly release TBTs from the surface, preventing the growth of barnacles and similar organisms. But once in the marine environment, TBTs also can kill "non-target organisms" such as oysters, mussels and clams, especially in shallow waters with heavy boat traffic.

In order to protect commercial shellfish beds, both France and Britain have banned the use of TBT paints on commercial and pleasure boats, and there is a growing call for similar legislation in this country.

Of greatest concern, however, are the TBT antifoulants used in salmon aquaculture. In a typical salmon farm, the fish are raised to maturity in ocean water, then enclosed in pens made of fine nylon mesh. If the nets become clogged by fouling organisms, water flow through the pens is impaired, and the oxygen supply can fall to dangerous or lethal levels. Fouling can be controlled by periodic manual cleaning, but that adds labor costs. A less costly alternative has been to treat the pens with TBT compounds, and this method has been standard throughout the salmon aquaculture industry.

There are two crucial questions posed by the use of TBTs in salmon farming: 1) Are they taken up by the fish, and if so, 2) are they potentially dangerous to humans?

While the toxic effects of TBTs in mollusks are dramatic and well-documented, the evidence on other organisms is less clear. So far, there is no solid evidence that TBTs are dangerous to humans, but little research has been done.

According to the manufacturers of TBT-based paints, these compounds are not toxic to fish, crustaceans or mammals except in very large amounts; unlike the mollusks, these animals can metabolize and excrete tri-organotins without any accumulation. However, other research by a National Marine Fisheries Service laboratory in Alaska has shown that TBTs can accumulate in the flesh of salmon reared in TBT-treated pens, and that accumulation increases with concentration of the chemical in the water and with time. Sufficient accumulation can kill the fish, especially young fish.

To protect shellfish beds, both France and Britain have banned the use of TBT paints

In the meantime, the fishing industry appears to be taking an extremely cautious approach. Both the Pacific Fisheries Legislative Task Force, a group of legislators from several western states, and the Pacific Coast Federation of Fishermen's Associations passed a resolution late last year asking Congress to ban both the use of TBT paints and the sale of fish raised in TBT-treated pens.

According to Mary Morgan of the state Senate Office of Research, the resolution comes in the absence of a known safe level of TBT consumption in the human diet. "Until we find out (what is a safe level), maybe we should look into alternative methods," said Morgan.

For salmon farmers, the main alternative method is manual cleaning.

Meanwhile, there will be salmon coming to market over the next few years that have spent part of their lives in TBT-treated pens. Whether these fish will have any measurable residues of TBTs in their flesh is an open question. TBT antifoulants are still in use in Norway, although in greatly reduced amounts and circumstances, according to an importer of Norwegian salmon. An importer of New Zealand salmon said TBTs were "absolutely not" in use at that country's salmon farms.

It is a complex issue, and there is no simple answer. So far, TBTs seem to pose a danger mainly to shellfish, although that danger alone is sufficient to restrict their use. They are being phased out in aquaculture mainly for their effects on the environment at large, rather than on the farmed fish. Based on the very limited evidence to date, there is no clear and present danger in eating aquacultured salmon. Still, there could be long-term effects of even slight exposure.

If there is sufficient public concern, the state or federal government could require inspection and regulation of TBTs in salmon aquaculture. At this point, however, individual consumers will have to decide the safety issue for themselves.

Jay Harlow is co-author of the "California Seafood Cookbook" (Aris Books).

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COOPERATIVE EXTENSION SERVICE

UNIVERSITY OF ALASKA
FAIRBANKS ALASKA 99701

Marine Advisory Programs
2651 Providence Avenue
Anchorage, Alaska 99504
(907) 263-1890

June 29, 1981

MEMORANDUM

TO: Brian Paust, Agent.

FR: John Ball, Safety Specialist

RE: Tributyl-Tin-Fluoride (TBF)

This is a response to your question about the toxicity and special handling of this anti-fouling compound. Since it is not uncommon and is a nasty item, I am taking the liberty of circulating this information to other friends in MAP/CES/Sea Grant.

For more information on this or other compounds there are several places to turn to in the future:

(1) Carl Harmon, Environmental Engineer with the State Department of Environmental Conservation in Anchorage (the person who helped me with this)--phone: 274-2533.

(2) Environmental Protection Agency (EPA)--phone: 271-5083.

(3) Poison Center at Providence Hospital in Anchorage--phone: 274-6535.

(4) Chemical Transportation Emergency Center (CHEMTREC)
Phones: (800) 424-9300 (supposedly toll free)
(202) 483-7616 (call collect 24 hours a day).

I did not have the occasion to call the Coast Guard on this, but on materials that are recognized hazardous materials, the Coast Guard does have some references.

(1)Well, basically this is a substance not unrelated to 2.4-D and agent orange.(2)It operates as an anti-fouling agent by breaking down the cell walls of living tissue. It will do this in people too.(3)It can be absorbed through the skin, inhaled, ingested, etc.(4)If it gets into the eyes and remains there for any appreciable period of time, it can affect vision and cause blindness.(5)Using this material in a confined space can lead to unconsciousness and presumably death.(6)For physical as well as health reasons this material should not be applied in a spray. It should be painted onto the surface to be protected (and I would go try to find my worst enemy to do the work).

(7) The material collects in fatty tissue and therefore has a considerable impact upon kidneys and livers.

(8) If one is going to use it, it is recommended that the application be done under controlled conditions, in open air (so others can share in the bounty?), with a respirator, protective clothing, gloves, etc.

I did not get the recommended solvent, but at all cost one ought to avoid getting this material in contact with the skin and it might be a good idea to be prepared with the recommended solvents and eye washes.

Basically, the stuff sounds almost too dangerous to use. The only other thing to add is that several brands have been removed from the market, and one ought to check with the CHEMTREC number above to see if specific brands are even allowed in the market anymore. Apparently, many of the earlier editions have been recalled. Keep the stuff in Petersburg, eh?

Hope this helps.

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ANTI-FOULING PAINTS FOR VESSEL BOTTOMS AND HULLS CONTAINING TBT METHACRYLATE

Carboline Company
40600 Albrae Street
Fremont, CA 94538

Carboline Super Tropical anti-fouling red 1240-31
Carboline Super Tropical anti-fouling black 1240-30

Hempel's Marine Paints, Inc.
Foot of Currie Ave
Wallington, NJ 07057

Hempel's antifouling nautic 7690-5030 red
Hempel's antifouling nautic 7690-5111 red
Hempel's antifouling nautic 7680-1221 gray
Hempel's antifouling nautic 7687-4222 green
Hempel's antifouling nautic 7685-1000 white
Hempel's antifouling nautic 7680-1999 black
Hempel's antifouling nautic 7685-1999 black
Hempel's antifouling nautic 7695-5030 red
Hempel's antifouling nautic 7695-5111 red
Hempel's antifouling nautic 7695-1999 black
Hempel's antifouling sleek 7650 Brown 6464
Hempel's antifouling nautic 7695-6464 Brown
Hempel's antifouling nautic 7697-5030 Red
Hempel's antifouling nautic Hi 7695-5030 Red

Pettit Paint Company, Inc.
36 Pine Street
Rockaway, NJ 07866

Pettit marine paint offshore antifouling Red 1680
Pettit marine paint offshore antifouling Black 1880
Pettit marine paint offshore antifouling Brown 1580
Pettit marine paint offshore antifouling Blue 1280
Pettit marine paint offshore antifouling Green 1380

ANTI-FOULING PAINTS FOR VESSEL BOTTOMS AND HULLS CONTAINING TBT OXIDE

Carboline Company
40600 Albrae Street
Fremont, CA 94538

Carboline Super Tropical anti-fouling red 1240-18
Carboline Super Tropical anti-fouling black 1240-1

Devoe Marine Coatings Co.
4000 Dupont Circle
Louisville, KY 40207

Devoe Marine Super Tropical anti-fouling ship bottom paint MD-2771
Triple "C" Cape Cod Copper Compound MD-8024
Devoe Marine Tropical anti-fouling ship bottom paint MD-1754
Devoe Marine Devran 216 permanent red anti-fouling paint MD-3873
Devoe Marine Forumula 218 Devran permanent red anit-fouling paint MD-3888
Devoe Marine ABC anti-fouling coating formula 8 MD-4755
Devoe Marine ABC Anti-fouling coating formula 2 red MD 4754
Devoe Marine ABC anti-fouling coating formula 8 black MD-5027
Devoe Marine Devchlor lt. red anti-fouling paint MD-5188
Devoe Marine Devran 222 Allseas permanent red anit-fouling paint MD-4312
Devoe Marine Devchlor anti-fouling paint red MD-4366
Devoe Marine ABC Anti-fouling coating formula 2 red MD-4754
Devoe Marine Devran 222 Allseas light blue Anti-fouling paint MD-5023
Devoe Marine ABC anti-fouling coating formula 2 black MD-4883
Devoe Marine ABC anti-fouling coating formula 2 light blue MD-5100

Dupont De Nemours, E.I. & Co. Inc.
Agricultural Products Department
Attn: Billie Lynn Rach
Barley Mill Plaza
Wilmington, DE 19898

Du Pont Chlorinated Rubber anti-fouling red 360-Y-782
Du Pont Chlorinated Rubber anti-fouling red 360-78-2
Du Pont Extended LIfe anti-fouling red 360-Y-785
Du Pont Extended Life anti-fouling red 360-785

Glidden Coatings and Resins
Div. of SCM Corporation
Attn: James Woebkenberg
16651 Sprague Road
Strongsvill, OH 44136

178-R-401 red vinyl-cote no-cop anti-fouling coating
Vinyl-Cote no-cop anti-fouling coating 7082 red (178-R-401)
178-B-404 Black Vinyl Cote no-cop anti-fouling coating
Vinyl-cote no-cop anti-fouling coating 7081 black (178-B-404)
178-R-401B Red vinyl-cote no-cop anti-fouling coating
Vinyl-cote no-cop anti-fouling coating 7083 (DGL 3 191)
178-W-401 White vinyl-cote no-cop anti-fouling coating
Vinyl-cote no-cop anti-fouling coating 7080 white (178-W-401)

Hempel's Marine Paints, Inc.
Foot of Currie Ave
Wallington, NJ 07057

Hempel's antifouling nautic 7690-5030 red
Hempel's antifouling nautic 7690-5111 red
Hempel's antifouling nautic 7680-1221 gray
Hempel's antifouling nautic 7687-4222 green
Hempel's antifouling nautic 7685-1000 white
Hempel's antifouling nautic 7680-1999 black
Hempel's antifouling nautic 7685-1999 black
Hempel's antifouling nautic 7695-5030 red
Hempel's antifouling nautic 7695-5111 red
Hempel's antifouling nautic 7695-1999 black
Hempel's antifouling sleek 765U Brown 6464
Hempel's antifouling nautic 7695-6464 brown
Hempel's antifouling nautic 7697-5030 red
Hempel's antifouling nautic HI 7695-5030 red

International Paint Co. (California) Inc.
220 S Linden Avenue
South San Francisco, CA 94080

Copper-lux antifouling paint 80 red
Latenac high builo antifouling red extra 3022/3021
Copper-lux antifouling paint 82 blue
International tropex antifouling paint 1600
Interlux antifouling 62T bottom paint red
Interlux antifouling 62T bottom paint blue
Intersmooth self polishing copolymer antifouling blue BFA042
Intersmooth SPC self polishing copolymer antifouling green BFA043
Intersmooth SPC self polishing copolymer antifouling pink BFA206
Intersmooth SPC self polishing copolymer antifouling plum BFA 204

Interspeed special copolymer antifouling brown BHA 018
Interspeed special copolymer antifouling red BHA017

Intersmooth spc self polishing copolymer antifouling pink BFA096
Intersmooth spc self polishing copolymer antifouling plum BFA094
Micron 22 organo-metallic polymer anti-fouling paint 450 blue
Micron 22 organo-metallic polymer anti-fouling paint 451 green
Micron 22 organo-metallic polymer anti-fouling paint 452 red
Micron 22 organo-metallic polymer anti-fouling paint 453 black
Micron 22 organo-metallic polymer anti-fouling paint 454 white
Micron 33 an organo-metallic polymer anti-fouling paint for brush or roller application 460 blue
Micron 33 an organo-metallic polymer anti-fouling paint for brush or roller application 461 green
Micron 33 an organo-metallic polymer anti-fouling paint for brush or roller application 462 red
Micron 33 an organo-metallic polymer anti-fouling paint for brush or roller application 463 black
Micron 33 an organo-metallic polymer anti-fouling paint for brush or roller application 464 white

Pettit Paint Company, Inc.
36 Pine Street
Rockaway, NJ 07866

Pettit marine paint anti-fouling 1970 starline bronze
Pettit marine paint unepoxy anti-fouling 1626 red inland formula
Pettit marine paint unepoxy anti-fouling 1326 green inland formula
Pettit marine paint unepoxy anti-fouling 1226 blue inland formula
Pettit marine paint unepoxy anti-fouling 1920 bronze tropic formula
Pettit marine paint unepoxy anti-fouling 1926 bronze inland formula
Pettit marine paint unepoxy anti-fouling 1924 bronze pacific formula
Pettit marine paint unepoxy anti-fouling 1324 green pacific formula
Pettit marine paint unepoxy anti-fouling 1320 green tropic formula
Pettit marine paint unepoxy anti-fouling 1224 blue pacific formula
Pettit marine paint unepoxy anti-fouling 1624 red pacific formula
Pettit marine paint unepoxy anti-fouling 1220 blue tropic formula
Pettit marine paint unepoxy anti-fouling 1620 red tropic formula
Pettit marine paint unepoxy anti-fouling 1126 white inland formula
Pettit marine paint anti-fouling 1130 alumacide white
Pettit marine paint anti-fouling 1805 alumacide black
Pettit marine paint anti-fouling 1205 alumacide blue
Pettit marine paint anti-fouling 1649 alumacide red
Pettit marine paint unepoxy 1124 anti-fouling white pacific

Pro-Line Paint Manufacturing Company
2646 Main Street
San Diego, CA 92113

1077 vinyl anti-fouling paint
1025-03-E red seven seas copperbottom anti-fouling paint

U.S. Paint Division/Grow Group, Inc.
831 South 21st Street
St. Louis, MO 63103

Awlgrip awlstar anti-fouling blue label 73134 red
Awlgrip awlstar anti-fouling blue label 73132 black
Awlgrip awlstar anti-fouling blue label 73133 lt. blue

Woolsey Marine Industries, Inc.
183 Lorraine Street
Brooklyn, NY 11231

Woolsey neptune anti-fouling 710 royal red
Woolsey self-spraying anti-fouling for outboard lower units
321 white
Woolsey maxitox fiber-glass anti-fouling 775 blue
Woolsey maxitox fiber-glass anti-fouling 774 green
Woolsey maxitox fiber-glass anti-fouling 773 red
Woolsey blue streak vinelast 200 sr blue

ANTI-FOULING PAINTS FOR VESSEL BOTTOMS AND HULLS CONTAINING TBT FLUORIDE

Carboline Company
40600 Albrae Street
Fremont, CA 94538

Carboline Super Tropical anti-fouling red 1240-18
Carboline Super Tropical anti-fouling black 1240-1B
Carboline Super Tropical anti-fouling 1240-31

DeSoto, Inc
1700 S. Mt. Prospect Road
Des Plaines, IL 60017

Sears Best anti-fouling bottom paint - gold bronze
Sears Best anti-fouling bottom paint - red
Sears Best anti-fouling bottom paint - copper bronze
Sears Best anit-fouling bottom paint - white
Sears Best anti-fouling bottom paint - green
Sears Best anti-fouling bottom paint - blue

DeVoe Marine Coatings Co.
4000 Dupont Circle
Louisville, KY 40207

Navicote anti-fouling vinyl anti-fouling white MD-3095
Navicote anti-fouling vinyl anti-fouling gray MD-3883
Navicote anti-fouling vinyl anti-fouling black MD-3761

Gibson Paint Co.
1199 East 12th Street
Oakland, CA 94606

Gibson Paints Copper Bottom Paint

Hempel's Marine Paints, Inc.
Foot of Currie Avenue
Wallington, NJ 07057

Hempel's antifouling oceanic 0733
Hempel's antifouling oceanic 0733-5140 red
Hempel's antifouling oceanic 0733-3084 blue
Hempel's antifouling nautic 7680-1999 black
Hempel's antifouling naucic 7685-1999 black
Hempel's antifouling nautic 7695-6464 brown

International Paint Co. (California) Inc.
220 S. Linden Avenue
South San Francisco, CA 94030

International red hand wide spectrum antifouling red
Mark II 3210
Interantioanl wide spectrum antifouling gray Mark I 3201
International red hand wide spectrum antifouling
Tri-Lux Vinyl-Base paint antifouling paint 64 wide spectrum
red (TBIF) Mark I
Tri-Lux Vinyl-Base paint antifouling paint 65 wide spectrum
dark green (TBIF) Mark I
Tri-Lux Vinyl-Base paint antifouling paint 66 wide spectrum
dark blue (TBTF) Mark I
Tri-Lux Vinyl-Base paint antifouling paint 67 wide spectrum
black (TBTF) Mark I
Tri-Lux Vinyl Base paint antifouling paint 68 wiide spectrum
white (TBTF) Mark I
Interlux outboard/outdrive antifouling paint 263 white
Interlux outboard/outdrive antifouling paint 267 black
Tri-lux vinyl base paint antifouling paint 63 wide spectrum
light green mark I (TBTF)
Tri-lux vinyl base paint antifouling paint GI wide spectrum
light blue Mark I (TBTF)

Koppers Company, Inc
1201 Kippers Building
Pittsburgh, PA 15219

Brolite Z-spar colortox bottom paint antifouling B-43 green
Brolite 2-spar colortox hard vinyl type antifouling paint
B-43 green
Brolite Z-spar colortox bottom paint antifouling B-42 blue
Brolite 2-spar colortox hard vinyl type antifouling paint B-42 blue
Brolite Z-spar colortox bottom paint B-41 red
Brolite 2-spar colortox hard vinyl type antifouling paint b-41 red
Brolite z-spar colortox bottom paint antifouling B-40 white
Brolite 2-spar colortox hard vinyl type antifouling paint B-40 white
Brolite z-spar colortox bottom paint antifouling B-44 black
Brolite 2-spar colortox hard vinyl type antifouling paint B-44 black
Brolite Z-spar B-70 supertox red antifouling paint
Brolite Z-spar B-71 supertox blue antifouling paint
Brolite Z-spar supertox hard type antifouling paint B-71 blue
Brolite Z-spar B-90 antifouling paint semi-hard type
Brolite Z-spar the protector hard type antifouling paint B-90 red
Brolite Z-spar B-60 racing bronze antifouling paint
Brolite Z-spar B-60 racing bronze hard racing type antifouling paint
Brolite Z-spar colortox bottom paint antifouling B-45 international orang
Brolite 2-soar colortox hard vinyl type antifouling
paint B-45 international orange
Brolite Z-spar supertox hard type antifouling paint B-73 brown
Brolite Z-spar the protector B-901 blue antifouling paint semi-hard type

Brolite Z-spar the protector hard type antifouling paint B-91 blue
Brolite Z-spar supertox hard type antifouling paint B-74 black

Porter Coatings Division of Porter Paint Co
400 South 13th Street
Louisville, KY 40201

Chlorinated rubber antifouling paint 1195 red
Chlorinated rubber antifouling paint 11958K black

Pro-Line Paint Manufacturing Co
2446 Main Street
San Diego, CA 92113

1077 Vinyl Antifouling paint
1088 Hi-speed antifouling paint

Sears Roebuck and Co.
Attn. L.D. Hurse
Sears Tower Dept. 766
Chicago, IL 60634

Sears Marine anti-fouling bottom paint gold bronze
Sears Marine antifouling bottom paint red
Sears Marine antifouling bottom paint copper bronze
Sears Marine antifouling bottom paint white
Sears Marine antifouling bottom paint green
Sears Marine antifouling bottom paint blue

The Valspar Corporation
Attn. B.C. Heath,
Technical Manager
1101 Third Street South
Minneapolis, MN 55415

Valspar Vinyl antifouling bottom paint 3548 bright red
Valspar vinyl antifouling bottom paint 3537 coho blue
Valspar vinyl antifouling bottom paint 3505 white

Woolsey Marine Industries Inc.
183 Lorraine Street
Brooklyn, N.Y. 11231

Woolsey Lumalast antifouling finish 678 white
Woolsey super vinelast 723 permanent red
Woolsey lumilast antifouling finish 679 black
Woolsey super vinelast 724 permanent blue

ALL TBT RESINATE

Woolsey Marine Industries Inc.
183 Lorraine Street
Brooklyn, NY 11231

Woolsey antifouling hard racing finish T 758 blue
Woolsey antifouling hard racing finish T 754 white
Woolsey antifouling hard racing finish T 755 red
Woolsey antifouling hard racing finish T 759 green
Woolsey antifoulin hard racing finish T 756 black

No. 81

STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE

Revision Date: _____

REQUEST

Bill/Resolution No.: SB 131
Title: TBT-based marine Antifouling paints

Sponsor: Sen. Zharoff
Requestor: _____
Date of Request: _____

FISCAL DETAIL 3-2-87

Agency Affected: Department of Environmental Con.
BRU: Environmental Health

Components: _____

EXPENDITURES/REVENUES : (Thousands of Dollars)

OPERATING	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	-0-	-0-	-0-	-0-	-0-	-0-
CAPITAL						
REVENUE						

FUNDING : (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL	-0-	-0-	-0-	-0-	-0-	-0-

POSITIONS :

FULL-TIME						
PART-TIME						
TEMPORARY						

ANALYSIS :

The committee believes that the provisions of the bill will be largely self-executing.

Prepared by: Mark K. Johnson, Counsel — Phone: 465-3822
Division: Senate Labor & Commerce Committee — Date: 3-2-87

Approved by Commissioner: _____ Date: _____
Agency: _____

Distribution (by Agency preparing fiscal note):
- Legislative Finance
- Legislative Sponsor
- Requestor
- Office of Management and Budget
- Impacted Agency(ies)

9/16/86