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September 24, 2018

Via E-mail and U.S. Mail

Linda Candelaria, PhD
Santa Ana Regional Water
Quality Control Board
3737 Main Street, Suite 500
Riverside, CA 92501-3348

Re: City of Newport Beach Supplemental Comments on Proposed Basin Plan Amendments to Incorporate Total Maximum Daily Loads (TMDLs) for Copper (Cu) and Non-TMDL Action Plans for other Metals in Newport Bay

Dear Dr. Candelaria:

We are writing on behalf of the City of Newport Beach ("City" or "Newport Beach") to provide additional comments and evidence concerning the Santa Ana Regional Water Quality Control Board's ("Regional Board") Proposed Basin Plan Amendments to Incorporate Total Maximum Daily Loads (TMDLs) for Copper (Cu) and Non-TMDL Action Plans for other Metals in Newport Bay, including the Revised Substitute Environmental Document ("RSED") for the Copper TMDLs and Action Plans for Zn, Hg, As and Cr in the Newport Bay project ("Project"). Please find attached a report authored by Dr. Whittaker, one of the authors of a study relied upon by the Regional Board in its environmental analysis of the Project. This report supplements the City's comments submitted to the Regional Board on August 24, 2018.

Dr. Whittaker's report identifies the impracticalities of substituting copper antifouling paints (Cu AFPs) in the current marketplace and discusses a number of changes that must first occur to effect industry-wide movement to alternate AFPs/coatings that are safer than, and equally efficacious to, Cu-based AFPs. The Report also indicates that the Regional Board must consider the dangers of forcing a "regrettable substitution," and causing new environmental problems with its proposed regulation. Most importantly, Dr. Whittaker concludes "there are **zero** commercially available non-Cu AFPs that are safer and perform as well as Cu AFPs."

As I am sure you are aware, the Regional Board must consider these comments even though the public comment period on the Regional Board's CEQA document has closed. "[A] party can litigate issues that were timely raised by others, but only if that party objected to the project approval on any ground during the public comment period or *prior to the close of the*

public hearing on the project." (*Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1200 (citing Pub. Res. Code sec. 21177, subd. (b)) (emphasis added).) "[I]f a public hearing is conducted on project approval, then new environmental objections [can] be made until close of this hearing. [Citations.] If the decision making body elects to certify the EIR without considering comments made at this public hearing, it does so at its own risk. If a CEQA action is subsequently brought, the EIR may be found to be deficient on grounds that were raised at any point prior to close of the hearing on project approval." (*Id.* at 1201.) Comments may be "presented to the public agency either orally or in writing by any person during the public comment period or during the hearing on project approval." (*Porterville Citizens for Responsible Hillside Development v. City of Porterville* (2007) 157 Cal.App.4th 885, 909; see also *POET, LLC v. State Air Resources Bd.* (2013) 218 Cal.App.4th 681, 704 (ARB received 290 pages of written comments presented after the close of the public comment period during the hearing); *Tracy First v. City of Tracy* (2009) 177 Cal.App.4th 912, 926 (comments contained in letters hand-delivered to the city council at meeting in which city council certified the EIR); *Bakersfield*, *supra*, 124 Cal.App.4th at 1200-1201 (written comments submitted after public comment period on adequacy of the EIR).) This is especially true where the Regional Board has continued the hearing and should have ample time to consider the importance of Dr. Whittaker's report to the proposed Project.

Sincerely,

Gregory J. Newmark
Attorney at Law

cc: Dave Kiff
Aaron C. Harp, Esq.
Michael Torres, Esq.

Encl.

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3063587.1

THE ABSENCE OF SAFER NON-COPPER ANTI-FOULING PAINTS:

A MAJOR OBSTACLE TO IMPLEMENTING THE SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD'S PROPOSED COPPER TOTAL MAXIMUM DAILY LOAD (TMDL)

Prepared by:

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September 18, 2018

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EXECUTIVE SUMMARY

The Santa Ana Regional Water Quality Control Board (SARWQCB) has proposed a Total Maximum Daily Load (TMDL) for copper in upper and lower Newport Bay. A TMDL defines how much of a pollutant a waterbody can tolerate and still meet water quality standards. As a primary means to attain the proposed Cu TMDL, the SARWQCB has proposed a 12-year transition timeline to facilitate movement from copper antifouling paints (AFPs) to alternative AFPs/coatings on recreational and commercial boats moored in the Bay permanently or intermittently for more than 30 consecutive days.

This report identifies the impracticalities of substituting copper antifouling paints (Cu AFPs) in the current marketplace and discusses a number of changes that must first occur to effect industry-wide movement to alternate AFPs/coatings that are safer than and equally efficacious to Cu-based AFPs.

Reports prepared for the U.S. EPA (2011) and CalEPA (2011) are often cited to substantiate movement from Cu AFPs. However, neither of these reports considered hazard as a primary assessment endpoint, so these reports are unable to identify whether non-Cu AFPs are safer than, or more hazardous than, Cu AFPs.

Despite statements in SARWQCB's July 9, 2018 Supplemental Staff Report (SSR) and SARWQCB's draft Substitute Environmental Document (SED), there are no widely available nontoxic alternatives to Cu AFPs.

A review of activities underway at the Shelter Island Yacht Basin and Marina del Rey (MdR) does not substantiate the SSR's contention that transition to non-toxic, non-Cu AFPs is underway on a region-wide scale. In fact, each region's movement to non-Cu AFPs has only occurred on a limited basis.

The SARWQCB's Draft Basin Plan Amendments specify a preference for non-biocidal AFPs over non-Cu biocidal AFPs. However, such a preference may result in use of environmentally hazardous non-Cu AFPs because of gaps in Federal chemical registration for new chemicals under the 2016 Frank R. Lautenberg Chemical Safety Act and chemical composition and hazard disclosure requirements required under OSHA's Hazard Communication Standard. Because environmental hazards do not require disclosure on U.S. Safety Data Sheets (SDS), formulators of non-Cu AFPs may select an ingredient, review the ingredient's SDS, and erroneously conclude the ingredient does not pose an environmental hazard.

One major challenge posed by SARWQCB's Draft Basin Plan Amendments is the plan's prioritization of non-biocidal non-Cu AFPs over registered non-Cu biocidal AFPs. Federal regulations do not mandate disclosure of environmental hazards in Safety Data Sheets, and because non-biocidal formulations do not require pre-registration and risk assessment similar to a registered pesticide, there is no prescreening of such AFPs to ensure that they are safe for the environment.

Incremental transition to non-Cu AFPs that are safer for the environment and perform as well as Cu AFPs is the ideal. However, there are **zero** commercially available non-Cu AFPs that are safer and perform as well as Cu AFPs.

INTRODUCTION

Copper-based antifoulant boat paints are formulated to release copper into water throughout the life of the paint, and release copper as a biocide to prevent marine organisms from attaching to boat hulls (LACDPW 2017, Ecology 2017a). In order to reduce copper in water and waterway sediment as required by the Federal Clean Water Act Section 303(d), the Santa Ana Regional Water Quality Control Board (SARWQCB) has proposed a Total Maximum Daily Load (TMDL) for copper in upper and lower Newport Bay (SARWQCB 2018a). A TMDL defines how much of a pollutant a waterbody can tolerate and still meet water quality standards. As a primary means to attain the proposed Cu TMDL, the SARWQCB has proposed a 12-year transition timeline to facilitate movement from copper antifouling paints (AFPs) to alternative AFPs/coatings on recreational and commercial boats moored in the Bay permanently or intermittently for more than 30 consecutive days. The SARWQCB's Draft Basin Plan Amendments specifies the following proposed order of preference for alternative AFPs/coatings (SARWQCB 2018a):

- Nontoxic AFPs/coatings
- Cu AFPs with leach rates at or below 9.5 $\mu g/cm^2/day$
- Non-Cu AFPs (other biocides)(provided no significant adverse environmental impacts associated with their use is demonstrated).

This report identifies the impracticalities of such substitution in the current marketplace and discusses a number of changes that must first occur to effect industry-wide movement to alternate AFPs/coatings that are safer than and perform as well as Cu AFPs. In preparation of this report, documents indexed on the SARWQCB website were reviewed, including SARWQCB's Supplemental Staff Report dated July 9, 2018, SARWQCB's Substitute Environmental Document (SED) dated August 30, 2016 (updated July, 2018), comment letters and attachments submitted to SARWQCB in August, 2018 in response to these reports, and pre-2016 SARWQCB proposals and comment letters. Additionally, this report relies upon information and data summarized in a December, 2017 State of Washington, Department of Ecology report (Ecology 2017a), a Copper Boat Paint Alternatives Assessment prepared by ToxServices LLC for the Department of Ecology (Ecology 2014)[1], and two earlier reports that evaluated the efficacy (and to a limited extent, safety) of alternatives to Cu AFPs (U.S. EPA 2011, CalEPA 2011).

ALTERNATIVES TO CU AFPs: NOT YET READY FOR PRIME TIME

Alternatives to Cu AFPs comprise a variety of paint formulations and non-paint technologies (SDRB 2018, Ecology 2017a):

- **Non-biocide paints**: This includes zinc oxide, ceramic, epoxy, fluorine, or silicone-based paints.

[1] The State of Washington, Department of Ecology report was actually completed in January, 2015 and should be cited by the SARWQCB as Ecology (2015). In order to be consistent with SARWQCB's citation and avoid confusion, the Ecology report is cited as Ecology (2014) throughout the current report.

- **Non-Cu biocide paints:** This include paints with the following active ingredients - Silver, Zinc, 4,5-Dichloro-2-octyl-4-isothiazolin-3-one (DCOIT), 2-(tert-Butylamino)-4-(cyclopropylamino)-6-(methylthio)-s-triazine (Cybutryne, Irgarol), or 4-Bromo-2-(4-chlorophenyl)-5-(trifluoromethyl)-1H-pyrrole-3-carbonitrile (Tralopyril, Econea®)
- **Lower leach rate Cu AFPs:** These are Cu AFPs that have leach rates lower than DPR's 9.5 μg/cm^2/d maximum allowable leach rate (DPR 2014)
- **Non-paint technologies:** This includes dry-docking and hull cleaning methods.

Non-Cu AFP paints can be classified into three general categories, as shown in Table 1.

Table 1: Classification of Alternatives to Conventional Copper Antifouling Paints (Cu AFPs)

Alternative Paint	Example of Alternative	Mechanism of Anti-Fouling
Non-biocide paints	Soft non-biocidal: Paint made of silicone or fluorinated materials	Protect boat hulls by creating a slick surface
	Hard non-biocidal: Paint made of ceramic or epoxy materials	Paints withstand frequent, aggressive cleaning, and have a hard, protective layer
Non-Cu biocidal paints (Non-Cu AFPs)	Zinc pyrithione	Zinc disrupts cell membranes
	Silver	Deactivates certain enzymes
	DCOIT	Reacts with proteins and interferes with attachment of organisms to surfaces
	Cybutyrene (Irgarol)	Interferes with photosynthesis and inhibits growth of algae and plants
	Tralopyril (Econea®)	Disrupts energy systems intracellularly
Lower leach rate Cu AFPs[1]	ACT with Slime Fighter, Epoxycop, Micron® CSC HS	Copper increases larval abnormalities and induces DNA damage

[1]Leach rates ≤ California Department of Pesticide Regulation maximum allowable leach rate of 9.5 μg/cm^2/day
Sources: Ecology (2017), Bressy and Lejars (2014)

SARWQCB's July 9, 2018 Supplemental Staff Report (SSR) states that "some" nontoxic alternatives to Cu AFPs are available and effective, and the SSR also states that lower leach rate Cu AFPs and non-Cu AFPs are also available (SARWQCB 2018b). The SSR's erroneous statement relating to the availability of nontoxic alternatives is reinforced by statements in SARWQCB's draft Substitute Environmental Document (SED) which also states that "Nontoxic alternatives to Cu AFPs are available and cost-effective, and nontoxic AFPs, along with lower leach rate Cu AFPs, are the preferred option to non-Cu AFPs (other biocides)(SARWQCB 2018c)." SARWQCB's statements are not accurate. Unfortunately, there are no widely available nontoxic alternatives to Cu AFPs.

Additionally, the SSR cites the adoption of two Cu TMDLs in southern California to advance the idea that moving from Cu AFPs to non-Cu AFPs is feasible in the current marketplace:

- The Shelter Island Yacht Basin (SIYB) Cu TMDL (San Diego Regional Board), and
- The Marina del Rey (MdR) Cu TMDL (Los Angeles Regional Board).

Neither Shelter Island Yacht Basin nor Marina del Ray has implemented widescale transition to non-Cu AFPs. Similarly, Washington State has delayed implementation of their copper boat paint ban in order to avoid potential environmental harm from non-Cu AFPs (Ecology 2017a,b).

Two Other Southern California Cu TMDLs: Little Progress Moving from Cu AFPs

A review of activities at the SIYB and MdR does not substantiate the SSR's contention that transition to non-toxic, non-Cu AFPs is underway on a region-wide scale. Furthermore, each region's movement to non-Cu AFPs has only occurred on a limited basis, as detailed below.

Shelter Island Yacht Basin: Limited Information and Limited Practical Implementation

The San Diego Regional Board (SDRB 2018) acknowledges that information is limited on eco-friendly non-copper boat paints, underscoring the paucity of information about safer boat paints:

> *"Converting to non-copper hull paint is the foundation of the Port's Copper Reduction Program. Reducing the use of copper hull paint - a major source of copper pollution in marina basins - will help improve water quality. In general, finding good information about this eco-friendly paint can be challenging,* ***because information is limited****."*

Although the SDRB is correct in their statement that "Alternative hull paints are better for the environment because non-Cu paints won't contribute to copper pollution", this statement does not address the potential environmental harm from non-Cu AFPs. The least proactive position that can be taken to eliminate a restricted chemical is to replace it with a chemical that is currently unrestricted. This approach can be risky because it is possible that a substitute will have the same (or worse) hazard characteristics as the original chemical of concern. This phenomenon is known as regrettable substitution, which is defined as the replacement of a toxic chemical with one that has unknown – if not greater – toxic effects (State of Washington 2018a).

The Port of San Diego has made only limited progress implementing the use of non-Cu AFPs, with alternative coatings being used piecemeal on a limited number of Harbor Police boats and General Services work boats (SDRB 2018).

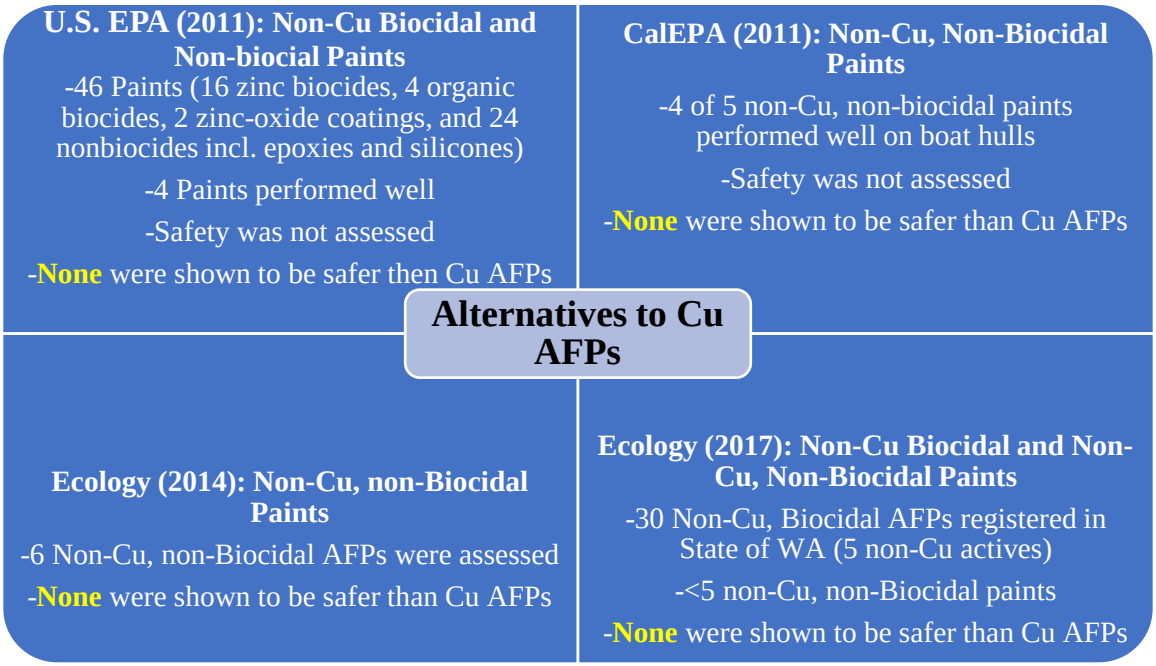
Marina del Rey: Non-Cu AFP Adoption Still in Pilot Stage

SARWQCB's July 9, 2018 SSR cites a pilot study to convert 100 boats in the Marina del Ray Harbor to nonbiocide paints over the next two years (SARWQCB 2018b). This pilot is also described in an April, 2017 report completed for the Los Angeles County Department of Public Works (LADPW 2017). No details are provided by the SARWQCB (2018b), the LADPW (2017), or the Marina del Ray TMDL website (MdR 2018) to describe the specifics of the conversion or the actual start date for undertaking of the pilot, which indicates that very little progress has been made to implement transition to non-Cu AFPs in this specific region.

STATE OF THE SCIENCE PERTAINING TO SAFETY AND AVAILABILTY OF NON-COPPER BOAT PAINTS

LACDPW's (2017) revised Site Implementation Plan (SIP) for the Marina del Ray TDML Plan and Ecology's Report to the Washington Legislature on Non-Copper Antifouling Paints (Ecology 2017a) describe the transition to non-Cu AFPs. In actuality, limited progress has been made to identify alternatives that are safer than ***and*** perform as well as Cu AFPs.

As illustrated in Figure 1, three comprehensive assessments have been undertaken to assess non-Cu AFPs (U.S. EPA 2011, CalEPA 2011, Ecology 2014), and Ecology has more recently performed a survey of non-Cu biocidal and non-biocidal paints (Ecology 2017a). Two of the comprehensive assessments illustrated Figure 1 (U.S. EPA 2011 and CalEPA 2011) are often cited to substantiate movement from Cu AFPs. However, neither of these reports considered hazard as a primary assessment endpoint, so these reports are unable to identify whether non-Cu AFPs are safer than, or more hazardous than, Cu AFPs. The U.S. EPA (2011) and CalEPA (2011) reports were conducted before, or in parallel to, the completion of two of the primary chemical hazard assessment frameworks now used to identify safer chemicals.[2] Both U.S. EPA (2011) and CalEPA (2011) assessments would have been greatly strengthened had they incorporated hazard as an endpoint. A striking omission from the SARWQCB (2018a,b) SSR and SED is that neither report acknowledges that not one of the four non-Cu AFP assessments shown in Figure 1 supports the conclusion that non-Cu AFPs are safer than Cu AFPs.



[2] U.S. EPA's Design for the Environment (DfE) Alternatives Assessment Criteria, which was released in draft form in December, 2010 and finalized as version 2.0 in April, 2011 (U.S. EPA 2010, 2011), and Clean Production Action's GreenScreen® for Safer Chemicals, which was released as version 1.0 in January, 2009 (CPA 2009).

Figure 1: Projects Assessing Non-Cu AFPs
(U.S. EPA 2011, CalEPA 2011, Ecology 2014, Ecology 2017a)

U.S. EPA (2011)

A U.S. EPA, Region 9 funded project (along with in-kind funds from the San Diego Unified Port District), was performed from January 2008 through December 2010 by a consortium to test and identify alternatives to Cu AFPs. This project comprising testing of panels and actual application to boat hulls. This report was focused on assessing product performance and cost of non-Cu AFPs.

Among a panel-tested group of forty-six alternatives to copper-based paints, twenty-one were identified as "top performers" for specific endpoints assessed (cleanability of panels and ability to retard fouling or repel growth or marine organisms). A subset of eleven of the 21 "top performers" were then tested directly on boat hulls for a period of up to 20 months, ending in October 2010. Four of the 11 boat bottom-tested coatings met the project criteria for performance. Two of these were non-biocide products (Intersleek 900 and Hempasil X3) and two were zinc-biocides (Ecominder and Seaguard HMF).

The U.S. EPA report erroneously concludes that "Non-biocides, in particular the soft non-biocide coatings, were identified as the best alternative options tested in the project. They do not contain biocides so they are more environmentally friendly." The term "environmentally friendly" is not defined in the report, and the report's basis of concluding safety of the four preferred AFPs is only described for two of the four AFPs (the biocides, which had to meet EPA toxicity guidelines for biocides), nor does the report conclude that the four formulations that met "project criteria" are in fact safer than Cu AFPs.

CalEPA (2011)

With funding from California EPA- and U.S. EPA, Region 9, the Institute for Research and Technical Assistance (IRTA) conducted a project as a follow-on to the U.S. EPA (2011) project (described above). The CalEPA project was initiated about six months before the U.S. EPA (2011) project was completed in 2010. Similar to the U.S. EPA (2011), the CalEPA project was focused on assessing performance; however, the CalEPA project was focused on assessing performance of non-Cu, non-biocide AFPs and find, test and evaluate methods of making nonbiocide paints less costly and easier to apply and use.

The panel testing involved inspecting panels with nonbiocide paints every three weeks for one year. The results demonstrated that five emerging nonbiocide paints performed very well. IRTA selected four of these paints and one additional emerging paint for testing on ten boats. The IRTA concluded that four of the five new and emerging paints performed well by the end of the project. These four non-Cu, non-biocide AFPs were XP-A101, XA 278, BottomSpeed, and SherRelease. According to LACPDW (2017), XP-A101 and Hempasil XA278 have been removed from the market; however, BottomSpeed and Sher-Release were reported to be available (as of 2017).

Ecology (2014)

With funding from the State of Washington, Department of Ecology, a consortium led by ToxServices LLC assessed the usability of the Interstate Chemicals Clearinghouse (IC2) Alternatives Assessment (AA) Guide while developing a basis for a future, detailed assessment of alternatives to copper antifouling paints. Six soft nonbiocide AFPs were assessed against IC2's Alternatives Assessment criteria using the three alternatives assessment frameworks described in the IC2 Guide: the Sequential, Simultaneous, and Hybrid Frameworks.

ToxServices created a Uniform Data Set by assessing 18 separate human health, environmental, and physical hazards posed by individual chemicals in each of the formulations using a method based on the hazard assessment tool GreenScreen® for Safer Chemicals (GreenScreen®). In addition to hazard, Performance Evaluation, Cost and Availability, and Exposure were assessed. Three additional modules (Materials Management, Social Impacts, and Life Cycle) were assessed in the hybrid AA framework.

Preferred alternatives were identified under each of the three AA frameworks. In the Sequential Framework, three paints, Intersleek 900 System, BottomSpeed TC Base Coat/Top Coat Clear, and Surface Coat Part A – Black, were identified as preferred alternatives. Under the Simultaneous Framework (Task 3), Surface Coat Part A – Black was the most preferable. Under the Hybrid Framework, BottomSpeed TC Base Coat/Top Coat Clear was selected as the preferred alternative.

Although the assessors were each able to select preferred alternatives, the results indicate that no alternative was an ideal alternative to Cu AFPs. Some paint formulations appeared to be slightly preferable to Cu AFPs in terms of hazard; however, all formulations contained hazardous chemicals that pose human health and/or environmental risks at their reported use levels.

Ecology (2017a)

As part of analysis assessing the State of Washington's ability to implement a ban on Cu AFPs, the State of Washington Department of Ecology assessed the safety of biocidal and non-biocidal non-Cu AFPs (Ecology 2017a).

<u>Non-Cu Biocidal Paints</u>

Ecology identified 30 non-Cu AFPs registered for use in Washington, comprising five types of biocides, with the majority (~75%) of non-Cu AFPs (22/30 registrants) containing the biocide zinc pyrithione alone or in combination with Tralopyril.

<u>Non-Cu, Non-Biocidal Paints</u>

Because there is no requirement to register non-biocidal AFPs it is not known with certainty how many non-biocidal AFPs are used in the State of Washington. Ecology (2017a) cites a report by Northwest Green Chemistry (NGC 2017) that identified five non-biocidal AFPs, with ingredients containing ceramic-epoxy mixtures, silicone, or zinc oxide (one of these five

formulations (Aurora VS721) is actually a polymer/wax applied to hulls, and is not technically an AFP). Of these five formulations, only one formulation (EPaint EP21), which contains a UV sensitized zinc oxide, is commercially available in online stores for marine paints (NGC 2017).

Ecology's Overall Conclusion

Ecology concluded that current data on the 30 non-Cu AFPs registered for use in Washington State do not demonstrate that non-Cu AFPs are safer for the marine environment. Ecology also concluded that there are limited data to demonstrate that non-biocidal, non-Cu AFPs are safer than Cu AFPs. Based on their findings, they proposed a delay in the implementation of the State of Washington's 2011 law that mandated a ban on copper boat paints beginning in 2018. This recommendation was accepted by the State of Washington Legislature, and resulted in an amendment to the State of Washington's Revised Code, postponing the ban on Cu AFPs until 2021 to afford the State of Washington to further assess the safety of non-Cu AFPs (State of Washington 2018b).

WHAT FACTORS MAKE IT DIFFICULT TO IDENTIFYING SAFER NON-CU AFPs?

The SARWQCB's Draft Basin Plan Amendments specify a preference for non-biocidal AFPs over non-Cu biocidal AFPs (SARWQCB 2018a). However, such a preference may result in use of environmentally hazardous non-Cu AFPs because of gaps in Federal chemical registration for new chemicals under the 2016 Frank R. Lautenberg Chemical Safety Act and chemical composition and hazard disclosure requirements required under OSHA's Hazard Communication Standard (29 CFR 1910.1200(g)), revised in 2012).

Unintended Consequences of TSCA Not Likely to Present Unreasonable Risk Determinations for New Chemicals

Section 5 of the Federal Toxic Substances Control Act (TSCA), as amended by the Frank R. Lautenberg Chemical Safety for the 21st Century Act, requires that EPA make affirmative determinations on notices received under Section 5 of TSCA. Section 5 of TSCA requires anyone who plans to manufacture (including import) a new chemical substance for a non-exempt commercial purpose to provide EPA with notice before initiating the activity. This notice is known as a premanufacture notice (PMN)(U.S. EPA 2018).

The U.S. EPA reviews PMNs to determine whether a new chemical has the potential to pose an unreasonable risk when used for the intended purposes specified in the PMN. EPA considers the nature of the potential exposures (e.g., duration, magnitude, population, etc.) under the conditions of use, including workplace practices and exposure controls (U.S. EPA 2018). There are four conclusions that EPA can make on a PMN:

- Not likely to present unreasonable risk
- Presents unreasonable risk
- Insufficient Information to Permit a Reasoned Evaluation
- Insufficient Information to Permit a Reasoned Evaluation and May Present Unreasonable

Risk

In cases where EPA determines that a new chemical or significant new use is not likely to present an unreasonable risk of injury to health or the environment, without consideration of costs or other nonrisk factors, including an unreasonable risk to a potentially exposed or susceptible subpopulation under the conditions of use, EPA will notify the submitter of its decision under TSCA section 5(a)(3)(C). For these "not likely to present an unreasonable risk" cases, PMN submitters may commence manufacture upon notification by EPA. EPA is only allowed to authorize manufacture of a new chemical without restriction when the Agency determines under Section 5(a)(3)(C) of TSCA that the chemical "is not likely to present an unreasonable risk."

The challenge with controlling future harm from Section 5(a)(3)(C) chemicals is that once EPA determines that the chemical is "not likely to present an unreasonable risk", these chemicals may be used in ways that weren't assessed in the original PMN application or be used at much higher concentrations than proposed in the PMN.

Non-Cu, non-biocidal AFPs have the potential to be made with such Section 5(a)(3)(C) chemicals that are being used in ways that were likely never considered in the original PMN application (unless the PMN application was specifically for use of the notified chemicals in boat paints). For those chemicals that fall through the Section 5(a)(3)(C) crack, there is no oversight and no requirement of a robust chemical hazard or risk assessment to ensure adequate environmental protection.

Environmental Loopholes in OSHA Hazard Communication Standard (HCS)-Compliant Safety Data Sheets (SDS)

The U.S. Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard (HCS) (29 CFR 1910.1200(g)), revised in 2012, requires that the chemical manufacturer, distributor, or importer provide a 16-section Safety Data Sheets (SDSs) (formerly MSDSs or Material Safety Data Sheets) for each hazardous chemical to downstream users to communicate information on these hazards. HCS-compliant SDS includes information such as the properties of each chemical; the physical, health, and environmental hazards (to a limited extent pertaining to accidental releases); protective measures; and safety precautions for handling, storing, and transporting the chemical.

An OSHA HCS-compliant SDS must also contain Sections 12 through 15 to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS); however, OSHA does not enforce the content of these four sections because these endpoints are regulated other agencies (OSHA 2012):

- Section 12: Ecological Information (Non-Mandatory on U.S. SDS)
- Section 13: Disposal Considerations (Non-Mandatory on U.S. SDS)
- Section 14: Transport Information (Non-Mandatory on U.S. SDS)
- Section 15: Regulatory Information (Non-Mandatory on U.S. SDS)

As a result, many companies using or importing chemicals or mixtures choose to leave Sections 12-15 of HCS-compliant SDS blank for environmental hazards, and not report environmental hazards in these sections or SDS Section 2 (Hazard Identification). This loophole in disclosure for specific environmental hazards is shown for Solvent naphtha (petroleum), light aromatic (CAS# 64742-95-6). This substance was identified as a hazardous ingredient in non-Cu AFPs and was assessed in the Ecology (2014) project as a chemical with high hazards (illustrated in Figure 2, below).

Solvent naphtha (petroleum), light aromatic (CAS# 64742-95-6) is aquatically toxic, and is classified under GHS as a Category 2 aquatic toxicant (Figure 3)(ECHA 2018). As illustrated below in Figures 4 and 5, an OSHA HCS-compliant SDS does not disclose the aquatic toxicity hazard (EMS 2015). This is in contrast to disclosure an EU SDS, which must comply with the Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures (the "CLP Regulation"), which is the EU's version of GHS (EC 2018). As shown in Figures 6 and 7, an EU CLP compliant SDS discloses the aquatic toxicity hazard (Fibregrid 2017).

As a result of a lack of disclosure of environmental hazards on SDS, formulators of non-Cu AFPs may select an ingredient, review the ingredient's HCS-compliant SDS, and erroneously conclude the ingredient does not pose an environmental hazard.

Table D-5: Chemical Hazard Summary Table for International Paint LLC's XZM480 International (Paint #4)

			Group 1 Human Health					Group II and II* Human Health									Ecotox.		Fate		Physical		
Chemical	CAS #	% in Ingredient[58]	Carcinogenicity	Mutagenicity	Reproductive	Developmental	Endocrine Activity	Acute Toxicity	Systemic Toxicity	Neurotoxicity	Skin Sensitization*	Respiratory Sensitization*	Skin Irritation	Eye Irritation	Acute Aquatic	Chronic Aquatic	Persistence	Bioaccumulation	Reactivity	Flammability	GreenScreen® Benchmark Score
Solvent naphtha (petroleum), light aromatic	64742-95-6	10-<25 %	H	H	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	H	M	vL	L	NA	NA	LT-1
1,2,4-Trimethylbenzene	95-63-6	2.5-<10 %	*L*	M	*M*	L	DG	M	M	L	vH	H	L	DG	H	H	H	H	*H*	L	*L*	M	BM 2
1,3,5-Trimethylbenzene	108-67-8	1-<2.5 %	*L*	M	*M*	L	DG	M	M	L	vH	H	L	DG	H	H	H	H	*H*	L	*L*	M	BM 2
Trimethoxy (methyl)silane	1185-55-3	1-<2.5 %	*L*	*M*	L	L	*M*	L	L	M	M	L	*M*	DG	L	L	L	L	*M*	*vL*	*L*	H	BM 1 $_{TP}$
Vinyltrimethoxy silane	2768-02-7	1-<2.5 %	*L*	L	M	*M*	DG	M	M	*H*	M	DG	*M*	DG	*L*	L	L	L	*M*	*vL*	*L*	H	BM 1 $_{TP}$
Silsesquioxane, 3-aminopropyl methyl, ethoxy-terminated	128446-60-6	1-<2.5 %	DG	DG	DG	DG	DG	DG	DG	DG	DG	DG	DG	DG	*H*	*H*	DG	DG	DG	DG	DG	*M*	BM U
Methanol	67-56-1	0-<1%	NA	NA	NA	H	NA	H	vH	NA	NA	NA	NA	NA	NA	NA	L	*L*	vL	*vL*	NA	H	LT-1

Unk.: Unknown
NA: Not Assessed

Figure 2: Hazard Classifications for Solvent Naphtha (petroleum), Light Aromatic (CAS# 64742-95-6) from Ecology Alternatives Assessment (Ecology 2014)

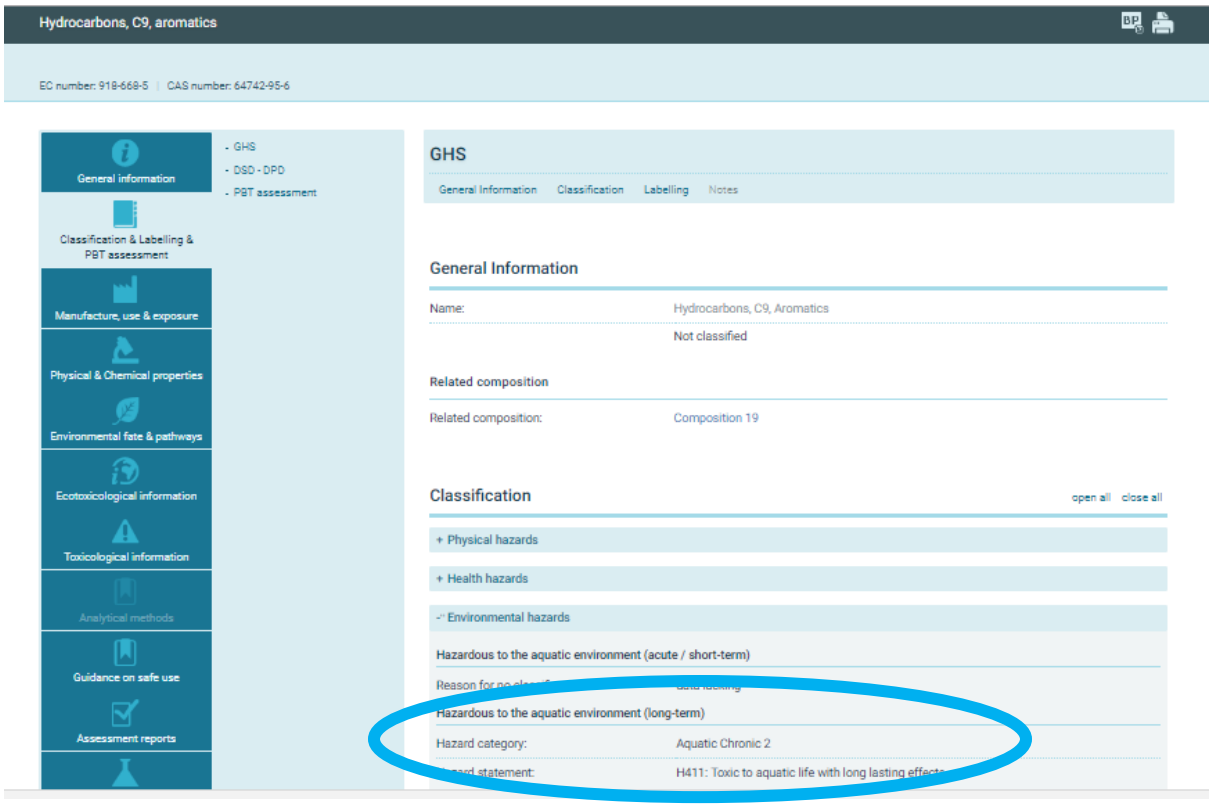
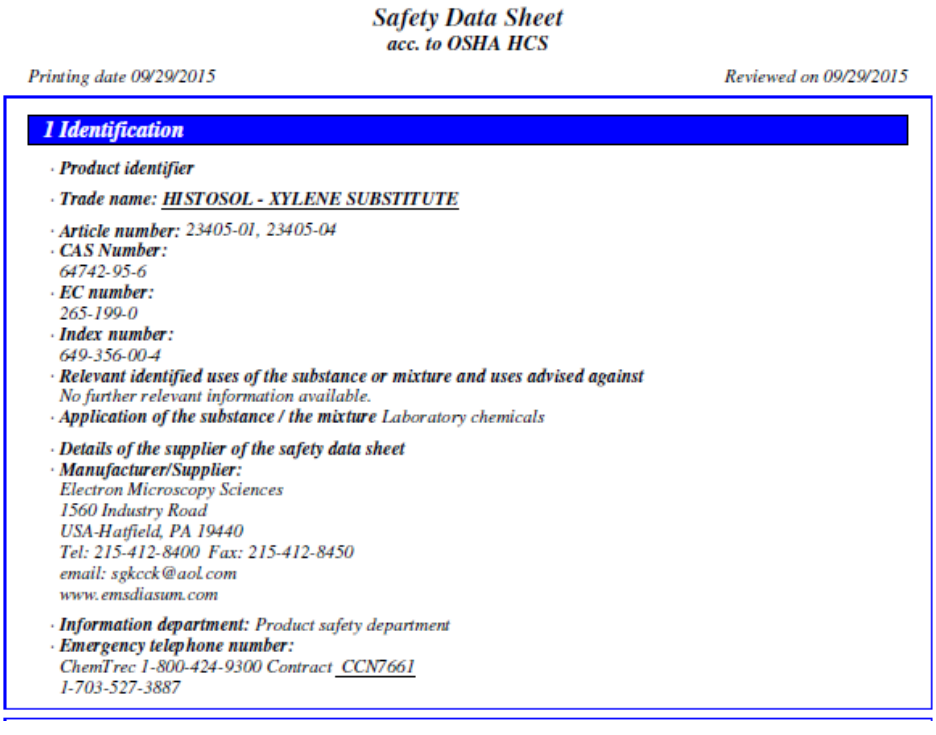


Figure 3: GHS Aquatic Toxicity Classification of Solvent Naphtha (Petroleum), Light Aromatic (CAS# 64742-95-6)



Safety Data Sheet
acc. to OSHA HCS

Printing date 09/29/2015 *Reviewed on 09/29/2015*

1 Identification

· ***Product identifier***

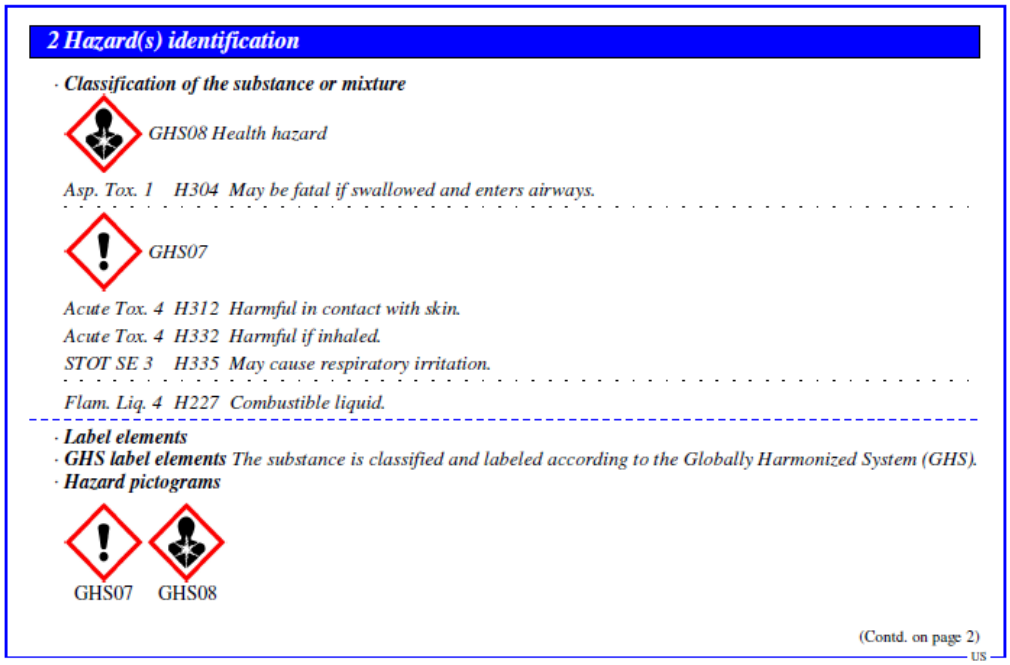
· ***Trade name: HISTOSOL - XYLENE SUBSTITUTE***

· ***Article number:*** *23405-01, 23405-04*
· ***CAS Number:***
64742-95-6
· ***EC number:***
265-199-0
· ***Index number:***
649-356-00-4
· ***Relevant identified uses of the substance or mixture and uses advised against***
No further relevant information available.
· ***Application of the substance / the mixture*** *Laboratory chemicals*

· ***Details of the supplier of the safety data sheet***
· ***Manufacturer/Supplier:***
Electron Microscopy Sciences
1560 Industry Road
USA-Hatfield, PA 19440
Tel: 215-412-8400 Fax: 215-412-8450
email: sgkcck@aol.com
www.emsdiasum.com

· ***Information department:*** *Product safety department*
· ***Emergency telephone number:***
ChemTrec 1-800-424-9300 Contract CCN7661
1-703-527-3887

Figure 4: SDS of Solvent Naphtha (Petroleum), Light Aromatic (CAS# 64742-95-6)



2 Hazard(s) identification

· **Classification of the substance or mixture**

GHS08 Health hazard

Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.

GHS07

Acute Tox. 4 H312 Harmful in contact with skin.
Acute Tox. 4 H332 Harmful if inhaled.
STOT SE 3 H335 May cause respiratory irritation.

Flam. Liq. 4 H227 Combustible liquid.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS07 GHS08

(Contd. on page 2)

US

Figure 5: Section 2 of HCS Compliant SDS for Solvent Naphtha (Petroleum), Light Aromatic (CAS# 64742-95-6)

Date Printed: 20/11/2017 Product: FG02N070

Safety Data Sheet
according to Regulation (EC)
No. 2015/830

FIBREGRID
The Anti Slip Flooring People

SECTION 1: Identification of the Substance/Mixture and the Company/Undertaking

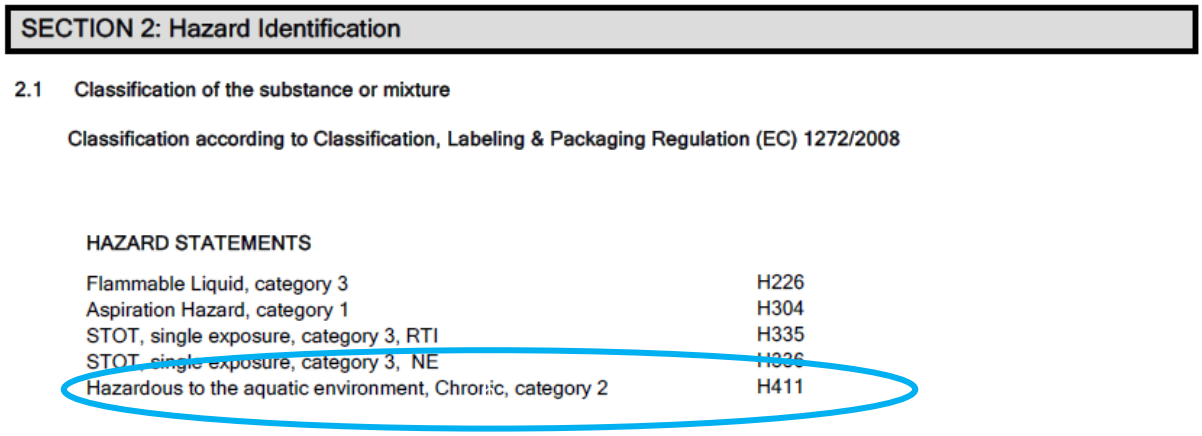
1.1 Product Identifier — FG02N070 — Revision Date: 20/11/2017
Product Name: STANDARD BLOCK PAVING SEALER — Supercedes Date: 31/08/2017

1.2 Relevant identified uses of the substance or mixture and uses advised against — Monocomponent industrial coating - Industrial use.

1.3 Details of the supplier of the safety data sheet

Supplier:
Fibregrid
Unit 2, Civic Industrial Estate,
Homefield Road Central,
Haverhill, Suffolk, CB9 8QP
Phone: 01440 712722
Fax: 01440 712733
Website: www.fibregrid.com
Email: sales@fibregrid.com

Figure 6: CLP Compliant SDS for Solvent Naphtha (Petroleum), Light Aromatic (CAS# 64742-95-6)



SECTION 2: Hazard Identification

2.1 Classification of the substance or mixture

Classification according to Classification, Labeling & Packaging Regulation (EC) 1272/2008

HAZARD STATEMENTS	
Flammable Liquid, category 3	H226
Aspiration Hazard, category 1	H304
STOT, single exposure, category 3, RTI	H335
STOT, single exposure, category 3, NE	H336
Hazardous to the aquatic environment, Chronic, category 2	H411

Figure 7: Section 2 of CLP Compliant SDS for Solvent Naphtha (Petroleum), Light Aromatic (CAS# 64742-95-6)

CONCLUSION

Incremental transition to non-Cu AFPs that are safer for the environment and perform as well as Cu AFPs is the ideal. However, there are **zero** commercially available non-Cu AFPs that are safer and perform as well as Cu AFPs. Identification of available non-Cu AFPs that are indeed safer and perform as well as Cu AFPs is critical to avoid a regrettable substitution. Copper itself is a regrettable substitute to organotin coatings, whose phase out took almost 25 years. This substitution began in the 1980s, from France's first ban of organotins on certain boats in 1982, while in the U.S., Congress passed the Organotin Antifouling Paint Control Act of 1988 and, on March 1, 1990, Congress banned over-the-counter sales of TBT and the use of TBT coatings on vessels less than 82 feet long. On a global scale, the International Maritime Organization banned organotins on boat surfaces from January 1, 2008 (Bressy and LeJars 2014). It is critical to avoid another regrettable substitution and avoid an endless cycle of reformulation. Such avoidance can be secured through careful screening of potential non-Cu AFP candidates using robust chemical hazard assessment frameworks, and ensure that ingredients and residuals in non-Cu AFPs are assessed for their potential harm against both environmental and human health endpoints.

One major challenge posed by the SARWQCB's Draft Basin Plan Amendments is the plan's prioritization of non-biocidal non-Cu AFPs over registered non-Cu biocidal AFPs. Current Federal regulations do not mandate disclosure of environmental hazards in Safety Data Sheets, and because non-biocidal formulations do not require pre-registration and risk assessment similar to a registered pesticide, there is no prescreening of such AFPs to ensure that they are safe for the environment.

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