

FACT SHEET FOR NPDES GENERAL PERMIT MODIFICATION FOR BOATYARDS

SUMMARY

This fact sheet is a companion document to the National Pollutant Discharge Elimination System (NPDES) modified General Permit for Boat Building and Repair Facilities. It explains the nature of the proposed discharge, Ecology's decisions on limiting the pollutants in the wastewater, and the regulatory and technical basis for those decisions. Public involvement information is contained in Appendix A.

The State of Washington, Department of Ecology (Ecology), has tentatively determined to modify a general permit to the boatyard industry operating in the State of Washington for the discharge of wastewater resulting from the building and repair of boats 65 feet or less in length. This general permit controls wastewater from pressure washing and stormwater runoff.

This is the third modification of this general permit. The proposed changes from the current general permit are: a lower benchmark for copper and a benchmark for zinc based on demonstrated performance of stormwater treatment, and increased monitoring requirements for stormwater discharge. This modification continues to require "no direct discharge to surface waters" for the pressure wash wastewater.

This permit is a settlement document produced and agreed upon by the Northwest Marine Trade Association and the PugetSoundkeeper Alliance.

The proposed terms, limitations, and conditions contained herein are tentative and may be changed as a result of comments and public hearings. Changes to the draft modification as a result of public comment are given in Appendix G.

This fact sheet has been modified from the original to explain changes since the issuance of the 2005 permit upon which this modification is based.

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the United States Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State and EPA include procedures for issuing general permits (Chapter 173-226 WAC), water quality criteria for surface and ground waters (Chapters 173-201A, 40 CFR 131.36 and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit.

This permit modification contains conditions that result from an appeal settlement as explained below. Public notice of the availability of the draft permit is required at least thirty days (30) before the final permit is issued (WAC 173-226-130). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures). After the public comment period has closed, the Department will summarize the substantive comments and respond to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. This fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix B--Response to Comments.

The goals of this permit are to be achieved primarily through prohibition of all pressure wash wastewater discharges to surface water and "Best Management Practices" (BMPs) or stormwater treatment designed to minimize or eliminate the discharge of pollutants. Numeric benchmarks are used to measure success of the BMPs or treatment and as an indicator of compliance with water quality standards.

BACKGROUND INFORMATION

HISTORY

Under task P-20 of the Puget Sound Water Quality Authority Plan, Ecology was directed to carry out a program for detection and identification of unpermitted discharge sources. One of the significant unpermitted point source discharge groups found by the Elliott Bay and Lake Union Urban Bay Action Teams was the boatyard industry.

Ecology signed a Memorandum of Agreement with the EPA for development and issuance of a general permit for small shipyards. During the development of the permit it was decided to describe facilities in this segment of the Ship and Boat Building and Repairing industry as boatyards. A general permit was issued in 1992, reissued in 1997 and again in December, 2005 (current permit). The 2005 permit was modified in 2006 to correct an error. The 2005 permit and 2006 modification were appealed by the Northwest Marine Trade Association (NMTA) and the Puget SoundKeeper Alliance (PSA). The appeal was heard by the Pollution Control Hearings Board in July 2006 and the Board issued a decision in January 2007. That decision was appealed to Superior Court by NMTA and PSA. The appeal to superior court was conditionally settled by incorporating some of the PCHB judgement orders into a second permit modification (January 2008) and the conduct of a pilot test of stormwater treatment during the winter of 07/08. The pilot test was conducted and a general economic analysis was conducted to estimate cost of installing treatment.

The January 2008 permit modification was appealed by PSA. The permit and the 2008 modifications remain under appeal.

There are presently 132 boatyards under permit in Washington State.

DESCRIPTION OF THE INDUSTRY

INDUSTRY PROCESS

The applicable Standard Industrial Classifications (SIC) are:

SIC No. 3731 Ship Building and Repairing: "Establishments primarily engaged in building and repairing all types of ships, barges, and lighters, whether propelled by sail or motor power or towed by other craft. This industry also includes the conversion and alteration of ships."

SIC No. 3732 Boat Building and Repairing: "Establishments primarily engaged in building and repairing all types of boats."

A boatyard, as defined for purposes of this permit, is a service business primarily engaged in new construction and repair of small vessels 65 feet or less in length. Services provided may include, but are not limited to: pressure washing; bottom and top side painting; engine, prop, shaft, and rudder repair and replacement; hull repair, joinery,

bilge cleaning; fuel and lubrication system repair or replacement; welding and grinding on the hull; buffing and waxing; top-side cleaning; MSD (marine sanitation device) repair or replacement, and other activities necessary to maintain a vessel.

A boatyard may employ one or more of the following to remove or return a vessel to the water: marine railway, drydock, crane, hoist, ramp, or vertical lift. Some yards may build a limited number of custom boats usually constructed of fiberglass or aluminum. Permanent moorage facilities are not usually a feature of a boatyard although a few boatyards do have such facilities.

Those boat repair activities, whether conducted by the vessel's owner or by an agent or contractor hired by the owner, which do not require coverage under this permit include the following:

- Engine repair or maintenance conducted within the engine space without vessel haul-out.
- Topsides cleaning, detailing and bright work.
- Electronics servicing and maintenance.
- MSD servicing and maintenance that does not require haul-out.
- Vessel rigging.
- Minor repairs or modifications to the vessel's superstructure and hull above the waterline which are not extensive (i.e. 25% or less of the vessel's surface area above the waterline).

These activities which do not require coverage under this permit are often conducted in marinas. Marinas or boat owners conducting boatyard activities may be subject to penalty for discharging without a permit. In addition, marinas must follow the in-water hull cleaning instructions in the Ecology Divers Advisory. Marinas on aquatic lands leased from the Washington Department of Natural Resources must, in accordance with RCW 90.48.386, maintain and follow of plan of operations detailing how all water pollution control requirements of state law will be met or risk losing the lease.

Historically boat repair has been done outdoors on the waterfront. The vessel was supported in a cradle, on barrels, or in a sling while work was done on the hull.

Some boatyard facilities are endeavoring to change operations in order to do the boat repair under cover. This will contribute to quality control, reduce or eliminate discharges, and improve worker safety.

If all activities are performed indoors, under cover, with no outside activities or exposure except haul-out, coverage under this permit may not be required.

This document will use the generic terms pressure washing and pressure wash wastewater for all pressure washing activities at boatyards.

This permit does not provide coverage for related, ancillary or related industrial or commercial facilities, such as a repair shop for marine engines. Those facilities may qualify for coverage under the Industrial Stormwater General permit, if necessary. This permit also does not cover in-water hull cleaning as conducted by contract divers. Ecology has issued guidelines for this type of work to prevent water pollution. Ecology will reissue that guidance concurrently with the issuance of this permit.

WASTEWATER CHARACTERIZATION

Wastes generated by boatyard activities include spent abrasive grits, spent solvent, spent oils, pressure wash wastewater, paint over-spray, paint drips, various cleaners and anti-corrosive compounds, paint chips, scrap metal, welding rods, wood, plastic, resins, glass fibers, and miscellaneous trash such as paper and glass. If not adequately controlled, these pollutants can enter the wastewater stream through the application and preparation of paints and the painted surface; the handling, storage and accidental spills of chemicals, leaks or drips of paints, solvents, thinners; the fracturing and breakdown of abrasive grits; and the repair and maintenance of mechanical equipment. Hull preparation for painting is commonly done by pressure washing, sanding, grinding or scraping and some abrasive blasting.

The two main wastewater streams from boatyards are 1) pressure wash wastewater and 2) stormwater runoff. Other minor potential sources are cooling water, pump testing, gray water, sanitary waste, wash-down of the work area, and engine bilge water. Engine room bilge water and oily wastes are typically collected and disposed of through a licensed contracted disposal company.

PRESSURE WASH WASTEWATER

Raw pressure wash wastewaters have been sampled by Ecology, local shipyards, boatyards and the Municipality of Metropolitan Seattle (METRO) (1992). The data on the untreated wastewater is presented in Table 1.

Table 1. Characterization of untreated boatyard pressure-washing wastewater

<u>PARAMETER</u>	<u>UNITS</u>	<u>MEAN</u>	<u>HIGHEST VALUE OR RANGE</u>
pH	Std. units	7.2	6.7 -8.2
Turbidity	NTU	469	1700
Suspended Solids	mg/L	800	3100
Oil/grease	mg/L	None visual	
Copper	µg/L	55,000	190,000
Lead	µg/L	1,700	14,000
Zinc	µg/L	6,000	22,000
Tin	µg/L	490	1,400

Arsenic	µg/L	80	100
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These metal concentrations (copper, lead, zinc) in the raw wastewater exceed the typical standards for discharge to sanitary sewer by about a factor of 10 and exceed surface water quality ambient standards by a factor of about 1,000.

STORMWATER

The 2005 permit required monitoring of stormwater runoff from boatyards for copper, oil/grease and total suspended solids (TSS). The modification in 2008 required additional monitoring of stormwater for zinc and lead. The monitoring data reported by the boatyards on their discharge monitoring reports for copper is presented in Table 2. This monitoring data is for stormwater runoff controlled solely by best management practices (BMPs).

Table 2. Boatyard stormwater runoff data for copper (2006 through 2008)

<i>Total copper</i>		<i>lognormal transformed</i>		
Mean	492.0811286	Mean	4.851026599	127.9
Standard Error	91.36143077	Standard Error	0.078097863	
Median	110	Median	4.700480366	109.9
Mode	25	Mode	3.218875825	
Standard Deviation	1783.303985	Standard Deviation	1.524409474	
Sample Variance	3180173.103	Sample Variance	2.323824243	
Kurtosis	179.5745141	Kurtosis	0.037723111	
Skewness	12.03228062	Skewness	0.373658149	
Range	29098.55	Range	9.906929897	
Minimum	1.45	Minimum	0.371563556	
Maximum	29100	Maximum	10.27849345	
Sum	187482.91	Sum	1848.241134	
Count	381	Count	381	
Largest(50)	807	Largest(50)	6.693323668	
Confidence Level(95.0%)	179.6372501	Confidence Level (95.0%)	0.153558074	
This data is from monitoring reports. The data was edited to remove all values less than 1, presumed to be errors of analysis or reporting				

For comparison, the State water quality criteria, WAC 173-201A, for acute toxic effects due to copper in marine water is 4.8 µg/L (dissolved) and the fresh water acute criterion is 7.7 µg/L (dissolved) at a receiving water hardness of 43 mg/l which is a typical hardness for Lake Union. The median concentration of 110 µg/L total copper in stormwater may result in a dissolved copper concentration ranging from approximately 2

µg/L to 99 µg/L in the receiving water near the point of discharge depending upon the nature of the copper matrix and receiving water characteristics.

The median reported copper value for the period of 1998 to 2002 under the 1997 permit was 410 µg/L which is about four times higher than the median value reported from the current 2005 permit.

Zinc and lead were required to be monitored by the permit modification of January 2008. That summary monitoring data is reported in Table 3.

Table 3.

	Zinc (Total)		Ln Zinc (Total)
Mean	396.7227083	Mean	5.005226728
Standard Error	72.68977557	Standard Error	0.251103714
Median	190	Median	5.245637109
Mode	20	Mode	2.995732274
		Standard	
Standard Deviation	503.6095379	Deviation	1.73969756
Sample Variance	253622.5667	Sample Variance	3.026547599
Kurtosis	4.722809438	Kurtosis	0.678647839
			-
Skewness	2.024393423	Skewness	0.857167682
Range	2419	Range	7.791522819
Minimum	1	Minimum	0
Maximum	2420	Maximum	7.791522819
Sum	19042.69	Sum	240.250883
Count	48	Count	48

For comparison, the State water quality criteria, WAC 173-201A, for acute toxic effects due to zinc in marine water is 90.0 µg/L (dissolved) and the fresh water acute criterion is 56 µg/L (dissolved) at a receiving water hardness of 43 mg/l. The median concentration of 180 µg/L total zinc in stormwater may result in a dissolved copper concentration ranging from approximately 36 µg/L to 176 µg/L in the receiving water at the point of discharge depending on the nature of the zinc matrix and receiving water characteristics.

<i>Lead (Total) statistics</i>	
Mean	46.384
Standard Error	21.43128686
Median	7
Mode	2
Standard Deviation	117.3839925
Sample Variance	13779.0017
Kurtosis	12.43699054
Skewness	3.461934627
Range	550
Minimum	<1
Maximum	550
Sum	1391.52
Count	30
Confidence Level(95.0%)	43.8319025

For comparison, the State water quality criteria, WAC 173-201A, for acute toxic effects due to lead in marine water is 210 µg/L (dissolved) and the fresh water acute criterion is 25 µg/L (dissolved) at a receiving water hardness of 43 mg/L. The median concentration of 7 µg/L total lead in stormwater may result in a dissolved lead concentration ranging from approximately 1.4 µg/L to 6.2 µg/L in the receiving water at the point of discharge depending on the nature of the lead matrix and receiving water characteristics.

The 2005 permit also contained benchmarks for oil/grease and total suspended solids (TSS). The derivation of the benchmarks is explained below. The monitoring data collected from the 2005 permit is given in Table 4.

Table 4. Monitoring data summary for Jan. 06 to Sept. 08.

Oil/Grease Monitoring Data (mg/L)		TSS Monitoring Data (mg/L)	
Mean	4.71045	Mean	26.40481
Standard Error	0.21422	Standard Error	4.26393
Median	5	Median	10
Mode	5	Mode	5
Standard Deviation	3.029527	Standard Deviation	85.59781
Sample Variance	9.178031	Sample Variance	7326.984
Kurtosis	31.09414	Kurtosis	115.9953
Skewness	4.270707	Skewness	9.924212
Range	31	Range	1199.561
Minimum	0	Minimum	0.439
Maximum	31	Maximum	1200
Sum	942.09	Sum	10641.14
Count	200	Count	403
Confidence Level(95.0%)	0.422432	Confidence Level(95.0%)	8.382387

This permit modification removes the requirement to monitor for TSS and Oil/Grease.

A full characterization of toxic pollutants (as µg/L) was conducted on stormwater runoff from three representative boatyards in the spring of 2006. (Ecology Publication 06-03-041). The water quality criteria are shown after the name of the chemical as (freshwater criteria/marine criteria) in µg/L.

Boatyard:	Swantown	Port Townsend	Seaview
Sample Number:	6144010/11 6154012	6214000	6144012
Date:	4/8, 4/13	5/23	4/8

Naphthalene	0.06 U	2.6	0.06 U	0.32
1-Methylnaphthalene	0.06 U	2.9	0.06 U	0.19
2-Methylnaphthalene	0.06 U	3.3	0.06 U	0.27
Acenaphthylene	0.06 U	3.9	0.06 U	0.42
Acenaphthene (670/990)	0.06 U	0.11	0.06 U	0.22
Fluorene (1300/1400)	0.06 U	0.29	0.06 U	0.33
Phenanthrene	0.13	0.12	0.15	2.1
Anthracene (9600/110,000)	0.06 U	0.07	0.06 U	0.58

Fluoranthene (300/370)	0.12	0.35	0.42	2.4
Pyrene (960/11000)	0.10	0.63	0.38 J	1.3
Benzo(a)anthracene (0.0028/0.031)	0.06 U	0.05 J	0.14	0.24

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Chrysene (0.0028/0.031)	0.07 J	0.08	0.26	0.82
Benzo(b)fluoranthene (0.0028/0.031)	0.06 U	0.05 J	0.2	0.39
Benzo(k)fluoranthene (0.0028/0.031)	0.06 U	0.07	0.15	0.4
Benzo(a)pyrene (0.0028/0.031)	0.06 U	0.06 U	0.04 J	0.26
Indeno(1,2,3-cd)pyrene (0.0028/0.031)	0.06 U	0.06 U	0.05 J	0.12
Benzo(ghi)perylene	0.06 U	0.08	0.06 J	0.16
Bis(2-Ethylhexyl) Phthalate (1.8/5.9)	2.8	1.3 UJ	2.1	15
Di-N-Butylphthalate	2.6	0.54	0.16 J	4.3
Dimethylphthalate (313000/2900000)	1.0	0.22	0.68	13 E
Diethylphthalate	0.28 J	0.05 J	0.09 J	1.2
Butylbenzylphthalate	0.39	0.14	0.03 J	2.1

Phenols

Phenol (21000/4600000)	0.84	0.55	0.29	4.6
2-Methylphenol	0.19	0.54	0.07	1.0
4-Methylphenol	0.85	0.06 U	1.2	3.1
2,4-Dimethylphenol (380/850)	0.16	3.0	0.06 U	1.1
4-Chloro-3-Methylphenol	0.12 U	0.13 U	8.4	0.13 U
2-Nitrophenol	0.25 J	0.25 U	0.26 U	0.26 U
4,6-Dinitro-2-Methylphenol	0.59 J	0.63 U	0.64 U	0.64 U

Benzyl Alcohol	0.64	0.13 U	0.13 UJ	4.5
Dibenzofuran	0.06 U	0.08	0.06 U	0.29
Retene	0.08	0.06 U	0.06 U	0.58
Caffeine	2.7	0.61	0.46	15
Benzoic Acid	5.8	1.3 U	0.74 J	1.3 U
Isophorone (8.4/600)	0.06 U	0.06 U	0.06 U	0.35
Carbazole	0.06 UJ	0.06 UJ	0.06 UJ	1.2 J

J = Estimated concentration , REJ = Data rejected

U = Not detected at or above the reported value, E = Exceeds calibration range

UJ = Not detected at or above the reported estimated value

Table 5 .Results of analyzing organotins in boatyard stormwater runoff collected during April-May 2006 (ug/L; parts per billion).

Boatyard	Sample Number	Date	Tributyltin (0.460/0.37)	Dibutyltin	Monobutyltin
Swantown " "	6144010/11	4/8	0.22	0.041 J	0.001 UJ
	6154012	4/13	0.13	0.002 UJ	0.001 UJ
	6224000	5/31	0.010 J	0.033 J	0.012 J
Port Townsend	6214000	5/23	0.18 J	0.010	0.006 J
Seaview "	6144012	4/8	6.0	0.064 J	0.001 UJ
	6214001	5/23	0.36	0.10	0.014

PROPOSED PERMIT MODIFICATION LIMITATIONS

Federal and State regulations require that effluent limitations set forth in an NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). State laws (RCW 90.48.010, 90.52.040 and 90.54.020) require the use of all known, available and reasonable methods (AKART) to prevent and control the pollution of waters of the state.

Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36). The more stringent of these two limits (technology or water quality-based) must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Technology-based effluent limitations for discharges consisting of process wastewater typically are based on some type of treatment technology to reduce the pollutants in that wastewater. Stormwater differs from process wastewater in that it is not a continuous discharge, the pollutant sources are not continuous, and the pollutant concentrations are highly variable. EPA, in their stormwater permits, has determined that the use of structural controls and Best Management Practices (BMPs) to prevent the discharge of pollutants via stormwater runoff may be equivalent to BCT and BAT, which are the federally mandated technology-based treatment levels.

Title 40 CFR 122.2 defines BMPs as “schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution

of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage." BMPs are techniques for pollution prevention or, in other words, preventing the pollutants from getting into the wastewater (stormwater).

EPA has defined shipyards as a point source category. The draft EPA "Development Document for Shipbuilding and Repair," EPA 440/1-70/076-b, recommends BMPs as the primary method of controlling waste discharges from shipyards to the waters of the state. BMPs achieve pollution control through careful management of the product streams, segregation of potential pollutants in waste streams, and preventing or minimizing contact between water and waste material. Shipyards and boatyards have similar operations.

The Development Document for Shipbuilding and Repair also determined that BMP's constitute BPT (Best Practicable Control Technology) for the shipyard industry. Ecology concluded in the 2005 permit that BMPs constituted BCT for stormwater discharges in the boatyard industry and that collection and treatment of pressure wash wastewaters constitutes BAT (Best Available Technology Economically Achievable).

METRO TREATMENT STUDY

BMPs to collect, and contain wastes and minimize waste generation during vessel repair and maintenance work have been researched, compiled and distributed in Washington by Ecology, the Lake Union Association Water Quality Committee and the Puget Sound Shipbuilders Association with funding assistance from the Puget Sound Water Quality Authority.

Many of the sources discussed in the Wastewater Characterization section can be contained, controlled or substantially reduced by the implementation of BMPs. BMPs are an essential component of this proposed general NPDES permit. BMPs include structural controls including catch basins and drains, berms, dikes and other containment for oils, chemicals and wastes; roofed storage areas and wastewater treatment facilities. Facilities covered by a general permit requiring BMPs will be required to implement them. The BMPs in the boatyard general permit included requirements for:

- Education of Employees and Customers
- Yard Cleaning and Sweeping
- Sediment Traps
- Dust and Overspray Control
- Maintenance of Hoses and Piping
- Bilge Water Control
- Paint and Solvent Use
- Use of Antifouling Paints
- Prohibition on use of Tributyltin

- Cleanup of Debris and Spent Paint
- Chemical Storage
- Waste Disposal
- Dangerous Waste Handling & Reporting
- Recycling of Spilled Chemicals and Rinse Water
- Accidental Oil Discharge
- Oil, Grease, and Fuel Transfers
- In-water hull cleaning
- Zebra Mussels
- Decontamination of the wash pad
- Over water work

The 2005 permit contained an additional and mandatory permit requirement for the use of vacuum sanders and grinders for removing paint. An analysis of the cost of this technology (Appendix E of the 2005 permit fact sheet) indicated costs would be fully recovered by boatyards in a short period of time if they chose to own and rent out the sanders.

TECHNOLOGY-BASED LIMITATIONS FOR PRESSURE WASH WASTEWATER

The primary source of the heavy metals in pressure wash wastewater is from paint removed from boat hulls. As noted previously, the copper concentration in this wastewater exceeded the water quality criteria by several orders of magnitude. The next most common metals, by frequency and in magnitude, in boatyard and shipyard wastewater (or contaminated stormwater) are zinc and lead.

METRO (Municipality of Metropolitan Seattle) received a National Estuary Grant to do a treatment study of Puget Sound shipyard and boatyard wastewater and storm water. The study involved sampling of pressure washing wastewater from a number of these facilities, and testing prototype collection and treatment systems to determine which methods could consistently meet state and local water quality standards.

METRO produced an analytical report of their findings and developed a guidance manual which was distributed to shipyards, boatyards and publicly owned treatment works (POTW). The manual includes options for treatment and discharge of pressure wash wastewater, bilge and ballast water, and contaminated stormwater to receiving waters, municipal treatment plants, or off-site treatment facilities.

METRO's work clarified and expanded the list of options for treatment and disposal of boatyard wastewaters. The treatment study project was closely aligned with the initial development of the first general NPDES permit for boatyards. The study's project manager and project coordinator made valuable contributions to the general permit development by assisting Ecology in establishing standards for best available technology practices for boatyards.

More specifically, the alternatives for treating and disposing of pressure wash wastewater are:

- (1) Recycle and Conservation,
- (2) Collection and discharge (with pretreatment as necessary) of the wastewater to the sanitary sewer which may include chemical addition followed by sedimentation and possibly evaporation.

Option 1 - Recycle/conservation

The preferred means of preventing pollution from pressure washing hulls is recycling of the pressure wash wastewater. The typical configuration is multi-stage filtration with some storage capacity. Water lost from evaporation during pressure washing can be made up from rain water falling on the wash pad or from tap water. The solids collected from the filters or from sedimentation in the storage tank are air-dried under cover and handled as solid waste. The recycled water may eventually become contaminated, requiring disposal or treatment. In this case the wastewater may be collected by a licensed waste hauler and treated off-site.

Option 2 - Discharge to POTW

For boatyard facilities which have the ability to connect to a POTW (Publicly Owned Treatment Works), recycling, with occasional discharge of contaminated recycle water to the POTW, is the best treatment method. The recycled water may have to be treated with a polymer and settled before discharge in order to meet the discharge limits of the permit.

For facilities with excess contaminated water, the contaminated water must be hauled to a treatment facility for proper treatment and disposal.

The guidance manual developed by METRO (1992) gives a more detailed discussion of recycling options for pressure wash wastewaters.

Since all boatyards have eliminated direct discharges of pressure wash wastewater to surface water, Ecology has determined that AKART for pressure wash wastewater is recycling, evaporation, or treatment and discharge to the sanitary sewer. Discharges to the sanitary sewer must meet the discharge requirements included in this permit for non-delegated POTWs or the requirements specified by delegated POTWs. Delegated POTWs are municipal wastewater treatment systems that have received federal pretreatment delegation, through Ecology, to restrict the pollutant loading or concentration of pollutants to their system by a permit system.

Monitoring of pressure wash wastewater in this permit is therefore restricted to discharges which go to a POTW without delegation. The following table gives the monitoring schedule and effluent limits in this draft permit. The POTW limits and monitoring frequency in this permit were adopted from METRO's pretreatment

limits. Pretreatment limits established by delegated POTW's have similar limits and monitoring requirements for discharge into their systems.

Table 8. Limits and monitoring requirements for pressure wash wastewater discharges to non-delegated POTW's

PARAMETER	MINIMUM SAMPLING	SAMPLE TYPE	LIMIT
Flow	June, July, August and September each year	Meter or calculate	N/A
Copper ¹	"	Grab	2.4 mg/L
Zinc ¹	"	Grab	3.3 mg/L
Lead ¹	"	Grab	1.2 mg/L
pH	"	Grab	Within the range of 5 to 11

¹. measured as total

TECHNOLOGY-BASED LIMITATIONS FOR STORM WATER DISCHARGES

As previously noted, EPA has determined that best management practices (BMP's) are Best Practicable Control Technology for stormwater discharges under the EPA Multisector Stormwater General permit and in their draft effluent guidelines for Shipyards. Ecology required mandatory BMPs in the 2005 permit and incorporated a process for additional BMPs when benchmarks were exceeded. The benchmarks in the 2005 permit were formulated as: (water quality criteria) times (dilution factor of 10 for some discharges) times (a receiving water effect) times (translator - a conversion factor to convert total metal to dissolved metal in the receiving water). The resultant benchmarks for existing boatyards discharging to surface water ranged from 38 (Lake Union and ship canal) to 384 (marine). The Pollution Control Hearing Board (PCHB 2007) required the dilution factor to be removed based on testimony that boatyards were not implementing BMPs and therefore not meeting the AKART requirement for a mixing zone (Order no.1). pg 33,34 The PCHB also ruled that copper was not a proper indicator for zinc and lead and that these parameters should be measured in boatyard stormwater (Order no.2). The PCHB also ruled that a translator typical of urban stormwater should be used for the calculation of the benchmark (Order no.1).

The PCHB decision was appealed by NMTA and PSA to Superior Court. The appeal was conditionally settled by agreement of the NMTA, PSA and Ecology to conduct a pilot of stormwater treatment at several boatyards during the winter of 2007/2008. The

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settlement agreement also required Ecology to incorporate several PCHB rulings into a permit modification.

The pilot treatment was conducted. Three treatment devices were installed at three boatyards in the Seattle area and multiple storm events were sampled. The results of the study are in a report entitled *Boatyard Stormwater Treatment Technology Study – Final Report March 2008* and is available on the Ecology web site at <http://www.ecy.wa.gov/programs/wq/permits/boatyard/index.html> . The cost of installing and operating each of the three treatment devices was estimated for three model boatyards. The net present value of the most cost-effective treatment device of the three pilot treatment devices was \$255,000 per acre (Arcadis 2008). The estimated cost for treatment and preparation work for a two acre boatyard is \$400,000 to \$900,000. This document is available at http://www.nmta.net/PDF/BoatyardCostAnalysis_051908.pdf .

The permit was modified as required by the settlement in 2008 to incorporate PCHB orders numbered 3, 2, 7, and 8. This permit modification, as noted above, was appealed by PSA (appeal 2). The appeal was on the permit modification section S3.C *Receiving Water Studies*. This section was added according to the PCHB order 7.

Annual monitoring of stormwater was required in the first issuance of the Boatyard Permit (1992) to verify the effectiveness of best management practices. Compliance with the monitoring requirement was poor. The few discharges sampled at each boatyard failed to provide the feedback necessary to verify the effectiveness of best management practices or to characterize discharges. Ecology then determined that more than one sample per year was necessary. Therefore, Ecology required four samples per year in the 1997 permit. The 2005 permit required five samples per year. Four samples were required during the times the boatyard activity is highest (spring and fall) and one sample was required in January, the time of highest rainfall. This modification requires monthly sampling.

Boatyards covered under this permit are required to adopt the BMP's listed in the permit if they are appropriate for their facility. Other BMP's which are specific for the facility are expected to be developed as required by the facility to meet the permit benchmark values. These BMP's are to be listed in a document called the Stormwater Pollution Prevention Plan (SWPPP). This plan is expected to be updated as necessary and it is a public document. The SWPPP also incorporates a monitoring plan, a spill plan, and weekly visual monitoring reports.

New boatyards are required to develop and implement the treatment system and BMPs as soon as they become operational.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will not cause a violation of established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving waters to be protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (40 CFR Part 131). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

WATER QUALITY-BASED EFFLUENT LIMITS

This permit proposes both benchmarks and effluent limitations to protect water quality.

PERMIT CONDITIONS

The following new or changed permit conditions were derived as a settlement agreement between NMTA and PSA. The following is a list of changes from the 2006/07 permit modification.

DEFINITIONS – A new definition of “Approved Stormwater Management Manuals”.

I. PERMIT COVERAGE REQUIRED – No change

II. DISCHARGE LIMITATIONS OR BENCHMARKS

- Section B. New paragraph specifying limits for stormwater discharges to non-delegated POTW.
- New Section C. Limitations for discharges of stormwater to a delegated POTW.
- Section D.3. Revised copper and zinc benchmarks for discharges to surface waters based on the performance of Stormwater Rx[®] in the pilot treatment study. The mean effluent concentration during the study period was used as the Long Term Average. The limits were calculated using 5% and 1% type 1 error rates using the USEPA (1991) method for calculating average and daily maximum limitations. The calculations are given in Appendix B.
- The previous lead limit for discharges to Lake Union and the Ship Canal was carried over as a water quality-based daily limit of 55.6 µg/L. The basis of this limit is explained in the 2008 permit modification.
- Benchmarks for oil/grease and TSS were removed.
- Sampling was increased to monthly.

Other changes or additions are underlined in the draft permit.

Impaired Waters

Section 303(d) of the federal [Clean Water Act](#) requires Washington State periodically to prepare a list of all surface waters in the state for which beneficial uses of the water – such as for drinking, recreation, aquatic habitat, and industrial use – are impaired by pollutants. These are water quality limited estuaries, lakes, and streams that fall short of state surface water quality standards, and are not expected to improve within the next two years.

Waters placed on the 303(d) list require the preparation of [Total Maximum Daily Loads](#) (TMDLs), a key tool in the work to clean up polluted waters. TMDLs identify the maximum amount of a pollutant to be allowed to be released into a waterbody so as not to impair uses of the water, and allocate that amount among various sources.

Ecology’s assessment of which waters to place on the 303(d) list is guided by federal laws, state water quality standards, and the state’s 303(d) policy. This policy describes

how the standards are applied, requirements for the data used, and how to prioritize TMDLs, among other issues. The goal is to make the best possible decisions on whether each body of water is impaired by pollutants, to ensure that all impaired waters are identified and that no waters are mistakenly identified.

This permit modification requires existing facilities and new facilities to meet water quality criteria in the stormwater discharge.

Ground Water

The treatment technology identified as an economical treatment method in an engineering report for the shipyard stormwater was discharge to an infiltration trench lined with metal-absorbent material. This treatment was called enhanced filtration (Hart Crowser 1997). Any discharge to an infiltration trench must be far enough back from surface water so as not to be deemed a surface discharge due to hydraulic continuity. In addition, the discharge must meet the ground water standards. The permit continues to require that this type of discharge be 200 feet from the water surface and meet a copper limit of 1000 µg/L. This limit is the ground water criteria for copper and should be obtainable with proper BMP's at the facility. Meeting the limit at the point of discharge to the treatment device eliminates the need for ground water sampling.

Sediment Quality Criteria

There is little data to judge the impact of boatyard activity on sediment quality. One study found sediment quality in two Puget Sound boatyard/marinas was well below current sediment quality criteria for copper, lead and zinc (Crecelius, E. et al 1989). Ecology collected sediment samples at three boatyards in 2006 to determine the impact of boatyard stormwater runoff to sediment quality (Ecology 2006a). Sediment contamination appears correlated to stormwater contamination. Ecology believes that controlling the pollutants in stormwater will cause a reduction of pollutants in the sediments.

ECONOMIC IMPACT ANALYSIS

This is a modification of an existing NPDES general permit.

ZEBRA MUSSELS

The permit contains reporting and treatment requirements for zebra mussels. Zebra mussels (*dreissena polymorpha*) have spread throughout the Great Lakes and other waterways in 18 states and two Canadian provinces think they were accidentally introduced into Lake Erie and St. Clair in the 1980's. This introduction has been attributed to a discharge of ballast water from a commercial freighter but other introductions are known to have come from hull biofouling.

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Zebra mussels will continue to expand their range as naturally flowing water carries their young, known as veligers, downstream. Commercial and recreational vessels and equipment can also spread zebra mussels when they move from infested waters to uninfested waters. Adult mussels may attach to any hard surface and the veligers may be transported in water.

A list of potential carriers includes:

- * boats, trailers and other equipment
- * live wells
- * scientific equipment
- * raw water
- * Scuba and snorkel gear
- * plants and animals

Placing these items in uninfested waters without following precautions may lead to an accidental introduction of mussels. Any boats or vessels from outside the State of Washington should be carefully examined and all boats or vessels from east of the Rocky Mountains should be considered infected.

Water hotter than 110 degrees F will kill veligers and 140 degrees F will kill adult mussels.

Therefore the permit contains inspection, reporting and quarantine requirements to minimize the infestation of zebra mussels.

REFERENCES

- Pollution Control Hearings Board (PCHB). 2007. PCHB Nos. 05-150, 05-151, 06-034, 06-040 Findings of Fact, Conclusions of Law, and Order.
- USEPA. 1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
- Ecology. 2006a. Chemical Characterization of Stormwater Runoff from Three Puget Sound Boatyards. Publication No. 06-03-041
- Ecology. 2006b. Permit Writer's Manual. Ecology Publication 92-500.
- Alexander, Kenneth C. 1988 "Characterization and Treatability of Hydroblast Wastewater," University of Washington.
- Puget Sound Shipbuilders Association & Puget Sound Water Quality Authority. 1990. "Best Management Practices for Ship and Boat Building and Repair Yards,"
- USEPA. 1978 "Development Document for Shipbuilding and Repair - Draft," EPA 440/1-70/076-b.
- Municipality of Metropolitan Seattle (METRO) 1992. "Maritime Industrial Waste Project - Reduction of Toxicant Pollution from the Maritime Industry in Puget Sound".

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Hart Crowser. 1997. Final Report, Shipyard AKART Analysis for Treatment of Storm Water.

Arcadis. 2008. Boatyard Stormwater Treatment Technology Cost Analysis.

Taylor Associates. 2008. Boatyard Stormwater Treatment Technology Study.

Appendix A--Public Involvement Information

Revising the Boatyard General Permit

The current boatyard NPDES and State Waste Discharge General Permit was issued by the Washington State Department of Ecology (Ecology) on November 2, 2005. The permit was appealed by Northwest Marine Trade Association (NMTA) and the PugetSoundkeeper Alliance (PSA). The permit has been under appeal and settlement discussion since that time. Ecology is now proposing to modify the permit. This is notice of a draft permit modification available for public comment. The draft Boatyard General Permit modification and fact sheet under review have been approved by NMTA and PSA as a result of the appeal settlement. The review and comment period will run from November 19, 2008 until close of business on December 31, 2008. Ecology will host an informational workshop and a public hearing on the draft modification. Oral comments may be given at the public hearing. Ecology will also accept written comments on the draft permit modification and fact sheet.

Purpose of the Boatyard General Permit

The Boatyard General Permit provides coverage for industries located in Washington State that discharge stormwater from areas used to renew the bottom paint on boats. Under Federal and State water quality law (Federal Clean Water Act and State Water Pollution Control Act), a permit is required for the discharge of wastewater, including stormwater. The proposed general permit addresses these legal requirements and controls the discharge of pollutants to protect surface water and ground water quality in Washington State.

A general permit is similar to an individual wastewater discharge permit except that it covers a group of facilities with similar operations. It implements the Federal Clean Water Act and State Water Pollution Control Act in a single permit. Individual facilities that receive coverage under the general permit are required to comply with the terms and conditions of the permit. Currently, 132 facilities are covered under the Boatyard General Permit.

Applying for a Boatyard Permit

Facilities covered under the existing Boatyard General Permit will continue to be covered under the modified permit.

Requesting Copies of the Permit

Beginning November 19, 2008 you can request copies of the draft permit modification and fact sheet or you can download copies from the website below:

<http://www.ecy.wa.gov/programs/wq/permits/boatyard/index.html>

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Contact Ecology: Gary Bailey
Department of Ecology
PO Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-6433
FAX: (360) 407-6426
E-Mail: gбай461@ecy.wa.gov

Submitting Written and Oral Comments

Ecology will accept written and oral comments on the draft Boatyard General Permit Modification. Written comments must be postmarked no later than midnight, December 31, 2008. Oral comments may be presented by attending and testifying at the public hearing. Comments may be submitted by email if the commenter includes name, address and telephone number in the comment email. Comments should reference specific text when possible. Comments may address the following:

- technical issues,
- accuracy and completeness of information,
- the scope of facilities proposed for coverage,
- adequacy of environmental protection and permit conditions, or
- any other concern that would result from issuance of the modified permit.

Submit written comments to: Gary Bailey
Department of Ecology
PO Box 47600
Olympia, WA 98504-7600
Gбай461@ecy.wa.gov

Public Workshop/Hearing

The public workshop and hearing on the draft general permit is scheduled to be held in Lacey, WA on December 22, 2008. The purpose of the workshop is to explain the general permit, explain the changes ~~from the previous permit~~, and answer questions in order to facilitate meaningful testimony during the hearing. The purpose of the hearing is to provide an opportunity for people to give formal oral testimony and comments on the proposed permit. Written comments will receive the same consideration as oral testimony. The public workshop and hearing will begin at 1:00 p.m. and conclude when public testimony is completed.

The December 22, 2008 (1 p.m.) workshop and hearing will be held at:

Lacey Timberland Regional Library (360) 491-3860
500 College St SE, Lacey, Washington

Issuing the Final Boatyard General Permit Modification

The final modified permit will be issued after Ecology receives and considers all public comments. If public comments cause a substantial change in the permit conditions from the

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original draft permit, another public notice of draft and comment period may ensue.

Ecology expects to issue the modified general permit on or about March 1, 2009 if there is no substantial change to the draft. It will be effective 30 days later on April 1, 2009. When issued, a copy of the notice of issuance and Ecology's responses to the comments will be sent to all persons who submitted written comment or gave public testimony. The response to comments will also be posted on Ecology's boatyard web site at:
<http://www.ecy.wa.gov/programs/wq/permits/boatyard/index.html>.

Appendix B

STORMWATER TREATMENT DATA

	Untransformed means-Copper					
	WWIX		Airquip		Wavelonics	
Mean	9.214286	Mean	10.17143	Mean	1046.293	
Standard Error	1.033829	Standard Error	0.987419	Standard Error	678.2473	
Median	7.5	Median	8.65	Median	142	
Mode	11	Mode	21	Mode	#N/A	
Standard Deviation	5.470508	Standard Deviation	5.22493	Standard Deviation	2626.841	
Sample Variance	29.92646	Sample Variance	27.29989	Sample Variance	6900291	
Kurtosis	-0.66996	Kurtosis	-0.4856	Kurtosis	12.47485	
Skewness	0.657951	Skewness	0.81021	Skewness	3.468039	
Range	17.4	Range	17	Range	10188.6	
Minimum	2	Minimum	4	Minimum	11.4	
Maximum	19.4	Maximum	21	Maximum	10200	
Sum	258	Sum	284.8	Sum	15694.4	
Count	28	Count	28	Count	15	
Confidence Level(95.0%)	2.121241	Confidence Level(95.0%)	2.026016	Confidence Level(95.0%)	1454.696	

	Untransformed means -Zinc			
Mean	13.42857	Mean	77.35714	
Standard Error	1.463334	Standard Error	4.699492	
Median	11.5	Median	75.5	
Mode	7	Mode	76	
Standard Deviation	7.743234	Standard Deviation	24.86737	
Sample Variance	59.95767	Sample Variance	618.3862	
Kurtosis	0.689242	Kurtosis	2.318858	
Skewness	1.343183	Skewness	1.445408	
Range	25	Range	107	
Minimum	6	Minimum	46	
Maximum	31	Maximum	153	
Sum	376	Sum	2166	
Count	28	Count	28	
Confidence Level(95.0%)	3.002513	Confidence Level(95.0%)	9.642561	

Transformed ln Copper

	WWIX		Airquip		Wavelonics
		In Copper			
Mean	2.031109	Mean	2.196782	Mean	5.133646
Standard Error	0.124355	Standard Error	0.09502	Standard Error	0.493644
Median	2.014547	Median	2.157543	Median	4.955827
Mode	2.397895	Mode	3.044522	Mode	#N/A
		Standard		Standard	
Standard Deviation	0.658023	Deviation	0.502801	Deviation	1.911875
Sample Variance	0.432994	Sample Variance	0.252809	Sample Variance	3.655267
Kurtosis	-0.58311	Kurtosis	-1.17063	Kurtosis	0.17756
Skewness	-0.36432	Skewness	0.209802	Skewness	0.548281
Range	2.272126	Range	1.658228	Range	6.79653
Minimum	0.693147	Minimum	1.386294	Minimum	2.433613
Maximum	2.965273	Maximum	3.044522	Maximum	9.230143
Sum	56.87104	Sum	61.50988	Sum	77.00468
Count	28	Count	28	Count	15
Confidence		Confidence		Confidence	
Level(95.0%)	0.255155	Level(95.0%)	0.194966	Level(95.0%)	1.058761

Transformed ln zinc

Mean	2.463466	Mean	4.305302	Mean	4.023101
		Standard		Standard	
Standard Error	0.095987	Error	0.054982	Error	0.351649
Median	2.441401	Median	4.324111	Median	3.89182
Mode	1.94591	Mode	4.330733	Mode	4.219508
		Standard		Standard	
Standard Deviation	0.507913	Deviation	0.290937	Deviation	1.686448
		Sample		Sample	
Sample Variance	0.257976	Variance	0.084644	Variance	2.844107
Kurtosis	-0.48005	Kurtosis	0.453549	Kurtosis	0.951127
Skewness	0.607082	Skewness	0.627326	Skewness	1.056392
Range	1.642228	Range	1.201797	Range	6.587156
Minimum	1.791759	Minimum	3.828641	Minimum	1.94591
Maximum	3.433987	Maximum	5.030438	Maximum	8.533067
Sum	68.97705	Sum	120.5485	Sum	92.53132
Count	28	Count	28	Count	23
Confidence		Confidence		Confidence	
Level(95.0%)	0.196948	Level(95.0%)	0.112813	Level(95.0%)	0.729275

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Appendix C

COMMENTS ON THE DRAFT AND ECOLOGY'S RESPONSES