POLLUTION CONTROL HEARINGS BOARD
STATE OF WASHINGTON

PUGET SOUNDKEEPER ALLIANCE, and NORTHWEST MARINE TRADE ASSOCIATION, Appellants, v. STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, Respondent.	PCHB NOS. 05-150, 05-151, 06-034, & 06-040 (Consolidated) **FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER**

This appeal involves the regulation of stormwater runoff from boatyards pursuant to the Federal Water Pollution Control Act, the "Clean Water Act" (CWA), 33 U.S.C. §1251 *et seq.* and the state Water Pollution Control Act, Chapter 90.48 RCW. In this consolidated appeal, Puget Soundkeeper Alliance (PSA) and Northwest Marine Trade Association (NMTA) challenge the validity of the Department of Ecology's (Ecology) Boatyard General National Pollutant Discharge Elimination System (NPDES) Permit No. WAG-030000 (2005 BGP, BGP, or Permit), contending that it violates the CWA, state law, and implementing regulations. A hearing was held before the Pollution Control Hearings Board (Board) in the above matter on July 10 through 14, 2006 in Lacey, WA. Appellant PSA was represented by Attorney Richard A. Smith.

Appellant NMTA was represented by Attorney James A. Tupper, Jr. Ecology was represented by Assistant Attorney General Joan M. Marchioro. The Board was comprised of William H. Lynch, Chair, Kathleen D. Mix, and Andrea McNamara Doyle, Members. Administrative Appeals Judge, Cassandra Noble presided over the hearing. Randi Hamilton and Kim L. Otis of Gene Barker and Associates of Olympia, Washington provided court reporting services. The Board received sworn testimony of witnesses and exhibits and heard argument on behalf of the parties. Having fully considered the record, the Board enters the following decision:

SUMMARY OF DECISION

The major issues presented in this appeal are whether the 2005 BGP complies with applicable federal and state laws and regulations and whether the Permit adequately protects water quality in waters receiving pollutants from boatyard stormwater discharges. Appellant PSA argues that the 2005 BGP unlawfully fails to ensure that authorized discharges do not cause or contribute to violations of water quality standards because it does not include numeric effluent limits for stormwater discharges of metals and other pollutants. PSA argues that Ecology failed to follow required procedures to determine the effect of regulated discharges on receiving water quality and failed to establish numeric effluent limitations for copper, lead, and zinc. PSA challenges the methodology Ecology used to determine benchmarks for toxic metals. PSA also challenges the monitoring and response provisions in the 2005 BGP, arguing that they are not stringent enough and are not enforceable. Appellant NMTA challenges some of the required best management practices (BMPs) and other increased requirements in the 2005 BGP.

The Board finds that, although the 2005 BGP is an improvement over previous boatyard stormwater permits in many respects, Appellant PSA has met its burden of proof and established that the Permit does not, in all respects, protect water quality and comply with the law. The Board further finds that, although the majority of the Permit's BMP conditions are reasonable, that NMTA has met its burden with regard to the lack of alternatives for one mandatory BMP (vacuum grinders).

The Board concludes that the law does not require the 2005 BGP to have numeric water quality-based effluent limitations. We are persuaded that the use of new mandatory BMPs under this Permit (such as vacuum sanders), coupled with the new adaptive management approach, may result in significant improvements to water quality by reducing the amount of pollutants in stormwater discharges. However, the Board also finds that the methodology used to derive benchmarks for copper is flawed, and that it is improper to rely on copper levels to determine the levels of lead and zinc. We further find that the adaptive management approach is incomplete because it does not explicitly require implementation of triggered responses nor does it address what happens when permittees continue to exceed benchmark levels after completing all three response levels. As a result, we conclude that it is appropriate to remand the 2005 BGP to Ecology for recalculation of the copper benchmarks, addition of separate benchmark and monitoring provisions for lead and zinc, modification of the adaptive management response scheme, and to correct the other deficiencies in the permit as identified in this opinion.

Statutory and Regulatory Framework

In 1972, Congress passed the CWA with the objective of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. *Title 33 U.S.C. §1251 et seq.* The stated national goals of the CWA included the complete elimination of the discharge of pollutants into the nation's waters, and prohibition of the discharge of toxic pollutants in toxic amounts into those waters. *33 U.S.C. §1251(a)(1).* The CWA created a system for permitting wastewater discharges (§402) known as the National Pollutant Discharge Elimination System (NPDES). *33 U.S.C. §1342.* Under NPDES permits, wastewater must be treated with the best treatment technology economically achievable regardless of the condition of the receiving water. The CWA provided for the creation of federal standards of performance for wastewater treatment and eventually, effluent guidelines, for major categories of industries. *33 U.S.C. §1316.*

Washington's water pollution control program is based on both federal and state law and aspires to a rigorous program to protect the state's water quality. *RCW 90.48.010.* The program has evolved concurrently with the federal program. Washington law requires dischargers to use "all known, available and reasonable methods of treatment" (commonly referred to as "AKART") prior to a discharge, regardless of the quality of the water to which the wastes are discharged. *RCW 90.48.010.* This is referred to as "technology-based control." *Exhibit 23.*

Stormwater in Washington is regulated under both the CWA and Washington's water pollution control law. In 1987, Congress amended the CWA and added §402(p) to establish a comprehensive new scheme for the regulation of stormwater. *33 U.S.C. § 1342.* Under an

assumption that widespread compliance with technology-based requirements had been largely achieved, the 1987 CWA amendments also emphasized water quality-based permitting for toxic pollutants. These amendments, and implementing regulations, require that each state adopt criteria for all toxic pollutants listed pursuant to CWA §307(a)(1) for which EPA has published criteria under §304(a) and for discharges that could reasonably be expected to interfere with the uses designated by the state. *33 U.S.C. §1313(c)(2)(B)*. One hundred twenty-six priority pollutants are listed at 40 CFR §423, Appendix A, including three that are relevant to this appeal: copper, lead, and zinc.

Ecology, the state agency charged with the duty of regulating stormwater in Washington pursuant to its authority in Chapter 90.48 RCW, has adopted water quality standards for surface waters that include toxic substances criteria for copper, lead, and zinc. The criteria are set forth separately for freshwater and marine water, and for both acute and chronic discharges. *Chapter 173-201A WAC.*

The CWA and state water quality laws require industrial stormwater discharges meet all applicable effluent limitations and water quality standards. *33 U.S.C. §1311(b)(1)(C), §1313(a) & §1342 (p)(3)(A); RCW 90.48.080; WAC 173-201A-160(3)(a); WAC 173-226-180(1); Defenders of Wildlife v. Browner, 191 F.3d 1159, 1164-1165 (9th Cir. 1999).* To achieve this, NPDES permits establish effluent limitations for the discharge of pollution. *33 U.S.C. §1311; §1312, §1342(a)(1).* These are expressed as either technology-based limitations, based on best available or practicable technology, or water quality based, to further regulate dischargers to prevent water quality from falling below acceptable levels. *EPA v. State Water Resources*

Control Board, *426 U.S. 200, 205 (1976); 33 U.S.C. §1311(b)(1)(A)*. Water quality-based effluent limitations are required when a permitting agency determines that there is a reasonable potential that pollutants will be discharged at a level above any state water quality standard. *40 C.F.R. §122.44(d)*.

In 1990, the Environmental Protection Agency (EPA) adopted regulations to address stormwater permits under its NPDES program. *40 C.F.R. §122.26*. In doing so, it recognized the inherent difficulties in regulating stormwater and created an interim permitting approach for EPA and state agencies to use as they began regulating industries with stormwater discharges. Ecology has promulgated regulations for general permits (WAC Chapter 173-226), and the agency first issued a general permit for stormwater discharges associated with industrial activities and construction activities in 1992.

FINDINGS OF FACT

General Background of the Boatyard Industry

1.

On November 2, 2005, Ecology issued the 2005 BGP pursuant to Washington's Water Pollution Control Act and the CWA. The Permit regulates the discharge of pressure wash wastewater and stormwater runoff from commercial facilities that build and repair boats less than 65 feet in length in the State of Washington. The 2005 BGP also regulates maintenance and repair for in-water vessels and upland vessels. *Exhibit 1*.

2.

Unless exempted, all boatyards in Washington must obtain coverage under this general permit. The 2005 BGP defines a boatyard as a commercial business engaged in the construction, repair and maintenance of small vessels, 85% of which are 65 feet or less in length, or revenues from which constitute more than 85% of gross receipts. Presently, 107 boatyards are covered under this permit in Washington State. *Exhibits 1, 2.* All of these boatyards are located in Western Washington. *Exhibit 3.*

3.

The commercial services typically provided at boatyards include pressure washing hulls, painting and coating, engine and propulsion system repair and replacement, hull repair, joinery, bilge cleaning, fuel and lubrication system repair and replacement, welding and grinding of hulls, buffing and waxing, marine sanitation device repair and replacement, and many other activities that are necessary to maintain vessels. *Exhibit 1, p. 12. Testimony of Radon, Anderson.*

4.

The discharge of stormwater from boatyards contains heavy metals, particularly copper, lead, and zinc, as well as other kinds of pollutants associated with industrial operations, such as hydraulic fluids, oils, and greases. Copper is found in anti-fouling paints used on the hulls of boats. Lead can be found in solders, certain bronzes, and brass. *Testimony of Horner*. Sailboat keels also contain lead foil, some of which can be removed during maintenance. Zinc is used as a sacrificial anode to prevent corrosion of metal on boats. Zinc can also be found in chain-link fences and metal roofing on sheds. Greases and oils are used in crank cases in boats,

lubrications, and machinery. Vessels have hydraulic lines that are subject to leakage or breakage. *Exhibit 28, p. 20.*

5.

In the 2005 BGP, Ecology regulates the stormwater discharges from boatyard activities by establishing benchmarks for oil and grease (measured in milligrams per liter, mg/L), total suspended solids (measured in milligrams per liter, mg/L) and copper (measured in micrograms per liter, µg/L). The 2005 BGP regulates these discharges in stormwater by requiring use of BMPs, monitoring (consisting of sampling, analysis, and reporting), and responsive actions if discharges exceed benchmarks. *Exhibits 1, 2; Testimony of Horner, Anderson.*

6.

Although boatyards produce typical industrial pollutants, similar to those produced at shipyards, operationally boatyards differ from shipyards in several respects. Boatyards, which handle smaller vessels than shipyards, typically have a rail or sling system by which they pull the boats out of the water in order to transfer them to a work site in another part of the yard. In contrast, shipyards service large vessels. They commonly have graving or dry docks that are designed to allow work in place on ships in place after the water from around the hulls is removed. *Testimony of Bailey.* Shipyards also tend to perform more of their work under overhead structures or inside buildings; whereas boatyards tend to perform more of their sanding and grinding activities outside, in open work areas using tarps and other less-sophisticated BMPs. *Testimony of Anderson, Kellems.* Sailboats, which contain lead foil in their keels, are not generally repaired and maintained at shipyards. *Testimony of Anderson.*

7.

Typically boatyards are small businesses. They are always located adjacent to water. Some are located at the base of slopes where stormwater originating off site from upland areas runs onto the boatyard property and mixes with stormwater discharges from boatyard operations. *Testimony of Anderson.*

8.

The boatyard industry has made various efforts to control the problem of toxic pollutants, especially copper, which is a product of hull paint removal operations. Some boatyard businesses have had much greater success than others in managing operations and discharges from their facilities. However, past performance and required monitoring under the previous BGP has yielded little understanding of the effectiveness of different environmental controls. Stormwater poses a much greater challenge for most of the boatyards than the management of pressure wash wastewater. This is because many facilities have containment and treatment capability for their pressure wash wastewater, or they can use a municipal sewer system for this water, but they do not currently have the same alternatives in place for the containment and treatment of stormwater. *Testimony of Anderson, Stasch.*

9.

Many boatyards allow private boat owners to use their facilities to perform maintenance and cleaning on their own boats. Outside contractors also commonly work on boats on the boatyard premises. These private individuals are not employees of the boatyards. Although many boatyard managers take steps to familiarize private owners and contractors with BMPs and

the problems associated with polluted discharges entering the public waterways, it is difficult to fully control the work activities of these individuals. *Testimony of Anderson, Horner.* Most boatyards do not have an environmental manager. *Testimony of Ortiz DeAnaya.*

10.

Approximately 265,000 recreational boats are registered in the State of Washington. NMTA is a private organization that works with boat owner members on issues of public benefit like boating safety, and environmental efforts such as the "Clean Marina" and "Envirostar" programs. NMTA has actively cooperated with Ecology in connection with the development of the 2005 BGP by commenting on proposals, serving in an advisory capacity, facilitating visits to boatyards for Ecology personnel, and sharing information about effective practices that respond to Ecology's regulatory concerns. *Testimony of Campbell.*

History of Boatyard Permits

11.

This is the third issuance of the BGP. In the early 1990s, Ecology determined that boatyards were an "industry of concern." As a result, the agency decided boatyards should be regulated with a general permit that was specific to the boatyard industry; and the first BGP was issued in 1992, with an expiration date of November 1997. Also in 1992, Ecology began a series of non-regulatory technical assistance campaigns with various industrial sectors, called "single industry campaigns." *Exhibit 28.*

12.

The 1992 BGP required a single stormwater discharge sample to be collected annually, and did not specify the testing methods or establish minimum detection limits. *Exhibit 73, p. 8.* Although the stormwater data from the first BGP was of limited value, Ecology found that "it was easy to recognize that a problem existed with the quality of the runoff leaving the site. . . [C]opper concentrations in the stormwater exceeded the surface water quality criterion by one to three orders of magnitude." *Exhibit 73, p.8.*

13.

In 1997, Ecology selected boatyards and marinas for its first agency-wide, single-industry campaign. It did for a number of reasons, including the large number of boatyard facilities, the immediate impact their discharges have on the environment, significant multimedia aspects, and the fact that Ecology was preparing to renew the BGP. *Exhibit 9, 28; Testimony of Bailey.* Because of the permit renewal, the "Ship Shape" campaign had a significant compliance assistance component, including site-specific guidance on proper stormwater sampling techniques, the proper location to collect samples, and improving source reduction through more effective use of BMPs. A total of 14 articles regarding this effort appeared in publications from such entities as NMTA, Ecology, and the Washington Public Ports Association, in addition to trade periodicals. *Exhibit 28.*

14.

The 1997 BGP was issued on December 8, 1997, with a stated expiration date of December 8, 2002. Among its other terms, the 1997 BGP required BMPs and increased

sampling of stormwater discharges to four times per year. The 1997 BGP also added management requirements for pressure wash wastewater and addressed the use of divers for underwater hull cleaning. The 1997 BGP did not require numeric effluent limits for stormwater discharges. *Exhibit 9.*

15.

Boatyards have a history of an extremely high rate of noncompliance with the requirements of the past BGPs. One experienced Ecology permit manager estimated that as much as ninety-five per cent (95%) of the industry failed to comply with the BMP requirements of the earlier permit, with a resulting lack of compliance with water quality standards in discharges. *Testimony of Ortiz DeAnaya.* Many boatyards failed to submit some or all of the discharge monitoring reports (DMR) required by the 1997 BGP. As a more recent example, in February 2006, a large number of boatyards failed to file required stormwater discharge monitoring information. *Exhibit 36.* It has also been common for Ecology to take no action when the DMRs that are submitted indicate noncompliance with permit conditions. *Exhibit 42, 75, 77; Testimony of Ortiz DeAnaya.*

16.

Some boatyards, however, have made significant and successful improvements in boatyard operations from 1992 forward in an effort to implement AKART. This has required investment in stormwater management infrastructure, close monitoring of discharges, and regular inspections of BMPs. Some boatyards have made greater, and again successful, efforts at containment of stormwater and have addressed off-site waters coming on to boatyard properties.

While such efforts have been a challenge and sometimes costly, for Boatyards that have accomplished these improvements, the result has been greater compliance with water quality and permit requirements. *Testimony of Radon, Anderson.*

17.

Ecology staff reviewed data submitted by permittees during the 1997 permit cycle DMRs, and made efforts to verify which of that data was an accurate depiction of boatyard discharges. The verified data from the 1997 permit demonstrated to some Ecology staff that boatyard discharges of copper, lead, and zinc, violated water quality standards. *Testimony of Drabek.* In December of 2003, Ecology notified the regulated boatyard community of their copper monitoring results. One purpose of this effort was to educate the boatyards about how to conduct proper copper monitoring and reporting, and to explain the harmful effects of copper discharges on fish. Another purpose of the effort was to inform boatyards of how much reduction or dilution of copper would be needed for them to meet a permit limit based upon the state water quality standards for copper. For most boatyards, their copper results indicated that in order to meet the copper standard, their copper discharge levels must be reduced by many—and in some cases by thousands—of times. *Exhibit 43.*

18.

Copper concentrations in stormwater discharging from boatyards frequently greatly exceed Washington surface water quality standards. The responsiveness summary for the 1997 BGP noted that "it was easy to recognize that a problem existed with the quality of the runoff leaving the site…copper concentrations in the storm water exceeded the surface water quality

criterion by one to three orders of magnitude." *Exhibit 73.* Ecology's 1999 "Ship Shape Industry Campaign Summary Report" noted the concerns about the quality of stormwater leaving boatyard facilities, and the fact that copper concentrations in stormwater remained high, and likely harmful to aquatic life, particularly salmon. *Exhibit 28, Testimony of Stasch.* The fact sheet for the 2005 BGP notes that metal concentrations (copper, lead, and zinc) in pressure wash wastewater from the boatyards exceed the typical standards for discharge to a sanitary sewer by about a factor of 10, and exceed surface water quality ambient standards by a factor of about 1,000. Stormwater runoff samples from boatyard facilities taken from marine waters in both spring and fall flush events also showed copper concentrations greatly in excess of the state water quality criteria of 4.8 µg/L (dissolved). *Exhibit 2.* The author of the 2005 BGP acknowledges that some boatyards violate the numeric water quality criteria with their stormwater discharges, particularly the copper criteria. *Exhibit 74, at pp. 94-97*; *Testimony of Bailey.*

Development of the 2005 Boatyard General Permit

19.

As Ecology readied to develop the 2005 BGP, an advisory committee was formed to help develop the permit, consisting of representatives from individual boatyards, ports, marinas, a consultant, an industry association, an environmental organization and agencies. *Exhibit 39.* Ecology also provided technical assistance to the boatyards and their organization, to work with them and answer their questions about compliance, BMP implementation, and to explain the technical bases for the limits and benchmarks. *Exhibit 43.*

20.

Ecology's permit writer for the 2005 BGP was Gary C. Bailey, Water Quality Permit Specialist. Bailey is also the principal author of Ecology's "Water Quality Program Permit Writer's Manual," (Permit Writer's Manual) most recently revised in July of 2005. *Exhibit 23, 74; Testimony of Bailey*. Ecology has adopted this Permit Writer's Manual as technical guidance and policy manual for wastewater discharge permit writers to use in crafting NPDES permits. While the manual is not regulatory authority for permit conditions, it describes and interprets the laws and regulations that must be followed by Ecology's permit writers when issuing water quality program permits. The manual does not address how to formulate benchmarks for a general permit, which are not site-specific discharge limitations. *Exhibit 23; Testimony of Bailey*.

21.

In the development of the 2005 BGP, there was disagreement about whether the permit should use a BMP-based approach or impose numeric effluent limitations. *Testimony of Bailey, Ortiz DeAnaya, Drabek, Stasch.* Ultimately, Mr. Bailey recommended the imposition of benchmarks, rather than numeric effluent limits, along with the other conditions because he wanted to give boatyards a realistic probability of being in compliance by the end of the permit. *Exhibit 50; Testimony of Bailey.* In crafting the benchmarks, Mr. Bailey adapted methodologies from the Permit Writer's Manual that are typically used in individual, site-specific NPDES permits and applied them to the Permit. *Exhibit 23; Testimony of Bailey.*

22.

In developing the 2005 BGP, Ecology also used guidance provided by EPA describing its interim permitting approach for water quality-based effluent limitations in stormwater permits. The EPA has recommended that the states adopt the federal approach to stormwater regulation "…that uses [BMPs] in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards." *Exhibit 22; 61 Fed.Reg. 43761.* The EPA has advised states that "each storm water permit should include a coordinated and cost-effective monitoring program to gather necessary information to determine the extent to which the permit provides for attainment of applicable water quality standards and to determine the appropriate conditions or limitations for subsequent permits." *Id.* Under federal and state NPDES regulations:

> [P]ermitting authorities may employ a variety of conditions and limitations in storm water permits, including [BMPs], performance objectives, narrative conditions, monitoring triggers, action levels (e.g., monitoring benchmarks, toxicity reduction evaluation action levels), etc., as the necessary water quality-based limitations, where numeric water quality-based effluent limitations are determined to be unnecessary or infeasible. *Exhibit 22, 61 Fed. Reg. 57425.*

23.

Ecology used the interim permitting approach endorsed by EPA in developing the 2005 BGP because regulating boatyard stormwater discharges was proving to be particularly difficult. Many characteristics of boatyard stormwater discharges, such as its intermittent nature, variable flow levels, and the different pollutant concentrations, are much more difficult to measure than the pollutants and flows that come from point sources at particular sites and specific receiving

waters. For these reasons, stormwater runoff does not lend itself to the use of numeric effluent limitations. Also, because most boatyards are small businesses, Ecology was reluctant to impose the potential liability and large monetary penalties that could result from citizen suits seeking to enforce numeric effluent limitations. *Testimony of Bailey.*

Key Conditions of the 2005 BGP

24.

The 2005 BGP relies on an adaptive management approach that requires permittees to utilize mandatory BMPs, adopt Stormwater Pollution Prevention Plans (SWPPPs) with further BMPs, monitor discharges and modify BMPs accordingly, all in an effort to meet permit benchmarks, achieve AKART, and comply with water quality standards. The Permit defines BMPs as schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs are categorized as operational, source control, and treatment BMPs. *Exhibit 1, p.6.*

25.

The 2005 BGP continues most of the previous permit requirements, including a prohibition of direct discharges to surface waters for pressure wash wastewater and all the 1997 BMPs. It also makes several additions from the previous permits, most notably conditions related to: (1) numeric benchmarks for copper, (2) mandatory use of vacuum sanders for all paint removal, (3) preparation of SWPPPs, (4) increased monitoring frequency to five samples per

year, and (5) a tiered response system to address exceedances of the benchmarks. *Exhibit 1, 18; Testimony of Bailey.*

26.

Other mandatory BMPs specified in the 2005 BGP include limitations on the use of tidal grids;[1] prohibition of in-water vessel maintenance and repair; use of drop cloths, tarpaulins, drapes, etc.; controls on stripping, sanding, scraping, sandblasting, painting, coating, and varnishing vessels; daily collection of solids from work, service and storage areas; controls on upland vessel maintenance and repair; solids management; controls on paint and solvent use; oils and bilge water management; management of sacrificial anode disposal; chemical management; wash pad decontamination; and sewage and gray water discharge controls. *Exhibit 1, p. 16-19*; *Testimony of Bailey.*

27.

The 2005 BGP requires the use of vacuum-assist sanders in all paint removal operations. Condition S2.C.7.a. Sanders are a finishing tool, and some boat repairs cannot be accomplished with vacuum sanders. For example, bottom paint turns sandpaper gummy. There is a functional difference between sanders and grinders. Grinders are used for heavier, more difficult or larger removal tasks and to repair damage. Vacuum grinders and sanders with very coarse grit are currently not readily available on the market. In addition, certain surface finish removal and fiberglass repair operations cannot be done with either vacuum-assist sanders or grinders because the dust collection shroud interferes with the tool's contact with the surface of the boat (typically

[1] Structures that facilitate work on boats in place along shorelines or beaches while tides are low.

in corners and tight spaces). Boatyard workers have developed other methods that have equivalent dust capture effectiveness. For example, it is possible to encapsulate the area where work is being performed with a grinder inside a booth. When shown to be effective and available, such methods would encourage implementation of dust control BMPs by boatyard owners. *Testimony of Anderson; Exhibit 10.*

28.

Each boatyard covered by the 2005 BGP must prepare and maintain a SWPPP specifically developed for the particular facility. *Exhibit 1,* Condition S5. The SWPPP is the centerpiece of effective pollution control by a boatyard. The SWPPP must comply with permit requirements and be fully implemented and updated as necessary to maintain compliance with the Permit. It must include "those BMPs necessary to provide all known, available and reasonable methods of prevention, control, and treatment (AKART)," and any "additional BMPs which are necessary to comply with state water quality standards." *Exhibit 1.* If boatyard permittees select BMPs from an approved stormwater technical manual, permittees do not have to describe how the selected BMPs meet the AKART requirement in state law. *Id.*

29.

Permittees are required to retain the SWPPP on site, or within reasonable access to the site, and make it immediately available upon request to Ecology or the local jurisdiction. A copy of the SWPPP, or access to the SWPPP, must be provided to any member of the public whenever it is requested in writing. *Exhibit 1, Condition S5.A.b.* The 2005 BGP provides that, upon receiving a written request for access to a SWPPP, a permittee must either provide a copy to the

requestor within 14 days of receipt of the written request, provide access to it for viewing and copying, and reasonable access to copying services for which a reasonable fee may be charged, or provide a copy of the SWPPP to Ecology so that the agency can make it available for public review and copying. *Exhibit 1.*

Expert Testimony Re: Criticisms of 2005 BGP

30.

Dr. Richard Horner testified about the presence of copper in stormwater runoff, the effect of copper on salmonids and the likelihood that boatyard discharges will cause violations of water quality standards. He expressed opinions regarding the ability of boatyards to better manage stormwater and the need for a more prescriptive approach to BMP implementation in order for boatyards to meet AKART. Dr. Horner presented criticisms of the methodology used to develop the copper benchmarks contained in the 2005 BGP. Dr. Horner demonstrated that certain factors used in the benchmark calculations, specifically the translator and dilution factors, were not supported by available data nor reflective of likely stormwater effluent characteristics.

31.

Dr. Horner serves part-time on the faculty of the University of Washington and engages in private consulting. He is an expert in all facets of stormwater and has studied the effects of urban stormwater runoff on wetlands, salmon and other organisms. He has served as a court appointed overseer in CWA cases, among other assignments. Dr. Horner has been a principal or co-principal investigator in a significant number of stormwater-related research projects and has

authored or co-authored an extensive list of technical reports and peer-reviewed or refereed publications on the subject of stormwater. *Exhibit 72.*

32.

The Board finds Dr. Horner's opinions and conclusions highly credible, based on his extensive expertise in stormwater. Many of his opinions were supported by the testimony of other witnesses, in whole or in part, particularly on issues related to the soundness of the methodology used to create the copper benchmarks. *Testimony of Kellems, Drabek, Ortiz DeAnaya.*

Environmental Concerns about Boatyard Stormwater Discharges

33.

Salmonids use rivers to travel from the open ocean to spawning grounds upstream. Salmon and trout, including steelhead, need cool, clean water in adequate supply to grow, migrate, and spawn in fresh water systems. Numerous salmon and steelhead populations in the Pacific Northwest have been listed for protection under the Endangered Species Act. *Exhibit 64.* The National Marine Fisheries Service (NMFS) has recognized the deleterious effects of copper upon fish populations. *Exhibit 59, p. 58.* Addressing untreated stormwater and other sources of pollution is listed among the top ten actions needed for salmon in the Draft Puget Sound Salmon Recovery Plan. *Exhibit 63, p. XIII.* Many Western Washington boatyards discharge effluent to Central Puget Sound and Lake Union, which are critical habitat for threatened Puget Sound Chinook. *50 CFR §226.212; 70 Fed. Reg. 52630 (Sept. 2, 2005); Exhibit 60, 62.*

34.

Boatyard stormwater discharges contain various components that are harmful to aquatic life, and those components appear in levels that are high enough to have the potential to negatively impact salmon and water quality. The anti-fouling paints used to coat the hulls of vessels are designed to keep organisms from colonizing on the boat bottom by releasing toxic metals such as copper, tin and lead-based compounds, which are known to have lethal and sub-lethal effects on salmonid species. *Exhibit 28, p. 00907.* Monitoring results of stormwater discharges from boatyards depict enormous amounts of copper in the effluent, levels that are more than what is found in highway discharges, discharges from other industrial users, and urban runoff. *Testimony of Horner; Exhibits 30-33.*

35.

Dissolved copper in waters, including stormwater, has both lethal and sub-lethal effects on several species of fish at very low concentrations. *Exhibits 43, 48, 58, 64, 65, 66 & 67.* Copper particularly impacts salmon recovery, due to the established detrimental effects of that metal on salmonid species. In the 500 to 10,000 µg/L range, copper has also been shown to kill half of the rainbow trout exposed in less than a day, often in just a few hours. Sub-lethal effects of copper exposure to fish include respiratory distress, reduction or elimination of olfactory function, and disruption of osmoregulation (the ability to balance salt and water in living cells as fish go from fresh to salt water). Copper pollution in water also causes behavioral effects in salmon, including compromise of predator avoidance skills, disorientation as to swim direction during migration, and changes in body orientation within the waterbody. These sub-lethal

effects lead to diminished functionality of salmon, which can render the fish unable to reproduce, thereby reducing population strength. Diminished functionality can also lead to early death. *Testimony of Horner.*

36.

Copper levels of 5 µg/L have been shown in scientific studies to be the sub-lethal end point to protect the life processes of salmon. In one study, downstream migration of yearling coho was impaired by exposure to dissolved copper concentration at or above 5 µg/L. Exposure to dissolved copper concentrations of 10 µg/L has been shown to reduce yearling coho feeding, growth, and ability to survive moving into seawater. Juvenile Chinook salmon exposed to 44 µg/L of dissolved copper quickly lost the ability to smell and avoid further copper exposure. *Testimony of Horner.*

37.

Copper's toxicity to the salmonids manifests on a time scale of minutes. Salmon have been shown to suffer olfactory impairment in less than ten minutes at copper concentrations as low as 2 to 20 µg/L. Fingerling rainbow trout exposed to dissolved copper concentrations of 10 µg/L for 24 hours showed greatly increased death from a common viral disease. In the Seattle area, the stormwater exposure of migrating salmon is typically about 21 hours. *Testimony of Horner.*

Benchmarks & Receiving Waterbody Classifications

38.

The Permit sets out two types of narrative stormwater effluent limitations—technology-based, which are expressed as BMPs, and water quality-based, which are expressed as numeric benchmarks. The method by which the benchmarks were developed and whether they protect water quality consistent with state and federal law were central issues in the case before the Board. In the context of the 2005 BGP, Ecology defines "benchmark" as, "a pollutant concentration used in [the BGP] as a threshold value such that effluent concentrations which are less than these values are considered unlikely to cause a water quality violation. Benchmark values are narrative effluent limits. Site-specific conditions must be considered to determine if an actual water quality violation exists when benchmarks are exceeded." *Exhibits 1, 2.* Benchmarks values themselves are not water quality standards and are not permit limits. They are indicator values, and Ecology considers sample test values at or below the benchmarks unlikely to cause water quality violations. *Exhibit 2; Testimony of Bailey.*

The 2005 BGP establishes benchmarks for five types of receiving waters as follows:

1. New source or new discharges to freshwater and marine water body segments listed on the current 303(d) list for copper or zinc;
2. Discharges to lakes not listed on the current 303(d) list;
3. Discharges to rivers or rivers with tidal fluctuation that are not listed on the current 303(d) list for copper or zinc;
4. Discharges to marine waters that are not listed on the current 303(d) list for copper or zinc; and
5. Discharges to infiltration basins that are located at least 200 feet from the water's edge.

39.

Ecology classified the receiving waters for the boatyard discharges covered by the Permit using the water quality standard rules then in effect. One of the water bodies identified as a

receiving water under the 2005 BGP is the Lake Washington Ship Canal, which is classified by Ecology as "Lake Class" in the applicable surface water quality standards rules and which meets the definition of a "Lake" contained in the Permit.[2] *WAC 173-201A-130 (58)*; *Exhibit 1.*

40.

Several boatyards regulated under the 2005 BGP are located on Lake Union, which is listed under § 303(d) of the CWA as a lead-impaired water body. *Exhibit 2.* The 2005 BGP does not establish any lead-based benchmarks or effluent limitation of any kind for receiving waters listed under § 303(d) for lead. *Exhibit 1, p. 15-16.* Ecology reasoned that the benchmark set for copper would also address the presence of lead.[3] *Testimony of Bailey.*

41.

The acute water quality standards for copper for marine and fresh water are set forth in the first table below. They are expressed in terms of "dissolved" copper, which refers to the amount of metal in the water column that, upon sampling, readily passes through a .45 micron filter. *Testimony of Bailey.* The 2005 BGP copper benchmarks for each of the relevant receiving waters are set forth in the second table below. They are expressed in terms of "total recoverable" copper, which refers to the particulate form of copper, plus the percentage of the dissolved copper, that is measured in a receiving water sample. Both assume a receiving water hardness of 25 mg/L.

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[2] Both sources define "Lake" as a water body, including reservoirs, with a mean detention time of greater than fifteen days. *See* WAC 173-201A-010; *Exhibit 1, p. 7.*

[3] Although it appears that the copper benchmark for Lakes contained in Condition S2.C.3 that was intended to apply to Lake Union inadvertently excludes Lake Union and any other Lake on the current § 303(d) list for any parameter.

STATE WATER QUALITY STANDARDS FOR COPPER
(WAC 173-201A)

Marine Water Acute Toxic Effects: **4.8 µg/L (dissolved)**
Fresh Water Acute Toxic Effects: **4.61 µg/L (dissolved)**

2005 BGP COPPER BENCHMARKS/LIMITS

BENCHMARKS	LIMIT
	New source or new discharges to freshwater & marine waters listed on the current § 303(d) list for copper or zinc: **16.0 µg/L (total recoverable)**
Lakes not listed on § 303(d) list: **38 µg/L (total recoverable)**	
Rivers and rivers with tidal fluctuation not § 303(d) listed: **384 µg/L (total recoverable)**	
Marine waters not § 303(d) listed: **229 µg/L (total recoverable)**	
Discharges to **infiltration basins** 200' from water's edge: **1,000 µg/L (total recoverable)**	

Ecology's Copper Benchmark Methodology

42.

Ecology established benchmarks for the various parameters (oil/grease, TSS, and copper) in the five types of receiving waters to protect water quality because it was not possible to develop facility-specific permit terms within the context of the general permit and still retain the benefits of a general permit. Ecology calculated the 2005 BGP copper benchmarks by using some of the same mitigating factors available to individual permittees, even though such factors normally rely on site-specific information in the calculation of effluent limitations. In Ecology's judgment, it was fair to give the boatyards covered under a general permit the same mitigating factors available to other businesses covered under individual, site-specific NPDES permits. *Exhibit 2, p. 17; Testimony of Bailey.*

43.

Ecology's permit writer, Mr. Bailey, borrowed the individual NPDES permit methodology to develop the copper benchmarks because there was no EPA or Ecology guidance for establishing benchmarks for stormwater discharges. Ecology used hypothetical scenarios believed to be generally representative of boatyard conditions, and revised data derived from a study of shipyard stormwater discharges. *Testimony of Bailey*; *Exhibit 49.*

44.

Ecology derived the copper benchmarks by calculating the levels at which boatyard discharge samples would be considered toxic, or in violation of water quality standards. Ecology's benchmark calculation process started with the state water quality criteria for copper

and then applied numeric values for various mitigating factors, including a water effects ratio (WER), a dilution factor, and a dissolved/total recoverable metals translator. The benchmark calculations assumed a generalized, identical water hardness level of 25 mg/L for all receiving waters, which is considered typical of western Washington waters where the boatyards are located. The results of this calculation process were benchmarks adjusted to numeric values other than the state water quality criteria for copper. Ecology concluded that this approach would yield values compliant with water quality standards because it considered each of the factors as adjustments to reflect the mitigating effect of receiving waters on toxic components of effluent. *Exhibit 3; Testimony of Horner, Bailey.*

45.

In developing the fresh water copper benchmark, Ecology began with the water quality criterion of 4.61 µg/L, assumed a water hardness of 25 mg/L, and then applied three factors: an assumed WER, an assumed dilution ratio, and an assumed dissolved fraction translator. Ecology used the same process for marine waters, but started with the 4.8 µg/L marine water quality standard for copper. *Testimony of Bailey, Horner.* Ecology's copper benchmark calculations for the different water bodies were as follows:

> The benchmark for existing sources discharging to freshwater lakes (assume 25 mg/L hardness) = (acute criteria)*(1/percent dissolved)*(water effect ratio). With an acute criteria of 4.61 µg/L, a dissolved percentage of 30%, and a WER of 2.5 the benchmark is 38 µg/L. There is no dilution

> factor assumed for these discharges which is consistent with the directives of [WAC] Chapter 173-201A.[4]
>
> The benchmark for existing discharges to freshwater rivers or rivers with tidal fluctuation = (acute criteria)*(1/percent dissolved)*(dilution factor)*(water effect ratio) = (4.61)*(3.33)*(10)*(2.5) = 384 µg/L (0.384 mg/L).
>
> The benchmark for existing sources discharging to marine waters = (4.8 µg/L)*(acute dilution factor)*(1/percent dissolved)*(water effect ratio). With an acute dilution factor of 10, a dissolved percentage of 30% and a WER of 1.43, the benchmark is 229 µg/L (0.229 mg/L).

Exhibit 2.

46.

The copper benchmarks in the 2005 BGP for freshwater rivers and marine waters (expressed, respectively, as 384 µg/L and 229 µg/L "total recoverable copper") are approximately 83 to 48 times as high as the water quality criterion for copper (expressed in terms of "dissolved" copper). *Exhibit 1*; WAC 173-201A-040.

47.

In crafting the copper benchmarks, Ecology did not consider the specific effect of boatyard discharges on salmonids, but rather assumed that the water quality criteria, if met, was protective of fish. *Testimony of Bailey.* Ecology was aware of this Board's prior decision that addressed the appropriate benchmark for copper in the context of a general permit for industrial stormwater discharges to waters containing endangered species. The Board has previously found

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[4] After issuing the BGP, Ecology made an adjustment to its Copper benchmark for lakes not listed on the current 303(d) list, substituting the value of 38 for 77 for total recoverable copper and provided notice to the regulated boatyard community. *Testimony of Gary Bailey.*

that a benchmark for copper of 63.6 µg/L was inadequate for discharges into waters where stormwater is identified as a limiting factor for salmon recovery and in waters listed as impaired for copper by the state under §303(d) of the CWA. *Puget Soundkeeper Alliance et.al. v. Ecology, PCHB No. 02-162 (2003).* Ecology did not use this decision as a factor in setting the copper benchmark, or consider the Board's rejection of the use of standard mixing zones in a general permit. *Id. at 18; Testimony of Bailey.* Ecology interpreted the Board's decision as recognizing that it is "impossible to do an individual evaluation of reasonable potential and still retain the advantages of general permits." *Exhibit 50, p. 3.*

48.

The National Marine Fisheries Service (NMFS), in addition to recognizing, generally, the deleterious effects of copper upon fish populations, has also concluded that a proposed copper benchmark of 0.014 mg/L (with a water hardness of 100 mg/L) for freshwater in the EPA's NPDES Multisector General Permit is too high because appreciable adverse impacts to salmonids could be expected around 0.005 mg/L or less. Ecology did not rely on the NMFS analysis in setting the copper benchmark. *Exhibit 58.*

Water-Effect Ratio (WER)

49.

A WER is a means to account for the difference between the toxicity of a metal in laboratory water and its toxicity in water at a regulated site in the field. *Exhibit 56.* In its interim guidance document, the EPA has explained the derivation of a WER as a site-specific criterion adjustment. Ecology's Permit Writer's Manual directs that, in individual NPDES permits with

numeric water quality-based effluent limits, site-specific sampling and analysis of receiving water and effluent are necessary prerequisites to the use of a WER. *Testimony of Horner; Exhibits 56, 23.*

50.

The development of a WER also requires whole effluent toxicity (WET) tests to be performed to measure the toxic interaction of all the pollutants present in the effluent. The species which must be tested differ between freshwater and saltwater discharges, and have both acute and chronic tests. The Permit Writer's Manual recognizes that this testing is costly. It states, "Because determining a WER requires substantial resources, the desirability of obtaining a WER should be carefully evaluated. . . ." *Exhibit 23, p. APP6-62.* An Ecology permit manager acknowledged that WERS are infrequently used in the state because it is very expensive to do the sets of testing required. *Testimony of Ortiz DeAnaya.*

51.

In calculating the 2005 BGP, Ecology used a WER as a way to generally account for the mitigating effects of the various receiving water quality on the toxicity of the metals in boatyard discharges. *Testimony of Bailey.* Ecology did not apply the listed pre-requisites for application of a WER to arrive at the copper benchmark in the Permit because these pre-requisite actions applied to individual permits using numeric water quality-based effluent limits. Instead, Ecology relied upon values obtained in several studies. Ecology used the lowest (1.43) of nine values reported for marine WERs to calculate the marine benchmark. The values ranged from 1.43 to 2.77 for dissolved WERs in marine water, which is a small range. *Testimony of Bailey; Exhibit*

23, p.18. In deriving the WER for freshwater, Ecology used a median value of 2.5. This value was derived by taking 50 percent of the mean of the seventeen values that were reported in studies of freshwater. *Testimony of Bailey; Exhibit 23, p.18-19.*

52.

PSA did not present any evidence indicating that the freshwater or marine WER values utilized by the Permit writer were not representative of waters in western Washington. Their criticism focused on the fact that a WER was utilized at all without first going through the requisite steps used to calculate a site-specific WER. The Board finds that the use of the WER by Ecology in calculating the copper benchmark was appropriate in the context of this Permit. Individual WERs are very expensive to perform, and there is no evidence indicating that the WER values used in the copper benchmark calculations were not representative of actual background conditions. The Board finds that PSA fails to meet its burden to invalidate the use of the WERs in the copper benchmark calculation.

Dilution Factor

53.

Ecology's Permit Writer's Manual defines "dilution factor" as follows: "A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. A dilution factor is expressed as the inverse of the effluent fraction e.g., a dilution of 10 means the effluent comprises 10% by volume and the receiving water 90%." *Exhibit 23.* There is no guidance for the use or selection of dilution factors in general permits. *Testimony of Bailey.*

In the course of developing the benchmarks for this Permit, Bailey considered whether it was appropriate to use a dilution factor. He compared the proposed benchmarks and proposed effluent limits for boatyards and found that, without a dilution factor, effluent limits for critical discharges, such as copper, would be lower by a factor of 10, which he determined was not practical for the boatyards. Ecology therefore applied an assumed dilution factor to the water quality standards value to derive benchmarks. In doing so, Ecology made generalizations about receiving water conditions to evaluate whether water quality criteria would be exceeded by an actual effluent's pollutant concentration. *Testimony of Bailey; Exhibit 2.* Ecology used a dilution factor of ten (10) in its copper benchmark calculations, for both rivers and marine waters for all facilities covered under the 2005 BGP. *Testimony of Bailey, Horner.*

54.

Dilution factors vary significantly depending on the location of the discharge. For example, there are flow variations on Lake Union that differ from the Ship Canal that would affect the dilution that occurs. *Testimony of Kellems.* Dilution factors are not granted without a mixing zone, which limits the amount of dilution that may occur. *Testimony of Drabek.* A dilution factor is also determined and used after applying AKART and after making a site-specific analysis of the receiving water. According to an experienced Ecology permit manager, few boatyard operations are currently complying with AKART. *Testimony of Ortiz DeAnaya.* Shipyards as a class are not granted a general dilution factor. Only one shipyard has been granted a mixing zone. *Testimony of Drabek.*

55.

In this Permit, these site-specific steps were not taken because this is a general, and not an individual, permit with numeric effluent limits. *Exhibit 17.* Although the Sand and Gravel General Permit was cited as an example of a general permit that uses a dilution factor (*Testimony of Bailey*), that permit also uses numeric effluent limits instead of benchmarks. *Testimony of Drabek.* The Board finds that it was inappropriate for Ecology to include a general dilution factor as part of its calculation of the copper benchmarks in this case. It is undisputed that few boatyards are complying with BMP requirements. The fact that the location of the outfall can make a large difference in the dilution factor, along with the toxic nature of the pollutants associated with stormwater discharges from boatyards, makes it possible for nearshore areas adjacent to boatyards to have levels of pollutants that are detrimental to fish.

56.

Translator Value

Since 1992, Washington's surface water quality standards for metals have been expressed in the form of "dissolved" metals, rather than the previously used form of "total recoverable" metals. The conversion from total recoverable to dissolved (which was made using the conversion factors recommended by EPA at the time) did not make the criteria more or less stringent, but was instead an effort to express them in the form believed to be toxic. This is because the fraction of metal present in the dissolved form is recognized as a better representation of the biologically active (*i.e.,* toxic) portion of the metal than is the total or total recoverable fraction. Under federal regulation, however, permit limits must, in most instances,

be expressed as total recoverable, which requires permit writers to use a "translator" to convert the dissolved metals criteria into an effluent limitation. *Exhibit 23, p. VI-5.* The translator represents the fraction of the total recoverable metal in the receiving water that is dissolved. For example, use of a 50% translator assumes that half of the total recoverable metal in a particular water sample is dissolved. *Testimony of Kellems.* Calculation of a translator must account for both the *solubility* of the metal and the *hardness* of the receiving water body.[5]

57.

In deriving the translator value of 30% dissolved for use in the 2005 BGP copper benchmarks, Ecology had no boatyard-specific data regarding either the solubility of copper in boatyard stormwater discharges or the hardness of the water bodies receiving such discharges. Instead, the agency made its conversion from total recoverable to dissolved copper by using guidance presented in scientific literature and data collected from shipyard discharges. *Testimony of Bailey.*

58.

Ecology assumed a water hardness factor of 25 mg/L for freshwater. *Exhibit 2, Testimony of Bailey.* It is undisputed that Western Washington waters have low water hardness. A hardness factor of 25 mg/L is the generally accepted "typical" hardness of Western Washington waters, and it is used as a representative value in the state's water quality standards. *Testimony of Kellems, Horner.* Copper solubility, however, can vary widely. The range can be as high as

[5] The solubility of a metal such as copper is related, in part, to the size or surface area of the metal particles present in the receiving water. The hardness of the water is also affects the solubility of the metal, and the lower the hardness of the receiving water, the more deleterious dissolved copper is to affected organisms. *Testimony of Horner.*

75%. The amount of copper is generally higher in stormwater, and is closer to 50%. A study conducted in King County Washington found mean copper levels to be at 51%. *Testimony of Horner.*

59.

The 30% dissolved translator value was the result of calculating a weighted mean of approximately 20 samples from two shipyards. Ecology considered this to be the most conservative approach, and more appropriate than using averages derived from a significantly larger body of general urban stormwater data or from the recommended default dissolved fraction or conversion factor for copper contained in the Permit Writer's Manual for situations where no receiving water data is available.[6] *Exhibit 2, p. 17-18; Testimony of Kellems, Bailey.*

60.

We find that the translator value of 30% dissolved copper is not a conservative assumption, in light of the extremely small number of shipyard samples used and the undisputed fact that dissolved copper has such high variability in both urban stormwater generally and in shipyard stormwater discharges specifically. *Testimony of Kellems, Bailey, Horner; Exhibits 4 (p.7) & 28.* Ecology relied on just 18 samples from one shipyard (averaging 22% dissolved, with a range of <1% to 67%) and three samples from a second shipyard (averaging 54% dissolved, with a range of 20% to 73%). Ecology was aware of, but chose not to utilize, the much larger body of available data from urban stormwater studies that has consistently found an average of

[6] The Permit Writer's Manual recommends estimates of 0.968 (90th percentile) and 0.996 (95th percentile) for the ambient dissolved fraction of copper when no receiving water data is available. Exhibit 23, p. VI-6.

50% dissolved copper in stormwater runoff (with a typical range of 20-60%), including an Ecology study finding an average of 51% dissolved copper (with a range of 25-75%). *Testimony of Kellems, Bailey, Horner*. The decision to use this limited shipyard data instead of available default dissolved fractions or conversion factors was also inconsistent with the direction provided in the Permit Writer's Manual. *Exhibit 23, p. VI-5; Testimony of Horner, Bailey.*

Lead and Zinc

61.

The 2005 BGP provides no specific benchmarks or other effluent limits for lead or zinc. Instead, Ecology used copper as an "indicator" parameter for zinc and lead. In doing so, Ecology assumed that the ratio of copper, zinc, and lead in boatyard stormwater discharges would remain constant and be present in approximately the same ratio as in pressure wash wastewater (not stormwater). Ecology concluded that copper would make a suitable indicator for the other lead and zinc based on the fact that copper has the lowest water quality criteria of the three metals and Ecology's assumption that it would have the highest concentration of the three. Ecology believed that facilities meeting the copper benchmarks would necessarily also meet the lead criteria. *Exhibit 3 (p.59); Testimony of Bailey.*

62.

Boatyards have a high potential to contribute to the degradation of water quality through discharges of copper, lead, and zinc, which each have effects on organisms. *Exhibit 30, 31, 32 & 33; Testimony of Horner.* Copper solubility ranges widely in urban runoff, and there is evidence that the ratios between copper and lead and zinc concentrations are not constant but, in fact,

highly variable. *Testimony of Horner.* In response to comments on the draft 2005 BGP, Ecology acknowledged "It's not clear if boatyards, which are much smaller and service fewer steel hulls, would demonstrate the same releases and in the same relative magnitude [as the 1995 Toxic Release Inventory Data (EPA 1997) for shipyards]." *Exhibit 3, p. 93.* Data from a shipyard stormwater study collected over an 18-month period and reported in 1997 shows that the ratios of zinc and lead to copper vary widely. *Exhibit 4, Table A-4.* For example, in the data for one shipyard in a 1995 sample, the measurement for copper was 430µg/L, and for zinc it was 110 µg/L. In 1996, the measurement of copper at that same shipyard was 81µg/L, and for zinc, it was 700 µg/L. *Id.* The Board finds that Ecology erred by not establishing separate benchmarks for zinc and lead.

63.

In addition to having no benchmark or effluent limitation for lead, the 2005 BGP also contains no sampling or reporting requirements for lead concentrations in receiving waters that are listed on the state's § 303(d) list as lead-impaired. Several boatyards are located on Lake Union, which is on the current § 303(d) list as an impaired water body for lead. *Exhibit 33, Testimony of Horner.* The absence of these sampling and reporting requirements for lead in waters listed pursuant to §303(d) for lead is an error.

Monitoring

64.

The 2005 BGP establishes stormwater monitoring requirements for three parameters and different types of discharges. Condition S3. Stormwater monitoring requirements include

sampling for oil and grease, total recoverable copper, and total suspended solids in discharge samples collected from locations affected by boatyard-related activities as noted on the application for coverage. If stormwater runoff from a facility occurs as sheet flow, then a collection point must be constructed to collect an adequate sample volume during the first flush of storm events. Stormwater must be monitored five times per year for three parameters. Non-stormwater, miscellaneous discharges (such as discharges from fire fighting activities, air conditioning or compressor condensate) must be monitored monthly. Visual monitoring of the facility must take place weekly. *Exhibit 1, p. 13, 20, 21.* The sampling and analytical methods used by boatyards must conform to the latest revision of EPA guidelines contained in Code of Federal Regulations. *40 C.F.R. §136 et seq.*

65.

The currently available data on the presence of stormwater-related metals in the receiving waters adjacent to the boatyards is not sufficient to perform an analysis of the extent and effect of discharges of metals from the boatyards on these water bodies, or to calculate numeric effluent limitations. *Testimony of Bailey.* The 2005 BGP does not require direct receiving water monitoring in the vicinity of the boatyards or in the general water bodies affected the most by boatyard discharges. One goal of the 1997 BGP was to obtain such stormwater data from the boatyards to help define the nature and variability of the pollutants being discharged into receiving waters. *Testimony of Stasch; Exhibit 73.*

66.

There is little dispute that receiving water data is the most accurate method by which to set benchmarks at appropriate levels and to move to more specific effluent limitations for the boatyard industry. *Testimony of Horner, Drabek, Ortiz DeAnaya.* Sampling to derive some of this data is not difficult to accomplish. *Testimony of Ortiz DeAnaya.* Ecology has required receiving water sampling in individual shipyard permits to determine if there is a potential for violation of water quality standards and to craft effluent limitations. *Exhibit 78.* Accordingly, some study of receiving waters, either through individual facility sampling, or representative sampling of certain water bodies facilitated by the agency, is a necessary next step. The 2005 BGP fails to provide a mechanism to gather any receiving water data necessary for crafting effluent limitations in future permits. *Testimony of Horner; Exhibits 1, 27, & 47.*

Adaptive Management

67.

The 2005 BGP Condition S4 employs an adaptive management scheme that requires three tiers of corrective actions that adapt and respond to excursions of benchmarks, as determined by the monitoring regime. *Exhibit 1, p. 22.* When monitoring results indicate levels exceeding benchmark values, permittees must respond as specified in the three-tiered approach, with a Levels One, Two or Three Response. *Id. at 22-23.*

Level One Response

Permittees must make a Level One Response each time a sampling result for any listed parameter is above a benchmark value. At Level One, permittees must conduct a prompt

inspection that identifies and evaluates possible sources of the parameter in the discharge, summarize the inspection results and the remedial actions taken, and include the remedial actions in the discharge monitoring report (DMR) for the sampling period. A schedule for the implementation of necessary improvements must be made part of the facility's SWPPP. *Id.*

Level Two Response

Permittees are required to make a Level Two Response whenever four sampling results for any one parameter exceed the benchmark value(s). This response includes all actions specified in a Level One Response, plus investigation of all available and applicable stormwater treatment BMPs to reduce contaminant levels and examination of options for covering the hull preparation area, treatment of stormwater runoff, or sending the stormwater to a municipal sewage treatment plant. A Level Two source control report must be prepared outlining potential stormwater treatment practices or structures to reduce stormwater contaminant levels, prioritized according to expected cost and ease of installation. The Level Two source control report must be sent to Ecology within three months of initiating the Level Two Response. *Id.*

Level Three Response

When any six samples are above benchmark values[7], in addition to the Levels One and Two requirements, permittees must prepare an engineering report meeting the requirements of WAC 173-240, which includes Ecology's rules for submission of plans and reports for construction of wastewater facilities. The report must include design and construction

[7] The permit does not specify whether the Level Three Response is triggered by six exceedances of the same parameter, or by six exceedances of any combination of parameters.

information for treatment devices or structures "which are to be installed," and a schedule for implementation of the preferred option within twelve months from the time Ecology accepts the engineering report. Permittees must submit the engineering report to Ecology within three months of initiating the Level Three Response, but there is no time requirement for Ecology's acceptance of the report. It typically takes Ecology about two months to review and approve an engineering report because the agency must determine if the appropriate design flow is being used. *Testimony of Drabek.* Implementation of the preferred option requires a modification of coverage under the Permit. *Id.* The Permit does not actually require Ecology to approve a report, nor does it require the preferred option to achieve effluent levels at or below benchmarks. *Testimony of Horner; Exhibit 1, p. 22, 23.*

68.

Any Conclusion of Law deemed to be a Finding of Fact is hereby adopted as such.

Having so found, the Board makes the following:

CONCLUSIONS OF LAW

Thirty three issues were raised in this case. Two were resolved on summary judgment. The remaining issues to be addressed fall into the following categories: (1) Reasonable potential analysis and numeric effluent limitations, (2) Use and calculation of benchmarks for discharges of metals, (3) Adequacy and reasonableness of the BMPs, (4) Adequacy and reasonableness of monitoring requirements, (5) Adequacy of the adaptive management protocols, (6) Classification of waterbodies affected by boatyard discharges, and (7) Public participation in administration and modifications of the Permit.

1.

The Board has jurisdiction over this matter and the parties pursuant to RCW 43.21B, RCW 90.48 and the CWA, 33 U.S.C. §§ 1251 *et seq.*

2.

As the appealing parties, PSA and NMTA bear the burden of proof as to the issues they each raise. *WAC 371-08-485*. The Board's Findings of Fact are based upon the preponderance of the evidence. *WAC 371-08-485(2)*.

3.

A general permit is a permit issued pursuant to the state and federal NPDES program which covers multiple dischargers of a point source category within a designated geographical area, in lieu of individual permits being issued to each discharger. *WAC 173-220-030(11)*. Despite the diversity in the individual circumstances and physical settings of the 107 regulated boatyards, the Board concludes that boatyards are a category of dischargers that share sufficient attributes to be regulated under Ecology's general permit program. *40 C.F.R. 122.28*. *See, NRDC v. EPA, 279 F3d 1180, 1183 (9th Cir. 2002)*. Ecology's decision to continue with the general permit scheme on an interim basis (rather than moving to individual permits for each boatyard), balances the need for increasingly stringent controls on stormwater with the need for regulatory flexibility and practical realities, and was lawful and appropriate.

4.

Regulation of stormwater discharges from boatyards presents a particularly difficult challenge, because of the largely small-business nature of the industry and also because of the

particularly harmful content of the effluent. This third iteration of the BGP is an improvement over the previous boatyard general permits. It also reflects the results of a collaborative effort between Ecology and the regulated boatyard community and an agreement on the need to control and monitor boatyard stormwater and pressure wash wastewater discharges to Washington's waters.

Reasonable Potential Analysis and Numeric Effluent Limitations

5.

PSA argues that Ecology was required by state and federal law to conduct a "reasonable potential analysis" in the development of the 2005 BGP in order to ensure protection of water quality standards, and failed to do so. This step, PSA asserts, was necessary to inform the development of water quality-based effluent limitations and, ultimately, should have been used to establish numeric criteria for boatyard discharges. PSA relies on the CWA, RCW 90.48.555 (3)(d), and 40 C.F.R. 122.44(d) as the basis for the requirement that Ecology should have conducted a reasonable potential analysis and established numeric effluent limitations for the Permit. The Board concludes that Ecology was not required to perform a reasonable potential analysis in order to set technology or water quality-based effluent limitations in the 2005 BGP. The Board holds that Ecology may, at this time, set narrative effluent limitations through the use of benchmarks and BMPs in this BGP. However, in those particular circumstances where—despite implementation of all mandatory BMPs and adaptive management corrective actions—discharges continue to result in excursions of the benchmark values, Ecology must consider the impact of an individual facility's discharge on the receiving water and, where there is a

reasonable potential that the discharge will violate, or in fact violates, water quality standards, impose more specific narrative or numeric water quality-based effluent limitations at the particular facility and take other actions outlined in this opinion.

6.

The term "reasonable potential" describes a systematic or statistical method by which the agency determines the potential for a discharge to violate, or fail to meet, water quality standards and to then set appropriate effluent limitations, usually numeric, in NPDES or waste discharge permits.[8] *Exhibit 23.* Federal regulations applicable to the development of NPDES permits use the term "reasonable potential" to direct agency directors to establish effluent limitations in NPDES permits necessary to control pollutants or pollutant parameters when a particular discharge "*will cause*, *have the reasonable potential to cause*, or contribute to an excursion above any State water quality standard." *40 C.F.R. 122.44(d)(1)(i) (emphasis added).*

EPA has discussed its interim permitting approach used for incorporating water quality-based effluent limitations into stormwater permits through a Question and Answer format. *61*

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[8] RCW 90.48.555(3)(d), which the Board has held does not apply to this permit, is instructive in the analysis, as it contains the only state statutory reference to the term "reasonable potential," and mirrors federal requirements. That provision requires Ecology to condition stormwater general permits for industrial and construction activities to require compliance with numeric effluent limitations when there has been "a determination by the Department that (i) [T]he discharges covered …..have a *reasonable potential* to cause or contribute to violation of state water quality standards; *and* (ii) [E]ffluent limitations based on non numeric best management practices are not effective in achieving compliance with state water quality standards" (emphasis added). Thus, under the industrial and construction permits covered by the statute, Ecology must use its judgment to assess both the likelihood that discharges will violate water quality standards *and* the effectiveness of BMPs to achieve compliance. Although this statute is not controlling in this case, Ecology did consider the effectiveness of implementation of new BMPs in the development of the 2005 BGP and concluded that they will be an effective approach to bring the boatyard industry into compliance with state and federal water quality laws. Had this statute been applicable in the BGP case, numeric effluent limitations would have been unnecessary for this reason.

Fed. Reg.57425 (November 6, 1996). In this guidance, EPA notes that the "reasonable potential" aspect of federal regulation is primarily relevant to continuous wastewater discharges at low flow conditions in the receiving water, not intermittent wet weather discharges during high flow conditions. *Exhibit 22.* This latter condition is applicable to an industry such as boatyards, which face intermittent stormwater run-off.

7.

Numeric water quality-based effluent limitations are difficult to derive for stormwater discharges, because such discharges are highly variable both in terms of flow and pollutant concentrations, and the relationships between discharges and water quality can be complex. EPA reasons, "[A]lthough NPDES permits must contain conditions to ensure that water quality standards are met, this does not require the use of numeric water quality-based limitations." EPA authorizes permitting authorities to employ a variety of conditions and limitations in stormwater permits, including use of BMPs, monitoring triggers, monitoring benchmarks as the water quality-based limitations, where numeric limitations are unnecessary or infeasible. *61 Fed.Reg.43761 (Aug. 26, 1996).* In the context of stormwater in particular, federal regulations authorize the use of BMPs for the control of pollutants when "numeric effluent limitations are infeasible." *40 C.F.R. 122.44(k).*

8.

There is no state requirement that effluent limitations be expressed numerically in waste discharge permits, nor does the requirement to implement AKART require numeric effluent limits. *Puget Soundkeeper v. State, 102 Wn.App.783, 793, 9 P.3d 892 (2000); WAC 173-220-*

130.[9] Other courts that have had occasion to look at this issue have also concluded that there is no legal requirement that effluent limitation be numeric. *Defenders of Wildlife v. Browner, 191 F.3d 1159 (9th Cir. 1999)*; *Communities for a Better Environment v. Water Resources Board*, *109 Cal.App. 4th 1089, 1 Cal.Rptr.3d 76, (2003)*. PSA itself concedes that there is no legal requirement that effluent limitations always be numeric, but argues that if there is adequate data and information for a particular industry, permitting authorities should attempt to derive numeric limitations. PSA believes such data exists here, through the verified data collected during the last BGP permit cycle.

9.

Ecology's permit writer, Mr. Bailey, testified that a reasonable potential analysis was not conducted to establish numeric effluent limitations because of the unique nature of the stormwater flushing from boatyards. Ecology concluded that such an analysis would not be useful in the context of a general permit that is based on a BMP and benchmark approach. *Exhibit 2; Testimony of Bailey*. Ecology also concluded that it was not feasible at this time to derive numeric limitations to control the discharge of stormwater from boatyards, in large part due to the lack of adequate information to develop a numeric limit that would work for all boatyards covered under the general permit. *Testimony of Bailey*. We agree with Ecology that that numeric limits would have required a greater analysis of site-specific factors, and that the

[9] However, RCW 90.48.555(3),would require a numeric limitation in industrial and construction general permits, when Ecology has determined that effluent limitations based on non-numeric BMPs are not effective in achieving compliance with water quality standards *and* there is a reasonable potential the discharges will cause or contribute to violations of water quality standards. *RCW 90.48.555(3)*.

value of a general permit for the boatyard industry would have been lost if such an analysis had been undertaken.

10.

In order to protect water quality, NPDES permits are expected to impose increasingly stringent limits on effluents discharging into the waters of the State. The Board concludes that no useful purpose would be served by performing a reasonable potential analysis to derive numeric effluent limitations when Ecology has already properly concluded that a BMP and benchmark approach best controls boatyard stormwater pollution, as it has in the 2005 BGP. *33 U.S.C. 1311(b)(2)(A)*. Neither is there a requirement that Permit effluent limitations for the control of stormwater discharges be expressed as numeric water quality-based limitations at the present time. We concur with Ecology's assessment that it would be infeasible to do so at this time. We also note that new mandatory BMPs required in the 2005 BGP, such as the required use of vacuum sanders, may significantly reduce the amount of pollutants that enter the stormwater discharges from boatyards. Accordingly, the Board concludes that narrative effluent limitations based on mandatory BMPs and numeric benchmarks are consistent with water quality laws and regulations.

11.

Although the benchmark and BMP approach is a lawful one, the Board also concludes that the 2005 BGP does not adequately protect water quality in the following respects:

1) The methodology Ecology used to derive the copper benchmarks is flawed;

2) Copper should not have been used as an indicator of the levels of lead and zinc in receiving water;

3) A requirement for some level of receiving water sampling is reasonable and necessary; and

4) The three-tiered adaptive management response protocol fails to require implementation of specified corrective actions or to address continued excursions of benchmarks.

Calculation of Copper Benchmarks

12.

The use of several mitigating factors in the calculation of copper benchmarks resulted in benchmarks that were many times higher than the water quality criteria copper. The Board concludes that the methodology to apply two of these mitigating factors (the "dilution factor" and the "translator") was flawed and requires a remand to Ecology to recalculate the copper benchmarks.

13.

Dilution Factor

The use of a dilution factor (a measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone) in the manner Ecology applied it in the 2005 BGP created the equivalent of a standard mixing zone. It did so by allowing an assumed assimilative capacity of the receiving waters to dilute the level of pollution, which in turn allows

a greater amount of pollution to be discharged into the water.[10] This was done without any site-specific receiving water analysis, or without any showing that AKART was being met, which are critical prerequisites to the grant of a mixing zone. This Board has previously rejected the use of standard mixing zones in general permits as inconsistent with the overall goals of the CWA. *Puget Soundkeeper Alliance v. Ecology, Order Granting Partial Summary Judgment, PCHB 02-162, 02-163 & 02-164, at 18-19, (2003).* The authority to grant mixing zones in Washington NPDES permits is found in WAC 173-201A-100.[11] The regulation provides that mixing zones may be granted "as appropriate" in general permits, but only *after* a discharge meets AKART, and only if "the supporting information clearly indicates a mixing zone would not have a reasonable potential to cause a loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses of the water body, result in damage to the ecosystem or adversely affect public health as determined by [Ecology]." *WAC 173-201A-100(2)&(4).* Mixing zones are meant to be exceptions to water quality standards and, as such, they must be carefully limited in their application. *WAC 173-201A-100(7)-(8).*

Although Ecology has not specifically articulated a grant of a mixing zone in the 2005 BGP, it derived the copper benchmarks from the same variables used to formulate site-specific mixing zones in individual permits, particularly a dilution factor. The result is that the point at which an excursion (of either a benchmark or an effluent limit) will trigger a regulatory response

[10] The term "mixing zone" refers to the use of the assimilative capacity of natural systems as part of an effective pollution control strategy. EPA regulations provide that states may include in their state standards implementation policies that include mixing zones. *40 C.F.R. §131.13.*

[11] WAC 173-201A-100 is the mixing zone provision found in the 1997 version of the State's surface water quality standards. The 2003 version of the mixing zone regulation, found at WAC 173-201A-400, is still under review by EPA and not yet in effect for NPDES permits.

has been relaxed through the general application of numerical factors that represent conditions that may not be present at individual boatyards. While a general permit does not lend itself to a site-specific analysis, the grant of a mixing zone to formulate effluent limitations (*i.e.* benchmarks) is not warranted in circumstances where there is a lack of application of AKART and evidence of widespread, ongoing violations of water quality standards. This is the situation in the boatyard industry.

14.

Translator Value

The Board finds that Ecology's decision to rely exclusively on shipyard data to derive the translator value for the copper benchmarks was flawed. Consequently, we conclude that the 30% dissolved translator value is unreasonably low. Use of a small number of samples from two shipyards cannot reliably create a generally applicable benchmark for boatyards. The evidence established that boatyard facilities and operations differ from shipyard facilities and operations in several important respects. Many of these differences are relevant to the issue of how much dissolved copper it is reasonable to assume will be present in representative boatyard stormwater discharges for purposes of deriving an appropriate translator to calculate a generalized copper benchmark. Most notably, the fact that boatyards tend to perform more outdoor sanding and grinding of hulls using less sophisticated BMPs compared to shipyards (which tend to perform their work under overhead structures or inside buildings) means that boatyards likely allow the release of greater quantities—and smaller particles—of anti-fouling paint chips, grit, and dust. Repair and paint work at boatyards is also often performed by private boat owners, who are less

likely than shipyard workers to employ proper BMPs. The Board concludes that these differences can, and likely do, result in the presence of a higher percentage of dissolved copper in boatyard stormwater discharges than in shipyard stormwater discharges.

Additionally, by relying exclusively on shipyard data, Ecology ignored a much larger body of scientific data available from studies in different contexts that identifies an average of 50% dissolved copper in urban stormwater. We find this information credible and persuasive and conclude that this data and the default values in the Permit Writer's Manual provide both a more realistic and a more conservative approach to deriving a translator value for the copper benchmarks.

15.

This Board has consistently found that copper has detrimental effects on salmon, and has noted particular concerns because it does not degrade into other compounds. *Puget Soundkeeper Alliance et.al. v. Ecology, PCHB No. 02-162 (2003), Allied Aquatics v. Ecology, PCHB No. 96-193 (Order Granting Summary Judgment) (1997).* The Board has also previously held that a copper benchmark of 63.6 µg/L is too high for discharges into waters where stormwater is identified as a limiting factor for salmon recovery and in waters listed as impaired for copper under § 303(d) of the CWA.

> [63.6 µg/L] is a range of 7 to 13 times higher than the acute water quality standard for copper. It is from 10 to 18 times higher than the chronic water quality standard for that metal. Copper is readily soluble, unlike zinc. This Board has previously discussed in detail the detrimental effects copper may have upon salmon. *Allied Aquatics v. Ecology, PCHB No. 96-193 (Order Granting Summary Judgment) (February 10, 1997).* In addition, the Board has recognized copper is an element of particular concern because it does not degrade into other compounds. *Aquatechnex v. Ecology, PCHB No. 02-090*

> *(Order Granting Summary Judgment) (December 24, 2002).* Therefore, this benchmark is excessively high in relation to both the acute and chronic standards for copper… The Board finds the benchmark value established for copper [63.6 µg/L] is inadequate for discharges into waters where stormwater is identified as a limiting factor for salmon recovery and in waters listed as impaired for copper by the state under Section 303(d) of the Clean Water Act.

Puget Soundkeeper Alliance et al. v. Ecology, PCHB No. 02-162, Order Granting Partial Summary Judgment (2003).

In the 2005 BGP, Ecology failed to apply, or even consider, this standard in the development of the copper benchmarks. Ecology's benchmark development did not take into account the lethal and sub-lethal effects that discharges at the benchmark levels would have on salmonid species. Because copper has lethal and sub-lethal effects on salmon, and the benchmark values are well in excess of what this Board has found acceptable in other relevant cases, the Permit must be remanded for recalculation of the copper benchmarks in light of these considerations.

16.

There is some confusion among the parties regarding the meaning of the term "limiting factor" in this case. The Board used this term in *Puget Soundkeeper Alliance et al. v. Ecology, PCHB Nos. 02-162, 02-163 and 02-164 (2003)*, as part of its remand of the 2002 Industrial Stormwater General Permit (2002 ISGP). In that case, the Board directed Ecology to develop a lower stormwater benchmark value for copper (the benchmark value was 63.6 µg/L) for use in waters where stormwater was identified as a limiting factor for salmon recovery, and in waters listed as impaired for copper under § 303(d) of the CWA.

In this appeal of the 2005 BGP, Ecology and NMTA contend that there are no boatyards that discharge to waters where stormwater has been identified as a limiting factor for salmon. *Exhibit 26.*[12] It is Ecology's and NMTA's position that a lower benchmark value for copper is therefore not justified. Appellant PSA asserts that copper is a limiting factor for salmon because numerous studies demonstrate that copper is harmful to salmon. Some additional clarification of the Board's position regarding copper as a limiting factor is necessary.

In its opinion regarding the 2002 ISGP, the Board used the term "limiting factor" to refer to habitat conditions in watersheds that limit natural salmon production, as identified pursuant to a process initiated by the Washington State Conservation Commission. Ecology and NMTA are using the term in this narrow sense in their arguments before the Board. PSA uses the term in the broader sense, arguing that copper in stormwater negatively impacts salmon and is a factor that affects their recovery.

After clarifying the meaning behind the Board's use of the term "limiting factor" in the 2002 ISGP opinion, the Board finds that such a narrow approach is not warranted in the establishment of the copper benchmark in the 2005 BGP. Stormwater discharges from boatyards contain very high levels of copper when compared to other types of discharges. Boatyards are also located on the shoreline of waters that salmon use for migration corridors. The negative impact of copper on salmon is undisputed. The Board therefore concludes that the large amount

[12] A careful reading of this document, however, indicates that it is more accurate to state that stormwater as a limiting factor for salmon cannot be ruled out. The gaps in data make the impacts uncertain, leading to conclusions of "unknown" and "possible" for a number of subbasins. *See e.., p. 1.2-5 through 1.2-7..*

of copper discharged by boatyards into these areas utilized by salmonids justifies a more restrictive benchmark for copper in the 2005 BGP.

Copper as an Indicator for Lead and Zinc

17.

Rather than set separate benchmarks for lead and zinc, Ecology used copper as an "indicator," a term that refers to the use of copper benchmarks as substitutes for specific benchmarks for zinc and lead. Although the presence of copper in boatyard stormwater may indicate the *presence* of zinc and lead as well, it is not possible to determine the *levels* of lead and zinc from the level of copper present. The evidence did not support Ecology's assumption that boatyard stormwater discharges had a fixed relationship and relatively constant ratio of copper to lead and zinc. Therefore, the Board concludes that Ecology's use of copper as an "indicator" or proxy value for zinc and lead levels was impermissible. Lead and zinc discharges from boatyards require separate analysis. The permit must be remanded to establish separate effluent limitations and monitoring for lead and zinc.

Classification of Receiving Waterbodies Affected by Boatyard Discharges

18.

Lake Union is on the current § 303(d) list as a waterbody impaired for lead. *Exhibit 2 & 33.* The 2005 BGP does not contain any copper benchmark, or any other effluent limitation for lead, applicable to Lake Union. Consequently, it will not adequately protect water quality in Lake Union. Permit condition S2.C3 must be clarified so that it clearly applies to Lake Union.

The Permit must also be modified to include an effluent limit for lead discharges to lakes listed on the current § 303(d) list for lead.

19.

NMTA challenges Ecology's classification of the Lake Washington Ship Canal as a "lake." The Ship Canal is the receiving water for several boatyards covered by the 2005 BGP. At the time the 2005 BGP was issued, the Ecology water classification regulations classified the Lake Washington Ship Canal as "Lake Class." *WAC 173-201A-130 (58)*. Ecology defined the term 'lakes' in its 1997 regulations as follows: ""Lakes" shall be distinguished from riverine systems as being water bodies, including reservoirs, with a mean detention time of greater than fifteen days." *WAC 173-201A-020*. The 2005 BGP definition of the term 'Lake' mirrors Ecology's rule. Rule challenges are governed by the Washington Administrative Procedure Act, Chapter 34.05 RCW, which requires that administrative rules must be challenged by declaratory action in superior court. *RCW 34.05.570 (2)*. This Board does not have jurisdiction to review Ecology's rules under RCW 43.21B.110, nor, by extension, the treatment of the Lake Washington Ship Canal as a lake in the 2005 BGP. Therefore, NMTA's challenge to the classification of the Lake Washington Ship Canal as a lake is not properly before the Board and must be denied.

Mandatory Best Management Practices (BMPs)

20.

The 2005 BGP mandates that permittees use only vacuum sanders and grinders. "A vacuum sander or rotary tool meeting minimum performance standards shall be used for all paint

removal where a sander is appropriate. Non-vacuum grinders are prohibited." Condition S2.C.7.a. NPDES permits may require BMPs when they are reasonably necessary to achieve effluent limitations and standards to carry out the purposes and intent of the CWA. *40 C.F.R. §122.44(k)(4).*

The evidence established that the vacuum grinding equipment necessary to meet this condition is not practicable for certain grinding tasks. Washington law requires the use of all known available and *reasonable* methods to prevent and control the pollution of state waters ("AKART"). In those circumstances where vacuum grinders are not practicable to accomplish the intended paint removal task, it is not reasonable to require their specific use. Likewise, it is not reasonable to prohibit non-vacuum grinders under *all* circumstances if other equally effective methods can be shown to achieve the purposes of the CWA and state water quality laws. Therefore Condition S.2.C.7.a must be modified to remove the absolute prohibition on non-vacuum grinders, and to allow for their use in limited circumstances where vacuum grinders are impracticable and a permittee employs an alternative determined by Ecology to be demonstrably equivalent.

21.

Condition S2.C.7.c of the 2005 BGP requires the use of drop cloths, tarpaulins, drapes, shrouding, or other protective devices placed at boatyard works areas to collect materials resulting from boat cleaning, repair, modifications, and surface preparations. NMTA objects to this mandatory BMP, questioning whether it is reasonable and consistent with applicable laws and regulations. Washington law requires the use of AKART, all known, available, and

reasonable methods to prevent and control the pollution of state waters. *RCW 90.48.010.* We find this condition to be broadly worded and, when read in conjunction with Condition S2.C.7.d, to allow boatyards a wide range of choices and methods to collect waste materials. Boatyards can utilize protective device(s) as are necessary to accomplish the waste-collection and pollution-prevention purposes of the permit. Because of this flexibility, the Board concludes that Condition S2.C.7.c is reasonable and consistent with applicable law.

Monitoring

22.

Monitoring, recording, and reporting requirements for waste discharge general permits are governed by WAC 173-226-090. This regulation provides Ecology with the discretion to impose *reasonable* monitoring requirements. *WAC 173-226-090(1).*

EPA guidance on stormwater permitting directs that "a coordinated and cost-effective monitoring program should gather necessary information to determine the extent to which the permit provides for the attainment of applicable water quality standards and to determine the appropriate conditions for subsequent permits." *61 Fed. Reg. 43761 (Aug. 26, 1996), 57426, 57428 (Answer 9) (Nov. 6, 1996), Exhibit 22.* The current EPA "interim" permitting approach for water quality-based effluent limitations in stormwater permits provides that such monitoring programs "may include ambient monitoring, receiving water assessment, discharge monitoring (as needed) or a combination of monitoring procedures designed to gather necessary information." *Exhibit 22, p. 3.*

This interim approach is predicated on the assumption that when BMPs alone are found to be inadequate, more specific conditions or limitations—including numeric effluent limitations—are to be incorporated into subsequent stormwater permits as necessary and appropriate to meet water quality standards. *Id.* It is also based on the recognition that "deriving numeric effluent limitations without an adequate effluent characterization or an adequate receiving water exposure assessment … may result in the imposition of inappropriate limitations on a discharge," either unnecessarily stringent or insufficiently protective. *Id. (Answer 5).*

23.

We find that the discharge monitoring requirements contained in the permit are both reasonable and in compliance with WAC 173-226-090. They provide relevant information regarding permittees' compliance with permit conditions, most notably attainment of the copper benchmarks. We are persuaded that this information is adequate to allow Ecology to determine the extent to which the permit provides for the attainment of some water quality standards. However, we conclude that the permit's monitoring requirements are nonetheless deficient in two significant respects: first, the Permit does not gather adequate information to determine permittees' attainment of water quality standards related to lead and zinc; and second, it does not gather essential information that will be necessary to determine appropriate conditions for subsequent boatyard general permits because of the lack of receiving water data and information.

In light of the boatyard industry's history of significant noncompliance with previous general permit BMP requirements, and verified boatyard sample results indicating the need for extraordinary reductions in copper levels, it is not unlikely that some Permittees will fall short of

attaining water quality standards. Given that realistic possibility, we conclude that it is prudent for Ecology to collect the type of information that will be necessary to determine appropriate permit conditions going forward.[13] We further conclude that it is reasonable and necessary for Ecology to require the boatyards covered under this permit to participate in the collection of such information during this permit cycle.

Adequacy of the Three-Tiered Discharge Response Protocol

24.

Federal and state regulations allow the use of an adaptive management approach to stormwater discharges, characterized by implementation of BMPs, monitoring, and response to excursions to control or abate the discharge of pollutants for the control of stormwater discharges. *40 C.F.R. §122.44(k)*. The Board concludes that this adaptive management approach, which includes BMPs as a technology-based effluent limitation, is generally permissible for the 2005 BGP, particularly in light of the addition of mandatory vacuum sanders.

25.

By the terms of the Permit, excursions above benchmarks trigger three levels of response by permittees, an appropriate adaptive management approach for the Permit. Benchmark exceedances do not, however, trigger a clear response timetable, implementation schedule, or specific enforcement responses by Ecology. For example, the Permit does not clearly identify how long after the fourth sample exceedance a permittee has to *initiate* a Level Two Source

[13] We note, for example, that the testimony was undisputed that information such as receiving water data is essential *either* to verify or modify the assumptions used in calculating the current benchmarks *or* to move toward development of numeric effluent limitations.

Control Report, only how long a permittee has to submit one after initiating it. The Level Two Response also does not establish or require a schedule for implementation of prioritized treatment practices or structure. The Permit is not clear whether the Level Three Response applies to six exceedances of *one* parameter (such as is the case for Level Two Responses) or six exceedances of *any combination* of parameters. The Level Three Response, the highest response level, requires preparation of an engineering report meeting unspecified requirements of WAC 173-240 and implementation within twelve months of approval by Ecology. But the Permit does not specifically require Ecology to approve an engineering report within any particular time frame, nor does it specify what happens if Ecology disapproves such a report. As a consequence, the Permit provides no assurance that a Level Three engineering report will be implemented as a BMP. Nor is there any requirement in the 2005 BGP that permittees actually achieve the benchmark levels set out for various discharges through the implementation of enhanced BMPs. The result is that there can be ongoing excursions of the benchmark values in the Permit without corrective action by the permittee or enforcement by the Ecology. This outcome is particularly troublesome given the history of noncompliance in this industry and data that demonstrates that some individual facilities are far from compliance with benchmarks and water quality standards.

26.

This Board has held that a lack of regulatory oversight results in the type of self-enforcing regulatory program invalidated by the Ninth Circuit in *Environmental Defense Center, Inc. v. EPA*, 344 F.3d 832 (9th Cir. 2003). *Puget Soundkeeper Alliance v. Ecology, PCHB No. 02-162 (2003)*. Other courts have made similar conclusions:

> The Clean Water Act demands regulation in fact, not only in principle. Under the Act, permits authorizing the discharge of pollutants may issue only where such permits *ensure* that every discharge of pollutants will comply with all applicable effluent limitations and standard…The Act further provides that [the agency] shall prescribe conditions for such permits *to assure compliance with* [all applicable requirements, including effluent limitations." *Waterkeeper Alliance, Inc. et al. v. USEPA,* 399 F.3d 486, 498 (2nd Cir. 2005).

The terms of the 2005 BGP do not assure compliance with effluent limitations set out in the Permit. Ecology must actively enforce the Permit, by ensuring that boatyards establish *and implement* measures that comply with the BMPs required in the Permit and in their SWPPPs, and by ensuring that implementation of the BMPs results in boatyard discharges that do not exceed the established benchmarks. Ecology also has a duty to ensure that dischargers implement AKART. *RCW 90.48.010; RCW 90.52.040; WAC 173-226-070(1).*

27.

The Board further concludes that the 2005 BGP is deficient in that there is no provision to address those permittees who fail or refuse to implement adequate BMPs, or despite the implementation of the tiered adaptive management response, do not meet permit benchmarks. Given the history of noncompliance in this industry, the verified data from the 1997 permit and Ecology's experience with the implementation of BMPs by this industry, it is likely that some boatyards will be out of compliance with permit terms and fail to meet benchmarks. These factors, as well as implementation of the tiered adaptive management response, will provide Ecology information and monitoring data that some individual facilities either have the reasonable potential to, or in fact, violate water quality standards. The CWA and Ch. 90.48

RCW require Ecology to impose more specific discharge conditions or limitations on boatyards that cannot meet BGP benchmarks through the adaptive management approach. *See, 61 Fed. Reg.57425, Question 7 (November 6, 1996).* The Permit must address this noncompliance by specifying that Ecology will require the imposition of individual, site-specific conditions, including numeric or narrative water quality-based effluent limitations, compliance schedules, or a requirement of an individual NPDES permit, at the particular facility.

Public Participation in Administration and Modifications of the BGP

28.

Appellants challenge the 2005 BGP's conditions that provide public access to SWPPPs within 14 days of a written request. *Exhibit 1.* NMTA argues that Ecology lacks the authority to require public access to a boatyard's SWPPP. The record indicates that there has been significant public interest in the BGPs and in the management of boatyard stormwater discharges. Ecology rules related to the administration of the NPDES program address public access to information, stating "…the department shall make records relating to NPDES permits available to the public for inspection and copying." *WAC 173-220-080(1).* Ecology's rule also includes provisions to facilitate public copying of documents and for the protection of permittees' sensitive business information. *WAC 173-220-080(2), (3) & (4).* The Board finds that the 2005 BGP's public access provisions are not overly intrusive to permittees' businesses and are a reasonable exercise of Ecology's authority in setting terms of the permit. The condition does not impermissibly subject permittees to the state's Public Disclosure Law (Ch. 42.17 RCW), nor impermissibly delegate enforcement to them. Rather, the Permit includes

reasonable options for convenient satisfaction of the public access condition and reasonably makes available to the public information on industry compliance with state and federal water quality laws. Therefore, the Board concludes that the provisions in Condition S5.A.1 governing the public's access to boatyard SWPPPs are reasonable and lawful.

29.

Any finding of fact deemed to be a conclusion of law is hereby adopted as such.

Having so found and concluded, the Board enters the following

ORDER

Ecology's decision approving NPDES Boatyard General Permit No. WAG-030000 is VACATED, and the 2005 BGP is REMANDED to Ecology to make the following changes consistent with this opinion:

1. **Copper Benchmarks.** (translator value, dilution factor, benchmark level). Ecology shall recalculate and lower the benchmarks for copper in the 2005 BGP. In doing so, Ecology shall use a more realistic and conservative (higher) translator value that does not rely exclusively on shipyard data, but also considers the available scientific data identifying an average of 50% dissolved copper in urban stormwater and the default values in the Permit Writer's Manual. In recalculating and lowering the copper benchmarks, Ecology shall not include a dilution factor, and shall specifically consider the lethal and sub-lethal effects on salmonid species that boatyard discharges in excess of the

benchmarks will have in waters where salmonids are present for part of the year and in waters listed as impaired for copper.

2. **Lead and Zinc.** Ecology shall establish separate benchmarks and monitoring requirements for lead and zinc that do not rely exclusively on copper as an indicator for these metals.

3. **Lake Union and Other Lead-Impaired Water Bodies.** Ecology shall establish an effluent limitation for lead that specifically applies to discharges to Lake Union and any other lakes listed on the current 303(d) list for lead. Ecology shall also clarify permit condition S2.C3 so that the copper benchmark for facilities (exisiting, new source, or new discharge) which discharge stormwater to lakes clearly applies to Lake Union (and, as necessary, to any other lakes that are listed on the current 303(d) list for any parameter other than copper).

4. **Adaptive Management Approach.** The Permit shall be modified to explicitly require *implementation* of remedial actions that are dictated at all three levels of the adaptive management approach. It shall also explicitly require that permittees must continue implementing required remedial actions unless and until the benchmarks and other limits are achieved. To that end, the Permit must address the contingency that implementation of all BMPs and remedial actions required in the 2005 BGP might fail to achieve the applicable benchmarks. Such provisions shall include a reasonable time frame within

which Ecology will respond to such situations and specify that Ecology will require the addition of individual, site-specific conditions under the general permit (such as additional BMPs, monitoring, monitoring triggers, numeric effluent limitations and/or compliance schedules) and/or that the boatyard facility obtain an individual NPDES permit.

5. **Level Two Responses.** Ecology shall clarify the time frame in which a Level 2 Source Control Report shall be *initiated* (relative to the sampling results). Ecology shall also establish or require an implementation schedule for prioritized treatment practices or structures outlined in a Level 2 Source Control Report. Such schedule shall be comparable to the implementation schedule for Level One Responses required under Condition S5.A.2. in terms of requiring due diligence within reasonable time frames for different types of measures.

6. **Level Three Responses.** Ecology shall clarify whether the Level Three Response applies to six exceedances of any *one* parameter or six exceedances of any *combination* of parameters. Ecology shall also clarify the time frame within which an engineering report required under Level Three must be *initiated* (relative to the sampling results). The Level Three response shall be modified to include a reasonable time frame within which Ecology will make a decision regarding an engineering report submitted by a boatyard. The Permit shall be modified to address the contingency that Ecology may not approve an

engineering report, and shall specify that in such cases Ecology will provide permittees with: (a) its specific criticism(s) of a disapproved engineering report and guidance regarding the revisions that will be necessary for Ecology to approve the report, and (b) a reasonable time frame within which a permittee must submit a revised engineering report.

7. **Sampling/Monitoring Data.** The 2005 BGP shall be modified to include a requirement for the collection of receiving water samples from some or all boatyards covered under the permit for the purpose of yielding data to verify or modify the assumptions used in calculating the current benchmarks or to develop numeric effluent limitations, as necessary and appropriate, in the next renewal of the BCP. The Permit may either require permittees to collect and analyze such samples, or to cooperate with Ecology in the collection and analysis of such samples.

8. **Mandatory BMPs.** Condition S2.C.7.a. shall be modified to allow an exception to the prohibition on non-vacuum grinders under those limited circumstances where it is impracticable to use a vacuum grinder and a permittee employs an alternative determined by Ecology to be demonstrably equivalent.

SO ORDERED this 26th day of January 2007.

POLLUTION CONTROL HEARINGS BOARD

WILLIAM H. LYNCH, Chair

KATHLEEN D. MIX, Member

ANDREA McNAMARA DOYLE, Member