TRIENNIAL REVIEW WORKSHOP #3
PUBLIC COMMENTS SUBMITTED
September 2014

- Idaho Conservation League
- Nu-West Industries, Inc.
- Agrium
- GEI Consultants
- Hecla
- Idaho Department of Lands
- Idaho Mining Association
- Idaho AGC
- Idaho Power
- I-Minerals Inc.
- City of Boise
- International Zinc Association/Windward Environmental

www.idahoconservation.org

Idaho Conservation League
PO Box 844, Boise, ID 83701
208.345.6933

September 22, 2014

Paula Wilson
DEQ State Office
Attorney General's Office
1410 N. Hilton
Boise, ID 83706

Submitted via email: paula.wilson@deq.idaho.gov

Re: ICL comments on WQS priorities for upcoming Triennial Review

Dear Ms. Wilson;

Since 1973, the Idaho Conservation League (ICL) has been Idaho's voice for clean water, clean air and wilderness—values that are the foundation for Idaho's extraordinary quality of life. The Idaho Conservation League works to protect these values through public education, outreach, advocacy and policy development. As Idaho's largest state-based conservation organization, we represent over 25,000 supporters, many of whom have a deep personal interest in protecting Idaho's water quality, the health of all Idahoans and our State's fisheries.

Thank you for providing us an opportunity to review and comment on DEQ's draft priorities for the upcoming water quality standards revisions.

We have listed below the items that we believe should be the priorities for DEQ's first round of rulemakings pursuant to the agency's forthcoming triennial review.

1) **Numeric Criteria for Toxic Substances**
   DEQ needs to respond to the recent NOAA Bi-Op on this matter. Failure to do so in a timely manner will result in significant challenges to the issuance of NPDES permits in Idaho.

2) **Numeric Criteria for Nutrients**
   Nutrients are a leading cause of impairment in Idaho waters. Idaho's reliance on the 303d integrated report and TMDL processes to identify nuisance aquatic growth and translate this into numeric water quality targets for nutrients is overly burdensome and takes an inordinate amount of time to navigate. Further, the TMDL process often results in discharges being treated very differently – with some dischargers receiving massive WLAs for total phosphorus and others receiving such small WLAs that it is very costly

for them to comply. The current system results in tremendous inequalities and is often punitive to certain dischargers while others get off scot-free. Numeric standards would result in more equitable effluent limits and expedite the attainment of water quality standards in numerous 303d listed waters.

3) **Numeric Criteria for nuisance aquatic growth**
Idaho's current lack of objective standards for judging whether or not aquatic growth is, or is not, a nuisance results in arbitrary decision making with regard to both determining impairment and developing targets for attaining water quality standards. DEQ has done significant work to address this issue in the Lower Boise nutrient TMDL. We believe this work could be utilized to develop numeric criteria for nuisance aquatic growth statewide.

4) **Pollutant Trading**
There is significant interest in utilizing pollutant trading and offsets to improve the health of numerous Idaho water bodies and help dischargers to meet their effluent limits. DEQ's current rules contain scant mention of this important mechanism and the guidance document that the State finalized several years ago is seriously flawed and likely provides guidance on issues that exceed what is authorized in statute and rule. Developing robust rules on this issue is critical if this mechanism is to become more utilized.

5) **Antidegradation – Short Term Degradation and Exemptions**
DEQ is currently exempting non-restoration activities that cause 'short term' degradation to water quality from Tier II review. This practice is not supported by the current antidegradation rules.

6) **Ammonia**
Idaho should consider for adoption the new EPA recommendation on ammonia criteria. Many Idaho dischargers have limits for ammonia – their permits would benefit from utilizing EPA's new recommended criteria.

Please contact me if you have any questions at 208-345-6933 x 24 or jhayes@idahoconservation.org

Sincerely,

Justin Hayes
Program Director

cc: Don Essig, DEQ
Lisa Macchio, EPA

Mitchell J. Hart, P.E.
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September 23, 2014

Mr. Don Essig
Water Quality Standards Lead
1410 N. Hilton
Boise, Idaho 83706

Sent Via E-Mail to: don.essig@deq.idaho.gov

Re: Idaho Water Quality Standards, Triennial Review Process

Dear Mr. Essig,

Nu-West Industries, Inc. and Nu-West Mining, Inc.; (collectively Nu-West) appreciates the opportunity to provide input into the Idaho Triennial Review process required by Section 303 of the Clean Water Act. Nu-West operates a phosphate mining and processing operation in Southeastern Idaho and is presently conducting remedial investigations, reclamation actions and remedial design activities for historic mining operations.

The water quality standards that are the subject of the triennial review process have a direct effect on those activities. With more than 70% of the waters of the state undesignated as to the beneficial uses, the application of water quality standards reflects a presumed beneficial use of cold water aquatic life and contact recreation for these waters, and are protected for those presumed uses. This presumption does not accurately reflect the actual attainable uses of many waterways. Actions are needed to clarify the applicability of water quality standards, and we commend the Idaho Department of Environmental Quality ("IDEQ") for recognizing that changes to the rules are warranted to address this situation.

In response to IDEQ's requests for comments and inputs into the triennial review process, Nu-West offers the following recommended actions to efficiently and properly address water quality issues in southeastern Idaho and throughout the State. A

summary of Nu-West's suggested priority rankings are summarized in the table below. Our specific comments and the reasons for our view of ranking priorities are in the attached document.

Issue	**Draft IDEQ Priority Rank**	**Nu-West's Recommended Rank**
010. Definitions 113. Waters and Waters of the State	Not Ranked	High Priority
109-160. Use Designations	High Priority	High Priority
101. Non-Designated Surface Waters	Medium Priority	High Priority
070. Application of Standards	Low Priority	High Priority

Our reasons for these rankings are set forth in the attached comments. We would be pleased to discuss the issues raised by our comments in more detail with you and your staff.

We appreciate your consideration of this proposal and look forward to working with you on these important issues.

Best Regards,

Mitchell J Hart, P.E.

cc: Sent Via E-Mail
Mary Ann Nelson, IDEQ
Josh Schultz, IDEQ

Nu-West Comments on IDEQ Water Quality Standards Triennial Review Process

September 23, 2014

010. Definitions.

113. Waters and Waters of the State.

Nu-West recommends that the Idaho Department of Environmental Quality ("IDEQ") amend the definition of "Waters and Waters of the State" in the Rules of the Department of Environmental Quality, IDAPA 58.01.02, "Water Quality Standards." ("WQS Rule") to make it consistent with the Idaho statutory definition of "Waters or Water Body," and believes this should be a ***high priority*** for IDEQ even though it does not appear on IDEQ's Draft WQS Priority list. Ensuring that the WQS Rule is consistent with the definitions and intent of Idaho Water Quality statutes must be paramount for the rest of the WQS Rule to operate properly. Currently, "Waters or water body" is defined in the Idaho Code with reference to the federal Clean Water Act definition of "navigable waters of the United States."

> "'Waters or water body'" means the navigable waters of the United States as defined in the federal clean water act. For the purposes of this chapter, water bodies shall not include municipal or industrial wastewater treatment or storage structures or private reservoirs, the operation of which has no effect on waters." *Idaho Code Ann. § 39-3602(34).*

However, the WQS Rule uses a different definition for "waters and waters of the state".

> "Waters and Waters Of The State. All the accumulations of water, surface and underground, natural and artificial, public and private, or parts thereof which are wholly or partially within, which flow through or border upon the state." *IDAPA 58.01.02.010.113.*

Nu-West recommends replacing the definition of "Waters and Waters Of The State" with two new definitions, one for "Waters or Water Body" that would repeat the statutory definition of those terms as quoted above, and another definition for "Waters of the State" that would read as follows:

> *"Waters Of The State. Any Waters or Water Body, or parts thereof which are wholly or partially within, which flow through or border upon the state."*

109-160. Use Designations

There are three elements to the IDEQ description of the use designation priority - 1) Designate appropriate uses for undesignated water bodies that have been assessed as fully supporting, 2) Rulemaking to allow Use Attainability Analysis (UAA) and 3) Revise current use designations as necessary through UAAs. Nu-West concurs that use designations for currently undesignated water bodies is necessary. Certain water bodies within Southeastern Idaho, while they support some aquatic species, cannot attain the full

use of cold water fisheries. However, many water quality criteria are based on fish species that are not present in the water bodies due to natural limitations, such as ephemeral flows or naturally poor habitat. Application of water quality criteria based on vertebrate species may therefore be erroneous for certain water bodies. Appropriate use designations for undesignated water bodies are crucial to addressing the actual risks within the water body while balancing the costs of environmental protection measures. Nu-West supports the IDEQ conclusion that this is a ***high priority*** item to be addressed in the water quality regulations.

The rulemaking to allow UAA is important to set forth the appropriate information and procedural components for designating appropriate beneficial uses that are reflective of actual conditions. Guidance is needed for the regulated community in addressing designations or changes in designations to provide a realistic basis for making risk management determinations, design of environmental protection measures and planning for economic development.

Further, Nu-West recommends clarification of the use designations as they pertain to perennial portions of waters. The Water Body Assessment Guidance (WBAG) clearly recognizes that "Somewhere in the continuum of stream channels from rivers to rills, there is a point above which a rivulet is so small that it cannot provide an aquatic habitat that can a support a biological community with composition and function similar to reference conditions." (IDEQ, 2002) It is recommended that the regulations clarify beneficial use lists in Sections 109-160 as applicable only to the perennial portions of the waters. Non-perennial flows should be addressed specifically and separately as a ***high priority*** to avoid an erroneous presumption that they should be protected for cold water aquatic uses. This issue is addressed separately in our comments.

101. Nondesignated Surface Waters

IDEQ proposes to consider additional clarification of what man-made waters are and the possibility of creating a man-made waters beneficial use category. Nu-West strongly recommends that this item be addressed as a ***high priority*** item because it potentially affects several types of water bodies associated with mining, agriculture, construction and other industrial type of facilities. Specifically, Nu-West recommends (1) exclusion of certain water management structures, and (2) amendment of the definition of Man-Made Waterways in the WQS Rule. Our reasons are set forth below.

1. ***Specifically exclude Water Management Structures, including artificial ponds and lakes within mined-out pits, and Stock Ponds from the WQS Rule***

The Idaho legislature expressly defined "Waters and water body" to be the navigable waters of the United States. EPA has long interpreted "navigable waters of the United States" to exclude artificial lakes and ponds used exclusively for things such as stock watering, irrigation and settling basins. In addition, the statutory definition of "waters and water body" expressly exclude private reservoirs, the operation of which has no effect on waters from the definition of "waters or water body." Accordingly, stock ponds and water management structures, including artificial ponds or lakes within mined-out

pits, should be excluded from regulation under the WQS Rule, and we suggest IDEQ expressly list such water features as excluded from the definition of "waters and water body" or "Waters of the State".

In its proposed rule on what constitutes waters of the United States, EPA and the Army Corps of Engineers state that they propose to:

> "exclude some waters and features that *the agencies have by longstanding practice generally considered not to be 'waters of the United States.'* Specifically, the agencies propose that the following are not 'waters of the United States' notwithstanding whether they would otherwise be jurisdictional under section (a):
>
> - Ditches that are excavated wholly in uplands, drain only uplands, and have less than perennial flow.
>
> - Ditches that do not contribute flow, either directly or through another water, to a traditional navigable water, interstate water, the territorial seas or impoundment.
>
> - The following features:
> - Artificially irrigated areas that would revert to upland should application of irrigation water to that area cease;
> - *Artificial lakes or ponds created by excavating and/or diking dry land and used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;*
> - Artificial reflecting pools or swimming pools created by excavating and/or diking dry land;
> - Small ornamental waters created by excavating and/or diking dry land for primarily aesthetic reasons;
> - Water-filled depressions created incidental to construction activity; as defined in the federal clean water act.
> - Groundwater, including groundwater drained through subsurface drainage systems; and
> - Gullies and rills and non-wetland swales."
>
> *79 Fed. Reg. 22188, 22218 (April 21, 2014)(emphasis added).*

Water management structures used in the mining industry are artificial lakes or ponds created by excavation and used for settling basins, and as such should not be subject to water quality standards. These structures which include both artificial ponds and lakes within mined-out pits and water management structures outside of the mined-out pits are often required pollution prevention measures and considered BMPs for control of nonpoint sources to protect surface water quality.

Similarly, stock ponds are impoundments constructed for the specific purpose of stock watering. As noted, one of the longstanding exemptions in the Clean Water Act includes an exemption for discharges from stock ponds and construction and maintenance of temporary mining roads. *See 79 Fed. Reg. 22188, 22193.* Given the clear exclusion of stock ponds from the definition of water of the United States, it follows that the water in

the stock ponds must be excluded from application of the Idaho water quality standards as well.

2. ***Amend the definition of Man-Made Waterway in the WQS Rule to include other Man-Made waters such as artificial ponds, impoundments and lakes.***

IDEQ identified Man-Made Waterways as a Potential Triennial Review Item. As part of its review, IDEQ is considering additional clarification of what man-made waters are and the possibility of creating a man-made waters beneficial use category. In its June 25, 2014 presentation, IDEQ made several suggestions for possible changes to the definition of Man-Made Waterways. Nu-West supports IDEQ's suggestion that it would be helpful if a revised definition of Man-Made Waterways explicitly mentioned other types of man-made waters "such as ponds (i.e. Park Center Pond, stock ponds, flood control basins)" and that IDEQ would need to develop standards to support a man-made water beneficial use. We recommend that other types of man-made waters be included in the definitions such as artificial ponds, impoundments and lakes to the extent they are otherwise "waters".

070. Application of Standards

The application of standards to intermittent waters is another ***high priority*** item that needs to be addressed in the Water Quality Standards. IDEQ proposes, as a low priority, to expand the Application of Standards to Intermittent Waters (section 06) to ephemeral waters and to revise the applicability of water quality standards to optimum flows. The present WQS Rule applies numeric water quality standards to "intermittent waters during optimum flow periods sufficient to support the uses for which the water body is designated" (Sec. 070.06) Nu-West concurs that the optimum flows identified in the present WQS Rule do not make sense for all channel sizes and should be revised. Water quality during "optimum flow conditions" is not necessarily the determining ecological risk factor for the aquatic life within these temporary waters, and often the intermittent nature of these flows does not support the same aquatic life as perennial waters for which these water quality criteria were developed. Consequently, a new use category for intermittent, ephemeral and seasonal waters is appropriate. Water quality standards for temporary waters should be developed using scientifically defensible methods that appropriately addresses the lack of fully established biologic communities in these waters.

There are presently two problems with the application of the standards to temporary waters. First, many of these water bodies are not presently designated. Secondly, the application of standards to optimal flows is not appropriate for all water quality parameters.

1) ***Presumed Use Designation is not appropriate***. Presently, numeric standards are applied to intermittent waters during optimal flow periods to support the uses for which the water body is designated. Given that the beneficial use of most of the temporary waters have not been designated, there is some question as to how the standards are applied. IDEQ reports a divergence between the State of Idaho and the EPA in the interpretation of the presumed use protections. In its Issue Paper

on Man–made Waterways – Undesignated Waters, August, 2014, IDEQ states that "EPA region 10 believes these use preemptions are equivalent to a use designation and thus require a use attainability analysis to change; Idaho maintains that these use presumptions are only a placeholder that provides protection until the appropriate use designation can be determined and promulgated into the use designation tables." This divergence of interpretations of the use designations, coupled with the fact that temporary waters, by nature, do not support fully established biological aquatic communities, results in a rule that does not reflect actual conditions or lend itself to reasonable interpretation.

In the WBAG, IDEQ recognizes that "all aquatic life uses presume fully established biologic communities, which in turn presume a persistent aquatic environment. Temporary waters (e.g., intermittent streams, vernal pools) may have important ecological functions but cannot attain the same biological communities as perennial waters." (WBAG p. 3-2) Nu-West recognizes that temporary waters do in fact support some cold water aquatic species that in turn supports downstream fisheries. The applicable water quality criteria should reflect the biota within these temporary waters rather than a more complete, but merely hypothetical, aquatic habitat.

For example, ongoing aquatic studies of creeks in Southeast Idaho documented reduced aquatic habitat that is limited by intermittent flow, small stream size, shallow water depths, lack of habitat diversity and a high percentage of fines when and where water is present. Many of these creeks are naturally unable support fish populations. While the existing biologic communities in such creeks do have some facultative macroinvertebrates, the presumed full use of cold water aquatic life is not supported because there is not a persistent aquatic environment.

Similarly, upstream reaches of some perennially flowing streams do not have fully established biological communities within a persistent aquatic environment. Some of these creeks have been documented to contain a biologic community with some cold water macroinvertebrate species, but it is not until the lowest reach of these streams where there is perennial flow, that a more complete biologic community, including fish, have been found to occur. The ephemeral flows should be considered in a separate manner from the perennial portions of this stream.

2) ***The application of water quality standards to optimal flows is not appropriate for all water quality parameters.***

Using the EPA interpretation that the presumed use is the designated use, most temporary waters would be regulated as Cold Water Aquatic Life, subject to water quality standards for that beneficial use. Thus, water in rills, ephemeral and intermittent streams and vernal pools would be subject to the most stringent of water quality criteria. This application is unrealistic, overreaching and not productive.

Water quality standards are generally designed to support the most sensitive species within a biologic community. While temporary waters may support some aquatic species, the application of a specific water quality standard should be carefully considered. Chronic standards may not be appropriate for temporary waters, particularly those seasonal in nature because the aquatic life is not subject to the water on a full time basis.

Nu-West concurs with the IDEQ that the application of numeric standards to optimal flows does not make sense for temporary waters. It is recommended that a new use category be created within the rules to define and delineate temporary waters, and set separate procedures and standards for this group of waters. It is important to recognize that there are many of these temporary waters- from rills to seasonal creeks- that need to be addressed in a manner that reflects existing conditions and attainable uses and not presumed uses. A mechanism to address these temporary waters, both in terms of designation and applicable standard, should be devised to streamline the manner in which these waters are managed, without the cumbersome and expensive UAAs for each and every rill within the State.

References

IDEQ, Water Body Assessment Guidance, January 2002.

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Alan Haslam
Director of Mining
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File #: MDP-14-004

September 25, 2014

Mr. Don Essig
Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706

Sent via email to: don.essig@deq.idaho.gov

Re: Idaho Water Quality Standards, Triennial Review Process

Dear Mr. Essig:

On behalf of Agrium CPO—a major producer of phosphate and nitrogen fertilizers with facilities located in southeastern Idaho—I am writing to respectfully request definitions of "waters" and "water bodies" be clarified in DEQ's water quality rules to ensure consistency with the definition in applicable Idaho Code.

"Waters and Waters of the State" are defined in state water quality rules as "All the accumulations of water, surface and underground, natural and artificial, public and private, or parts thereof which are wholly or partially within, which flow through or border upon the state." *See* IDAPA 58.01.02.010,113.

However, "waters or water body" are defined in 39-3602(34), Idaho Code as: "the navigable waters of the United States as defined in the federal clean water act. For the purposes of this chapter, water bodies shall not include municipal or industrial wastewater treatment or storage structures or private reservoirs, the operation of which has no effect on waters."

Because Title 39 Chapter 36 is the section of Idaho Code governing surface water quality, we believe the definitions in the water quality rules should be changed to be consistent with the statutory definitions in that section of Idaho Code. Please initiate rule-making to clarify this issue.

Thank you for your consideration of this request.

Sincerely,

Alan Haslam

Alan Haslam

* A Registered Name of Nu-West Industries, Inc.

September 26, 2014

Geotechnical
Environmental
Water Resources
Ecological

Miranda Adams
Water Quality Standards Coordinator
Idaho Department of Environmental Quality
1410 North Hilton Street
Boise, ID 83706

Re: Notice of Review of WQS: Proposal for Biotic Ligand Model for Copper Aquatic Life Criteria in Idaho

Dear Ms. Adams,

We would like to participate in the Idaho Department of Environmental Quality (IDEQ) triennial review of surface water quality standards on behalf of our client, the Copper Development Association (CDA). CDA played a significant role in sponsoring scientific research used in development of the freshwater Biotic Ligand Model (BLM) for copper, which was adopted by the United States Environmental Protection Agency (USEPA) in its latest national ambient water quality criteria (USEPA 2007). It is our understanding that the conclusion of the National Marine Fisheries Service's (NMFS) Biological Opinion regarding Idaho's water quality standards was that the state's current copper standards would have to be updated to be no less stringent than criteria derived using the BLM. CDA is interested in offering its support for IDEQ in adoption of such standards and GEI has considerable experience in other states on implementation issues of the BLM on both site-specific and state-wide bases.

GEI has been working closely with both the regulatory and regulated community within Colorado for over a decade on BLM-based water quality standards. These efforts have included regulatory support, development of sampling plans, and the analysis and derivation of site-specific standards using the BLM. These have ranged from water-effects ratios to using more advance techniques, such as USEPA's Fixed Monitoring Benchmark (FMN; EPA 2012). GEI has also been active in working with regulators in Oregon and New Mexico as they explore state-wide BLM standards. On behalf of CDA, we would be glad to offer our expertise regarding options for implementing BLM-based standards in Idaho as well.

In our experience, the most challenging step of implementation is collecting the proper data in order to utilize the BLM. Given the number of water quality parameters that affect copper bioavailability, the collection of appropriate data for the BLM is more complex and costly than analyzing for a single parameter, hardness, to derive criteria. To facilitate the adoption of the BLM within the state, IDEQ may consider developing geochemical regional estimations of the required BLM parameters that could then be supplemented using site-specific data collected

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by individual dischargers. GEI and the CDA project team could potentially assist by reviewing datasets, if provided by IDEQ, to evaluate how the BLM may be implemented on different spatial scales, possible data simplification, and to evaluate potential BLM-based criteria for waters in Idaho.

Additionally, GEI will be giving several platform presentations at this year's Society of Environmental Toxicology and Chemistry (SETAC) meeting in Vancouver regarding the copper BLM that may be of interest to any IDEQ staff in attendance. These talks will cover the current usage of the BLM by state agencies throughout the country, as well as several discussions on implementing BLM-based standards here in Colorado where we are building substantial experience working with real-world datasets to update regulatory standards using the BLM.

We appreciate the opportunity to provide comments on the proposed water quality standards. Please let us know if you have any questions. We look forward to discussing this with you further.

Sincerely,

GEI CONSULTANTS, INC.

Robert W. Gensemer, Ph.D.
Senior Ecotoxicologist

RWG
cc: Joe Gorsuch, CDA
Steven Canton, GEI
John Gondek, GEI
David DeForest, Windward Environmental
Eric Van Genderen, International Zinc Association

References

U.S. Environmental Protection Agency (USEPA). 1985. Guidelines for deriving numerical national water quality criteria for the protection of the aquatic organisms and their uses. PB85-227049, U.S. Environmental Protection Agency, Washington, DC.

U.S. Environmental Protection Agency (USEPA). 1994. Interim guidance on determination and use of water-effect ratios for metals. EPA-823-B-94-001, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (USEPA). 2001. Streamlined water-effect ratio procedure for discharges of copper. EPA-822-R001-005, U.S. Environmental Protection Agency, Washington, D.C.

U.S. Environmental Protection Agency (USEPA). 2007. Aquatic Life Ambient Freshwater Quality Criteria – Copper. EPA-822-R-07-001. U.S. Environmental Protection Agency, Washington, D.C.

Hecla

Mr. Don Essig
Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706

Sent via email to: don.essig@deq.idaho.gov

Re: Idaho Water Quality Standards, Triennial Review Process

Dear Mr. Essig:

In response to IDEQ's requests for comments, Hecla offers the following recommendations. We request that IDEQ address the following issues as high priorities:

- Clarify the definition of waters and waters of the State in the regulations to make it consistent with the statutory definition.
- Clarify the definition of man-made waterways.
- Add a beneficial use category for man-made waterways.
- Designate beneficial uses for undesignated water bodies and provide rules for Use Attainability Analyses.
- Clarify the application of standards to temporary waters.

We request definitions of "waters" and " water bodies" be clarified in DEQ's water quality rules in view of the inconsistency of the statutory definitions of those terms. We believe this should be a high priority and should be addressed early in your rulemaking process.

"Waters and Waters of the State" are defined in your water quality rules (IDAPA - 58.01.02) as "All the accumulations of water, surface and underground, natural and artificial, public and private, or parts thereof which are wholly or partially within, which flow through or border upon the state."

This appears to be based on the definition of "Waters" in 39-103(18), Idaho Code: "all accumulations of water, surface and underground, natural and artificial, public and private or parts thereof which are wholly or partially within, flow through or border upon this state except for private waters as defined in section 42-212, Idaho Code."

"Waters or water body" are defined in 39-3602(34), Idaho Code: "the navigable waters of the United States as defined in the federal clean water act. For the purposes of this chapter, water bodies shall not include municipal or industrial wastewater treatment or storage structures or private reservoirs, the operation of which has no effect on waters."

Because Title 39 Chapter 36 is the section of Idaho Code governing water quality, we believe the definitions in the water quality rules must be consistent with the statutory definitions in that section of code not the definition in Title 39 Chapter 1.

We also request that another high priority be to include artificial ponds, impoundments and lakes in the definition of man-made waters and that they be subject to a new beneficial use category that protects those waters for the purpose for which the structures were constructed. We further request that man-made waters then be excluded from the definition of "waters or water bodies."

Thank you for your consideration of these requests.

Sincerely,

Paul L. Glader, P.E.

Corporate Environmental Director

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IDAHO DEPARTMENT OF LANDS

TOM SCHULTZ, DIRECTOR
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September 26, 2014

Don Essig
Water Quality Standards Lead
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706

Dear Don,

The Idaho Department of Lands (IDL) appreciates the opportunity to comment on the Idaho Water Quality Standards Triennial Review (WQSTR) public scoping process.

IDL manages approximately 2.3 million acres of State endowment trust lands. These lands were granted to the State through various Territorial Acts and upon statehood by the federal government for the express purpose of maximizing returns to the trust beneficiaries–the largest trust beneficiary being Idaho's K-12 public schools.

IDL is also responsible for fire management on over six million acres and for administering the Idaho Forest Practices Act (IFPA) on State and private forestlands.

Our main concern with the WQSTR is the proposed revision to IDAPA 58.01.02.070.06 to include ephemeral waters.

The Current ID Water Quality Standards Rule:
070.06. Application of Standards to Intermittent Waters. Numeric water quality standards only apply to intermittent waters during optimum flow periods sufficient to support the uses for which the water body is designated. For recreation, optimum flow is equal to or greater than five (5) cubic feet per second (cfs). For aquatic life uses, optimum flow is equal to or greater than one (1) cfs.

The DRAFT WQS Priorities include the following:
070. Application of Standards. 06. Application of Standards to Intermittent Waters. Expand to include ephemeral waters. Optimum flows identified in rule do not make sense for all channel sizes and should be revised. A simple fix for this situation may be to preface sentences about optimum flows with the words "absent information to the contrary," so as to provide flexibility. Another option may be to define a new use category for waters that are seasonal.

While we concur that the optimum flows identified in the rule do not make sense for all channel sizes, we do not concur that adding the words "absent information to the contrary" will provide any greater clarity.

Further, given the proposed US Environmental Protection Agency/US Army Corps of Engineers joint rule on Waters of the US, it seems work on defining or changing standards on ephemeral or intermittent streams is premature. This issue should be tabled until after a final rule on Waters of the US is published.

Thank you for the opportunity to submit comments on this proposal. Please contact Michele Andersen at (208) 769-1525 or by email at *mandersen@idl.idaho.gov* if you have any questions regarding these comments.

Respectfully submitted,

Ara Andrea
Technical Services Bureau Chief
Idaho Department of Lands

CC: David Groeschl, Deputy Director, Forestry & Fire, IDL
Bob Brammer, Chief Operations Officer, IDL
Michele Andersen, Interdisciplinary Program Manager, IDL
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September 25, 2014

Mr. Don Essig
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Re: Idaho Water Quality Standards, Triennial Review Process

Dear Mr. Essig,

In response to IDEQ's requests for comments and inputs into the triennial review process, we offer recommendations of issues and priorities to efficiently and properly address water quality issues in the State. Specifically, we request that IDEQ address the following issues as high priorities:

- Clarify the definition of waters and waters of the State in the regulations to make it consistent with the statutory definition.
- Clarify the definition of man-made waterways.
- Add a beneficial use category for man-made waterways.
- Designate beneficial uses for undesignated water bodies and provide rules for Use Attainability Analyses.
- Clarify the application of standards to temporary waters.

We believe these are high priority items that should be addressed early in the rulemaking process. Our reasons are set forth below:

Definition of Waters and Waters of the State

We request definitions of "waters" and " water bodies" be clarified in DEQ's water quality rules in view of the inconsistency of the statutory definitions of those terms. We believe this should be a high priority and should be addressed early in your rulemaking process.

"Waters and Waters of the State" are defined in your water quality rules (IDAPA - 58.01.02) as "All the accumulations of water, surface and underground, natural and artificial, public and private, or parts thereof which are wholly or partially within, which flow through or border upon the state."

We believe the definitions in the water quality rules must be consistent with the statutory definitions and should be modified.

Clarification of Man-made waterways and Addition of a Beneficial Use Category

IDEQ has proposed to consider, as a medium priority, to clarify what Man-made Waters are, and to evaluate the possibility of creating a man-made waterways beneficial use category. We recommend that this issue be a high priority. To the extent that artificial ponds, impoundments and lakes are not excluded from the definition of waters of the United States, we recommend they be included in the definition of Man-made waterways subject to a new beneficial use category that protects the waters for which they were constructed.

Designation of Undesignated Waters and Use Attainability Analyses

The rulemaking to allow UAA is important to set forth the appropriate information and procedural components for designating appropriate beneficial uses that are reflective of actual conditions. Guidance is needed for the regulated community in addressing designations or changes in designations to provide a realistic basis for making determinations as to risk management, design of environmental protection measures and planning for economic development.

Application of Standards to Temporary Waters

It is recommended that a new use category be created within the rules to define and delineate temporary waters, and set separate procedures and standards for this group of waters. It is important to recognize that there are many of these temporary waters – from rills to seasonal creeks – that need to be addressed in a manner that reflects existing conditions and not presumed uses. A mechanism to address these temporary waters, both in terms of designation and applicable criteria, should be devised to streamline the manner in which these waters are managed.

We appreciate the opportunity to provide input into this important process and look forward to reviewing specific rulemaking on the above topics.

Sincerely,

Jack Lyman
Executive Vice President

September 23, 2014

RECEIVED
SEP 25 2014
DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE WATER QUALITY PROGRAM

Mr. Don Essig
Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706

Sent via email to: don.essig@deq.idaho.gov

Re: Idaho Water Quality Standards, Triennial Review Process

Dear Mr. Essig:

I write on behalf of the nearly 600 Idaho firms that make up the Idaho Associated General Contractors (AGC), the largest and only statewide network of commercial contractors in Idaho. AGC members hail from every county in Idaho, build the factories and buildings where all Idahoans work and construct the roads and bridges we all use each and every day. The Idaho AGC and its members are committed to helping ensure that Idaho remains an ideal place to live and work. That is why we continue to follow the work of the Idaho Department of Environmental Quality with such keen interest.

We request definitions of "waters" and " water bodies" be clarified in DEQ's water quality rules in view of the inconsistency of the statutory definitions of those terms. We believe this should be a high priority and should be addressed early in your rulemaking process.

"Waters and Waters of the State" are defined in your water quality rules (IDAPA - 58.01.02) as "All the accumulations of water, surface and underground, natural and artificial, public and private, or parts thereof which are wholly or partially within, which flow through or border upon the state."

This appears to be based on the definition of "Waters" in 39-103(18), Idaho Code: "all accumulations of water, surface and underground, natural and artificial, public and private or parts thereof which are wholly or partially within, flow through or border upon this state except for private waters as defined in section 42-212, Idaho Code."

"Waters or water body" are defined in 39-3602(34), Idaho Code: "the navigable waters of the United States as defined in the federal clean water act. For the purposes of this chapter, water bodies shall not include municipal or industrial wastewater treatment or storage structures or private reservoirs, the operation of which has no effect on waters."

Because Title 39 Chapter 36 is the section of Idaho Code governing water quality, we believe the definitions in the water quality rules must be consistent with the statutory definitions in that section of code not the definition in Title 39 Chapter 1.

We also request that another high priority be to include artificial ponds, impoundments and lakes in the definition of man-made waters and that they be subject to a new beneficial use category that protects those waters for the purpose for which the structures were constructed. We further request that man-made waters then be excluded from the definition of "waters or water bodies."

Thanks you for your consideration of these requests.

Sincerely,

Wayne L. Hammon
Executive Director

IDAHO POWER®
An IDACORP Company

September 26, 2014

VIA EMAIL
Miranda Adams
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706-1255

Subject: Idaho Power Company's Comments on IDEQ's 2014 Triennial Review

Dear Ms. Adams:

The Idaho Power Company ("IPC") submits the following comments to the Idaho Department of Environmental Quality ("IDEQ") in response to the third and final triennial review meeting held on August 20, 2014. IDEQ is soliciting comments on both the presentation given at that meeting, which explained IDEQ's rulemaking priorities, and the triennial review in general. IPC appreciates the time and effort IDEQ put into this triennial review and the opportunity to provide these comments.

At the August 20th meeting, IDEQ gave a presentation in which it identified potential future rulemakings and assigned them a priority. Among those rulemakings identified was a revision to the Criteria for Surface Water Quality Criteria for Aquatic Life Designations relating to salmonid spawning and temperature criteria (58.01.02.250.02.f.), which has been assigned a "high" priority, and a revision relating to Dissolved Oxygen (58.01.02.250.02.a.), which has been assigned a "medium" priority.

In comments filed on July 25, 2014, IPC requested that if IDEQ proceeds with the Dissolved Oxygen rulemaking it also consider a companion rulemaking on Total Dissolved Gas (TDG) (58.01.02.250.01.b.). In those comments, IPC cited research developed by McGrath, et al. (2006) that demonstrates that short term exposure of up to 120% of saturation does not produce significant effects in migratory juvenile or adult salmonids when compensating depths are available. *See also* Weitkamp (2008). IPC would like to take this opportunity to reiterate those comments and encourage IDEQ to consider reflecting the analysis in its upcoming rulemakings.

IPC understands that IDEQ anticipates rulemakings given a "high" priority will take place in the next 2-3 years, while "medium" priority rulemakings may take place in 4-5 years. IPC appreciates that IDEQ has limited resources available for its rulemakings, however, a rulemaking to revise the TDG standard would be compatible as a companion rulemaking to either of the above identified rulemakings, especially in light of the state of the science on this topic. A companion rulemaking of this nature may be a way for IDEQ to efficiently address an additional

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area of its regulations without the added cost of a separate rulemaking. Finally, given the rulemaking timeline anticipated by IDEQ, IPC requests that IDEQ revise its timeline and consider the TDG rulemaking at an earlier date, regardless of whether it is combined with another rulemaking.

Thank you for the opportunity to provide these comments.

Best regards,

Craig A. Jones
Environmental Program Manager

cc: Sarah Higer, Idaho Power
Ralph Myers, Idaho Power
Brian Hoelscher, Idaho Power

I-MineralsInc.
877.303.6573 • 604.303.6573 • Fax 604.684.0642
Suite 880, 580 Hornby Street • Vancouver, BC Canada V6C 3B6 • www.imineralsinc.com

September 24, 2014

Mr. Don Essig
Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706

Re: Idaho Water Quality Standards, Triennial Review Process

Dear Mr. Essig:

I-Minerals Inc., an Idaho based company, appreciates the opportunity to comment on Triennial Review Process regarding Idaho's water quality standards. Please see our comments below.

We request definitions of "waters" and "water bodies" be clarified in DEQ's water quality rules in view of the inconsistency of the statutory definitions of those terms. We believe this should be a high priority and should be addressed early in your rulemaking process.

"Waters and Waters of the State" are defined in your water quality rules (IDAPA - 58.01.02) as "All the accumulations of water, surface and underground, natural and artificial, public and private, or parts thereof which are wholly or partially within, which flow through or border upon the state."

This appears to be based on the definition of "Waters" in 39-103(18), Idaho Code: "all accumulations of water, surface and underground, natural and artificial, public and private or parts thereof which are wholly or partially within, flow through or border upon this state except for private waters as defined in section 42-212, Idaho Code.".

"Waters or water body" are defined in 39-3602(34), Idaho Code: "the navigable waters of the United States as defined in the federal clean water act. For the purposes of this chapter, water bodies shall not include municipal or industrial wastewater treatment or storage structures or private reservoirs, the operation of which has no effect on waters."

Because Title 39 Chapter 36 is the section of Idaho Code governing water quality, we believe the definitions in the water quality rules must be consistent with the statutory definitions in that section of code not the definition in Title 39 Chapter 1.

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We also request that another high priority be to include artificial ponds, impoundments and lakes in the definition of man-made waters and that they be subject to a new beneficial use category that protects those waters for the purpose for which the structures were constructed. We further request that man-made waters then be excluded from the definition of "waters or water bodies."

Thanks you for your consideration of these requests.

Sincerely,

A. Lamar Long
Project Manager

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Telephone: (208) 773-8984 • Fax: (208) 773-2704

From: Robbin Finch [mailto:RFINCH@cityofboise.org]
Sent: Monday, September 29, 2014 4:40 PM
To: Paula Wilson
Cc: Don Essig; Barry Burnell; Steve Burgos
Subject: Boise City Comments on Proposed Triennial Review Priorities

Dear Ms. Wilson,

The City of Boise appreciates the three triennial rulemaking meeting held by the Idaho Department of Environmental Quality over the summer. The City has participated in two of the three meetings and reviewed the triennial review issue papers and found them very useful in describing the wide ranges of pending water quality standards issues before the state. The City has the following comments on the issue papers and priorities.

Comment 1: Manmade Waters should be a High Priority for Rulemaking

The manmade waters issue is proposed as a medium priority. Because of municipal wastewater and stormwater discharges and associated National Discharge Pollutant Elimination System (NPDES) permitting for discharges to manmade waters of the state, the City believes that the manmade waters issue should be elevated to high priority.

The basis for elevation of manmade waters to high priority is that essentially every Municipal Separate Storm Sewer System (MS4), multiple Multi-Sector General Permits (MSGP), multiple Construction General Permits (CGP) permits and a number of municipal wastewater facilities discharge, at least in southern Idaho, to manmade waters, making this issue of critical importance for permitting, impaired water listing, and TMDL development. The appropriate protections for manmade waters (default or use for which the manmade structures were constructed) and related NPDES permit requirements, impaired waters listings, and TMDL development obligations are all dependent on the uses that manmade waters are determined to be protected for.

An example of the issue is the Boise/Garden City MS4 permit issued in 2012, is based on MS4 discharges to at least 30 manmade waters (e.g. laterals, canals, ditches, or drains, including Ridenbaugh, Settlers, and Boise City Canals…; Milk, Gruber, Powell, and Rust laterals…; and A, A1, and B drains…) and the Boise River, which has designated uses, are identified as receiving waters. The beneficial uses and associated criteria are the basis for development of the MS4 requirements, impaired waters listing, and subsequent TMDL development as needed.

Clearly, resolution of the uses and associated criteria for protection of the uses is a critical element of standards setting and NPDES permitting.

Comment 2: EPA Policy on Manmade Waters

EPA policy regarding manmade waters appears to support the Idaho Department of Environmental Quality position that manmade waters are to be protected for the uses for which they were constructed. In the 2008 EPA final NPDES Water Transfer Rule response to comments on intervening use, the agency states that:

> "For example, if the water is withdrawn to be used *as cooling water, use drinking water, irrigation, or any other such that it is no longer a water of the U.S.* before being returned to a water of the U.S., the water has been subjected to an intervening use." 73 Fed. Reg. 33704 (June 13, 2008).

The City appreciates the opportunity to comment on the triennial review process priorities and the informed, clear, and transparent process around priority setting for this important work.
If you have questions concerning these comment, please feel free to contact me.

Robbin Finch
Water Quality Manager
Boise City Public Works

September 29, 2014

Ms. Adams
Water Quality Standards Coordinator
Idaho Department of Environmental Quality
1410 North Hilton Street
Boise, ID 83706

Subject: Comments on the Idaho Triennial Review: Recommendation for Updating the Aquatic Life Criteria for Zinc

Dear Ms. Adams:

This letter provides comments for the current triennial review of water quality standards (WQS) in Idaho. The comments provided here are primarily related to the numeric zinc criteria for protection of freshwater aquatic life and, specifically, use of a tool called the biotic ligand model (BLM) that allows for derivation of freshwater criteria based on site-specific water chemistry parameters. These comments are being provided jointly by the International Zinc Association (IZA, Durham, NC) and Windward Environmental (Seattle, WA).

The IZA is a non-profit industry association dedicated to the global market for zinc and the role of zinc in sustainable development. As such, the IZA actively supports research programs on the fate and effects of zinc in the environment and supports the adoption of regulatory standards for zinc that reflect the current state-of-the-science. Windward Environmental is a consulting firm consisting of environmental scientists and engineers who support the IZA on zinc research projects and work with the regulated community in complying with water quality standards for zinc and other metals.

The following section first provides a brief summary of our recommendation with regard to updated aquatic life criteria for zinc in Idaho, with subsequent sections briefly providing additional background used as the basis of our recommendation (we included technical details in the appendix to this letter).

Summary of Recommendations for Updated Freshwater Aquatic Life Zinc Criteria in Idaho

The hardness-based zinc criteria for protection of freshwater aquatic life in Idaho were last updated in 1995. Accordingly, Idaho's current zinc criteria are now almost 20 years old. Research conducted since the 1995 criteria were released has added a substantial amount of data on the toxicity of zinc to a number of freshwater species. In addition to hardness, it is now well understood that several other water chemistry variables influence the bioavailability and, hence, toxicity of zinc. The biotic ligand model (BLM) is a tool to predict the toxicity of zinc, and other metals, to aquatic life over a range of water chemistry conditions (and not just over a range of hardness conditions). Recognizing the importance of this new tool, in 2007 the EPA provided nationally recommended BLM-based copper criteria for freshwater aquatic life (EPA 2007). Draft BLM-based zinc criteria were submitted to the EPA in 2006 by the International Lead Zinc Research Organization (ILZRO), but these criteria have not been released by the EPA for public comment. In addition, an updated evaluation of BLM-based criteria for zinc, including development of BLM-based acute and chronic criteria following the EPA guidelines for criteria development (EPA 1985), has recently been published in the peer-reviewed journal Environmental Toxicology and Chemistry (DeForest and Van Genderen 2012). Notably, chronic BLM-based zinc criteria derived using the expanded ecotoxicity database demonstrated that several of the most sensitive genera were not protected using the current hardness-based criteria.

Given the opportunity to provide more accurate water quality protection, we strongly recommend that the IDEQ adopt the BLM as the basis for freshwater zinc criteria in Idaho. However, the current status of BLM-based zinc criteria within EPA may complicate statewide adoption of BLM-based zinc criteria during the current triennial review. Accordingly, as an interim step, we recommend that the IDEQ consider updating Reg. 2.308 to specifically allow for use of the BLM to derive site-specific zinc criteria.

INTRODUCTION

The current Idaho WQS provide freshwater aquatic life criteria based on nationally recommended EPA criteria that have not been updated for many years, in some cases for more than two decades. These criteria include the priority pollutant metals arsenic, chromium, copper, lead, nickel, selenium, silver, and zinc. It is the EPA's policy to update criteria as new scientific information becomes available, especially that which could significantly affect environmental management decisions. However, EPA criteria updates have not kept pace with the state of the science. As long as they follow accepted EPA guidance, states are free to provide their own criteria updates and not wait for EPA to provide criteria documents. Given the current state of the science as explained below, the IDEQ has an opportunity to use the current triennial review to bring their state WQS up-to-date with the best science and provide more appropriate policy and more accurate tools for regulating and managing water quality in the state.

LIMITATIONS WITH IDAHO'S CURRENT ZINC CRITERIA

The Idaho WQS currently include acute and chronic zinc criteria that are calculated as a function of water hardness. These criteria are based on the 1987 EPA criteria updates. A more recently developed tool for deriving water quality criteria for several metals, including zinc, is the biotic ligand model (BLM). The BLM accounts for several factors that influence metal bioavailability and, hence, toxicity. For example, in addition to hardness, zinc toxicity is also strongly related to other important factors such as pH and dissolved organic carbon (DOC), which are accounted for in the BLM (see Appendix A for a more detailed discussion of the BLM and derivation of BLM-based criteria).

The BLM-based criteria, therefore, can provide more accurate levels of freshwater aquatic life protection across a broad range of water quality conditions than the outdated hardness-based criteria. In fact, the recent evaluation of DeForest and Van Genderen (2012) determined that chronic hardness-based zinc criteria do not meet the desired level of protection in certain water bodies (several most sensitive genera not protected), while the chronic BLM-based criteria do.

PRECEDENT FOR BLM-BASED CRITERIA

For copper, the EPA recently released aquatic life criteria based on the BLM (EPA 2007). The BLM represents a significant step forward for developing criteria based on the best available science for not only copper, but several other metals, including zinc. Draft BLM-based zinc criteria were submitted to the EPA in 2006, but the EPA has yet to review and release the draft BLM-based zinc criteria for public comment. In addition, as previously noted, an updated evaluation of BLM-based criteria for zinc, including development of BLM-based acute and chronic criteria following the EPA guidelines for criteria development (EPA 1985), has been recently published in the peer-reviewed journal *Environmental Toxicology and Chemistry* (DeForest and Van Genderen 2012).

While EPA review and issuance of nationwide criteria is a principal pathway for states to update their own criteria, it is not the only means of doing so. States can provide their own updates following EPA guidance and procedures and these can be approved by the EPA, as required. Many states have decided not to wait for EPA criteria updates and have already developed and adopted their own updated criteria for metals such as zinc, cadmium and aluminum (e.g., Colorado and New Mexico in 2010-2011).

IMPLEMENTATION OF BLM-BASED CRITERIA

Some commonly expressed concerns with implementing BLM-based criteria are that there are too many water quality parameters to measure, that the parameter measurements are time varying, that the model is too complex, or that state-wide implementation is premature. However, some of these concerns are misperceptions or are germane to any water quality criterion, while there are existing procedures for simplifying implementation.

- First, in terms of the number of water quality parameters required, the BLM generates instantaneous acute and chronic criteria using 10 water quality input parameters that typically cost less than $200 per sample (temperature, pH, and concentrations of DOC, calcium, magnesium, sodium, potassium, sulfate, chloride, and alkalinity). However, several of these measurements are routinely measured (e.g., temperature and pH, and calcium and magnesium in support of hardness-based criteria). Accordingly, the added cost and field effort for these remaining BLM data needs are minimal. In addition, not all of the parameters are equally important in the BLM and may be estimated from concentrations of other parameters, such as using calcium concentrations to estimate concentrations of other ions (Peters et al. 2011).
- Second, the concern with time varying water chemistry is not an issue unique to the BLM as this also applies to hardness when implementing hardness-based metals criteria. There are existing approaches, such as the fixed monitoring benchmark (FMB) approach (current BLM-based implementation approach being reviewed by the EPA), which is a probability-based method that incorporates time variability in BLM-predicted instantaneous water quality criteria and in-stream metal concentrations.
- Third, in terms of the perception that the BLM is too complex, the BLM software is publicly available, sanctioned by EPA, and requires only brief training to generate rapid and useable output (the user interface looks like an Excel® spreadsheet). The model has built in features to guide the user and prevent errors, such as using inconsistent units or using input parameters beyond calibration ranges.
- Fourth, state-wide implementation can be incremental or deferred while site-specific BLM criteria are implemented. New Mexico is an example of one state that has elected this approach for the EPA's 2007 copper BLM-based criteria (NMED 2011).

IMPORTANCE OF UPDATED BLM-BASED ZINC CRITERIA

In Idaho, numerous permittees covered by National Pollution Discharge Elimination System (NPDES) permits would be subject to compliance based on the EPA's outdated zinc criteria. These permits are the principle regulatory vehicle for Clean Water Act implementation to protect and restore water quality. The NPDES permits

rely on state WQS and criteria for setting appropriate effluent limits or performance benchmarks. Water quality criteria drive permit compliance decisions and can lead to significant capital expenditures. Water quality criteria also drive the 303(d) and TMDL process for identifying and cleaning up impaired water bodies.

Using outdated criteria for regulatory purposes could lead to wasted resources on unnecessary listings (i.e., false positives). Using outdated criteria may also result in under-protection of aquatic life (i.e., false negatives). The EPA has always intended criteria to be updated as new toxicity data become available and has specific guidance for developing and updating criteria.

PROPOSED CHANGES TO IDEQ'S NUMERIC CRITERIA FOR ZINC

In summary, the IZA and Windward Environmental encourage the IDEQ to adopt BLM-based zinc criteria as the default basis for development of state-wide zinc criteria or, at a minimum, as an explicit option for deriving site-specific zinc criteria. Use of the BLM to derive zinc criteria is based on the most current science and has been recommended by the EPA for copper (EPA 2007) and adopted in several states. However, we believe that statewide implementation of BLM-based zinc criteria should be the ultimate goal of the IDEQ. Using the BLM would allow the IDEQ to more effectively assess and manage waters where the hardness-based criteria could be over- or under-protective of aquatic life and correspondingly result in over- or under-regulating permittees. The evaluation of DeForest and Van Genderen (2012) indicated that for most waters the existing hardness-based acute zinc criteria are over-protective and that the chronic zinc criteria are under-protective.

The IZA and Windward Environmental believe that adoption of BLM-based water quality criteria for metals represents a fundamental advancement to achieve appropriate environmental protection and regulation. To this end, comments being submitted to the IDEQ on behalf of the Copper Development Association (CDA) and International Copper Association (ICA) are also recommending that the IDEQ consider updating the freshwater aquatic life criteria for copper using the BLM.

Thank you for the opportunity to provide these comments for consideration by the IDEQ during Idaho's triennial review process. Please let us know if you have any questions or if you would like to discuss this further.

Sincerely,

Eric Van Genderen, Ph.D.
Manager, Environment and Sustainability
International Zinc Association
evangenderen@zinc.org

Scott Tobiason
Sr. Associate | Sr. Environmental Engineer
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REFERENCES

DeForest DK, Van Genderen EJ. 2012. Application of USEPA guidelines in a bioavailability-based assessment of ambient water quality criteria for zinc in freshwater. Environ Toxicol Chem 31:1264-1272.

EPA. 1985. Guidelines for deriving numerical national water quality criteria for the protection of aquatic organisms and their uses. U.S. Environmental Protection Agency, Washington, D.C. PB85-227049.

EPA. 1987. Ambient aquatic life water quality criteria for zinc. Office of Water, U.S. Environmental Protection Agency, Washington, D.C. EPA 440/5-87-003.

EPA. 2007. Aquatic life ambient freshwater quality criteria - Copper. Office of Water, U.S. Environmental Protection Agency, Washington, D.C. EPA-822-R-07-001.

New Mexico Environment Department (NMED). 2011. State of New Mexico Standards for Interstate and Intrastate Surface Waters. 20.6.4 NMAC as amended by the WQCC through January 14, 2011. Approved by EPA as of April 18, 2011

Peters A, Merrington G, De Schamphelaere K, Delbeke K. 2011. Regulatory consideration of bioavailability for metals: Simplification of input parameters for the chronic copper biotic ligand model. Integr Environ Assess Manage 7:437-444.

APPENDIX A

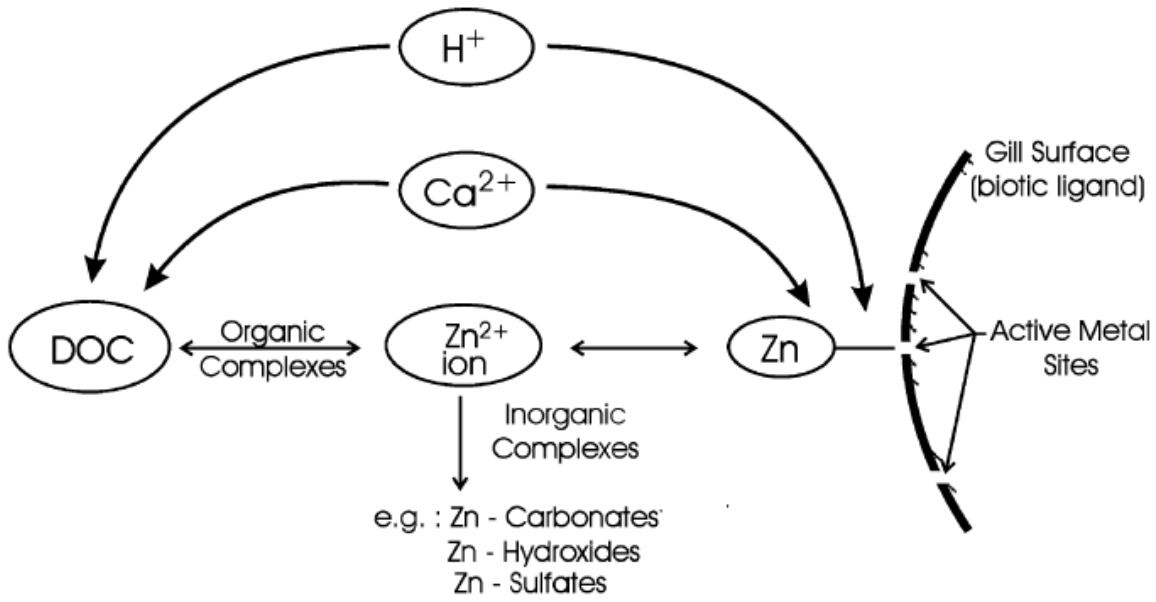
TECHNICAL BASIS OF THE ZINC BLM

Like the copper BLM recommended by the EPA for copper criteria development, the zinc BLM is a computational model that incorporates chemical reaction equations to evaluate the amount of metal that would bind to organism tissues (termed the "biotic ligand", such as a fish gill) and thus be ultimately responsible for causing toxicity. By incorporating chemical equilibria, the BLM better represents the complex chemical factors that influence zinc bioavailability, more so than the simple hardness-based approach (Di Toro et al. 2001, Heijerick et al. 2002). Unlike the hardness-based equation for zinc criteria, the BLM explicitly accounts for more of the important water quality variables that determine zinc bioavailability, and the BLM is not limited to a particular correlation between toxicity and these variables.

The mechanistic principles underlying the BLM follow general trends of zinc toxicity as related to individual water quality variables and their combinations. The basic premise of the BLM is that changes in water quality will cause a corresponding change in the concentrations of toxic forms of zinc (primarily Zn^{2+}) that can potentially bind to biological surfaces (i.e., the "biotic ligand"; Di Toro et al. 2001). Zinc bioavailability is also affected by competitive chemical binding interactions at the biotic ligand (e.g., fish gill) with calcium, in particular (Santore et al. 2002). The interactions between zinc, other ions, dissolved organic carbon (DOC), and the biotic ligand are shown in Figure 1. Each of the dissolved chemical species, with which the biotic ligand reacts, is represented by characteristic binding site densities and conditional stability constants (Playle et al. 1993). In turn, each of the chemical species can be predicted as a function of inorganic and organic equilibrium reactions. The thermodynamic constants used to simulate these equilibrium reactions are empirically derived and do not change for simulations involving different organisms.

Predictions of zinc toxicity are based on the relationships between the dissolved zinc LC50 and a critical level of zinc accumulation at the biotic ligand. This critical accumulation is called the median-lethal biotic ligand accumulation concentration, or LA50. While LA50 values can vary based on differential species sensitivity (i.e., more or less zinc-gill accumulation required to exert a similar toxic response), they are assumed to be constant within individual species regardless of water quality (Meyer et al. 1999). Overall, increases in hardness and natural organic matter tend to decrease zinc bioavailability, while changes in pH may have a variable influence on Zn bioavailability (Santore et al. 2002; Clifford and McGeer 2009).

Figure 1. Conceptual Diagram of the Biotic Ligand Model for Zinc



Source: Santore et al. (2002)

The draft BLM-based zinc criteria submitted to EPA in 2006 were ultimately developed using an approach that is analogous to EPA metals criteria derivation methods that are based on normalizing available toxicity data to a similar hardness (EPA 1985). The zinc BLM was used to normalize LC50 values to a single reference exposure condition that includes all of the BLM water quality parameters. Although not all historical studies reported concentrations of parameters needed for the BLM, the dataset was supplemented by new data from current research. Once the data were normalized to the BLM parameters for this reference exposure condition, criteria derivation procedures followed EPA guidance (EPA 1985). Accordingly, the acute criterion was estimated from a ranked distribution of BLM-normalized genus-mean acute values from which the 5th percentile of sensitivity (i.e., the final acute value) was divided by two to calculate the acute criterion. Insufficient data were available to explicitly derive a separate BLM-based chronic criterion. Thus, according to the EPA guidance, the BLM-normalized acute criterion was divided by the final acute-chronic ratio to derive a chronic criterion.

As discussed above, updated BLM-based zinc criteria have recently been updated and developed following EPA guidelines (DeForest and Van Genderen 2012). This included an update of acute and chronic zinc toxicity data, parameterization of a single BLM that accurately predicts acute and chronic zinc toxicity as a function of varying water chemistry (i.e., varying DOC, hardness, pH, etc.), and development of BLM-based acute and chronic criteria. The chronic BLM-based zinc criteria developed in DeForest and Van Genderen (2012) are based on empirical chronic toxicity data and preclude the use of an ACR. This evaluation found that the existing hardness-based chronic criteria for zinc may be under-protective in several water types.

Use of the BLM represents a significant improvement upon the current hardness-based zinc criteria. The BLM has been adequately validated for a wide range of water quality conditions, and therefore provides more accurate and scientifically-defensible water quality criteria. Validation studies have shown that over a very wide range of water quality characteristics (e.g., hardness, alkalinity, and ion composition), the BLM provides criteria concentrations that are more accurate and consistently protective of even the most acutely sensitive aquatic organisms (e.g., De Schamphelaere et al. 2005).

APPLICATION OF THE BLM TO WATER QUALITY CRITERIA

It is important to note that both the hardness-based and BLM-based zinc criteria rely on "models" to calculate criteria. For hardness-based metals criteria, a simple equation, which is in essence a "model," mathematically relates the criterion concentration to a single variable, in this case hardness (hardness is an aggregate measure of calcium and magnesium cations). For the BLM-based zinc criteria, a computer model mathematically relates multiple water quality characteristics, including hardness cations, to the final criterion concentration. While the BLM itself is mathematically more complex, it is mechanistically more realistic than the hardness-based approach.

Like any policy, changes to a regulatory criterion should consider implementation needs and how they will be different from the status quo. Most states have guidance documents for implementing water quality criteria in assessments and regulatory needs and other guidance documents. Guidance documents like these can be a more appropriate place to provide the necessary details for implementation than the WQS language, especially given that rulemaking considerations affect only the standards (i.e., guidance documents are not rules). Accordingly, the IDEQ should thoroughly evaluate their related guidance and policy documents so they are effective and up-to-date with best practices and EPA guidance.

In terms of data needs for implementation, for determining zinc criteria under either the hardness- or BLM-based approach, measurements of Ca^{2+} and Mg^{2+} are needed (assuming the hardness-based criterion would employ the more accurate method for determining hardness by calculating hardness from the Ca and Mg ion concentrations per SM2340B). Therefore, the difference between data needs for the hardness-based and BLM-based criteria are the remaining eight BLM parameters: temperature, pH, alkalinity, DOC, sodium, potassium, chloride, and sulfate. Temperature and pH data must be field collected, which is a straight forward process using handheld meters or simpler means. For the remaining additional parameters, the costs for analyses by accredited laboratories are typically less than $100. Furthermore, samples for these analyses are as easily collected as the samples for hardness data needs for hardness-based criteria. Note that DOC samples must be filtered shortly after collection, which is also needed for evaluating metals criteria compliance based on a dissolved (filtered) metals sample. Therefore, the added cost and field effort for BLM data needs are minimal.

The next criteria implementation need would address the number and location of water quality samples that need to be collected to adequately characterize a particular water body for applying the criterion. General guidance is available from EPA which provides several suggested sampling strategies depending on the type of water body and the anticipated seasonal or spatial variation anticipated in BLM parameters (EPA 2007b). This potential issue of variability over time and space would be important to address for both BLM-based and the current hardness-based criteria. It is important to note that any criterion based on an instantaneous or short-term reading such as a hardness would be susceptible to certain time-variability considerations. Therefore, this situation is not unique to the BLM, as noted in the EPA's BLM-based copper criteria (EPA 2007a):

With regard to BLM-derived freshwater criteria, to develop a site-specific criterion for a stream reach, one is faced with determining what single criterion is appropriate even though a BLM criterion calculated for the event corresponding to the input water chemistry conditions will be time-variable. This is not a new problem unique to the BLM – hardness-dependent metals criteria are also time-variable values. Although the variability of hardness over time can be characterized, EPA has not provided guidance on how to calculate site-specific criteria considering this variability. Multiple input parameters for the BLM could complicate the calculation of site-specific criteria because of their combined effects on variability. Another problem arises from potential scarcity of data from small stream reaches with small dischargers.

EPA has also provided general guidance as to the various regulatory options that could be used to encourage states and tribes to implement copper BLM-based criteria in their water quality standards programs (EPA 2007c). This guidance emphasizes that considerable flexibility exists in implementing BLM-based copper criteria, with suggested implementation options being full statewide implementation of the BLM-based criteria, or the incremental approach of using the BLM for certain water bodies (i.e. TMDLs) on a site-specific basis.

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