

**Proposed Revisions to Chapter 1, Water Quality Rules and
Regulations**

For Review by the Environmental Quality Council

Rule Package

**For Consideration at the Upcoming
Environmental Quality Council Hearing**

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Memo from the Director

Section 1



Department of Environmental Quality



To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Director

June 12, 2008

Chairman
Environmental Quality Council
122 West 25th Street
Herschler Building, 1W
Cheyenne, WY 82002

Dear Mr. Chairman:

Enclosed, please find a rule package containing proposed revisions to the Wyoming Water Quality Rules and Regulations, Chapter 1, "Wyoming Surface Water Quality Standards".

Revisions to Chapter 1, Section 20, Agricultural Water Supply in the form of a new appendix (Appendix H, Agricultural Use Protection) were considered by the Water and Waste Advisory Board during a series of four public meetings and three public comment periods. The Board has recommended forwarding the draft rule with their final recommendations to the Environmental Quality Council for a public hearing.

I recommend that you proceed with final adoption of these rules. The Water Quality Divisions (WQD) will work closely with the Environmental Quality Council to accommodate the Council's schedule and to allow adequate review of the rule package. If you have any questions concerning the rule package or the request, please contact David Waterstreet with the WQD at 777-6709.

Sincerely,

John Corra
Director
Department of Environmental Quality

JVC/DHW/bb/8-0472.DOC

Enclosures: Notice of Intent to Adopt Rules
Draft Chapter 1
Statement of Principal Reasons
Implementation Policies
CD – Administrative Record

cc: John Wagner, WQD
Terri Lorenzon, EQC

Herschler Building • 122 West 25th Street • Cheyenne, WY 82002 • <http://deq.state.wy.us>

ADMIN/OUTREACH (307) 777-7937 FAX 777-3610	ABANDONED MINES (307) 777-6145 FAX 777-6462	AIR QUALITY (307) 777-7391 FAX 777-5616	INDUSTRIAL SITING (307) 777-7369 FAX 777-5973	LAND QUALITY (307) 777-7756 FAX 777-5864	SOLID & HAZ. WASTE (307) 777-7752 FAX 777-5973	WATER QUALITY (307) 777-7781 FAX 777-5973
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Notice of Intent

Section 2

NOTICE OF INTENT TO ADOPT RULES AND REGULATIONS

1. Agency: Department of Environmental Quality / Water Quality Division
Address: 122 West 25th Street, Herschler Building, 4W, Cheyenne
Agency Contact Person for these Rules: David Waterstreet
Work Telephone: 777 - 6709

2. Statement of the terms and substance of the proposed rule or a description of the subjects and issues involved:

The Department of Environmental Quality (DEQ), Water Quality Division, pursuant to the authority vested in it by the Act, Wyoming Statutes 35-11-101 to 1507 *et seq.*, proposes to amend and revise Chapter 1 of the Wyoming Water Quality Rules and Regulations (Chapter 1). Chapter 1 contains the quality standards for surface waters in the state including water classifications, designation of protected uses, numeric and narrative water quality criteria, and implementation policies. These proposed revisions are directly related to Section 20, Agricultural Water Supply in the form of a new appendix (Appendix H) which serves to interpret the Section 20 narrative standard into procedures for setting effluent limits and conditions in Wyoming Pollution Discharge Elimination System (WYPDES) permits.

3. Citation to each agency rule being amended or repealed:

Wyoming Water Quality Rules and Regulations, Chapter 1: adding a new appendix (Appendix H, Agricultural Use Protection) which interprets Section 20; revision to Section 20, referencing Appendix H.

4. If the proposed rules amend existing rules, a copy of the proposed rules in a format that clearly indicates additions to and deletions from existing language may be obtained at:

Copies of this proposed rule and the statement of principal reasons are available from the Department of Environmental Quality, 122 West 25th Street, Herschler Building-4W, Cheyenne, WY, 307-777-7781; Persons may request a copy of the proposed rules by contacting Connie Osborne at 307-777-5593, fax at 307-777-5973; email address: cosbor@state.wy.us. Questions regarding the proposed rules may be directed to David Waterstreet at 307-777-6709.

5. Statement of the time when, the place where, and the manner in which interested persons may present their views on the intended action:

Interested persons may submit written comments without attending the Environmental Quality Council hearing by submitting them to the DEQ/Water Quality Division, ATTN: David Waterstreet, 122 West 25th Street, Herschler Building- 4W, Cheyenne, WY 82002. Written comments will be received within the comment period time frame before the public hearing. Oral comments will be received at the hearing. A hearing date and location has not been set. There is a potential that the EQC will vote to adopt the rules at the end of the hearing.

In accordance with the Americans with Disabilities Act, special assistance or alternate formats will be made available upon request for individuals with disabilities.

6. (If not already scheduled as shown by Item 7 below) A public hearing will be held if requested by 25 persons, a governmental subdivision or by an association having not less than 25 members. Requests for a public hearing may be addressed to:

DEQ/Water Quality Division, ATTN: David Waterstreet, 122 West 25th Street, Herschler Building- 4W, Cheyenne, WY 82002

7. Yes No A public hearing on the proposed rules has been scheduled.

If Yes: Date, time and place of scheduled hearing:

N/A

8. Any person may urge the agency not to adopt the rules and also request the agency to state its reasons for overruling the consideration urged against adoption. Requests for an agency response under this Item 8 must be made prior to, or within (thirty) 30 days after adoption of the rule, addressed to:

Administrator, Water Quality Division, 122 West 25th Street, Herschler Building, 4W, Cheyenne, WY 82002.

9. Yes No These are New Rules (i.e., these are the first set of rules to be promulgated by the agency after the Legislature's adoption of a new statutory provision or an act significantly amending an existing statute. A new rule is one that is promulgated in direct response to, or that is mandated by, the enacted statute and may involve creation of an entirely new provision in the agency's rules or the repeal or amendment of an existing rule.)

If Yes: Citation to the specific legislation resulting in promulgation of these rules:

N/A

10. Yes No These rules are adopted, amended or repealed to comply with federal law or regulatory requirements.

If Yes:

(a) Citation to applicable federal law or regulation:

These rule revisions are proposed to comply with the federal regulations regarding the adoption of state water quality standards, specifically 40 CFR Part 131 which requires the designation of water uses, the establishment of water quality criteria sufficient to protect the designated uses, and the implementation of an antidegradation policy.

(b) Indicate one:

The proposed rules meet but do not exceed minimum federal requirements; (or)

The proposed rules exceed minimum federal requirements.

(c) Any person wishing to object to the accuracy of any information provided by the agency under this Item 10 should submit their objections prior to final adoption to:

Administrator, DEQ/Water Quality Division, 122 West 25th Street, Herschler Building, 4W, Cheyenne, WY 82002.

If timely objections are submitted, the agency will provide the objecting person with a written response explaining and substantiating the agency's position by reference to federal law or regulations.

11. Indicate one: (Required by W.S. 16-3-103(a)(i)(G))

The proposed rule change meets minimum substantive state statutory requirements.

The proposed rule change exceeds minimum substantive state statutory requirements.

If the rule change exceeds the minimum substantive state statutory requirements, the agency shall include a statement explaining the reason the rule exceeds minimum substantive statutory requirements.

Proposed Draft, Chapter 1

Section 4

Wyoming Environmental Quality Council Hearing

(Date of Hearing)

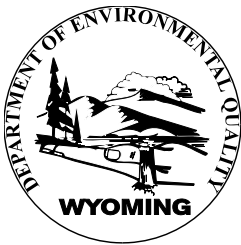
The Wyoming Environmental Quality Council (EQC) will meet on (Date), at (Location) to accept public comments and consider adoption of revisions to Chapter 1, Wyoming Water Quality Rules and Regulations – Surface Water Quality Standards. Interested persons may submit written comments without attending the EQC hearing by submitting them to the DEQ/Water Quality Division, ATTN: David Waterstreet, 122 West 25th Street, Herschler Building- 4W, Cheyenne, WY 82002 by (Date). Oral comments will also be received at the hearing. There is a potential that the EQC will vote to adopt the proposed rule revisions at the end of the hearing.

The Department of Environmental Quality (DEQ), Water Quality Division, pursuant to the authority vested in it by the Act, Wyoming Statutes 35-11-101 to 1507 et seq., proposes to amend and revise Chapter 1 of the Wyoming Water Quality Rules and Regulations (Chapter 1). Chapter 1 contains the quality standards for surface waters in the state including water classifications, designation of protected uses, numeric and narrative water quality criteria, and implementation policies. These proposed revisions are directly related to Section 20, Agricultural Water Supply in the form of a new appendix (Appendix H) which serves to interpret the Section 20 narrative standard into procedures for setting effluent limits and conditions in Wyoming Pollution Discharge Elimination System (WYPDES) permits.

Copies of this proposed rule and the Statement of Principal Reasons are available for review at the following internet address: <http://deq.state.wy.us/wqd/watershed/surfacestandards/index.asp>, or from the Department of Environmental Quality, 122 West 25th Street, Herschler Building-4W, Cheyenne, WY, 307-777-7781; Persons may request a copy of the proposed rules by contacting Connie Osborne at 307-777-5593, fax at 307-777-5973; email address: cosbor@state.wy.us. Questions regarding the proposed rules may be directed to David Waterstreet at 307-777-6709.

In accordance with the Americans with Disabilities Act, special assistance or alternative formats will be made available upon request for individuals with disabilities.

DEPARTMENT OF ENVIRONMENTAL QUALITY
HERSCHLER BUILDING
122 WEST 25TH STREET - 4W
CHEYENNE, WYOMING 82002



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Proposed Draft, Chapter 1

Section 4

WATER QUALITY RULES AND REGULATIONS

Chapter 1

DRAFT

WYOMING SURFACE WATER QUALITY STANDARDS

Proposed Rules
1st Draft
(Public Notice Date)

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Chapter 1

WYOMING SURFACE WATER QUALITY STANDARDS

Section 1. **Authority.** These regulations are promulgated pursuant to W. S. 35-11-101 through 1507 specifically 302 (a) (i) and 302 (b) (i) and (ii), and no person shall cause, threaten or allow violation of a surface water quality standard contained herein. Nothing in this definition is intended to expand the scope of the Environmental Quality Act, as limited in W. S. 35-11-1104 nor do these regulations supersede or abrogate the authority of the state to appropriate quantities of water for beneficial uses.

Section 2. **Definitions.**

(a) The definitions in section 35-11-103(a) and (c) of the Wyoming Environmental Quality Act apply to these rules. For example:

(i) “Compensatory mitigation” means replacement, substitution or enhancement of ecological functions and wetland values to offset anticipated losses of those values caused by filling, draining or otherwise damaging a wetland;

(ii) “Credible data” means scientifically valid chemical, physical and biological monitoring data collected under an accepted sampling and analysis plan, including quality control, quality assurance procedures and available historical data;

(iii) “Discharge” means any addition of any pollution or wastes to any waters of the state;

(iv) “Ecological function” means the ability of an area to support vegetation and fish and wildlife populations, recharge aquifers, stabilize base flows, attenuate flooding, trap sediment and remove or transform nutrients and other pollutants;

(v) “Man-made wetlands” means those wetlands that are created intentionally or occur incidental to human activities, and includes any enhancement made to an existing wetland which increases its function or value;

(vi) “Mitigation” means all actions to avoid, minimize, restore and compensate for ecological functions or wetland values lost;

(vii) “Natural wetlands” means those wetlands that occur independently of human manipulation of the landscape;

(viii) “Nonpoint source” means any source of pollution other than a point source. For purposes of W.S. 16-1-201 through 16-1-207 only, nonpoint source includes leaking underground storage tanks as defined by W.S. 35-11-1415(a)(ix) and aboveground storage tanks as defined by W.S. 35-11-1415(a)(xi);

(ix) “Point source” means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessel or other floating craft, from which pollutants are or may be discharged;

(x) “Pollution” means contamination or other alteration of the physical, chemical or biological properties of any waters of the state, including change in temperature, taste, color, turbidity or odor of the waters or any discharge of any acid or toxic material, chemical or chemical compound, whether it be liquid, gaseous, solid, radioactive or other substance, including wastes, into any waters of the state which creates a nuisance or renders any waters harmful, detrimental or injurious to public health, safety or welfare, to domestic, commercial, industrial, agricultural, recreational or other legitimate beneficial uses, or to livestock, wildlife or aquatic life, or which degrades the water for its intended use, or adversely affects the environment. This term does not mean water, gas or other material which is injected into a well to facilitate production of oil, or gas or water, derived in association with oil or gas production and disposed of in a well, if the well used either to facilitate production or for disposal purposes is approved by authority of the state, and if the state determines that such injection or disposal well will not result in the degradation of ground or surface or water resources;

(xi) “Wastes” means sewage, industrial waste and all other liquid, gaseous, solid, radioactive, or other substances which may pollute any waters of the state;

(xii) “Waters of the state” means all surface and groundwater, including waters associated with wetlands, within Wyoming;

(xiii) “Wetlands” means those areas in Wyoming having all three (3) essential characteristics:

- (A) Hydrophytic vegetation;
- (B) Hydric soils; and
- (C) Wetland hydrology.

(xiv) “Wetland value” means those socially significant attributes of wetlands such as uniqueness, heritage, recreation, aesthetics and a variety of economic values.

(b) The following definitions supplement those definitions contained in section 35-11-103 of the Wyoming Environmental Quality Act.

(i) “Acute value” means the one hour average concentration. The EPA has determined that this value, if not exceeded more than once every three years on average, should not result in unacceptable effects on freshwater aquatic organisms and their uses. Acute values represent a response to a stimulus severe enough to induce a rapid reaction, typically in 96 hours or less. Appendix B contains acute values for certain pollutants.

(ii) “Adjacent wetlands” means wetlands that are connected by a defined channel to a surface tributary system, or are within the 100 year flood plain of a river or stream, or occupy the fringe of any still water body which is connected by a defined channel to a surface tributary system.

(iii) “Ambient-based criteria” means water quality criteria that are calculated based upon actual ambient or background water body conditions.

(iv) “Aquatic life” means fish, invertebrates, amphibians, and other flora and fauna which inhabit waters of the state at some stage of their life cycles. Aquatic life does not include insect pests or exotic species which may be considered undesirable by the Wyoming Game and Fish or U.S. Fish and Wildlife Service within their appropriate jurisdictions and identified human pathogens.

(v) “Assimilative capacity” means the increment of water quality in terms of concentration, during the appropriate critical condition(s) that is better than the applicable numeric criterion. The concept of assimilative capacity has no meaning in relation to pollutants that are limited only by narrative criteria.

(vi) “Best management practices (BMPs)” means a practice or combination of practices that after problem assessment, examination of alternative practices, and in some cases public participation, are determined to be the most technologically and economically feasible means of managing, preventing or reducing nonpoint source pollution.

(vii) “Chronic value” means the four day average concentration. The EPA has determined that this value, if not exceeded more than once every three years on average, should not result in unacceptable effects on freshwater aquatic organisms and their uses. Chronic values represent a response to a continuous, long-term stimulus. Appendix B contains chronic values for certain pollutants.

(viii) “Cold water game fish” means burbot (Genus Lota), grayling (Genus Thymallus), trout, salmon and char (Genus Salmo, Oncorhynchus and Salvelinus), and whitefish (Genus Prosopium).

(ix) “Construction-related discharge” means discharges of sediment or turbidity related to construction activities in or along waters of the state. Generally, these discharges include but are not limited to construction site dewatering, temporary diversions, runoff from construction sites, excavation or equipment operation beneath the water’s surface, the discharge of dredged or fill material and placement of structural members such as bridge abutments, culverts, pipelines, etc. into or across any water of the state.

(x) “Designated uses” means those uses specified in water quality standards for each water body or segment whether or not they are being attained.

(xi) “Dissolved oxygen” means a measure of the amount of free oxygen in water.

(xii) “E. coli” means any of the bacterium in the Family *Enterobacteriaceae* named *Escherichia* (Genus) *coli* (Species).

(xiii) “Effluent dependent water” means a water body that would be ephemeral without the presence of permitted effluent, but which has perennial or intermittent flows for all or a portion of its length as the result of the discharge of wastewater.

(xiv) “Effluent dominated water” means a water body that would be intermittent or perennial without the presence of wastewater effluent, but for which the flow or volume of water for the majority of the year is primarily attributable to the discharge of wastewater.

(xv) “Effluent limitations” means any restriction established by the state or by the administrator of the Environmental Protection Agency on quantities, rates and concentrations of chemical, physical, biological and other constituents which are discharged from point sources into waters of the state, including schedules of compliance.

(xvi) “Environmental Protection Agency” means the federal Environmental Protection Agency (EPA).

(xvii) “Ephemeral stream” means a stream which flows only in direct response to a single precipitation in the immediate watershed or in response to a single snow melt event, and which has a channel bottom that is always above the prevailing water table.

(xviii) “Eutrophic” means the condition whereby waters or environments saturated with water become nutrient enriched (especially with phosphorus or nitrogen). This action leads to those waters becoming oxygen depleted or anaerobic.

(xix) “Existing quality” as used in these regulations refers only to Class 1 waters and means the established chemical, physical, and biological water quality as of the date the specific water segment was designated Class 1 with recognition of the fact that water quality

will tend to fluctuate on a seasonal and year-to-year basis depending upon natural fluctuations in water quantity.

(xx) “Existing use” means those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards.

(xxi) “Federal Act” means the Federal Water Pollution Control Act (Clean Water Act) and amendments as of June 21, 2001.

(xxii) “Full body contact water recreation” means any recreational or other surface water use in which there is contact with the water sufficient to pose a significant health hazard (i.e., water skiing, swimming).

(xxiii) “Game fish” means bass (Genus Micropterus and Ambloplites), catfish and bullheads (Genus Ameiurus, Ictalurus Noturus and Pylodictis), crappie (Genus Pomoxis), freshwater drum (Genus Aplodinotus) grayling (Genus Thymallus), burbot (Genus Lota), pike (Genus Esox), yellow perch (Genus Perca), sturgeon (Genus Scaphirhynchus), sunfish (Genus Lepomis), trout, salmon and char (Genus Salmo, Oncorhynchus, and Salvelinus), walleye and sauger (Genus Stizostedion), and whitefish (Genus Prosopium).

(xxiv) “Historic data” means scientifically valid data that is more than five years old, or qualitative information that adds some factual information on the historic conditions of a water body. This historic qualitative information may include photographs, journals and factual testimony of persons who have lived near or relied upon the water body, and old records on water use and water conditions.

(xxv) “Hydric soil” means a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

(xxvi) “Hydrophytic vegetation” means a community of plants where, under normal circumstances more than 50 percent of the composition of the dominant species from all strata are obligate wetland (OBL), facultative wetland (FACW), and/or facultative (FAC) species; or a frequency analysis of all species within the community yields a prevalence index value of less than 3.0 (where OBL = 1.0, FACW = 2.0, FAC = 3.0, FACU (facultative upland) = 4.0, and UPL (upland species) = 5.0).

(xxvii) “Intermittent stream” means a stream or part of a stream where the channel bottom is above the local water table for some part of the year, but is not a perennial stream.

(xxviii) “Isolated water” means any surface water of the state which is not connected by a defined channel to a surface tributary system and is not within the 100 year flood

plain of any river or stream and does not occupy the fringe of any still water body which is connected by a defined channel to a surface tributary system.

(xxix) “Main stem” means the major channel of a river or stream as shown on the latest and most detailed records of the Wyoming State Engineer.

(xxx) “Micrograms per liter (mg/L)” means micrograms of solute per liter of solution equivalent to parts per billion (ppb) in liquids, assuming unit density.

(xxxi) “Milligrams per liter (mg/L)” means milligrams of solute per liter of solution equivalent to parts per million (ppm) in liquids, assuming unit density.

(xxxii) “Mixing zone” means limited area or volume of a surface water body within which an effluent becomes thoroughly mixed with the water body.

(xxxiii) “Nanograms per liter (ng/L)” means nanograms of solute per liter of solution equivalent to parts per trillion in liquids, assuming unit density.

(xxxiv) “Natural” means that condition which would exist without the measurable effects or measurable influence of man's activities.

(xxxv) “Natural biotic community” means the population structures which were historically or normally present under a given set of chemical and physical conditions or which would potentially exist without the measurable effects or measurable influence of man's activities had not the habitat been altered.

(xxxvi) “Natural water quality” means that quality of water which would exist without the measurable effects or measurable influence of man's activities.

(xxxvii) “Nephelometric turbidity unit (NTU)” means the standard unit used to measure the optical property that causes light to be scattered and absorbed rather than transmitted in straight lines through water, as measured by a nephelometer.

(xxxviii) “Net environmental benefit (NEB)” means a risk management approach to derive site-specific criteria for effluent dependent water bodies that weighs the potential for loss of a permitted effluent discharge against the benefits of augmented flow. A net environmental benefit is demonstrated where there is a credible threat to remove the permitted discharge, and the discharge has been shown to create an environmental benefit and removal of the discharge would cause more environmental harm than leaving it in place and the discharge will not pose a health risk to humans, livestock or wildlife.

(xxxix) “Nongame fish” means all fish species except those listed in Section 2 (b)(xx) above.

(xl) “Non-priority pollutant” means any substance or combination of substances other than those listed by EPA under Section 307(a) of the Federal Clean Water Act.

(xli) “Perennial stream” means a stream or part of a stream that flows continually during all of the calendar year as the result of a groundwater discharge or surface runoff.

(xlii) “pH” means a term used to express the intensity of acid or alkaline conditions. pH is a measure of the hydrogen ion activity in a water sample. It is mathematically related to hydrogen ion activity according to the expression: $\text{pH} = -\log_{10} (\text{H}^+)$, where (H^+) is the hydrogen ion activity. A pH value of 7 at 25 degrees C is neutral, with pHs of less than 7 progressively more acid and pHs of greater than 7 progressively more basic (alkaline).

(xliii) “PicoCuries per liter (pCi/L)” means a term describing the radiation level of water or solutions. A picocurie is equal to 10^{-12} curie; a curie is defined as 3.7×10^{10} disintegrations per second.

(xliv) “Priority pollutants” means those substances or combination of substances that are listed by EPA under Section 307(a) of the Federal Clean Water Act.

(xlv) “Primary contact recreation” means any recreational or other surface water use that could be expected to result in ingestion of the water or immersion (full body contact).

(xlvi) “Salinity” means the total mineral dissolved constituents, after carbonates have been converted to oxides, organics have been oxidized and bromine and iodine have been replaced by chloride. This term is often used interchangeably with the term total dissolved solids.

(xlvii) “Seasonal fishery” means a water body, or portion thereof, which supports game and/or nongame fish or spawning for only a portion of the year, but does not have the natural physical conditions necessary to support those uses on a year round basis. Seasonal fisheries may include intermittent and ephemeral streams, shallow reservoirs, lakes, or ponds, which either naturally recruit fish from adjacent perennial water bodies or are managed as put-and-take fisheries.

(xlviii) “Secondary contact recreation” means any recreational or other surface water use in which contact with water is either incidental or accidental and that would not be expected to result in ingestion of the water or immersion.

(xlix) “Storm water” for the purposes of Section 7 of this chapter, means surface runoff from construction sites or industrial activities which are regulated under Section 402 (p) of the federal Clean Water Act and Chapter 2 or Chapter 18 of the Wyoming Water Quality Rules and Regulations. Excluded from this definition are those storm water discharges

associated with industrial activities which are subject to an existing federal effluent limitation guideline addressing storm water and where the constituents listed in the federal effluent limitations have a reasonable potential to affect the receiving waters.

(l) “Surface waters of the state” means all perennial, intermittent and ephemeral defined drainages, lakes, reservoirs, and wetlands which are not man-made retention ponds used for the treatment of municipal, agricultural or industrial waste; and all other bodies of surface water, either public or private which are wholly or partially within the boundaries of the state. Nothing in this definition is intended to expand the scope of the Environmental Quality Act, as limited in W.S. 35-11-1104.

(li) “Toxic materials” means those materials or combinations of materials including disease causing agents, which, after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the director of the Wyoming Department of Environmental Quality cause death, disease, behavioral abnormalities, cancer, genetic malfunctions, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such organisms or their offspring.

(lii) “Tributary” means those streams or stream segments which flow into or contribute water to another stream, stream segment, downstream reach of the same stream, or other water body.

(liii) “Undesirable aquatic life” means organisms generally associated with degraded or eutrophic conditions. These may include the following organisms where they have replaced members of the natural biotic community: exotic fish, or species which are designated “undesirable” by the Wyoming Game and Fish Department or the U.S. Fish and Wildlife Service within their appropriate jurisdictions.

(liv) “Use attainability analysis (UAA)” means a structured scientific assessment of the factors affecting the attainment of the use. The factors may include physical, chemical, biological, and economic factors as described in Section 33 of these regulations.

(lv) “Warm water game fish” means bass (Genus Micropterus and Ambloplites), catfish and bullheads (Genus Ameiurus, Ictalurus, Noturus and Pylodictus), crappie (Genus Pomoxis), yellow perch (Genus Perca), sunfish (Genus Lepomis), walleye and sauger (Genus Stizostedion), pike (Genus Esox), sturgeon (Genus Scaphirhynchus) and freshwater drum (Genus Aplodinotus).

(lvi) “Wetland hydrology” means the presence of water on or near the land surface at a frequency and duration to cause the formation of hydric soils and support a prevalence of vegetation typically adapted to saturated and/or inundated conditions.

(lvii) “Wyoming Continuing Planning Process (CPP)” means a planning process provided for under Section 303 (e) (1) of the Federal Act developed through public participation and consisting of policies, procedures and programs that result in the definition and implementation of actions that lead to the prevention, reduction and abatement of water pollution and for the protection and enhancement of water uses in the State of Wyoming. The CPP is continuous in time and is designed to respond to changes in conditions and attitudes. The CPP is adopted by resolution of the Water and Waste Advisory Board and is certified by the Governor.

(lviii) “Wyoming surface waters” shall have the same meaning as “surface waters of the state” defined in Section 2 (b)(xlv).

(lvix) “Zone of passage” means a continuous water route which joins segments of a surface water body above and below a mixing zone.

(lx) “404 permit” means a permit issued pursuant to Section 404 of the Federal Act to regulate the discharge of dredged or fill materials into surface waters of the United States.

Section 3. **Water Uses.** The objectives of the Wyoming water pollution control program are described in W.S. 35-11-102. These objectives are designed to serve the interests of the state and achieve the related goals, objectives, and policies of the Federal Act. The objectives of the Wyoming program are to provide, wherever attainable, the highest possible water quality commensurate with the following uses:

(a) Agriculture. For purposes of water pollution control, agricultural uses include irrigation or stock watering.

(b) Fisheries. The fisheries use includes water quality, habitat conditions, spawning and nursery areas, and food sources necessary to sustain populations of game and nongame fish. This use does not include the protection of exotic species which are designated “undesirable” by the Wyoming Game and Fish Department or the U.S. Fish and Wildlife Service within their appropriate jurisdictions.

(c) Industry. Industrial use protection involves maintaining a level of water quality useful for industrial purposes.

(d) Drinking water. The drinking water use involves maintaining a level of water quality that is suitable for potable water or intended to be suitable after receiving conventional drinking water treatment.

(e) Recreation. Recreational use protection involves maintaining a level of water quality which is safe for human contact. It does not guarantee the availability of water for any recreational purpose.

(f) Scenic value. Scenic value use involves the aesthetics of the aquatic systems themselves (odor, color, taste, settleable solids, floating solids, suspended solids, and solid waste) and is not necessarily related to general landscape appearance.

(g) Aquatic life other than fish. This use includes water quality and habitat necessary to sustain populations of organisms other than fish in proportions which make up diverse aquatic communities common to the waters of the state. This use does not include the protection of insect pests or exotic species which may be considered “undesirable” by the Wyoming Game and Fish Department or the U.S. Fish and Wildlife Service within their appropriate jurisdictions and human pathogens.

(h) Wildlife. The wildlife use includes protection of water quality to a level which is safe for contact and consumption by avian and terrestrial wildlife species.

(i) Fish consumption. The fish consumption use involves maintaining a level of water quality that will prevent any unpalatable flavor and/or accumulation of harmful substances in fish tissue.

Section 4. Surface Water Classes and Uses. The following water classes are a hierarchical categorization of waters according to existing and designated uses. Except for Class 1 waters, each classification is protected for its specified uses plus all the uses contained in each lower classification. Class 1 designations are based on value determinations rather than use support and are protected for all uses in existence at the time or after designation. There are four major classes of surface water in Wyoming with various subcategories within each class (see “Wyoming Surface Water Classification List” for current listing).

(a) Class 1, Outstanding Waters. Class 1 waters are those surface waters in which no further water quality degradation by point source discharges other than from dams will be allowed. Nonpoint sources of pollution shall be controlled through implementation of appropriate best management practices. Pursuant to Section 7 of these regulations, the water quality and physical and biological integrity which existed on the water at the time of designation will be maintained and protected. In designating Class 1 waters, the Environmental Quality Council shall consider water quality, aesthetic, scenic, recreational, ecological, agricultural, botanical, zoological, municipal, industrial, historical, geological, cultural, archaeological, fish and wildlife, the presence of significant quantities of developable water and other values of present and future benefit to the people.

(b) Class 2, Fisheries and Drinking Water. Class 2 waters are waters, other than those designated as Class 1, that are known to support fish or drinking water supplies or where those uses are attainable. Class 2 waters may be perennial, intermittent or ephemeral and are protected for the uses indicated in each sub category listed below. There are five subcategories of Class 2 waters.

(i) Class 2AB. Class 2AB waters are those known to support game fish populations or spawning and nursery areas at least seasonally and all their perennial tributaries and adjacent wetlands and where a game fishery and drinking water use is otherwise attainable. Class 2AB waters include all permanent and seasonal game fisheries and can be either “cold water” or “warm water” depending upon the predominance of cold water or warm water species present. All Class 2AB waters are designated as cold water game fisheries unless identified as a warm water game fishery by a “ww” notation in the “Wyoming Surface Water Classification List”. Unless it is shown otherwise, these waters are presumed to have sufficient water quality and quantity to support drinking water supplies and are protected for that use. Class 2AB waters are also protected for nongame fisheries, fish consumption, aquatic life other than fish, recreation, wildlife, industry, agriculture and scenic value uses.

(ii) Class 2A. Class 2A waters are those that are not known nor have the potential to support game fish but are used for public or domestic drinking water supplies, including their perennial tributaries and adjacent wetlands. Uses designated on Class 2A waters include drinking water, aquatic life other than fish, recreation, wildlife, industry, agriculture and scenic value.

(iii) Class 2B. Class 2B waters are those known to support or have the potential to support game fish populations or spawning and nursery areas at least seasonally and all their perennial tributaries and adjacent wetlands and where it has been shown that drinking water uses are not attainable pursuant to the provisions of Section 33. Class 2B waters include permanent and seasonal game fisheries and can be either “cold water” or “warm water” depending upon the predominance of cold water or warm water species present. All Class 2B waters are designated as cold water game fisheries unless identified as a warm water game fishery by a “ww” notation in the “Wyoming Surface Water Classification List”. Uses designated on Class 2B waters include game and nongame fisheries, fish consumption, aquatic life other than fish, recreation, wildlife, industry, agriculture and scenic value.

(iv) Class 2C. Class 2C waters are those known to support or have the potential to support only nongame fish populations or spawning and nursery areas at least seasonally including their perennial tributaries and adjacent wetlands. Class 2C waters include all permanent and seasonal nongame fisheries and are considered “warm water”. Uses designated on Class 2C waters include nongame fisheries, fish consumption, aquatic life other than fish, recreation, wildlife, industry, agriculture, and scenic value.

(v) Class 2D. Effluent dependent waters which are known to support fish populations and where the resident fish populations would be significantly degraded in terms of numbers or species diversity if the effluent flows were removed or reduced. Class 2D waters are protected to the extent that the existing fish communities and other designated uses are maintained and that the water quality does not pose a health risk or hazard to humans, livestock or wildlife. Uses designated on Class 2D waters include game or nongame fisheries, fish consumption, aquatic life other than fish, recreation, wildlife, industry, agriculture, and scenic value.

(c) Class 3, Aquatic Life Other than Fish. Class 3 waters are waters, other than those designated as Class 1, that are intermittent, ephemeral or isolated waters and because of natural habitat conditions, do not support nor have the potential to support fish populations or spawning, or certain perennial waters which lack the natural water quality to support fish (e.g., geothermal areas). Class 3 waters provide support for invertebrates, amphibians, or other flora and fauna which inhabit waters of the state at some stage of their life cycles. Uses designated on Class 3 waters include aquatic life other than fish, recreation, wildlife, industry, agriculture and scenic value. Generally, waters suitable for this classification have wetland characteristics, and such characteristics will be a primary indicator used in identifying Class 3 waters. There are four subcategories of Class 3 waters.

(i) Class 3A. Class 3A waters are isolated waters including wetlands that are not known to support fish populations or drinking water supplies and where those uses are not attainable.

(ii) Class 3B. Class 3B waters are tributary waters including adjacent wetlands that are not known to support fish populations or drinking water supplies and where those uses are not attainable. Class 3B waters are intermittent and ephemeral streams with sufficient hydrology to normally support and sustain communities of aquatic life including invertebrates, amphibians, or other flora and fauna which inhabit waters of the state at some stage of their life cycles. In general, 3B waters are characterized by frequent linear wetland occurrences or impoundments within or adjacent to the stream channel over its entire length. Such characteristics will be a primary indicator used in identifying Class 3B waters.

(iii) Class 3C. Class 3C waters are perennial streams without the natural water quality potential to support fish or drinking water supplies but do support wetland characteristics. These may include geothermal waters and waters with naturally high concentrations of dissolved salts or metals or pH extremes.

(iv) Class 3D. Effluent dependent waters which are known to support communities of aquatic life other than fish and where the existing aquatic habitat would be significantly reduced in terms of aerial extent, habitat diversity or ecological value if the effluent flows are removed or reduced.. Class 3D waters are protected to the extent that the existing aquatic community, habitat and other designated uses are maintained and the water quality does not pose a health risk or hazard to humans, livestock or wildlife.

(d) Class 4, Agriculture, Industry, Recreation and Wildlife. Class 4 waters are waters, other than those designated as Class 1, where it has been determined that aquatic life uses are not attainable pursuant to the provisions of Section 33 of these regulations. Uses designated on Class 4 waters include recreation, wildlife, industry, agriculture and scenic value.

(i) Class 4A. Class 4A waters are artificial canals and ditches that are not known to support fish populations.

(ii) Class 4B. Class 4B waters are intermittent and ephemeral stream channels that have been determined to lack the hydrologic potential to normally support and sustain aquatic life pursuant to the provisions of Section 33(b)(ii) of these regulations. In general, 4B streams are characterized by only infrequent wetland occurrences or impoundments within or adjacent to the stream channel over its entire length. Such characteristics will be a primary indicator used in identifying Class 4B waters.

(iii) Class 4C. Class 4C waters are isolated waters that have been determined to lack the potential to normally support and sustain aquatic life pursuant to the provisions of Section 33(b)(i), (iii), (iv), (v), or (vi) of these regulations. Class 4C includes, but is not limited to off-channel effluent dependent ponds where it has been determined under Section 33(b)(iii) that removing a source of pollution to achieve full attainment of aquatic life uses would cause more environmental damage than leaving the source in place.

(e) Specific stream segment classifications are contained in a separate document entitled “Wyoming Surface Water Classification List” which is published by the department and periodically revised and updated according to the provisions of sections 4, 33, 34, 35 and Appendix A of this chapter. Class 1 waters are those waters that have been specifically designated by the Environmental Quality Council. Class 2AB, 2A, 2B and 2C designations are based upon the fisheries information contained in the Wyoming Game and Fish Department’s “Stream and Lakes” inventory database as submitted to the Department of Environmental Quality in June, 2000. This database represents the best available information and is considered conclusive. Class 2D and 3D designations are based upon Use Attainability Analyses demonstrating that the waters are effluent dependent and do not pose a hazard to humans, wildlife or livestock. Class 4 designations are based upon knowledge that a water body is an artificial, man made conveyance, or has been determined not to support aquatic life uses through an approved Use Attainability Analysis. All other waters are designated as Class 3A or 3B. New information made available to the department may be cause to amend the classifications. Additionally, Section 27 of this chapter describes how recreation use designations are made for specific water bodies.

Section 5. **Standards Enforcement.** The numerical and narrative standards contained within these regulations shall be used to establish effluent limitations for those discharges requiring control via permits to discharge in the case of point sources and best management practices in the case of nonpoint sources. If no permit or best management practice has been issued or implemented for a pollution source the state may, in addition to other appropriate legal action, take direct action to enforce these standards.

The processes used to implement the standards are described in various implementation documents adopted by the department. Such documents are adopted with full public participation and include, but are not limited to, the implementation policies for antidegradation, mixing zones, turbidity, use attainability analysis and agricultural use protection, the Wyoming Continuing Planning Process (CPP), and best management practices.

These regulations shall not be interpreted to preclude the establishment of appropriate compliance schedules for permitting purposes nor shall compliance with the conditions of these regulations exempt any discharger from the penalty provisions of W.S. 35-11-901.

Section 6. **Interstate Compacts, Court Decrees and Water Rights.** The department shall, after review and conference with the State Engineer, make recommendations to the State Engineer concerning proposed new diversions which could cause violations of these regulations.

Section 7. **Class 1 Waters.**

(a) Except as authorized in paragraph (b), no new point sources other than dams, may discharge, and no existing point sources, other than dams, may increase their quantity of pollution discharge, to any water designated as Class 1.

(b) Storm water and construction-related discharges of pollution to Class 1 waters may be authorized and shall be controlled through applicable water quality permits, Section 401 certifications and/or by the application of best management practices. Such discharges shall not degrade the quality of any Class 1 water below its existing quality or adversely affect any existing use of the water. Temporary increases in turbidity that are within the limits established in Section 23 of these regulations and that do not negatively affect existing uses can be permitted. For purposes of this section, temporary increases in turbidity shall not exceed the actual construction period. The department shall impose whatever controls and monitoring are necessary on point source discharges to Class 1 waters and their tributaries to ensure that the existing quality and uses of the Class 1 water are protected and maintained.

(c) Nonpoint source discharges of pollution to Class 1 waters or tributaries of Class 1 waters shall be controlled by application of best management practices adopted in accordance with the Wyoming Continuing Planning Process. For Class 1 waters, best management practices will maintain existing quality and water uses.

Section 8. **Antidegradation.**

(a) Water uses in existence on or after November 28, 1975 and the level of water quality necessary to protect those uses shall be maintained and protected. Those surface waters not designated as Class 1, but whose quality is better than the standards contained in these regulations, shall be maintained at that higher quality. However, after full intergovernmental coordination and public participation, the Wyoming Department of Environmental Quality may issue a permit for or allow any project or development which would constitute a new source of pollution, or an increased source of pollution, to these waters as long as the following conditions are met:

(i) The quality is not lowered below these standards;

(ii) All existing water uses are fully maintained and protected;

(iii) The highest statutory and regulatory requirements for all new and existing point sources and all cost effective and reasonable best management practices for nonpoint sources have been achieved; and

(iv) The lowered water quality is necessary to accommodate important economic or social development in the area in which the waters are located.

(b) The administrator may require an applicant to submit additional information, including but not limited to an analysis of alternatives to any proposed discharge and relevant economic information before making a determination under this section.

(c) The procedures used to implement this section are described in the “Antidegradation Implementation Policy.”

Section 9. **Mixing Zones.** Except for acute whole effluent toxicity (WET) values and Sections 14, 15, 16, 17, 28 and 29 (b) of these regulations, compliance with water quality standards shall be determined after allowing reasonable time for mixing. Except for the zone of initial dilution, which is the initial 10% of the mixing zone, the mixing zone shall not contain pollutant concentrations that exceed the acute aquatic life values (see Appendix B). In addition, there shall be a zone of passage around the mixing zone which shall not contain pollutant concentrations that exceed the chronic aquatic life values (see Appendix B). Under no circumstance may a mixing zone be established which would allow human health criteria (see Appendix B) to be exceeded within 500 yards of a drinking water supply intake or result in acute lethality to aquatic life. The procedures used to implement this section are described in the “Mixing Zone and Dilution Allowances Policy.”

Section 10. **Testing Procedures.** For determination of the parameters involved in the standards, analyses will be in accordance with test procedures defined pursuant to: Title 40, Code of Federal Regulations, Part 136, or any modifications thereto. For test procedures not listed in the Code of Federal Regulations, test procedures outlined in the latest editions of: EPA Methods for Chemical Analysis of Water and Wastes; or, Standard Methods for the Examination of Water and Wastewaters; or, ASTM Standards, Part 31, Water shall be used.

The analytical technique for total uranium (as U) shall be the fluorometric method as referenced in Methods for Determination of Radioactive Substances in Water and Fluvial Sediments, Techniques of Water - Resource Investigations of the U.S. Geological Survey, Book 5, Chapter A-5, pp. 83 - 92.

Where standard methods of testing have not been established, the suitability of testing procedures shall be determined by the department and the EPA using defensible scientific methods.

Section 11. **Flow Conditions.**

(a) Numeric water quality standards shall be enforced at all times except during periods below low flow. Low flow can be determined by the following methods. Whatever method is selected for a specific situation, application of the standards will conform to the magnitude, frequency, and duration provisions as described in these regulations.

(i) Using the 7Q10 (the minimum seven (7) consecutive day flow which has the probability of occurring once in ten (10) years);

(ii) The EPA's biologically based flow method which determines a four (4) day, three (3) year low flow for chronic exposures and a one (1) day, three (3) year low flow for acute exposures (ref: Technical Guidance Manual For Performing Waste Load Allocation; Book VI, Design Conditions: Chapter 1, Stream Design Flow for Steady-State Modeling, August 1986, US EPA);

(iii) Other defensible scientific methods.

(b) During periods when stream flows are less than the minimums described above, the department may, in consultation with the Wyoming Game and Fish Department and the affected discharger(s), require permittees to institute operational modifications as necessary to insure the protection of aquatic life. This section should not be interpreted as requiring the maintenance of any particular stream flow.

(c) The narrative water quality standards in Sections 14, 15, 16, 17, 28 and 29(b) of these regulations shall be enforced at all stream-flow conditions.

Section 12. **Protection of Wetlands.** Point or nonpoint sources of pollution shall not cause the destruction, damage, or impairment of naturally occurring wetlands except when mitigated through an authorized wetlands mitigation process. When approving mitigation, the department may consider both the ecological functions and the wetland value of the disturbed wetland.

This section does not apply to wetlands created by point or nonpoint sources; nor are such wetlands required to be maintained through continuation of such discharges. Similarly, any man-made wetlands or enhancements which have been credited in the state wetland banking program are not required to be maintained until the credit is used for mitigation purposes. These areas will, however, be protected from discharges of wastes, toxic substances or chemical pollutants as are any other waters of the state.

Section 13. **Toxic Materials.** Except for those substances referenced in Sections 21 (e) and (f) of these regulations, toxic materials attributable to or influenced by the activities of

man shall not be present in any Wyoming surface water in concentrations or combinations which constitute “pollution”.

Section 14. **Dead Animals and Solid Waste.** Dead animals or solid waste shall not be placed or allowed to remain in Wyoming surface waters. When discovered, removal shall be expeditious unless removal would likely cause more contamination than non-removal. This section should not be interpreted to place a burden on any person to remove dead wildlife from surface waters where the death of the animals occurs under natural or uncontrollable circumstances.

Except as authorized through a 404 permit, solid waste shall not be placed or allowed to remain in surface waters of the state, nor shall solid wastes be placed or allowed to remain in any location which would cause or threaten contamination of Wyoming surface waters.

Section 15. **Settleable Solids.** In all Wyoming surface waters, substances attributable to or influenced by the activities of man that will settle to form sludge, bank or bottom deposits shall not be present in quantities which could result in significant aesthetic degradation, significant degradation of habitat for aquatic life or adversely affect public water supplies, agricultural or industrial water use, plant life or wildlife.

Section 16. **Floating and Suspended Solids.** In all Wyoming surface waters, floating and suspended solids attributable to or influenced by the activities of man shall not be present in quantities which could result in significant aesthetic degradation, significant degradation of habitat for aquatic life, or adversely affect public water supplies, agricultural or industrial water use, plant life or wildlife.

Section 17. **Taste, Odor and Color.** No Class 1, 2, or 3 waters shall contain substances attributable to or influenced by the activities of man that produce taste, odor and color or that would:

- (a) Of themselves or in combination, impart an unpalatable or off-flavor in fish flesh;
- (b) Visibly alter the natural color of the water or impart color to skin, clothing, vessels or structures;
- (c) Produce detectable odor; or
- (d) Directly or through interaction among themselves, or with chemicals used in existing water treatment processes, result in concentrations that will impart undesirable taste or odor to public water supplies.

Section 18. **Human Health.** In all Class 1, 2AB, and 2A waters, the human health values for “Fish and Drinking Water” listed in Appendix B of these regulations shall not be

exceeded. In all Class 2B, 2C and 2D waters, the human health values for “Fish Only” (consumption of aquatic organisms) shall not be exceeded.

In certain waters, the criteria listed in Appendix B of these regulations may not be appropriate due to unique physical or chemical conditions. In such cases, human health values may be determined by use of the site-specific procedures outlined in the references listed in Appendix E of these regulations.

Section 19. **Industrial Water Supply.** All Wyoming surface waters which have the natural water quality potential for use as an industrial water supply shall be maintained at a quality which allows continued use of such waters for industrial purposes.

Degradation of such waters shall not be of such an extent to cause a measurable increase in raw water treatment costs to the industrial user(s).

Unless otherwise demonstrated, all Wyoming surface waters have the natural water quality potential for use as an industrial water supply.

Section 20. **Agricultural Water Supply.** All Wyoming surface waters which have the natural water quality potential for use as an agricultural water supply shall be maintained at a quality which allows continued use of such waters for agricultural purposes.

Degradation of such waters shall not be of such an extent to cause a measurable decrease in crop or livestock production.

Unless otherwise demonstrated, all Wyoming surface waters have the natural water quality potential for use as an agricultural water supply.

[The procedures used to implement this section are described in Appendix H, “Agricultural Use Protection.”](#)

Section 21. **Protection of Aquatic Life.**

(a) Ammonia.

(i) The toxicity of ammonia varies with pH and temperature and the applicable limitations are included in the charts in Appendix C of these regulations. The numeric ammonia criteria in Appendix C apply to all Class 1, 2A, 2B, 2AB and 2C waters.

(ii) In all Class 3 waters, concentrations of ammonia attributable to or influenced by human activities shall not be present in concentrations which could result in harmful acute or chronic effects to aquatic life, or which would not fully support existing and designated uses.

(b) Specific numeric standards for a number of toxicants are listed in the aquatic life “acute value” and “chronic value” columns in Appendix B of these regulations. These standards apply to all Class 1, 2A, 2B, 2AB, 2C, 3A, 3B and 3C waters. For these pollutants, the chronic value (four (4) day average concentration) and the acute value (one (1) hour average concentration) shall not be exceeded more than once every three (3) years.

(c) Others. For those pollutants not listed in Appendix B or C of these regulations, maximum allowable concentrations on Class 1, 2 and 3 waters shall be determined through the bioassay procedures outlined in the references listed in Appendix E of these regulations.

(d) In certain waters, the criteria listed in Appendix B or C of these regulations may not be appropriate due to unique physical or chemical conditions. In such cases, acute and chronic values may be determined by use of the site-specific procedures outlined in sections 33 or 36 or in the references listed in Appendix E of these regulations.

(e) Aquatic pesticides specifically designed to kill, repel or mitigate aquatic pest problems (such as mosquito larvae or heavy plant growth in irrigation ditches) may be added to surface waters of the state if the use and application is in compliance with the following:

(i) The chemical toxicant used is a product which has been registered by the EPA and approved by the Wyoming Department of Agriculture for use in the state;

(ii) The application is conducted by a person licensed by the Wyoming Department of Agriculture to purchase and apply such toxicants in the state;

(iii) All applications of aquatic pesticides must be administered in accordance with label directions. However, compliance with label directions shall not exempt any person or agency from the penalty provisions of W.S. 35-11-901 should non-target species or non-target areas be affected.

(f) This section shall not apply to the use of fish toxicants if the use and application is in compliance with the following:

(i) The chemical toxicant used is a product which has been registered by the EPA and approved by the Wyoming Department of Agriculture for use in the state;

(ii) The application is conducted by a person licensed by the Wyoming Department of Agriculture to purchase and apply such toxicants in the state;

(iii) All applications of fish toxicants must be administered in accordance with label directions. However, compliance with label directions shall not exempt any person or agency from the penalty provisions of W.S. 35-11-901 should non-target species or non-target areas be affected.

(iv) The Wyoming Game and Fish Department may apply fish toxicants to any surface water of the state provided that prior notice is made to the Department of Environmental Quality and after receipt of a verification from the Water Quality Division that the proposed application is in compliance with this section.

(v) The National Park Service, as the wildlife management agency in Yellowstone National Park, may apply fish toxicants to surface waters within Yellowstone National Park for the purpose of killing or controlling fish provided that prior notice is made to the Department of Environmental Quality and after receipt of a verification from the Water Quality Division that the proposed application is in compliance with this section. Approval from the Wyoming Game and Fish Department is also required prior to application of fish toxicants to waters which flow into surface waters of the state outside of Yellowstone National Park.

(vi) Private certified pesticide applicators for restricted use pesticides may apply fish toxicants only to waters located entirely on private property where there is no surface outlet to waters of the state provided that prior notice is made to the Department of Environmental Quality and after receipt of a verification from the Water Quality Division that the proposed application is in compliance with this section. Approval, including any necessary permits, from the Wyoming Game and Fish Department is also required prior to application of fish toxicants to insure protection of fish and wildlife resources.

(vii) Pesticide applications must be conducted in a manner that minimizes to the extent practicable, the magnitude of any change in the concentration of the parameters affected by the activity and the length of time during which any change may occur. The application must include measures that prevent significant risk to public health and ensure that existing and designated uses of the water are protected and maintained upon the completion of the activity.

(viii) Except for the circumstances described in (i) through (vii) above, no other agency or person may apply fish toxicants in any water of the state.

Section 22. **Radioactive Material.**

(a) In Class 1, 2AB and 2A waters, the radiological limits established in the most recent Federal Primary Drinking Water Standards published by EPA or its successor agency (40 CFR parts 141.15 and 141.16, published July 1, 1998) shall not be exceeded.

(b) In Class 2B, 2C, 2D, 3 and 4 waters, the total radium 226 concentration shall not exceed 60 pCi/L.

(c) In all Wyoming surface waters, radioactive materials attributable or influenced by the activities of man shall not be present in the water or in the sediments in amounts which could cause harmful accumulations of radioactivity in plant, wildlife, stock, or aquatic life.

Section 23. **Turbidity.**

(a) In all cold water fisheries and drinking water supplies (classes 1, 2AB, 2A, and 2B), the discharge of substances attributable to or influenced by the activities of man shall not be present in quantities which would result in a turbidity increase of more than ten (10) nephelometric turbidity units (NTUs).

(b) In all warm water or nongame fisheries (classes 1, 2AB, 2B and 2C), the discharge of substances attributable to or influenced by the activities of man shall not be present in quantities which would result in a turbidity increase of more than 15 NTUs.

(c) An exception to paragraphs (a) and (b) of this section shall apply to:

(i) The North Platte River from Guernsey Dam to the Nebraska line during the annual “silt run” from Guernsey Dam; and

(ii) Short-term increases of turbidity that have been determined by the administrator to have only a minimal effect on water uses. Such determinations shall be made on a case-by-case basis and shall be subject to whatever controls, monitoring, and best management practices are necessary to fully maintain and protect all water uses. The procedures used to implement this section are described in the “Turbidity Implementation Policy.”

Section 24. **Dissolved Oxygen.** In all Class 2A, 2D and 3 waters, wastes attributable to or influenced by the activities of man shall not deplete dissolved oxygen amounts to a level which will result in harmful acute or chronic effects to aquatic life, or which would not fully support existing and designated uses.

In all Class 1, 2AB, 2B and 2C waters, wastes attributable to or influenced by the activities of man shall not be present in amounts which will result in a dissolved oxygen content of less than that presented on the chart in Appendix D of these regulations.

Section 25. **Temperature.**

(a) For Class 1, 2 and 3 waters, effluent attributable to or influenced by the activities of man shall not be discharged in amounts which change ambient water temperatures to levels which result in harmful acute or chronic effects to aquatic life, or which would not fully support existing and designated uses.

(b) When ambient temperatures are above 60 degrees F in all Class 1, 2AB, and 2B waters which are cold water fisheries, effluent attributable to or influenced by the activities of man shall not be discharged in amounts which will result in an increase of more than 2 degrees F (1.1 degree C) in existing temperatures.

(c) When ambient temperatures are above 60 degrees F in all Class 1, 2AB, 2B and 2C waters, which are warm water fisheries, effluent attributable to or influenced by the activities of man shall not be discharged in amounts which will result in an increase of more than 4 degrees F (2.2 degrees C) in existing temperatures.

(d) Except on Class 2D, 3 and Class 4 waters, the maximum allowable stream temperature will be the maximum natural daily stream temperature plus the allowable change, provided that this temperature is not lethal to existing fish life and under no circumstance shall this maximum temperature exceed 68 degrees F (20 degrees C) in the case of cold water fisheries and 86 degrees F (30 degrees C) in the case of warm water fisheries.

(e) With the exception of the provisions of Sections 9 and 11 of these regulations, temperature standards shall apply at all times and at all depths of the receiving water and may not be violated at any time or at any depth.

(f) The various requirements of this section may be waived only under the provisions of Section 316 (a) of the Federal Act.

Section 26. **pH.**

(a) For all Wyoming surface waters, wastes attributable to or influenced by the activities of man shall not be present in amounts which will cause the pH to be less than 6.5 or greater than 9.0 standard units.

(b) For all Class 1, 2 and 3 waters, effluent attributable or influenced by human activities shall not be discharged in amounts which change the pH to levels which result in harmful acute or chronic effects to aquatic life, directly or in conjunction with other chemical constituents, or which would not fully support existing and designated uses.

Section 27. **E. coli Bacteria.**

(a) Primary Contact Recreation. In all waters designated for primary contact recreation, during the summer recreation season (May 1 through September 30), concentrations of E. coli bacteria shall not exceed a geometric mean of 126 organisms per 100 milliliters based on a minimum of not less than 5 samples obtained during separate 24 hour periods for any 30-day period. All waters in Table A of the Wyoming Surface Water Classification List are designated for primary contact recreation unless identified as a secondary contact water by a "(s)" notation. Waters not specifically listed in Table A of the Wyoming Surface Water Classification List shall be designated as secondary contact waters. During the period October 1 through April 30, all waters are protected for secondary contact recreation only.

(b) Secondary Contact Recreation. In all waters designated for secondary contact recreation, and in waters designated for primary contact recreation during the winter recreation season (October 1 through April 30), concentrations of E. coli bacteria shall not exceed a geometric mean of 630 organisms per 100 milliliters based on a minimum of not less than 5 samples obtained during separate 24 hour periods for any 30-day period.

(c) Single-sample Maximum Concentrations. During the summer recreation season, on all waters designated for primary contact recreation, the following single-sample maximum concentrations of E. coli bacteria shall apply:

- (i) High use swimming areas - 235 organisms per 100 milliliters
- (ii) Moderate full body contact - 298 organisms per 100 milliliters
- (iii) Lightly used full body contact - 410 organisms per 100 milliliters
- (iv) Infrequently used full body contact - 576 organisms per 100 milliliters

Single-sample maximum values may be used to post recreational use advisories in public recreation areas and to derive single-sample maximum effluent limitations on point source discharges. An exceedence of the single-sample maxima shall not be cause for listing a water body on the State 303(d) list or development of a TMDL or watershed plan. The appropriate recreational use category (i through iv above) shall be determined by the administrator as needed, on a case by case basis. In making such a determination, the administrator may consider such site-specific circumstances as type and frequency of use, time of year, public access, proximity to populated areas, and local interests.

(d) Variiances. Temporary and/or permanent variances to the E. coli values provided in (a) through (c) above may be granted in instances where the primary source of bacterial contamination is found to be natural in origin (wildlife), unavoidable (off-channel stock watering pits), or otherwise in the public interest.

Section 28. **Undesirable Aquatic Life.** All Wyoming surface waters shall be free from substances and conditions or combinations thereof which are attributable to or influenced by the activities of man, in concentrations which produce undesirable aquatic life.

Section 29. **Oil and Grease.** In all Wyoming surface waters, substances attributable to or influenced by the activities of man shall not be present in amounts which would cause:

- (a) The oil and grease content to exceed 10 mg/L; or
- (b) The formation of a visible sheen or visible deposits on the bottom or shoreline, or damage or impairment of the normal growth, function or reproduction of human, animal, plant or aquatic life.

Section 30. **Total Dissolved Gases.** In all Class 1, 2AB, 2B and 2C waters, the total dissolved gas concentration below man-made dams shall not exceed 110 percent of the saturation value for gases at the existing atmospheric and hydrostatic pressures.

Section 31. **Colorado Basin Salinity.** The State of Wyoming is a member of the Colorado River Basin Salinity Control Forum, which includes all states in the Colorado River Basin. This forum has adopted a salinity control program for the basin which has been adopted as Chapter 6 of the Wyoming Water Quality Rules and Regulations.

Section 32. **Biological Criteria.** Class 1, 2 and 3 waters of the state must be free from substances, whether attributable to human-induced point source discharges or nonpoint source activities, in concentrations or combinations which will adversely alter the structure and function of indigenous or intentionally introduced aquatic communities.

Section 33. **Reclassifications and Site Specific Criteria.**

(a) Any person at any time may petition the department or the Environmental Quality Council (Council) to change the classification, add or remove a designated use or establish site specific criteria on any surface water.

(b) The Water Quality Administrator may lower a classification, remove a designated use which is not an existing use or an attainable use, establish ambient-based criteria on effluent dependent waters, or make a recommendation to the Environmental Quality Council to establish sub-categories of a use, or establish site-specific criteria if it can be demonstrated through a Use Attainability Analysis (UAA) that the original classification and/or designated use or water quality criteria are not feasible because:

(i) Naturally occurring pollutant concentrations prevent the attainment of the classification or use; or

(ii) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met; or

(iii) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(iv) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the classification or use, and it is not feasible to restore the water body to its original condition or to operate such modification in such a way that would result in the attainment of the classification or use; or

(v) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of the classification or use; or

(vi) Controls more stringent than those required by Sections 301(b) and 306 of the Federal Act would result in substantial and widespread economic and social impact. This subsection shall not apply to the derivation of site-specific criteria.

(c) The Water Quality Administrator may raise a classification, add a designated use, or make a recommendation to the Environmental Quality Council to establish sub-categories of a use or site-specific criteria, if it can be demonstrated through a Use Attainability Analysis (UAA) that such uses are existing uses or may be attained with the imposition of more stringent controls or management practices.

(d) The procedures used to implement this section are described in the “Use Attainability Analysis Implementation Policy.”

(e) The provisions of subsections (b) and (c) above are not applicable to Class 1 designations. Class 1 designations may be added or removed in accordance with the provisions of the Environmental Quality Act, the Wyoming Administrative Procedures Act and Section 4 (a) of these regulations.

Section 34. Use Attainability Analysis. The Water Quality administrator shall review all petitions submitted under Section 33 of these regulations and make a determination based upon the technical merits of the Use Attainability Analysis. Public notice and opportunity for comment shall be provided prior to making this determination.

(a) Any changes in water classifications or use designations resulting from the administrator’s determination shall be submitted to EPA for approval as revised water quality standards for Clean Water Act purposes and shall become effective either upon EPA approval or 90 days after submittal, whichever comes first. If within 90 days of submittal, the EPA determines that any such revised or new standard is not consistent with the applicable requirements of the Federal Act and specifies the changes needed to meet such requirements, the administrator may consider EPA’s recommendations and publish a revised final determination. All determinations made under this subsection are considered final actions of the administrator and may be appealed pursuant to Chapter 1, Section 16 of the Rules of Practice and Procedure.

(b) Except for ambient-based criteria on effluent dependent waters, proposed changes in water quality criteria that result from the administrator’s findings shall be recommended to the Environmental Quality Council for adoption as revised rules. Ambient-based criteria for effluent dependent waters shall be established according to the provisions of Section 36 of these rules. If adopted by the Council, the revised rules shall be filed with the secretary of state and shall become effective 90 days after filing. The revised rules shall also be

concurrently submitted to EPA for approval as revised water quality standards for Clean Water Act purposes. If within 90 days of submittal, the EPA determines that any such revised or new standard is not consistent with the applicable requirements of the Federal Act and specifies the changes needed to meet such requirements, the department may recommend a new standard incorporating EPA's specifications to the Environmental Quality Council for adoption.

Section 35. Credible Data.

(a) Development of scientifically valid chemical, physical and biological monitoring data shall:

(i) Consist of data collection using accepted referenced laboratory and field methods employed by a person who has received specialized training and has field experience in developing a monitoring plan, a quality assurance plan, and employing the methods outlined in such plans; or works under the supervision of a person who has these qualifications. Specialized training includes a thorough knowledge of written sampling protocols and field methods such that the data collection and interpretation are reproducible, scientifically defensible, and free from preconceived bias; and

(ii) Includes documented quality assurance consisting of a plan that details how environmental data operations are planned, implemented, and assessed with respect to quality during the duration of the project.

(b) Credible data shall be collected on each water body, as required in this section and shall be considered for purposes of characterizing the integrity of the water body including consideration of soil, geology, hydrology, geomorphology, climate, stream succession and the influences of man upon the system. These data in combination with other available and applicable information shall be used through a weight-of-evidence approach to designate uses and determine whether those uses are being attained. In those instances where numerical standards contained in these rules are exceeded or on ephemeral and intermittent water bodies where chemical and biological sampling may not be practical or feasible, less than a complete set of data may be used to make a decision on attainment.

(c) All changes to use designations after the effective date of this rule shall include the consideration of credible data relevant to the decision. Changes which involve the removal of a use designation or the replacement of a designation shall be supported by a use attainability analysis (UAA).

(d) After the effective date of this rule, credible data shall be utilized in determining a water body's attainment of designated uses.

Section 36. Effluent Dependent Criteria. In addition to the provisions of Section 33, the Water Quality Administrator may make modifications to the numeric values for pollutants listed

in Appendix B on Class 2D and 3D waters. These modifications may be made on a categorical or site-specific basis by application of the following process:

a. The adopted statewide numeric criteria may be modified on Class 2D and 3D waters to reflect ambient conditions by developing a UAA demonstrating that the water body is effluent dependent and that continued discharge of a permitted effluent to the water body has been shown to create a net environmental benefit. Criteria modification based on a finding of net environmental benefit is authorized where:

1. The water body is effluent dependent;
2. The discharge has been shown to create an environmental benefit and removal of the discharge would cause more environmental harm than leaving it in place;
3. There is a credible threat to remove the discharge; and
4. Appropriate safeguards are in place, ensuring that downstream uses will be protected and the discharge will pose no health risk or hazard to humans, livestock or wildlife.

b. Where the above factors have been satisfied, site specific criteria may be set equal to the background concentration plus a margin of error for each parameter where the highest background concentration exceeds the statewide numeric criteria. Such site-specific criteria will be implemented as instantaneous maximum values.

1. The background concentration shall be the highest concentration recorded over the course of a one year period where samples have been taken at least once in each month.
2. The margin of error shall be one standard deviation calculated from the same data set used to establish background.
3. In addition to water column values, aquatic life tissue criteria shall also be established for all parameters known to be bio-accumulating and where recommended criteria have been developed by EPA. Such values shall be at least equal to the nationally recommended tissue criteria published by EPA under section 304(a) of the Clean Water Act.

(c) The procedures used to implement this section are described in the "Use Attainability Analysis Implementation Policy."

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Appendix A

Wyoming Surface Water Classifications

All surface waters in Wyoming are classified as follows:

- (a) Class 1 Waters. The following waters are designated Class 1:
 - (i) All surface waters located within the boundaries of national parks and congressionally designated wilderness areas as of January 1, 1999;
 - (ii) The main stem of the Snake River through its entire length above the U.S. Highway 22 Bridge (Wilson Bridge);
 - (iii) The main stem of the Green River, including the Green River Lakes from the mouth of the New Fork River upstream to the wilderness boundary;
 - (iv) The Main Stem of the Wind River from the Wedding of the Waters upstream to Boysen Dam;
 - (v) The main stem of the North Platte River from the mouth of Sage Creek (approximately 15 stream miles downstream of Saratoga, Wyoming) upstream to the Colorado state line;
 - (vi) The main stem of the North Platte River from the headwaters of Pathfinder Reservoir upstream to Kortez Dam (Miracle Mile segment);
 - (vii) The main stem of the North Platte River from the Natrona County Road 309 bridge (Goose Egg bridge) upstream to Alcova Reservoir;
 - (viii) The main stem of Sand Creek above the U.S. Highway 14 bridge;
 - (ix) The main stem of the Middle Fork of the Powder River through its entire length above the mouth of Buffalo Creek;
 - (x) The main stem of the Tongue River, the main stem of the North Fork of the Tongue River, and the main stem of the South Fork of the Tongue River above the U.S. Forest Service Boundary;
 - (xi) The main stem of the Sweetwater River above the mouth of Alkali Creek;
 - (xii) The main stem of the Encampment River from the northern U.S. Forest Service boundary upstream to the Colorado state line;

(xiii) The main stem of the Clarks Fork River from the U.S. Forest Service boundary upstream to the Montana state line;

(xiv) All waters within the Fish Creek (near Wilson, Wyoming) drainage;

(xv) The main stem of Granite Creek (tributary of the Hoback River) through its entire length;

(xvi) Fremont Lake;

(xvii) Wetlands adjacent to the above listed Class 1 waters.

(b) Individual water classifications for major water bodies are listed in the most current version of the “Wyoming Surface Water Classification List” published and periodically updated by the Wyoming Department of Environmental Quality, Water Quality Division. In addition to the listings contained in that document, the following provisions apply:

(i) National Parks and Wilderness Areas. All surface waters located within the boundaries of Yellowstone and Grand Teton National Parks and congressionally designated wilderness areas as of January 1, 1999 are Class 1 waters. Such Class 1 designation always takes precedence over the classification given in the listing. For example, Dinwoody Creek is shown as a Class 2 water; however, the upper portions are within a wilderness area and those portions are Class 1. The portion below the wilderness boundary is Class 2.

(ii) Unlisted Waters. The waters contained in the “Wyoming Surface Water Classification List” are all waters which are named on the USGS 1:500,000 hydrologic map of Wyoming and those otherwise classified by the department. The Classification List does not contain an exhaustive listing of all the surface waters in the state. Waters which are not listed are classified as follows:

(1) All waters shown as having any species of game fish present in the Wyoming Game and Fish Department's *Streams and Lakes Database* as submitted to the Department of Environmental Quality in June, 2000 are classified as 2AB;

(2) All waters shown as having only nongame fish species present in the Wyoming Game and Fish Department's *Streams and Lakes Database* as submitted to the Department of Environmental Quality in June, 2000 are classified as 2C;

(3) All other waters shall be classified as follows:

(A) Those waters supported by an approved UAA containing defensible reasons for not protecting aquatic life uses shall be 4A, 4B or 4C. This category includes isolated, effluent dependent waters;

populations shall be 2D; (B) Effluent dependent waters that support resident fish

populations shall be 3D; (C) Effluent dependent waters that do not support resident fish

(C) The remaining waters shall be 3A, 3B or 3C.

(iii) Wetlands. All adjacent wetlands shall have the same classification as the water to which they are adjacent.

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PRIORITY POLLUTANTS

Appendix B
Water Quality Criteria ⁽¹⁾

<u>Pollutant</u>	<u>Aquatic Life Acute Value Micrograms/L</u>	<u>Aquatic Life Chronic Value Micrograms/L</u>	<u>Human Health Value Fish & Drinking Water⁽²⁾ Micrograms/L</u>	<u>Human Health Value Fish Only⁽⁸⁾ Micrograms/L</u>
Acenaphthene			20 ⁽⁷⁾	990
Acrolein			190	290
Acrylonitrile ⁽³⁾			0.051	0.25
Benzene ⁽³⁾			2.2	51
Benzidine ⁽³⁾			0.000086	0.00020
Carbon tetrachloride ⁽³⁾ (Tetrachloromethane)			0.23	1.6
Chlorobenzene (Monochlorobenzene)			100 ⁽⁹⁾	1600
1,2,4 Trichlorobenzene			35	70
Hexachlorobenzene ⁽³⁾			0.00028	0.00029
1,2-Dichloroethane ⁽³⁾			0.38	37
1,1,1-Trichloroethane			200 ⁽⁹⁾	
Hexachloroethane ⁽³⁾			1.4	3.3
1,1,2-Trichloroethane ⁽³⁾			0.59	16
1,1,2,2,-Tetrachloroethane ⁽³⁾			0.17	4
Bis(2-chloroethyl) ether ⁽³⁾			0.030	0.53
2-Chloronaphthalene			1000	1600
2,4,6-Trichlorophenol ⁽³⁾			1.4	2.4
p-Chloro-m-cresol (4-Chloro-3-methylphenol)			3000 ⁽⁷⁾	
Chloroform (HM) ⁽³⁾ (Trichloromethane)			5.7	470
2-Chlorophenol			0.1 ⁽⁷⁾	150
1,2-dichlorobenzene			420	1300
1,3-Dichlorobenzene			320	960
1,4-Dichlorobenzene			63	190
3,3-Dichlorobenzidine ⁽³⁾			0.021	0.028
1,1-Dichloroethylene ⁽³⁾			330	7100

PRIORITY POLLUTANTS

<u>Pollutant</u>	<u>Aquatic Life Acute Value Micrograms/L</u>	<u>Aquatic Life Chronic Value Micrograms/L</u>	<u>Human Health Value Fish & Drinking Water⁽²⁾ Micrograms/L</u>	<u>Human Health Value Fish Only⁽⁸⁾ Micrograms/L</u>
1,2-trans-Dichloroethylene			100 ⁽⁹⁾	10000
2,4-Dichlorophenol			0.3 ⁽⁷⁾	290
1,2-Dichloropropane			0.50	15
1,3-Dichloropropylene (1,3-Dichloropropene) (cis and trans isomers)			0.34	21
2,4-Dimethylphenol			380 ⁽⁷⁾	850
2,4-Dinitrotoluene ⁽³⁾			0.11	3.4
1,2-Diphenylhydrazine ⁽³⁾			0.036	0.20
Ethylbenzene			530	2100
Fluoranthene			130	140
Bis(2-chloroisopropyl) ether			1400	65000
Methylene chloride (HM) ⁽³⁾ (Dichloromethane)			4.6	590
Methyl bromide (HM) (Bromomethane)			47	1500
Bromoform (HM) ⁽⁶⁾ (Tribromomethane)			4.3	140
Dichlorobromomethane (HM) ⁽⁶⁾			0.55	17
Chlorodibromomethane (HM) ⁽⁶⁾			0.40	13
Hexachlorobutadiene ⁽³⁾			0.44	18
Hexachlorocyclopentadine			1 ⁽⁷⁾	1100
Isophorone ⁽³⁾			35	960
Nitrobenzene			17	690
2,4-Dinitrophenol			69	5300
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)			13	280
N-Nitrosodimethylamine ⁽³⁾			0.00069	3
N-Nitrosodiphenylamine ⁽³⁾			3.3	6
N-Nitrosodi-n-propylamine ⁽³⁾			0.005	0.51
Pentachlorophenol	19 ⁽⁵⁾	15 ⁽⁵⁾	0.27 ⁽³⁾	3 ⁽³⁾
Phenol			300 ⁽⁷⁾	1700000
Bis(2-ethylhexyl)phthalate ⁽³⁾			1.2	2.2

PRIORITY POLLUTANTS

<u>Pollutant</u>	<u>Aquatic Life Acute Value Micrograms/L</u>	<u>Aquatic Life Chronic Value Micrograms/L</u>	<u>Human Health Value Fish & Drinking Water⁽²⁾ Micrograms/L</u>	<u>Human Health Value Fish Only⁽⁸⁾ Micrograms/L</u>
Butyl benzyl phthalate			1500	1900
Di-n-butyl phthlate			2000	4500
Diethyl phthalate			17000	44000
Dimethyl phthalate			270000	1100000
Benzo(a)anthracene (PAH) ⁽³⁾ (1,2-Benzanthracene)			0.0038	0.018
Benzo(a)pyrene (PAH) ⁽³⁾ (3, 4-Benzopyrene)			0.0038	0.018
Benzo(b)fluoranthene (PAH) ⁽³⁾ (3,4-Benzofluoranthene)			0.0038	0.018
Benzo(k)fluoranthene (PAH) ⁽³⁾ (11,12-Benzofluoranthene)			0.0038	0.018
Chrysene (PAH) ⁽³⁾			0.0038	0.018
Anthracene (PAH) ⁽⁶⁾			8300	40000
Fluorene (PAH) ⁽⁶⁾			1100	5300
Dibenzo(a,h)anthracene (PAH) ⁽³⁾ (1,2,5,6-Dibenzanthracene)			0.0038	0.018
Indeno(1,2,3-cd)pyrene (PAH) ⁽³⁾			0.0038	0.018
Pyrene (PAH) ⁽⁶⁾			830	4000
Tetrachloroethylene ⁽³⁾			0.69	3.3
Toluene			1000 ⁽⁹⁾	15000
Trichloroethylene ⁽³⁾			2.5	30
Vinyl chloride ⁽³⁾ (Chloroethylene)			0.025	2.4
Aldrin ⁽³⁾	1.5		0.000049	0.000050
Dieldrin ⁽³⁾	0.24	0.056	0.000052	0.000054
Chlordane ⁽³⁾	1.2	0.0043	0.00080	0.00081
4,4'-DDT ⁽³⁾	0.55	0.001	0.00022	0.00022
4,4'-DDE ⁽³⁾			0.00022	0.00022
4,4'-DDD ⁽³⁾			0.00031	0.00031
alpha-Endosulfan	0.11	0.056	62	89
beta-Endosulfan	0.11	0.056	62	89
Endosulfan sulfate			62	89

PRIORITY POLLUTANTS

<u>Pollutant</u>	<u>Aquatic Life Acute Value Micrograms/L</u>	<u>Aquatic Life Chronic Value Micrograms/L</u>	<u>Human Health Value Fish & Drinking Water⁽²⁾ Micrograms/L</u>	<u>Human Health Value Fish Only⁽⁸⁾ Micrograms/L</u>
Endrin	0.086	0.036	0.59	0.060
Endrin aldehyde			0.29	0.30
Heptachlor ⁽³⁾	0.26	0.0038	0.000079	0.000079
Heptachlor epoxide ⁽³⁾	0.26	0.0038	0.000039	0.000039
alpha-BHC ⁽³⁾ (Hexachlorocyclohexane-alpha)			0.0026	0.0049
beta-BHC ⁽³⁾ (Hexachlorocyclohexane-beta)			0.0091	0.017
gamma-BHC (Lindane) ⁽³⁾ (Hexachlorocyclohexane- gamma)	0.95		0.2 ⁽⁹⁾	1.8
PCB-1242 (Arochlor 1242) ⁽³⁾		0.014	0.000064 ⁽¹³⁾	0.000064 ⁽¹³⁾
PBC-1254 (Arochlor 1254) ⁽³⁾		0.014	0.000064 ⁽¹³⁾	0.000064 ⁽¹³⁾
PBC-1221 (Arochlor 1221) ⁽³⁾		0.014	0.000064 ⁽¹³⁾	0.000064 ⁽¹³⁾
PBC-1232 (Arochlor 1232) ⁽³⁾		0.014	0.000064 ⁽¹³⁾	0.000064 ⁽¹³⁾
PBC-1248 (Arochlor 1248) ⁽³⁾		0.014	0.000064 ⁽¹³⁾	0.000064 ⁽¹³⁾
PBC-1260 (Arochlor 1260) ⁽³⁾		0.014	0.000064 ⁽¹³⁾	0.000064 ⁽¹³⁾
PBC-1016 (Arochlor 1016) ⁽³⁾		0.014	0.000064 ⁽¹³⁾	0.000064 ⁽¹³⁾
Toxaphene ⁽³⁾	0.73	0.0002	0.0028	0.0028

PRIORITY POLLUTANTS

Antimony			5.6	640
Arsenic ⁽³⁾	340	150	10	10
Asbestos ⁽³⁾			7000000 fibers/L ⁽⁹⁾	
Beryllium ⁽³⁾			4 ⁽⁹⁾	
Cadmium	2.0 ⁽⁴⁾	0.25 ⁽⁴⁾	5 ⁽⁹⁾	
Chromium (III)	569.8 ⁽⁴⁾	74.1 ⁽⁴⁾	100 ⁽⁹⁾ (total)	
Chromium (VI)	16	11	100 ⁽⁹⁾ (total)	
Copper	13.4 ⁽⁴⁾	9 ⁽⁴⁾	1000 ⁽⁷⁾	
Cyanide (free)	22	5.2	200 ⁽⁹⁾	220000
Lead	64.6 ⁽⁴⁾	2.5 ⁽⁴⁾	15 ⁽⁹⁾	
Mercury	1.4	0.77	0.050	0.051
Nickel	468.2 ⁽⁴⁾	52.0 ⁽⁴⁾	100 ⁽⁹⁾	4600
Selenium	20	5 ⁽¹⁰⁾	50 ⁽⁹⁾	4200
Silver	3.4 ⁽⁴⁾			
Thallium			2.4	4.7
Zinc	117.2 ⁽⁴⁾	118.1 ⁽⁴⁾	5000 ⁽⁷⁾	26000
Dioxin (2,3,7,8-TCDD) ⁽³⁾			0.000000005	0.000000005

NON-PRIORITY POLLUTANTS

<u>Pollutant</u>	<u>Aquatic Life Acute Value Micrograms/L</u>	<u>Aquatic Life Chronic Value Micrograms/L</u>	<u>Human Health Value Fish & Drinking Water⁽²⁾ Micrograms/L</u>	<u>Human Health Value Fish Only⁽⁸⁾ Micrograms/L</u>
Alachlor ⁽³⁾			2 ⁽⁹⁾	
Aluminum (pH 6.5-9.0 only)	750	87 ⁽¹⁴⁾		
Ammonia	See Appendix C			
Atrazine			3 ⁽⁹⁾	
Barium			2000 ⁽⁹⁾	
Bis(chloromethyl) Ether ⁽³⁾			0.00010	0.00029
Carbofuran			40 ⁽⁹⁾	
Chloride	860000 ⁽¹⁵⁾	230000 ⁽¹⁵⁾		
Chlorine (total residual)	19	11		
Chlorophenoxy Herbicide 2,4,5,- TP			10	
Chlorpyrifos	0.083	0.041		
Chlorophenoxy Herbicide 2,4,-D			70 ⁽⁹⁾	
Dalapon			200 ⁽⁹⁾	
Demeton		0.1		
Di(2-ethylhexyl)adipate			400 ⁽⁹⁾	
Dibromochloropropane (DBCP) ⁽³⁾			0.2 ⁽⁹⁾	
Dichloroethylene (cis-1,2-)			70 ⁽⁹⁾	
Dinoseb			7 ⁽⁹⁾	
Dinitrophenols			69	5300
Dissolved Gases		100% Sat.		
Dissolved Oxygen		See Appendix D		
E. coli			See Section 27	
Diquat			20 ⁽⁹⁾	
Endothall			100 ⁽⁹⁾	
Ethylene dibromide (EDB) ⁽³⁾			0.05 ⁽⁹⁾	
Fluoride			2000 ⁽⁹⁾	
Glyphosate			700 ⁽⁹⁾	
Guthion		0.01		

NON-PRIORITY POLLUTANTS

Iron		1000 ⁽¹²⁾	300 ⁽¹¹⁾	
Malathion		0.1		
Manganese	3110 ⁽⁴⁾⁽¹²⁾	1462 ⁽⁴⁾⁽¹²⁾	50 ⁽¹¹⁾	
Methoxychlor		0.03	40 ⁽⁹⁾	
Mirex		0.001		
Nitrite (as N)			1000 ⁽⁹⁾	
Nitrates (as N)			10000 ⁽⁹⁾	
Nitrite+Nitrate (both as N)			10000 ⁽⁹⁾	
Nitrosamines			0.0008	1.24
Nitrosodibutylamine,N			0.0063	0.22
Nitrosodiethylamine,N			0.0008	1.24
N-nitrosopyrrolidene ⁽³⁾			0.016	34
Oxamyl (Vydate)			200 ⁽⁹⁾	
Parathion	0.065	0.013		
Pentachlorobenzene			1.4	1,5
pH		6.5-9.0		
Picloram			500 ⁽⁹⁾	
Simazine			4 ⁽⁹⁾	
Styrene			100 ⁽⁹⁾	
Sulfide-Hydrogen Sulfide (S ²⁻ , HS ⁻)		2		
1,2,4,5-tetrachlorobenzene			0.97	1.1
Tributyltin	0.46	0.063		
Trichlorfluoromethane			10000	860000
2,4,5-trichlorophenol			1.0 ⁽⁷⁾	3600
2,4,5-TP (2,4,5-trichlorophenoxy) propionic acid			50 ⁽⁹⁾	
Xylenes			10000 ⁽⁹⁾	

- (1) Except for the aquatic life values for metals and where otherwise indicated, the values given in this Appendix refer to the total recoverable (dissolved plus suspended) amount of each substance. For the aquatic life values for metals, the values refer to dissolved amount.
- (2) Except where otherwise indicated, these values are based on EPA Section 304(a) criteria recommendations assuming consumption of 2 liters of water and 6.5 grams of aquatic organisms per day.

- (3) Except for arsenic, the substance is classified as a carcinogen with the value based on an incremental risk of one additional instance of cancer in one million persons. Arsenic is classified as a carcinogen, however, the value is not based on an additional 1:1,000,000 cancer risk.
- (4) Hardness dependent criteria. Value given is an example only and is based on a CaCO₃ hardness of 100 mg/L. Criteria for each case must be calculated using the formula in Appendix F.
- (5) pH dependent criteria. Value given is an example only and is based on a pH of 7.8. Criteria for each case must be calculated using the formula in Appendix G.
- (6) Chemicals which are not individually classified as carcinogens but which are contained within a class of chemicals with carcinogenicity as the basis for the criteria derivation for that class of chemicals; an individual carcinogenicity assessment for these chemicals is pending.
- (7) Value is based on organoleptic (taste and odor) effects and is more stringent than if based solely on toxic or carcinogenic effects.
- (8) EPA Section 304(a) human health criteria recommendation assuming consumption of contaminated aquatic organisms at a rate of 6.5 grams per day.
- (9) The criterion is based on an EPA drinking water standard (Maximum Contaminant Level or MCL).
- (10) This value is expressed in terms of total recoverable metal in the water column. It is scientifically acceptable to use the conversion factor 0.922 to convert this to a value that is expressed in terms of dissolved metal. Using this conversion, the chronic aquatic life value for selenium is 4.61 µg/L as dissolved metal.
- (11) The iron and manganese criteria are based on Safe Drinking Water Act secondary standards and are intended to prevent undesirable aesthetic effects. These values represent the dissolved amount of each substance rather than the total amount.
- (12) Value is based on the dissolved amount which is the amount that will pass through a 0.45 µm membrane filter prior to acidification to pH 1.5-2.0 with nitric acid.
- (13) This criterion applies to total PCBs, i.e., the sum of all congener or all isomer analyses.
- (14) - The 87 µg/L chronic criterion for aluminum is based on information showing chronic effects on brook trout and striped bass. The studies underlying the 87 µg/L chronic value, however, were conducted at low pH (6.5 - 6.6) and low hardness (< 10 ppm CaCO₃), conditions uncommon in Wyoming surface waters. A water effect ratio

toxicity study in West Virginia indicated that aluminum is substantially less toxic at higher pH and hardness (although the relationship is not well quantified at this time). Further, EPA is aware of field data indicating that many high quality waters in the U.S. contain more than 87 µg/L when either the total recoverable or dissolved aluminum is measured. Based on this information and considering the available toxicological information in Tables 1 and 2 of EPA's Aluminum Criteria Document (EPA 440/5-86-008), the Department of Environmental Quality will implement the 87 µg/L chronic criterion for aluminum as follows: where the pH is equal to or greater than 7.0 and the hardness is equal to or greater than 50 ppm as CaCO₃ in the receiving water after mixing, the 87 µg/L chronic criterion will not apply, and aluminum will be regulated based on compliance with the 750 µg/L acute aluminum criterion. In situations where the 87 µg/L chronic criterion applies, a discharger may request development of and provide the basis for a site-specific chronic criterion based on a water-effect ratio.

(15) Criterion applies on Class 1, 2AB, 2B and 2C waters only.

SITE-SPECIFIC CRITERIA

The criteria in this section is applicable only to the waters and/or locations specified and replaces similar criteria expressed elsewhere in these regulations.

Belle Fourche Drainage

The numeric human health criteria for iron and manganese shall not apply to Class 2 waters in the Belle Fourche River Drainage above the confluence of Donkey Creek and the main stem of the Belle Fourche River;

The numeric human health criteria for iron and manganese shall not apply to main stem of the Belle Fourche River below the confluence of Donkey Creek.

Big Horn River Drainage

Cottonwood Creek (near Hamilton Dome): The aquatic life criterion for chloride shall be 860 mg/L and the aquatic life criterion for selenium shall be 43 µg/L. These values represent instantaneous maximum values, not to be exceeded at any time.

Cheyenne River Drainage

The numeric human health criteria for iron and manganese shall not apply to Class 2 tributaries of Antelope Creek;

The numeric human health criteria for iron and manganese shall not apply to Little Thunder Creek and all of its Class 2 tributaries below the confluence of North Prong.

Little Powder River Drainage

The numeric human health criteria for iron and manganese shall not apply to Class 2 waters in the Little Powder River Drainage.

North Platte River Drainage

Poison Spider Creek: The aquatic life criterion for chloride shall be 531 mg/L. This value represents an instantaneous maximum value, not to be exceeded at any time.

Powder River Drainage

The numeric human health criteria for iron and manganese shall not apply to Class 2 waters in the Powder River Drainage except on the following waters:

The main stem of Clear Creek and its Class 2 tributaries upstream of Clearmont, Wyoming;

The main stem of Crazy Woman Creek and its Class 2 tributaries;

The North Fork of the Powder River and all its Class 2 tributaries; and

The Middle Fork of the Powder River and all its Class 2 tributaries.

Salt Creek: The aquatic life criterion for chloride shall be 1600 mg/L. This value represents an instantaneous maximum value, not to be exceeded at any time.

Meadow Creek (tributary to Salt Creek): The aquatic life criterion for chloride shall be 1600 mg/L. This value represents an instantaneous maximum value, not to be exceeded at any time.

Powder River below Salt Creek: The aquatic life criterion for chloride shall be 984 mg/L. This value represents an instantaneous maximum value, not to be exceeded at any time.

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Appendix C
Ammonia Toxicity Criteria

(a) The ammonia values in the tables below are expressed in milligrams ammonia nitrogen per liter (mg N/L) and vary with temperature and/or pH, and fish species or fish life stage. The ammonia criteria for pH values not represented in the tables can be calculated using the formulas in section (b) of this appendix.

pH-Dependent Values of the Acute Criterion (CMC)⁽¹⁾ for Ammonia

Acute Values, mg N/L		
pH	Salmonids Present	Salmonids Absent
6.5	32.6	48.8
6.6	31.3	46.8
6.7	29.8	44.6
6.8	28.1	42.0
6.9	26.2	39.1
7.0	24.1	36.1
7.1	22.0	32.8
7.2	19.7	29.5
7.3	17.5	26.2
7.4	15.4	23.0
7.5	13.3	19.9
7.6	11.4	17.0
7.7	9.65	14.4
7.8	8.11	12.1
7.9	6.77	10.1
8.0	5.62	8.40
8.1	4.64	6.95
8.2	3.83	5.72
8.3	3.15	4.71
8.4	2.59	3.88
8.5	2.14	3.20
8.6	1.77	2.65
8.7	1.47	2.20
8.8	1.23	1.84
8.9	1.04	1.56
9.0	0.885	1.32

Appendix C
Ammonia Toxicity Criteria

**Temperature and pH Dependent Values of the Chronic Criterion (CCC)⁽²⁾
for Fish Early Life Stages Present**

pH	Temperature, EC									
	0	14	16	18	20	22	24	26	28	30
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

Appendix C
Ammonia Toxicity Criteria

**Temperature and pH Dependent Values of the Chronic Criterion (CCC)⁽²⁾
for Fish Early Life Stages Absent**

Temperature, EC										
pH	0-7	8	9	10	11	12	13	14	15*	16*
6.5	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89	6.46	6.06
6.6	10.7	9.99	9.37	8.79	8.24	7.72	7.24	6.79	6.36	5.97
6.7	10.5	9.81	9.20	8.62	8.08	7.58	7.11	6.66	6.25	5.86
6.8	10.2	9.58	8.98	8.42	7.90	7.40	6.94	6.51	6.10	5.72
6.9	9.93	9.31	8.73	8.19	7.68	7.20	6.75	6.33	5.93	5.56
7.0	9.60	9.00	8.43	7.91	7.41	6.95	6.52	6.11	5.73	5.37
7.1	9.20	8.63	8.09	7.58	7.11	6.67	6.25	5.86	5.49	5.15
7.2	8.75	8.20	7.69	7.21	6.76	6.34	5.94	5.57	5.22	4.90
7.3	8.24	7.73	7.25	6.79	6.37	5.97	5.60	5.25	4.92	4.61
7.4	7.69	7.21	6.76	6.33	5.94	5.57	5.22	4.89	4.59	4.30
7.5	7.09	6.64	6.23	5.84	5.48	5.13	4.81	4.51	4.23	3.97
7.6	6.46	6.05	5.67	5.32	4.99	4.68	4.38	4.11	3.85	3.61
7.7	5.81	5.45	5.11	4.79	4.49	4.21	3.95	3.70	3.47	3.25
7.8	5.17	4.84	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89
7.9	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89	2.71	2.54
8.0	3.95	3.70	3.47	3.26	3.05	2.86	2.68	2.52	2.36	2.21
8.1	3.41	3.19	2.99	2.81	2.63	2.47	2.31	2.17	2.03	1.91
8.2	2.91	2.73	2.56	2.40	2.25	2.11	1.98	1.85	1.74	1.63
8.3	2.47	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48	1.39
8.4	2.09	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17
8.5	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.06	0.990
8.6	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.951	0.892	0.836
8.7	1.26	1.18	1.11	1.04	0.976	0.915	0.858	0.805	0.754	0.707
8.8	1.07	1.01	0.944	0.885	0.829	0.778	0.729	0.684	0.641	0.601
8.9	0.917	0.860	0.806	0.756	0.709	0.664	0.623	0.584	0.548	0.513
9.0	0.790	0.740	0.694	0.651	0.610	0.572	0.536	0.503	0.471	0.442

* At 15 EC and above, the criterion for fish early life stages absent is the same as the criterion for fish early life stages present.

(b) For pH values not expressed in the table above, ammonia toxicity criteria can

be calculated as follows:

- (i) Salmonids or other sensitive cold water species present:

$$CMC = \frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}}$$

- (ii) Salmonids or other sensitive cold water species absent:

$$CMC = \frac{0.411}{1 + 10^{7.204 - pH}} + \frac{58.4}{1 + 10^{pH - 7.204}}$$

- (iii) Criterion Continuous Concentration (CCC) when fish early life stages are present

$$CCC = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \cdot \text{MIN}(2.85, 1.45 \cdot 10^{0.028 \cdot (25 - T)})$$

- (iv) Criterion Continuous Concentration (CCC) when fish early life stages are absent

$$CCC = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \cdot 1.45 \cdot 10^{0.028 \cdot (25 - \text{MAX}(T, 7))}$$

¹ Criterion Maximum Concentration (CMC) refers to the one-hour average concentration of total ammonia nitrogen (in mg N/L) not to be exceeded more than once every three (3) years. The CMC can also be referred to as the acute value.

² Criterion Continuous Concentration (CCC) refers to the 30-day average concentration of total ammonia nitrogen (in mg N/L) not to be exceeded more than once every three (3) years. In addition, the highest 4-day average within the 30-day period should not exceed 2.5 times the CCC. The CCC can also be referred to as the chronic value. The CCC values are implemented on Class 2 waters with an assumption that early life stages of fish are present. This assumption can be rebutted, but only where a permittee, discharge permit applicant or affected party provides sufficient site-specific information to support a conclusion that the assumption is not appropriate for that waterbody.

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Appendix D

Minimum Dissolved Oxygen Criteria* (mg/L)

	<u>Cold water Criteria</u>		<u>Class 2C and Warm water Criteria</u>	
	Early Life Stages ^{(1),(2)}	Other Life Stages	Early Life Stages ⁽²⁾	Other Life Stages
30 Day Mean	NA ⁽³⁾	6.5	NA	5.5
7 Day Mean	9.5 (6.5)	NA ⁽³⁾	6.0	NA ⁽³⁾
7 Day Mean Minimum ⁽⁴⁾	NA ⁽³⁾	5.0	NA ⁽³⁾	4.0
1 Day Minimum ⁽⁴⁾	8.0 (5.0)	4.0	5.0	3.0

- (1) These are water column concentrations recommended to achieve the required intergravel dissolved oxygen concentrations shown in parentheses. For species that have early life stages exposed directly to the water column, the figures in parentheses apply.
- (2) Includes all embryonic and larval stages and all juvenile forms to 30-days following hatching.
- (3) NA (not applicable).
- (4) All minima should be considered as instantaneous concentrations to be achieved at all times.

* These limitations apply to Class 1, 2A, 2B and 2C waters only and in no case shall be interpreted to require dissolved oxygen concentrations greater than 100 percent saturation at ambient temperature and elevation.

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Appendix E

References for Use in Making Bioassays of Surface Waters

U.S. Environmental Protection Agency: Quality Criteria for Water. EPA-440/5-86/001. U.S. EPA, 1986.

U.S. Environmental Protection Agency: Ambient Water Quality Criteria Documents, 1980, and subsequent revisions. U.S. EPA, 1980.

U.S. Environmental Protection Agency: Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses. U.S. EPA, 1985.

U.S. Environmental Protection Agency: Technical Support Manual: Waterbody Surveys and Assessments for Conducting Use Attainability Analyses. U.S. EPA, 1983.

U.S. Environmental Protection Agency: Technical Guidance Manual for Performing Waste Load Allocation, Book VI, Chapter 1: Stream Design Flow for Steady-State Modeling. U.S. EPA, 1986.

U.S. Environmental Protection Agency: Technical Support Document for Water Quality Based Toxics Control. U.S. EPA, 1985.

U.S. Environmental Protection Agency: Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms. EPA-600/4-85/013. U.S. EPA, 1985.

U.S. Environmental Protection Agency: Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Second Edition. EPA-600/4-89/001. U.S. EPA, 1989.

U.S. Environmental Protection Agency: Water Quality Standards Handbook, Second Edition, EPA 823-B-94-005a, August 1994, with Appendices.

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Appendix F

Conversion Factors for Hardness Dependent Metals

Conversion Factors: Total Recoverable Values - |Dissolved Values for Metals
Equations For Parameters With Hardness⁽¹⁾ Dependence

Conversion Factors: Aquatic life values for the following metals are based on dissolved amounts of each substance. Because the National Toxics Criteria (*EPA's Section 304(a) criteria*) are expressed as “total recoverable” values, the application of a conversion factor is necessary to convert from “total recoverable” to “dissolved”.

Furthermore, the toxicity of the associated metals varies with hardness and the total recoverable value must be calculated based on the CaCO₃ hardness prior to multiplying by the conversion factor (CF).

The conversion factors for the following metals are constants:

Metal	Acute Value	Chronic Value
Chromium (III)	0.316	0.860
Copper	0.960	0.960
Nickel	0.998	0.997
Silver	0.85	N/A
Zinc	0.978	0.986

The conversion factors (CF) for Cadmium and Lead are not constant but vary with hardness (CaCO₃) and can be calculated using the following equations:

$$\text{Cadmium Acute: } CF = 1.136672 - [(\ln \text{ hardness})(0.041838)]$$

$$\text{Cadmium Chronic: } CF = 1.101672 - [(\ln \text{ hardness})(0.041838)]$$

$$\text{Lead Acute and Chronic: } CF = 1.46203 - [(\ln \text{ hardness})(0.145712)]$$

⁽¹⁾ Hardness as mg/L CaCO₃

Appendix F

Equations For Parameters With Hardness⁽¹⁾ Dependence

The following equations include the conversion factors to derive the dissolved metals values:

Parameter	Acute 1-Hour Average Concentration (µg/L)	Chronic 4-Day Average Concentration (µg/L)
<i>Cadmium</i>	$e^{(1.0166 [\ln(\text{hardness})]-3.924)}(CF)$	$e^{(0.7409 [\ln(\text{hardness})]-4.719)}(CF)$
<i>Chromium (III)</i>	$e^{(0.8190 [\ln(\text{hardness})] +3.7256)}(0.316)$	$e^{(0.8190 [\ln(\text{hardness})]+0.6848)}(0.860)$
<i>Copper</i>	$e^{(0.9422 [\ln(\text{hardness})]-1.700)}(0.960)$	$e^{(0.8545 [\ln(\text{hardness})]-1.702)}(0.960)$
<i>Lead</i>	$e^{(1.273 [\ln(\text{hardness})]-1.460)}(CF)$	$e^{(1.273 [\ln(\text{hardness})]-4.705)}(CF)$
<i>Manganese</i>	$e^{(0.7693[\ln(\text{hardness})]+4.4995)}$	$e^{(0.5434[\ln(\text{hardness})]+4.7850)}$
<i>Nickel</i>	$e^{(0.8460 [\ln(\text{hardness})]+2.255)}(0.998)$	$e^{(0.8460 [\ln(\text{hardness})]+0.0584)}(0.997)$
<i>Silver</i>	$e^{(1.72 [\ln(\text{hardness})]-6.52)}(0.85)$	N/A
<i>Zinc</i>	$e^{(0.8473 [\ln(\text{hardness})]+0.884)}(0.978)$	$e^{(0.8473 [\ln(\text{hardness})]+0.884)}(0.986)$

⁽¹⁾ Hardness as mg/L CaCO₃. Hardness values used in these equations must be less than 400 mg/L. For hardness values greater than 400 mg/L use 400.

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Appendix G

Equations For Parameters With pH Dependence

Parameter	4-Day Average Concentration ($\mu\text{g/L}$)	1-Hour Average Concentration ($\mu\text{g/L}$)
Pentachloro-Phenol	$e^{[1.005 (\text{pH})-5.290]}$	$e^{[1.005 (\text{pH})-4.830]}$

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1 Appendix H

2
3 Agricultural Use Protection

4
5 (a) Purpose. All surface waters in Wyoming are protected to some extent for
6 agricultural uses. “Agricultural uses” are described in Section 3 as being either stock watering
7 or irrigation.

8 The purpose of this Appendix is to provide the criteria and procedures to be used by the
9 Water Quality Division when translating the narrative goals expressed in the Section 20 standard
10 into appropriate WYPDES permit limits where maintaining agricultural use of the receiving
11 waters is an issue.

12
13 “Measurable Decrease”. The first task in translating the standard is defining what is
14 meant by “measurable decrease in crop or livestock production”. The phrase implies that there
15 is a pre-existing agricultural use of a stream or drainage prior to an application for a WYPDES
16 discharge permit. For livestock watering purposes, a pre-existing use will always be assumed.
17 For irrigation purposes, there needs to be either a current irrigation structure or mechanism in
18 place for diverting water from the stream channel, or a substantial acreage of naturally sub-
19 irrigated pasture within a stream floodplain. Where neither of these conditions exist, there can
20 be no irrigation use, nor loss in crop production attributable to water quality.

21
22 Where there are pre-existing agricultural uses, it may often be impossible to measure a
23 loss in crops or livestock that can be attributed to water quality because of the many other factors
24 that will affect actual production. It is also important to be able to predict the probability of a
25 measurable decrease in production rather than relying solely on after-the-fact measurements.
26 Therefore, the implementation of the narrative criteria through WYPDES permits will always
27 involve making reasonable judgments and assumptions.

28
29 Effluent limits on discharges that began prior to January 1, 1998 will not be affected by
30 this Appendix in relation to the protection of agricultural uses. Where discharges have been
31 occurring prior to that date, it will be assumed that the discharge has had no adverse effect on
32 agricultural production. Therefore, it is not necessary to modify those discharges in order to
33 achieve the goal of “no measurable decrease” in crop or livestock production. It would only be
34 necessary to maintain the existing quality of the discharge. It is important to note, however, that
35 effluent limits on historic discharges may be made where the quality of the discharge is shown to
36 constitute a threat to any other designated uses described in Chapter 1 of the Wyoming Water
37 Quality Rules and Regulations.

1 (b) Livestock Watering. The following limits apply to discharges that will be used
2 for livestock watering. Each limit must be achieved at the end-of-pipe prior to mixing with the
3 receiving stream:

- 4 5,000 mg/L TDS;
- 5 3,000 mg/L Sulfate;
- 6 2,000 mg/L Chloride

7
8 In addition to the basic effluent limitations above, the Agricultural Use Protection Policy
9 includes additional limits for livestock protection which may be incorporated into WYPDES
10 permits when there is reason to believe they may be associated with a discharge.

11
12 (c) Irrigation. Electrical conductivity (EC) and sodium adsorption ratio (SAR) limits
13 will be derived in permits where effluent discharges may reach irrigated lands.

14 (i) For the purposes of this rule, irrigated lands include the following:

15
16 (A) “Artificially Irrigated Lands” means the artificially irrigated lands
17 where water is intentionally applied for agricultural purposes. Artificially irrigated lands will be
18 identified by the presence of canals, ditches, spreader dikes, spray irrigation systems or any other
19 constructed mechanism intended to divert water from a stream channel for application on
20 adjacent lands.

21
22 (B) “Naturally Irrigated Lands” means lands along stream channels
23 that have enhanced vegetative production due to periodic natural flooding or sub-irrigation.
24 Naturally irrigated lands are those lands where a stream channel is underlain by unconsolidated
25 material and on which the combination of stream flow and channel geometry provides for
26 enhanced productivity of plants used for agricultural purposes. Naturally irrigated lands may be
27 identified by an evaluation of infra-red aerial imagery, surficial geologic maps, wetland
28 mapping, landowner testimony, site-specific assessment, any combination of that information, or
29 other types of evaluations.

30
31 (ii) Appropriate effluent limits for EC and SAR will be calculated and applied
32 to WYPDES discharge permits in all instances where the produced water discharge may reach
33 any artificially irrigated lands.

34
35 (iii) EC and SAR limits will be applied to WYPDES permits where the
36 produced water discharge may reach stream segments containing single parcels of naturally
37 irrigated land greater than 20 acres in size or multiple parcels in near proximity that total more
38 than 20 acres. In making this estimation, small drainage bottoms may be excluded from
39 consideration. Two specific criteria which may be used to exclude lands include lack of a persistent
40 active channel and unconsolidated floodplain deposits which are generally less than 50 feet in width.

41
42 (iv) If there are no pre-existing diversions within reach of a discharge, if the
43 water will be impounded or managed so as not to reach a diversion during the irrigation season.

1 or if the discharge will not reach an irrigated field, either because of natural conditions or water
2 management techniques, then permit limits will be established to protect other relevant water
3 uses (e.g. livestock watering, wildlife, aquatic life, etc.).

4
5 (v) Data and Information. A minimum amount of data must be collected to
6 identify existing irrigation uses and to appropriately set effluent limits on discharges that may
7 affect those uses. At a minimum, the following information must be obtained:

8
9 (A) Location(s) of irrigation diversions and/or naturally irrigated
10 acreage;

11 (B) Crops grown under irrigation;

12 (C) Published tolerance values for the most sensitive crop;

13 (D) Season of use.

14
15 Additional information may be required of the applicant to ensure that appropriate
16 effluent limits are set to protect the receiving water.

17
18 (vi) Establishing Effluent Limits. A 3-tiered decision making process will be
19 used to establish appropriate effluent limits for EC and SAR whenever a proposed discharge will
20 likely reach irrigated lands.

21
22 (A) Tier 1- Default EC and SAR Limits. Default limits for EC and
23 SAR may be used where the quality of the discharge water is relatively good or the irrigated
24 crops are salt-tolerant. The default values shall be based upon the published soil EC tolerance
25 values for the most sensitive crop and shall be calculated as follows:

26
27 (I) Default EC limits will be based upon 100 percent yield
28 threshold values for soil EC as reported by the USDA Agriculture Research Service (ARS) Salt
29 Tolerance Database. In the event that the species of interest is not included in the ARS Salt
30 Tolerant Database, then the following alternative references can be consulted:

31
32 (1.) Hanson et al. 1999. Agricultural Salinity and
33 Drainage. DANR Pub. 3375, Univ. of Calif. Davis;

34
35 (2.) Ayers and Westcot. 1985. Water Quality for
36 Agriculture. UN FAO Irrigation and Drainage Paper 29 (revised); and

37
38 (3.) CPHA. 2002. Western Fertilizer Handbook. 9th
39 Edition. Interstate Pub., Inc., Danville, IL.

40
41 (II) The relationship between soil EC values and irrigation
42 water EC values will be: $EC(\text{soil}) = 1.5 EC(\text{water})$, i.e., the published soil EC threshold
43 obtained from the appropriate reference will be divided by the soil concentration factor of 1.5 to
44 establish the discharge EC limit.

1 However, in circumstances where the background water quality of the receiving water(s)
2 is known to be significantly better than would otherwise be required based on a theoretical 100%
3 yield, effluent limits may be set to maintain that higher quality.

4
5 (III) Default limits will be set to ensure the relationship between
6 SAR and EC remains within the designated zone of “no reduction in rate of infiltration” as
7 depicted in Figure 1 at the end of this appendix. The following equation will be used to
8 determine the default SAR limit: $SAR = (7.10 \times EC \text{ dS/m}) - 2.48$. If the actual EC
9 concentration of the discharge is observed to be of higher quality than the published default
10 concentration then the SAR limit may be adjusted to actual EC concentrations depending on site
11 specific conditions. When the calculated default SAR value exceeds 10, the limit will be set at
12 10 as the maximum default limit. The maximum default limit is only intended to apply to
13 calculating Tier 1 limits and may be modified according to the provisions of Section (B) and
14 Section (C) below.

15
16 (IV) At a minimum, the EC and SAR limits will apply during
17 the irrigation season and when flows are sufficient to support the use. For sub-irrigated lands
18 and passively irrigated lands such as those under spreader dike systems, EC and SAR limits will
19 generally apply year-round.

20
21 (B) Tier 2 - Background Water Quality. If sufficient data is available to
22 demonstrate or calculate that the pre-existing background water quality at the point(s) of
23 diversion is worse than the effluent quality, EC and SAR effluent limits may be based upon those
24 background conditions rather than tolerance values for the most sensitive crop.

25
26 (I) Measured Data. Background water quality may be
27 established based upon published pre-discharge historic data. Generally, this data only exists on
28 larger, perennial, mainstem stream channels where historic gauging has taken place. Actual
29 measured data is the most reliable means of establishing background and must be considered on
30 those waters where it is available.

31
32 (II) Calculated Background. On intermittent and ephemeral
33 stream channels, pre-discharge water quality data is usually scarce or non-existent and very
34 difficult to collect. In these circumstances, background water quality can be estimated by
35 conducting soil surveys on land that has been historically irrigated from the subject stream.

36
37 In the event that soil studies are used as a means to estimate baseline water quality for a
38 given drainage, the following requirements apply:

39
40 (1.) Sample Site Selection. Soil samples shall be taken
41 at semi-random sites within each contiguous irrigated segment downstream of the proposed
42 discharge. “Semi-random” in this case is intended to mean that the applicant will identify the
43 various major distinguishing terrain zones within each irrigated segment and select sample sites
44 randomly within each terrain zone. For example, the channel bottom may constitute one terrain
45 zone, the first small terrace above the channel bottom may be another terrain zone, and the

1 adjacent meadow or field may be a single remaining terrain zone, or that meadow / field may
2 actually be comprised of several other known zones such as discharge-affected soils vs. non-
3 affected soils, sub-irrigated reaches vs. non-sub-irrigated reaches, etc.

4
5 (2.) Number of Sample Sites. Listed below are the
6 minimum number of soil sample sites required for each of the identified terrain zones (based on
7 zone area) within a contiguous irrigated segment:
8

<u>Zone Area</u>	<u>Minimum Number of Sample Sites</u>
<u>0 – 5 acres</u>	<u>3</u>
<u>5 - 10 acres</u>	<u>5</u>
<u>10 + acres</u>	<u>7</u>

9
10 (3.) Sample Collection. Sample sites must be located a
11 minimum of 50 feet apart from one another. Each sample site shall be sampled at a minimum of
12 four depths (0-12”, 13-24”, 25-36”, 37-48”). If alfalfa is present within the terrain zone, each
13 sample site within that terrain zone must be sampled at a total of 6 depths (at the above-noted
14 depths, plus 49-60” and 61-72”). Each twelve inch sample increment must be analyzed either
15 individually or combined (composited) with other corresponding depth samples from the other
16 sample sites within the same terrain zone (e.g., all 0-12” samples from a given terrain zone
17 bulked together and analyzed as a single composite sample).

18
19 (4.) Sample Analysis. At a minimum, a saturated paste
20 extract for each sample shall be analyzed for EC. Though not necessary for the estimation of
21 background water conductivity, it is advisable to also analyze the soil samples for pH, SAR, soil
22 texture and exchangeable sodium percentage (ESP) to avoid having to duplicate the sampling if
23 the results indicate that a “no harm analysis” (Section (C) below) needs to be completed. Percent
24 organic matter shall be analyzed in the surface 0-12” samples only. In addition, analyses to
25 identify the clay mineralogy types present in the soils may also be warranted.

26
27 (III) Soil Report Preparation. At a minimum the applicant shall
28 submit:

29
30 (1.) A map or diagram identifying where each of the soil
31 sample sites is located. At a minimum, the map or diagram must show the basic topography and
32 stream course, irrigation structures (if present - such as spreader dams or head gates), estimated
33 boundaries of the irrigated acreage, surface ownership of the irrigated acreage (including
34 downstream irrigated areas) and section / township / range identification. This map must also
35 show any delineated terrain zones, plus elevations of the terrain zones;

36
37
38 (2.) An accompanying location table which includes the

1 quarter / quarter, section, township, range, and latitude / longitude for each sample site;
2

3 (3.) Summary data table showing the analytical results
4 for each of the soil parameters listed above, for each depth, at each sample site;
5

6 (4.) All associated lab sheets.
7

8 (C) Tier 3 - No Harm Analysis. The actual effects of EC and SAR on
9 crop production are variable based upon soil type and chemistry and may be mitigated to some
10 extent by managing irrigation practices. EC and SAR effluent limits may also be established
11 based upon a scientifically defensible site specific study that examines local soil characteristics,
12 natural water quality, expected crop yield, irrigation practices and/or other relevant factors
13 related to crop production.
14

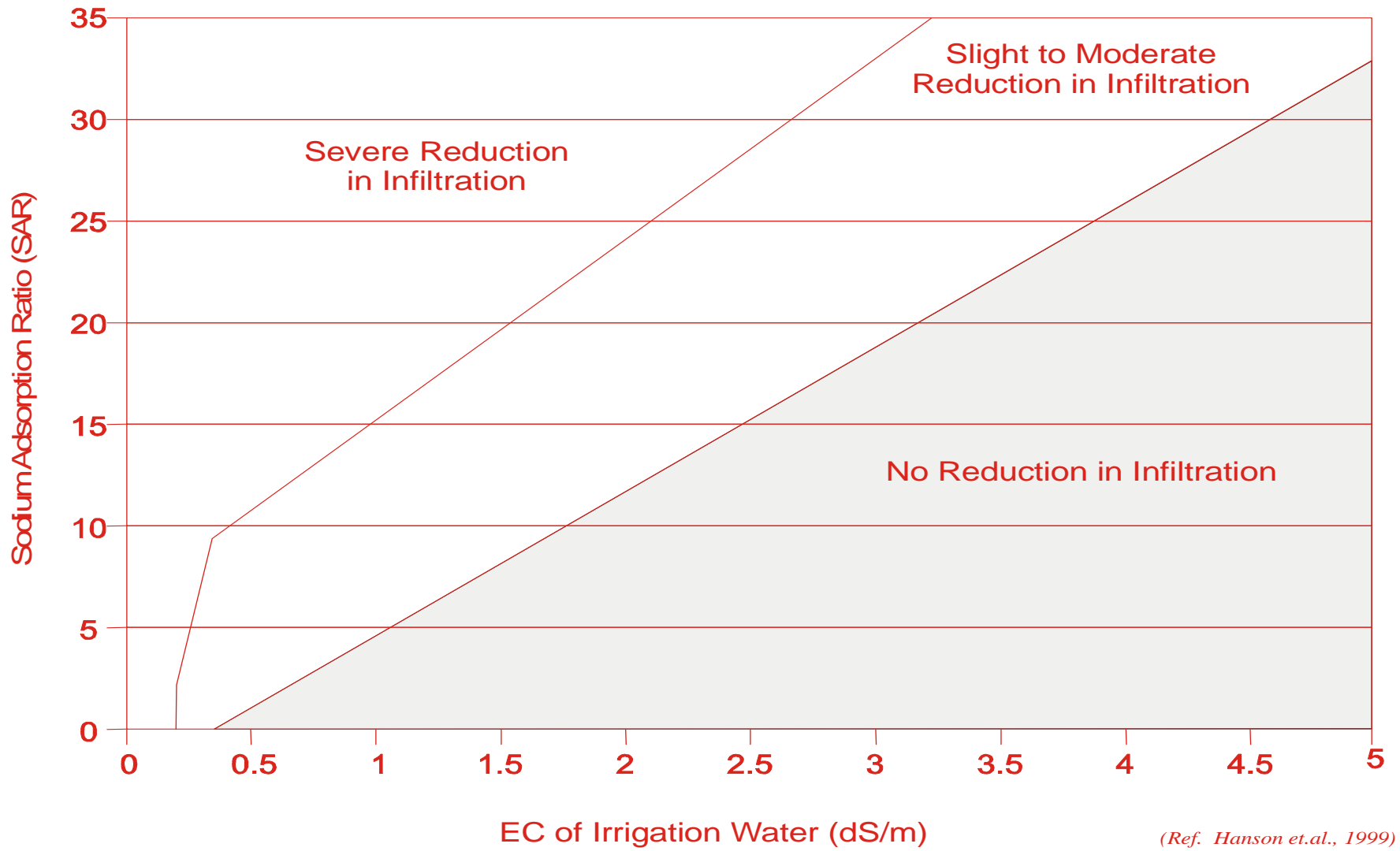
15 Because of the site-specific nature of this approach and the number and complexity of
16 variables that may need to be considered, there is a burden of proof placed upon the applicant to
17 demonstrate through a comprehensive study that levels of EC and/or SAR, higher than either the
18 default values or estimated background water quality, would most likely not measurably harm an
19 existing irrigation use. Refined limits for EC and SAR resulting from a "no harm" analysis
20 should incorporate a reasonable margin of safety to account for variables that cannot be precisely
21 measured or modeled.
22

23 (vii) Irrigation Waiver. An exception to EC or SAR limits established under
24 the Tier 1, 2 or 3 procedures may be made when affected landowners request use of the water
25 and thereby accept any potential risk to crop production on their lands. Irrigation waivers will
26 only be granted in association with an irrigation management plan that provides reasonable
27 assurance that the lower quality water will be confined to the targeted lands.
28

29 Reasonable Access Requirement. In circumstances where a landowner chooses to deny
30 access for the purpose of developing a Section 20 analysis, EC and SAR limits will be based
31 upon the best information that can be reasonably obtained for developing permit limits. This
32 circumstance may involve utilizing alternate sampling locations where conditions are expected
33 to be similar in nature to the inaccessible area.

Figure 1

Hanson Chart



Appendix H, Red Line Strike-out

Section 5

Appendix H

Agricultural Use Protection

~~a. Purpose~~

(a) Purpose. All surface waters in Wyoming are protected to some extent for agricultural uses. “Agricultural uses” are described in Section 3 as being either stock watering or irrigation. ~~The standard that applies to the protection of these uses is contained in Section 20 which states:~~

~~Section 20.—Agricultural Water Supply.—All Wyoming surface waters which have the natural water quality potential for use as an agricultural water supply shall be maintained at a quality which allows continued use of such waters for agricultural purposes.~~

~~Degradation of such waters shall not be of such an extent to cause a measurable decrease in crop or livestock production.~~

~~Unless otherwise demonstrated, all Wyoming surface waters have the natural water quality potential for use as an agricultural water supply.~~

~~All water quality standards are established for two reasons. The first is to provide a benchmark against which a determination can be made as to whether a waterbody is impaired and requires some kind of corrective action. The second is to provide a basis for establishing permit limits on regulated activities (WYPDES & Section 404 permits). The purpose of this Appendix is to provide the criteria and procedures to be used by the Water Quality Division when translating the narrative goals expressed in the Section 20 standard into appropriate WYPDES permit limits where maintaining agricultural use of the receiving waters is an issue.~~

~~Agricultural use of surface water is an opportunistic endeavor. The varying uses as well as the different qualities of the water found in the state are many and the farming and ranching industries have always had to make do with what water is available. The goal expressed in the Section 20 standard is simply to maintain surface water quality at a level that will continue to support the local agricultural uses that have developed around it.~~

~~Though the goal is simple, achieving it is not. For the most part, managing water quality for continued agricultural support requires managing the concentration and chemical makeup of dissolved solids. Because of local differences in crop types, soil types and natural water quality and availability, it isn’t possible to establish simple numeric criteria for pollutants such as TDS and SAR that will allow an efficient use of surface water for irrigation purposes. The determination of what is acceptable water quality for irrigation must necessarily involve an evaluation of local agricultural practices and background water quality conditions. For livestock watering uses, it is somewhat less complicated because there are fewer variables to consider.~~

1 “Measurable Decrease”.

2
3 The first ~~task in part of~~ translating the standard is defining what is meant by “*measurable decrease in crop or livestock production*”. The phrase ~~implies~~ that there is a pre-existing agricultural use of a stream or drainage prior to an application for a WYPDES discharge permit. For livestock watering purposes, a pre-existing use will always be assumed. For irrigation purposes, there needs to be either a current irrigation structure or mechanism in place for diverting water from the stream channel, or a substantial acreage of naturally sub-irrigated pasture within a stream floodplain. Where neither of these conditions exist, there can be no irrigation use, nor loss in crop production attributable to water quality.

11
12 Where there are pre-existing agricultural uses, it may often be impossible to measure a loss in crops or livestock that can be attributed to water quality because of the many other factors that will affect actual production. It is also important to be able to predict the probability of a measurable decrease in production rather than relying solely on after-the-fact measurements. Therefore, the implementation of the narrative criteria through WYPDES permits will always involve making reasonable judgments and assumptions.

19 Effluent limits on ~~historic~~ discharges that began prior to January 1, 1998 ~~of produced water~~ will not be affected by this Appendix in relation to the protection of agricultural uses. Where discharges have been occurring prior to that date, it will be assumed that the discharge has had no adverse effect on agricultural production. ~~for many years, the permitted quality of those discharges shall be considered to be “background” conditions and be fully protective of the agricultural uses that have developed around them.~~ Therefore, it is not necessary to modify those discharges in order to achieve the goal of “no measurable decrease” in crop or livestock production. It would only be necessary to maintain the existing quality of the discharge. It is important to note, however, that effluent limits on historic discharges may be made where the quality of the discharge is shown to constitute a threat to any other designated uses described in Chapter 1 of the Wyoming Water Quality Rules and Regulations. ~~hazard to humans, livestock or wildlife.~~

33 (b) Livestock Watering

35 i. Livestock Watering. The following limits apply ~~basic concept in protecting a livestock watering use is to~~ discharges ~~ensure that will be used~~ water quality is not acutely toxic to livestock or does not contain pollutants in concentrations that would affect growth or reproduction. ~~There are basic effluent limitations provided in the WYPDES permit regulations (Chapter 2 of the Water Quality Rules and Regulations) that are intended to ensure that the water is safe~~ for livestock watering. Each limit to drink. ~~These limits are:~~ must be achieved at the end-of-pipe prior to mixing with the receiving stream:

44 5,000 mg/L TDS;
45 3,000 mg/L Sulfate;
46 2,000 mg/L Chloride

1
2 ~~and each must be achieved at the end of pipe prior to mixing with the receiving stream.~~
3 In addition to the basic effluent limitations ~~above~~, the Agricultural Use Protection Policy
4 includes additional following limits for livestock protection which may be incorporated into
5 WYPDES permits when there is reason to believe they may be associated with a
6 discharge.~~discharge:~~

7 _____(NOTE for Council members: Metals criteria and Livestock
8 Watering Waiver below have been revised and moved to the Implementation Policies).

Selenium	50 µg/L	Total Recoverable
Fluoride	4000 µg/L	Dissolved
Arsenic	20 µg/L	Total Recoverable
Copper	500 µg/L	Dissolved
Cadmium	50 µg/L	Dissolved
Boron	5000 µg/L	Dissolved
Chromium	1000 µg/L	Dissolved
Lead	100 µg/L	Dissolved
Mercury	10 µg/L	Dissolved
Zinc	2500 µg/L	Dissolved

9
10 ~~Livestock watering waiver.—An exception to the limits above may be made whenever the~~
11 ~~background water quality of the receiving water is worse than the value listed for the associated~~
12 ~~pollutant or when the livestock producer requests use of the water and thereby accepts any~~
13 ~~potential risk to his livestock.~~

14
15 (c) Irrigation. ~~Electrical~~The interpretation of the Section 20 standard for irrigation is more
16 complex than for livestock watering because there are more variables than just the quality of
17 the water to consider. However, after considering the local circumstances relative to
18 irrigation and crop production, effluent limits can be established on WYPDES permits that
19 will be protective of the pre-existing irrigation uses. The goal is to ensure that pre-existing
20 irrigated crop production will not be diminished as a result of the lowering of water quality.

21
22 The basic water quality parameters of concern in regard to irrigation are electrical
23 conductivity (EC) and sodium adsorption ratio (SAR) limits will be derived in permits .
24 ~~Protection of irrigation uses where effluent discharges may~~WYPDES permits are involved
25 amounts to deriving appropriate effluent limits for EC and SAR in each instance.

26
27
28 ii. Identification and Protection of Irrigation Uses.—Implementation of the Section
29 20 standard through the WYPDES permitting program involves a sequence of decisions
30 based upon the amount and quality of data that is available to the permit writer. The most
31 basic question is whether a proposed discharge will reach irrigated lands. If the discharge
32 will not reach an irrigated field, either because of natural conditions or water
33 management techniques, it could not affect crop production on that field. For the
34 purposes of this policy, irrigated lands include the following:

35 (i) For the purposes of this rule, irrigated lands include the following:
36

1
2 ~~A.(A)~~ “(Artificially Irrigated Lands)” means the artificially~~Lands:~~
3 ~~Artificially~~ irrigated lands ~~are those~~ where water is intentionally applied for agricultural
4 purposes. Artificially irrigated lands will be identified by the presence of canals, ditches,
5 spreader dikes, spray irrigation systems or any other constructed mechanism intended to divert
6 water from a stream channel for application on adjacent lands.

7
8 ~~B.(B)~~ “(Naturally Irrigated Lands)” means~~Lands: Naturally irrigated~~ lands
9 ~~are areas of land~~ along stream channels that have enhanced vegetative production due to periodic
10 natural flooding or sub-irrigation. Naturally irrigated lands are those lands where a stream
11 channel is underlain by unconsolidated material and on which the combination of stream flow
12 and channel geometry provides for enhanced productivity of ~~agriculturally significant~~ plants
13 ~~used for agricultural purposes.~~ Naturally irrigated lands may be identified by an evaluation of
14 infra-red aerial ~~imagery, photography,~~ surficial geologic maps, wetland mapping, landowner
15 testimony, ~~site-specific assessment,~~ ~~or~~ any combination of that ~~information, or other types of~~
16 ~~evaluations.~~~~information.~~

17
18 ~~iii.(ii)~~ Appropriate effluent limits for EC and SAR will be calculated and applied
19 to WYPDES discharge permits in all instances where the produced water discharge may reach
20 any artificially irrigated lands.

21
22 ~~iv.(iii)~~ EC and SAR limits will ~~also~~ be applied to WYPDES permits where the
23 produced water discharge may reach stream segments containing ~~sufficient acreage of naturally~~
24 ~~irrigated land to be considered agriculturally significant. In general, stream segments containing~~
25 ~~single parcels of naturally irrigated land greater than 20 acres in size or multiple parcels in near~~
26 ~~proximity that total more than 20 acres, shall be considered agriculturally significant.~~ In making
27 this estimation, small drainage bottoms may be excluded from consideration. Two specific
28 criteria which may be used to exclude lands include lack of a persistent active channel and
29 unconsolidated floodplain deposits which are generally less than 50 feet in width.

30
31 ~~v.(iv)~~ If there are no pre-existing diversions within reach of a discharge, ~~or~~ if the
32 water will be impounded or managed so as not to reach a diversion during the irrigation season,
33 or if the discharge will not reach an irrigated field, either because of natural conditions or water
34 management techniques, then permit limits will ~~there would be no potential to adversely affect~~
35 ~~crop production. Likewise, if there are no agriculturally significant, naturally irrigated lands~~
36 ~~within reach of a discharge there would be no potential to adversely affect crop production. In~~
37 ~~these circumstances, permit limits would~~ be established to protect other relevant water uses (e.g.
38 livestock watering, wildlife, aquatic life, etc.).

39
40 ~~b. Data and Information~~

41
42 ~~(v)~~ There is a Data and Information. A minimum amount of data ~~that~~ must be
43 collected ~~in every circumstance in order~~ to identify existing irrigation uses and to appropriately
44 set effluent limits on discharges that may affect those uses. At a minimum, ~~Additional~~
45 ~~information that is beyond the minimum requirements can also be considered to fine tune the~~
46 ~~permitting decisions in a way that best addresses the various interests for the water. At a~~

1 ~~minimum~~ the following information must be obtained:

2
3 ~~i.(A)~~ Location(s) of irrigation diversions and/or naturally irrigated
4 acreage;

5 ~~ii.(B)~~ Crops grown under irrigation;

6 ~~iii.(C)~~ Published tolerance values for the most sensitive crop;

7 ~~iv.(D)~~ Season of use.

8
9 Additional information may be required of the applicant to ensure that appropriate
10 effluent limits are set to protect the receiving water.

11
12 ~~v.—Description of Irrigation Practices~~

13
14 ~~e. ——— Establishing Effluent Limits.~~

15
16 ~~(vi) ——— Establishing Effluent Limits. A 3-tiered decision making process~~
17 ~~will be used to establish appropriate effluent limits for EC and SAR whenever a proposed~~
18 ~~discharge will likely reach irrigated lands. —Tier 1 refers to a procedure for setting default EC~~
19 ~~and SAR limits and is useful in situations where the irrigated crops are salt-tolerant and/or the~~
20 ~~discharge water quality is relatively good. Tier 2 refers to a process whereby the default limits~~
21 ~~may be refined to equal background water quality conditions and is intended to be used in~~
22 ~~situations where the background EC and SAR is worse than the effluent quality. As a final~~
23 ~~measure, Tier 3 applies where background EC and SAR is better than the effluent quality. The~~
24 ~~purpose of a Tier 3 analysis is to provide sufficient justification to establish effluent limits that~~
25 ~~are of a lower quality than the pre-discharge background conditions. Under Tier 3, effluent~~
26 ~~limits may be established based upon local site conditions and irrigation practices to a level that~~
27 ~~can be demonstrated to cause no harm to the existing irrigation uses.~~

28
29 ~~i.(A) Tier 1 - —Default EC and SAR Limits.~~limits.~~~~ Default limits for EC
30 and SAR may be used where the quality of the discharge water is relatively good or the irrigated
31 crops are salt-tolerant. The default values shall be based upon the published soil EC tolerance
32 values for the most sensitive crop and shall be calculated as follows:

33
34 ~~A.(1) Default EC limits will be based upon 100 percent yield~~
35 ~~threshold values for soil EC as reported by the USDA Agriculture Research Service (ARS) Salt~~
36 ~~Tolerance Database.~~NRCS Bridger Plant Materials Center 1996 Technical Notes No. 26⁺.~~ In the~~
37 ~~event that the species of interest is not included in the ARS Salt Tolerant Database.~~Bridger Plant~~~~
38 ~~Materials Center document, then the following alternative references can be consulted:~~

39

~~⁺The Water and Waste Advisory Board recommended using the Bridger Plant Materials Center document as the primary reference for soil salinity tolerance values based upon comments submitted by Kevin Harvey, an industry consultant. The DEQ/WQD disagrees with this recommendation and maintains that the Salt Tolerance Database published by the USDA Agricultural Research Service (ARS) National Salinity Laboratory is a more appropriate reference for this purpose.~~

1 I.(1.) Hanson et al. 1999. Agricultural Salinity and
2 Drainage. DANR Pub. 3375, Univ. of Calif. Davis;

3
4 H.(2.) Ayers and Westcot. 1985. Water Quality for
5 Agriculture. UN FAO Irrigation and Drainage Paper 29 (revised); and

6
7 III.(3.) CPHA. 2002. Western Fertilizer Handbook. 9th
8 Edition. Interstate Pub., Inc., Danville, IL.

9
10 B.(II) The relationship between soil EC values and irrigation
11 water EC values will be: $EC(\text{soil}) = 1.5 EC(\text{water})$, i.e., the published soil EC threshold
12 obtained from the appropriate reference will be divided by the soil concentration factor of 1.5 to
13 establish the discharge EC limit.

14
15 However, in circumstances where the background water quality of the receiving water(s)
16 is known to be significantly better than would otherwise be required based on a theoretical 100%
17 yield, effluent limits may be set to maintain that higher quality.

18
19 I. (III) Default ~~limits SAR values~~ will be ~~set to ensure extrapolated~~
20 ~~from the Hanson et al. (1999) Chart (see Figure 1 attached) based upon the default EC value in~~
21 ~~each circumstance up to a maximum default value of 16². The effluent limit for SAR will be~~
22 ~~determined in conjunction with EC so that the relationship between of SAR and to EC remains~~
23 ~~within the designated zone of “no reduction in rate of infiltration” as depicted in Figure 1 at the~~
24 ~~end of this appendix. The zone of Figure 1. The maximum SAR limit is, therefore, set below~~
25 ~~the line separating the “no reduction in rate of infiltration” zone from the “slight to moderate~~
26 ~~reduction in infiltration” zone in the Hanson et al. diagram, which is represented by the~~
27 ~~following equation will be used to determine the default SAR limit: $SAR = SAR < (7.10 \times EC$~~
28 ~~$dS/m) - 2.48$. If the It must be noted that SAR values are tied to the EC concentration and might~~
29 ~~need to be adjusted to correlate to the actual EC concentration of the discharge is observed to be~~
30 ~~of higher quality rather than the published default concentration then the SAR limit may be~~
31 ~~adjusted to actual EC concentrations depending on site specific conditions. When the~~
32 ~~calculated theoretical maximum. Use of the Hanson diagram to extrapolate default SAR value~~
33 ~~exceeds 10, the limit will be set at 10 as the maximum default limit. The maximum default~~
34 ~~limit effluent limits for SAR is capped at a maximum SAR of 16² to minimize the potential for~~
35 ~~sodium build-up in poorly drained soils. This 16 SAR cap is only intended to apply to~~
36 ~~calculating Tier 1 limits when utilizing the default procedure and may be modified according to~~
37 ~~the provisions of Section (B) section C.2 “Refining EC and Section (C) SAR Limits”, described~~
38 ~~below.~~

39
40 C.(IV) At a minimum, the EC and SAR limits will apply during
41 the irrigation season and when flows are sufficient to support the use. ~~For~~ On sub-irrigated lands

² ~~The DEQ/WQD originally proposed setting a default SAR cap at 10. The Water and Waste
Advisory Board raised the default SAR cap to 16 based upon industry comments. The DEQ
disagrees with the Board’s recommendation and believes that an SAR cap of 10 is more
defensible as a statewide default.~~

1 and passively irrigated lands such as those under spreader dike systems, EC and SAR limits
2 ~~will the irrigation season shall~~ generally apply ~~be considered to be~~ year-round.

3
4 ~~ii. Refining EC and SAR limits (Tiers 2&3).— Establishing EC and SAR limits~~
5 ~~based simply on the most sensitive crop is the most stringent approach and would~~
6 ~~be protective of the irrigation use in all circumstances. It may be possible to~~
7 ~~refine those values if additional information is available showing that less~~
8 ~~stringent effluent limits would be adequately protective. This type of showing~~
9 ~~can be made by demonstrating that background water quality conditions are of a~~
10 ~~lower quality than the default values or by demonstrating that because of local~~
11 ~~soil conditions and irrigation practices there would be no harm to crop production~~
12 ~~from less stringent EC and SAR limits.~~

13
14 A.(B) Tier 2 - Background Water Quality.— If sufficient data is available
15 to demonstrate or calculate that the pre-existing background water quality at the point(s) of
16 diversion is worse than the effluent quality, EC and SAR effluent limits may be based upon those
17 background conditions rather than tolerance values for the most sensitive crop.

18
19 I.(I) Measured Data. ~~Data:-~~ Background water quality may be
20 established based upon published pre-discharge historic data. Generally, this data only exists on
21 larger, perennial, mainstem stream channels where historic gauging has taken place. Actual
22 measured data is the most reliable means of establishing background and must be considered on
23 those waters where it is available.

24
25 H.(II) Calculated Background. ~~Background:-~~ On intermittent and
26 ephemeral stream channels, pre-discharge water quality data is usually scarce or non-existent and
27 very difficult to collect. In these circumstances, background water quality can be estimated by
28 conducting soil surveys on land that has been historically irrigated from the subject stream.

29
30 In the event that soil studies are used as a means to estimate baseline water quality for a
31 given drainage, the following requirements apply:

32
33 a.(1.) Sample Site Selection. ~~Selection:-~~ Soil samples shall
34 be taken at semi-random sites within each contiguous irrigated segment downstream of the
35 proposed discharge. “Semi-random” in this case is intended to mean that the applicant will
36 identify the various major distinguishing terrain zones within each irrigated segment and select
37 sample sites randomly within each terrain zone. For example, the channel bottom may constitute
38 one terrain zone, the first small terrace above the channel bottom may be another terrain zone,
39 and the adjacent meadow or field may be a single remaining terrain zone, or that meadow / field
40 may actually be comprised of several other known zones such as discharge-affected soils vs.
41 non-affected soils, sub-irrigated reaches vs. non-sub-irrigated reaches, etc.:-

42
43 b.(2.) Number of Sample Sites. ~~Sites:-~~ Listed below are
44 the minimum number of soil sample sites required for each of the identified terrain zones (based
45 on zone area) within a contiguous irrigated segment:

46 —

Zone Area	Minimum Number of Sample Sites
0 – 5 acres	3
5 - 10 acres	5
10 + acres	7

1
2
3 ~~a.(3.)~~ Sample Collection.~~Collection~~:- Sample sites must
4 be located a minimum of 50 feet apart from one another. Each sample site shall be sampled at a
5 minimum of four depths (0-12”, 13-24”, 25-36”, 37-48”). If alfalfa is present within the terrain
6 zone, each sample site within that terrain zone must be sampled at a total of 6 depths (at the
7 above-noted depths, plus 49-60” and 61-72”). Each ~~twelve~~ ~~12~~-inch ~~depth~~ sample increment
8 must be analyzed either individually or combined (composited) with other corresponding depth
9 samples from the other sample sites within the same terrain zone (~~e.g., (i.e.,~~ all 0-12” samples
10 from a given terrain zone bulked together and analyzed as a single composite sample).

11
12 ~~b.(4.)~~ Sample Analysis.~~Analysis~~:- At a minimum, a
13 saturated paste extract for each sample shall be analyzed for EC.- Though not necessary for the
14 estimation of background water conductivity,- it is advisable to also analyze the soil samples for
15 pH, SAR, soil texture and exchangeable sodium percentage (ESP) to avoid having to duplicate
16 the sampling if the results indicate that a “no harm analysis” (Section (C)~~(item b. below)~~) needs to
17 be completed. Percent organic matter shall be analyzed in the surface 0-12” ~~inch~~ samples only.
18 In addition, analyses to identify the clay mineralogy types present in the soils may also be
19 warranted.

20
21 ~~H.(III)~~ Soil Report Preparation.~~Preparation~~:- At a minimum the
22 applicant shall submit:

23
24 ~~a.(1.)~~ A map or diagram identifying where each of the soil
25 sample sites ~~is~~~~were~~ located. At a minimum, the map or diagram must show the basic topography
26 and stream course, irrigation structures (*if present - such as spreader dams or head gates*),
27 estimated boundaries of the irrigated acreage, surface ownership of the irrigated acreage
28 (*including downstream irrigated areas*) and section / township / range identification. This map
29 must also show any delineated terrain zones, plus elevations of the terrain zones;

30
31
32 ~~b.(2.)~~ An accompanying location table which includes the
33 quarter / quarter, section, township, range, and latitude / longitude for each sample site;

34
35 ~~e.(3.)~~ Summary data table showing the analytical results
36 for each of the soil parameters listed above, for each depth, at each sample ~~site~~;~~site~~.

37
38 ~~d.(4.)~~ All associated lab sheets.

39
40
41 ~~B.(C)~~ Tier 3 - No Harm Analysis. = The actual effects of EC and SAR

1 on crop production are variable based upon soil type and chemistry and may be mitigated to
2 some extent by managing irrigation practices. EC and SAR effluent limits may also be
3 established based upon a scientifically defensible site specific study that examines local soil
4 characteristics, natural water quality, expected crop yield, irrigation practices and/or ~~any~~ other
5 relevant factors related to crop production.

6
7 ~~_____~~ Because of the ~~very~~ site-specific nature of this approach and the
8 number and complexity of variables that may need to be considered, ~~it is not very useful to~~
9 ~~specify any particular type of analysis in this policy. When taking this approach, however,~~ there
10 is a burden of proof placed upon the applicant to demonstrate through a comprehensive study
11 that levels of EC and/or SAR, higher than either the default values or estimated background
12 water quality, would most likely not measurably harm an existing irrigation use. ~~This approach~~
13 ~~will allow a degree of creativity regarding landowner preferences and management.~~ Refined
14 limits for EC and SAR resulting from a "no harm" analysis should incorporate a reasonable
15 margin of safety to account for variables that cannot be precisely measured or modeled.

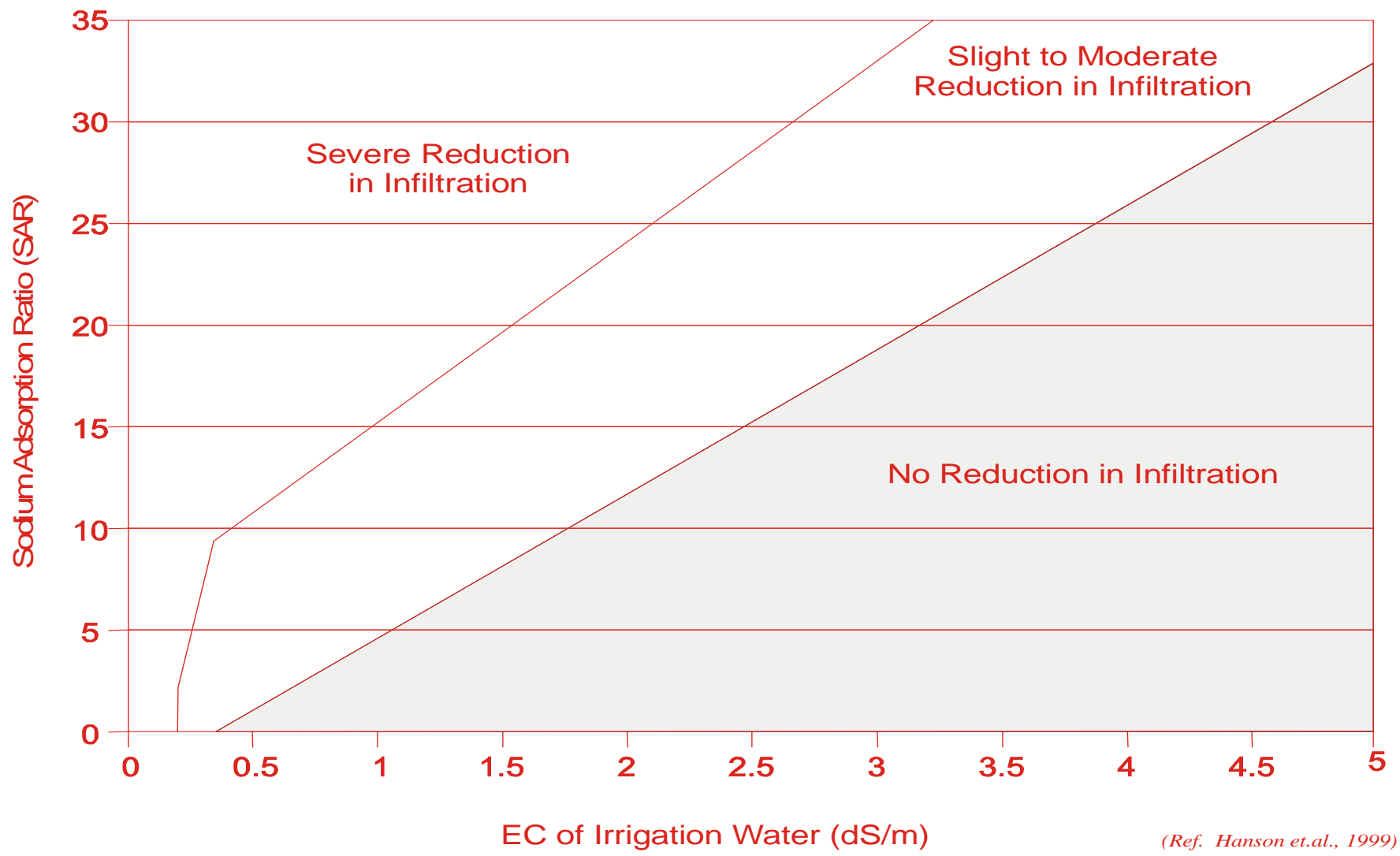
16
17 ii.(vii) Irrigation Waiver. ~~—~~An exception to EC or SAR limits established under
18 the Tier 1, 2 or 3 procedures may be made when affected landowners request use of the water
19 and thereby accept any potential risk to crop production on their lands. Irrigation waivers will
20 only be granted in association with an irrigation management plan that provides reasonable
21 assurance that the lower quality water will be confined to the targeted lands.

22
23 Reasonable Access Requirement. ~~—The procedure for establishing default EC and SAR limits is~~
24 ~~intended to provide the ability to permit the discharge of high quality water without an obligation~~
25 ~~to conduct site specific studies. In practice, the use of the default procedure will only apply~~
26 ~~where permitted discharges are of exceptionally high quality. In many applications, appropriate~~
27 ~~limits for EC and SAR will have to be based on refined procedures rather than default. Because~~
28 ~~the refined procedures require the acquisition of site specific data, it is necessary that permit~~
29 ~~applicants and/or the DEQ have reasonable access to obtain the required information. In~~
30 circumstances where a landowner chooses to deny access for the purpose of developing a Section
31 20 analysis, EC and SAR limits will be based upon the best information that can be reasonably
32 obtained for developing permit limits. This circumstance may involve utilizing alternate
33 sampling locations where conditions are expected to be similar in nature to the inaccessible
34 area and may be less stringent than Tier 1 default limits.

1 (Note for Council members – no changes to Figure 1)

2 Figure 1

Hanson Chart

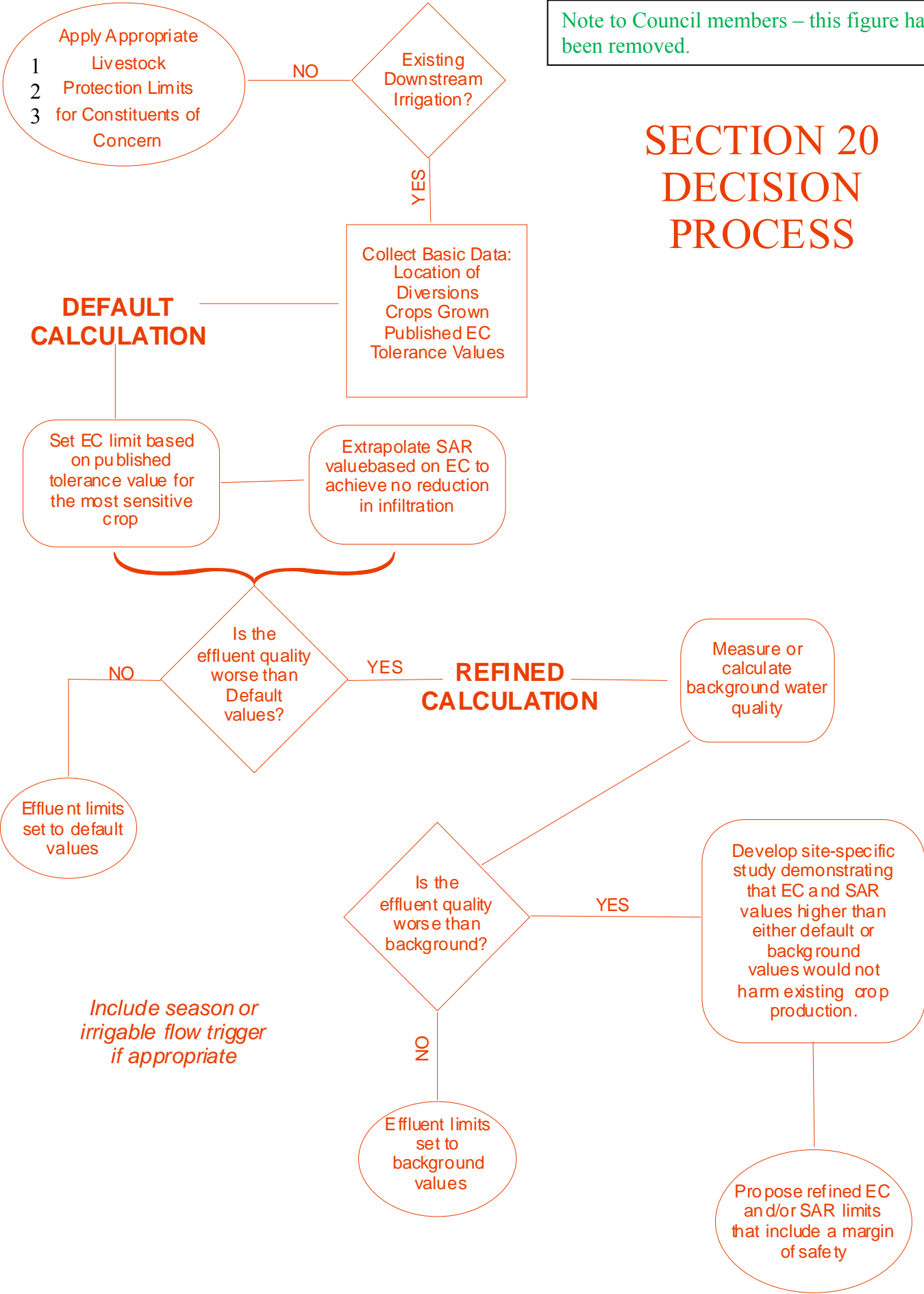


(Ref. Hanson et.al., 1999)

31

Note to Council members – this figure has been removed.

SECTION 20 DECISION PROCESS



Statement of Principal Reasons

Section 6

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**BEFORE THE
DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL QUALITY COUNCIL
STATE OF WYOMING**

8 IN THE MATTER OF CHAPTER 1,)
9 QUALITY STANDARDS FOR)
10 WYOMING SURFACE WATERS,)
11 WATER QUALITY RULES AND)
12 REGULATIONS)

DRAFT

16
17

STATEMENT OF PRINCIPAL REASONS

18
19

Background

20 The Department of Environmental Quality (DEQ), Water Quality Division (WQD), pursuant to
21 the authority vested in it by the Wyoming Environmental Quality Act, Wyoming Statutes 35-11-
22 101 to 1507 *et seq.*, has been directed by the Environmental Quality Council (EQC) to amend
23 and revise Chapter 1 of the Wyoming Water Quality Rules and Regulations. Chapter 1 contains
24 the water quality standards for surface waters in the state including water classifications and
25 designation of protected uses.

26
27 On February 16, 2007, the EQC approved proposed revisions to Chapter 1 except for Appendix
28 H, Agricultural Use Protection which was removed from the rule and remanded back to DEQ for
29 directed revisions. In May of 2007, proposed revisions to Appendix H were posted on the
30 DEQ's website and notice was published in the Casper Star Tribune. On June 15, 2007
31 comments were received at a Water and Waste Advisory Board (Board) meeting in Casper,
32 Wyoming. On September 14, 2007, the Board held a second meeting in Jackson, Wyoming
33 which included video conference sites at eight other Wyoming municipalities. At the Jackson
34 meeting, testimony was heard and comments were received on the previously published
35 University of Wyoming (UW) report entitled "Water Quality for Wyoming Livestock and
36 Wildlife" which discusses recommended safe drinking water levels for Wyoming livestock and
37 wildlife. On December 7, 2007 the Board received additional public comments regarding DEQ's
38 proposed rule revisions to Chapter 1, Appendix H, Agricultural Use Protection and comments on
39 the response summaries from the previous two Board meetings. On March 28, 2008, the Board
40 considered a final round of public comments and recommended DEQ proceed with formal
41 rulemaking before the EQC.

42 This rule making is a substantial proposed revision to Chapter 1. All proposed revisions to
43 Chapter 1 are associated with Section 20, Agricultural Water Supply. The major revisions
44 proposed for this rulemaking include:

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1. Creating a new Appendix H which provides the procedures for interpreting and implementing the Section 20 narrative standard for the protection of agricultural water supplies through the point source permitting program. Section 20 provides that degradation of surface waters which are designated for agricultural uses shall not be of such an extent to cause a measurable decrease in crop or livestock production. The specific provisions of the new Appendix H include:
 - A discussion of what is meant by “measurable decrease in crop or livestock production”;
 - An exemption for historic discharges;
 - Effluent limits on the concentration of a number of pollutants relative to the protection of livestock drinking water supplies;
 - A provision for establishing irrigation limits equal to background water quality;
 - Definitions for “artificially irrigated lands” and “naturally irrigated lands”;
 - A 3-tiered decision making process for establishing effluent limits for electrical conductivity (EC) and sodium adsorption ratio (SAR) on permitted discharges that may affect irrigated lands;
 - A provision for landowner waivers of the irrigation limits which would otherwise apply;
 - A provision for establishing effluent limits in circumstances where access to collect site specific data has not been granted.
 2. Modifying Section 20 to provide the necessary reference to Appendix H.
 3. Revising the Agricultural Use Protection section of the Implementation Policies.

36 **Purpose and Intent of this Proposed Revision**

37
38 Section 303(c) of the federal Clean Water Act (CWA) provides states, tribes and territories with
39 the primary authority and responsibility to establish water quality standards for waters of the
40 United States within their respective jurisdictions. The CWA also requires states to review their
41 water quality standards at least once every three years and to make revisions where appropriate.
42 This three-year revision cycle is commonly referred to as the "triennial review."
43

1 Chapter 1 of the Wyoming Water Quality Rules and Regulations contains the state’s surface
2 water quality standards. These revised rules, once adopted, become state requirements and are
3 submitted to the United States Environmental Protection Agency (EPA), Region VIII for
4 approval under the CWA as the applicable standards in the State of Wyoming.
5

6 In this rule making, the Department of Environmental Quality proposes to update the Wyoming
7 surface water quality standards to protect and maintain the designated uses of waters of the state
8 associated with agricultural use and to achieve the goals of the CWA. These goals will be
9 accomplished by creating procedures for implementing the Section 20, Agricultural Water
10 Supply standard through the establishment of effluent limits on point source discharges.
11

12 All surface waters in Wyoming are protected to some extent for agricultural uses. “Agricultural
13 uses” are described in Section 3 as being either stock watering or irrigation. The standard that
14 applies to the protection of these uses is contained in Section 20 and states:
15

16 *Section 20. **Agricultural Water Supply.** All Wyoming surface waters which have the natural
17 water quality potential for use as an agricultural water supply shall be maintained at a quality
18 which allows continued use of such waters for agricultural purposes.*
19

20 *Degradation of such waters shall not be of such an extent to cause a measurable decrease in
21 crop or livestock production.*
22

23 *Unless otherwise demonstrated, all Wyoming surface waters have the natural water quality
24 potential for use as an agricultural water supply.*
25

26 The purpose of this Appendix is to provide the criteria and procedures to be used by the WQD
27 when translating the narrative goals expressed in the Section 20 standard into appropriate
28 WYPDES permit limits where maintaining agricultural use of the receiving waters is an issue.
29

30 These rules are also intended to implement various provisions of the Wyoming Environmental
31 Quality Act (WS 35-11-101 through 35-11-1507 et. seq.).
32

33 Specifically, these rules are being revised to:
34

- 35 1. Meet the triennial review requirements of the CWA;
36
- 37 2. Provide an improved procedure for implementing the narrative standard found in Section
38 20 when setting effluent limits on discharges used for agricultural purposes;
39
- 40 3. Implement the applicable provisions of the Wyoming Environmental Quality Act; and
41
- 42 4. Maintain Wyoming’s primacy for delegated programs of the CWA.
43
44

1 **Compliance with Federal Regulations (WS 16-3-103(a)(i)(F)**

2
3 These rule revisions are proposed to comply with the federal regulations regarding the adoption
4 of state water quality standards, specifically those contained in 40 CFR Part 131, which require
5 the designation of water uses, and the establishment of numeric and narrative water quality
6 criteria sufficient to protect the water's designated uses. These rule changes are designed to meet
7 the minimum requirements of the federal law and regulations.
8
9

10 **Proposed Revisions to Chapter 1, Wyoming Water Quality Rules and Regulations**

11
12 **Appendix H**

13
14 **Agricultural Use Protection**

15
16 **Section (a) - Purpose**

17
18 Agricultural use of surface water is an opportunistic endeavor. The varying uses as well as the
19 different qualities of the water found in the state are many and the farming and ranching
20 industries have always had to make do with what water is available. The goal expressed in the
21 Section 20 standard is simply to maintain surface water quality at a level that will continue to
22 support the local agricultural uses that have developed around it.
23

24 Though the goal is simple, achieving it is not. For the most part, managing water quality for
25 continued irrigation requires managing the salinity and SAR. Because of local differences in
26 crop types, soil types and natural water quality and availability, it is not possible to establish a
27 single numeric criteria for salinity and SAR that will allow an efficient use of surface water for
28 irrigation purposes. The determination of what is acceptable water quality for irrigation must
29 necessarily involve an evaluation of local agricultural practices and background water quality
30 conditions. For livestock watering uses, it is somewhat less complicated because there are fewer
31 variables to consider.
32

33 **“Measurable Decrease”**

34
35 The first task in translating the standard is defining what is meant by “*measurable decrease in*
36 *crop or livestock production*”. The phrase implies that there is a pre-existing agricultural use of
37 a stream or drainage prior to an application for a WYPDES discharge permit. For livestock
38 watering purposes, a pre-existing use will always be assumed. For irrigation purposes, there
39 needs to be either a current irrigation structure or mechanism in place for diverting water from
40 the stream channel, or in other cases, substantial acreage of naturally sub-irrigated pasture within
41 a stream floodplain. Where neither of these conditions exists, there can be no irrigation use or
42 loss in crop production attributable to water quality.
43

44 Where there are pre-existing agricultural uses, it may often be impossible to measure a loss in

1 crops or livestock that can be attributed to water quality because of the many other factors that
2 will effect actual production. It is also important to be able to predict the probability of a
3 measurable decrease in production rather than relying solely on after-the-fact measurements.
4 Therefore, the implementation of the narrative criteria through WYPDES permits will always
5 involve making reasonable judgments and assumptions.
6
7

8 **Historic Discharges**

9

10 The historic discharge provision allows preexisting discharges to maintain current effluent limits.
11 Where discharges have been occurring prior to January 1, 1998, it will be assumed that the
12 discharge has had no adverse effect on agricultural production. Therefore, it is not necessary to
13 modify those discharges in order to achieve the goal of “no measurable decrease” in crop or
14 livestock production. It would only be necessary to maintain the existing quality of the
15 discharge. It is important to note, however, that effluent limits on historic discharges may be
16 adjusted where the quality of the discharge is shown to constitute a threat to any other designated
17 uses described in Chapter 1 of the Wyoming Water Quality Rules and Regulations.
18

19 The current state of energy development is unlike anything that has occurred historically. The
20 impact of historic produced water discharges on surface water quality and the use of produced
21 water for agriculture (primarily ranching) is mitigated to a great extent by the fact that it includes
22 only 470 outfalls distributed over many years across the entire state. In just the past 10 years,
23 coalbed methane has accounted for approximately 8,000 outfalls in just the greater Powder River
24 development area. The sheer scale of this development requires new concepts in regulation.
25 Additionally, the proposed rule is not specific to CBM but applies equally to all discharges of
26 produced water that originated after 1997 including conventional oil and gas development and
27 mining.
28

29 This rapid growth in coalbed methane production has raised legitimate concerns over the effects
30 that such large development may have on agricultural production and is the primary impetus for
31 the development of the Agricultural Use Protection Policy. On the other hand, agricultural
32 producers who have been affected over the years by discharges from the historic conventional oil
33 and gas discharges have been overwhelmingly in favor of retaining those discharges. The
34 inclusion of the January 1, 1998 cutoff date achieves the purpose of separating those historic
35 discharges which have been demonstrated to be useful for agricultural purposes from the more
36 recent coalbed methane discharges which present new risks and challenges to agricultural
37 productivity.
38

39 Some have contended that the exemption for historic discharges should also extend to all current
40 discharge permits and not be retroactive to permits issued after January 1, 1998. Taking this
41 approach would remove some of the important concepts in the rule. To grandfather all of the
42 current permits would continue to leave most of the bottomlands in the Powder River
43 development area without appropriate protection from potential effects of elevated salinity and
44 SAR. Therefore, DEQ has retained January 1, 1998 as the appropriate point to delineate the

1 regulation of historic discharges.
2
3

4 **Section (b) - Live Stock Watering** 5

6 The basic concept in protecting the livestock watering use is to ensure that water quality is not
7 acutely harmful to livestock or does not contain pollutants in concentrations that would affect
8 growth or reproduction. There are basic effluent limitations for TDS (5000 mg/L), chloride
9 (2,000 mg/L), and sulfate (3000 mg/L) provided in the WYPDES permit regulations (*Chapter 2*
10 *of the Water Quality Rules and Regulations*) that are intended to ensure that the water is safe for
11 livestock to drink. These limits have also been included in Chapter 1, Appendix H. The
12 supplemental Agricultural Use Protection policy also includes a number of other pollutants that
13 may have effects on livestock health and production. The policy describes additional limits and
14 provisions that may be applied to discharge permits. In circumstances where initial sampling
15 indicates the presence of any of the parameters listed in the policy, they too will be subject to
16 receiving effluent limits.
17

18 On September 14, 2007 the Board received comments on a report which was contracted by the
19 WQD to assist with determining appropriate effluent limits for livestock watering. In the
20 University of Wyoming (UW) report titled “Water Quality for Wyoming Livestock & Wildlife”,
21 (Raisbeck et. al., 2007), UW conducted a comprehensive literature search of toxicological values
22 which were determined to have the potential for impacting livestock health and production.
23 During the September Board meeting and at a following meeting on December 7, 2007, the
24 Board heard discussion and public comment about the potential affects to livestock health and
25 production from produced water discharges. Although significant effects to livestock have been
26 observed in scientific studies as described in the U.W. report, the vast majority of testimony
27 from individuals and stakeholder groups suggested that livestock health and production has not
28 been impacted negatively by produced water discharges at the current levels set in the
29 Agricultural Use Protection Policy and Chapter 2 of the Water Quality Rules and Regulations.
30

31 During deliberation at a Board meeting on March 28, 2008, the Board decided and the WQD
32 agreed that the current limits set for protecting agricultural use from produced water are
33 adequately protective of the livestock watering use, although future studies may indicate the
34 need for more protective limits.
35

36 ***Section (b)(i) – Effluent Limits for Livestock Watering*** 37

38 As discussed in the section above, the limits set for protection of livestock watering have been
39 determined to be protective of the livestock watering use. Three parameters (total dissolved
40 solids, sulfates, and chlorides) are currently used to measure the point when produced water is
41 presumed to be toxic to livestock. In addition, when other parameters listed in the Agricultural
42 Use Protection Policy are observed during initial sampling then appropriate limits and provisions
43 for each parameter will also be set in WYPDES discharge permits.
44

1 The basic concept in protecting the livestock watering use is to ensure that water quality is not
2 acutely toxic to livestock or does not contain pollutants in concentrations that would affect
3 growth or reproduction. There are basic effluent limitations provided in the WYPDES permit
4 regulations (*Chapter 2 of the Water Quality Rules and Regulations*) that are intended to ensure
5 that the water is safe for livestock to drink. These limits are also included in Chapter 1,
6 Appendix H at the following levels:

7
8 5000 mg/L TDS;
9 3000 mg/L Sulfate;
10 2000 mg/L Chloride;

11
12 and each must be achieved at the end-of-pipe prior to mixing with the receiving stream.
13
14

15 **Section (c) - Irrigation**

16
17 The interpretation of the Section 20 standard for irrigation is more complex than for livestock
18 watering because there are more variables than just the quality of the water to consider.
19 However, after considering the local circumstances relative to irrigation and crop production,
20 effluent limits can be established in WYPDES permits that will be protective of the pre-existing
21 irrigation uses. The goal is to ensure that pre-existing irrigated crop production will not be
22 diminished as a result of the lowering of water quality.

23
24 The basic water quality parameters of concern with regard to irrigation are EC and SAR.
25 Protection of irrigation uses, where WYPDES permits are involved, amounts to deriving
26 appropriate effluent limits for EC and SAR. Effluent limits for EC were developed to address
27 potential impacts to crop production from harmful levels of salinity, and salinity is often a
28 component of oil and gas discharges. Effluent limits for SAR have been developed to address
29 potential impacts to soil structure and permeability.

30
31 Identification and protection of irrigation uses involves a sequence of decisions based upon the
32 amount and quality of data that is available to the permit writer. The most basic question is
33 whether a proposed discharge will reach irrigated lands. If the discharge will not reach an
34 irrigated field, either because of natural conditions or water management techniques, it could not
35 affect crop production on that field and irrigation driven limits for EC and SAR will not be
36 required.

37
38 If the discharge will reach an irrigated field or a naturally irrigated land, a 3-tiered decision
39 making process will be used to establish appropriate effluent limits for EC and SAR.
40
41

42 ***Section (c)(i) – Irrigated Lands Definitions***

43
44 **“Artificially Irrigated Lands”** means the artificially irrigated lands where water is

1 intentionally applied for agricultural purposes. Artificially irrigated lands will be identified by
2 the presence of canals, ditches, spreader dikes, spray irrigation systems or any other constructed
3 mechanism intended to divert water from a stream channel for application on adjacent lands.
4

5 Appropriate limits for EC and SAR will be applied on all discharges that can reasonably be
6 expected to reach the diversion point for an artificially irrigated land of any size.
7

8 **“Naturally Irrigated Lands”** means lands along stream channels that have enhanced vegetative
9 production due to periodic natural flooding or sub-irrigation. Naturally irrigated lands are those
10 lands where a stream channel is underlain by unconsolidated material and on which the
11 combination of stream flow and channel geometry provides for enhanced productivity of plants
12 used for agricultural purposes. Naturally irrigated lands may be identified by an evaluation of
13 infra-red aerial imagery, surficial geologic maps, wetland mapping, landowner testimony, site
14 specific assessment, any combination of that information, or other types of evaluations.
15

16 Naturally irrigated lands are commonly referred to as “bottomlands”. Though not “irrigated” in
17 the traditional sense, they are characterized by enhanced forage production due to natural
18 overland flooding or sub-irrigation. EC and SAR limits will be applied to WYPDES permits
19 where the produced water discharge may reach stream segments containing single parcels of
20 naturally irrigated land greater than 20 acres in size or multiple parcels in near proximity that
21 total more than 20 acres. In making this estimation, small drainage bottoms may be excluded
22 from consideration. Two specific criteria which may be used to exclude lands include lack of a
23 persistent active channel and unconsolidated floodplain deposits which are generally less than 50
24 feet in width.
25

26 ***Section (c)(vi)(A) – Tier 1 (default EC and SAR limits)***
27

28 ***Section (c)(vi)(A)(I) – Default EC Limits***
29

30 Tier 1 refers to a procedure for setting default EC and SAR limits and is useful in situations
31 where the irrigated crops are salt-tolerant and/or the discharge water quality is relatively good.
32 The basic idea involves identifying the most salt sensitive forage species that may be affected by
33 a permitted discharge and basing the effluent limit for EC on the published soil salinity threshold
34 value for that plant. Because the published values represent soil salinities that would support a
35 theoretical 100% yield, this approach assures that there would be no measurable decrease in crop
36 production due to water quality. The primary reference for obtaining salinity threshold values is
37 the Salt Tolerance Database published by the USDA Agriculture Research Service (ARS) but
38 other references may be used for plants not included in the USDA database.
39

40 ***Section (c)(vi)(A)(II) – Soil EC to Water EC Conversion***
41

42 Once the most sensitive crop for a given agricultural area is identified, EC limits will be
43 determined from the USDA ARS Salt Tolerance Database and converted from the reported soil
44 value to a water value by dividing the soil value by a conversion factor of 1.5.

1
2 “In circumstances where the background water quality of the receiving water(s) is known to be
3 significantly better than would otherwise be required based on a theoretical 100% yield, effluent
4 limits may be set to maintain that higher quality.” This provision for setting Tier 1 default limits
5 generally refers to perennial or intermittent streams where there is preexisting data to determine
6 background water quality. Where background water is of exceptionally high quality it can
7 support uses other than irrigation. It is DEQ’s obligation to preserve that higher quality and
8 ensure the support of all potential uses.
9

10 ***Section (c)(vi)(A)(III) – Default SAR Limits***
11

12 Default SAR values will be extrapolated from the Hanson et al. (1999) Chart (*see Figure 1,*
13 *Appendix H*) based upon the default EC value in each circumstance up to a maximum default
14 value of 10. The effluent limit for SAR will be determined in conjunction with EC so that the
15 relationship of SAR to EC remains within the “no reduction in rate of infiltration” zone, of
16 Figure 1. The maximum SAR limit is therefore set below the line separating the “no reduction in
17 rate of infiltration” zone from the “slight to moderate reduction in infiltration” zone in the
18 Hanson et al. diagram, which is represented by the following equation: $SAR < (7.10 \times EC) -$
19 2.48 . It should be noted that SAR values are tied to the EC concentration and might need to be
20 adjusted to correlate to the actual EC concentration rather than the theoretical maximum.
21

22 Use of the Hanson diagram to extrapolate default effluent limits for SAR is capped at a
23 maximum SAR of 10 to minimize the potential for sodium build-up in poorly drained soils. This
24 10 SAR cap is only intended to apply when utilizing the default procedure and may be modified
25 using the Tier 2 or Tier 3 procedures provided in Sections (c)(vi)(B) and (c)(vi)(C).
26

27 Meeting Tier 1 default limits is difficult for most oil and gas producers without additional
28 treatment before the discharge. For this reason, other alternatives for using/discharging
29 produced water beneficially have been developed which are also protective of agricultural uses.
30 Some of these alternatives are discussed below and include Tier 2 effluent limits based on
31 background water quality, Tier 3 effluent limits based on no harm analysis studies, and a waiver
32 option for setting effluent limits which exceed those derived by the tiered approach.
33

34 ***Section (c)(vi)(IV) – Season of Use***
35

36 Effluent limits for EC and SAR are intended to apply during times when the water may be
37 applied to irrigated land and when flows are sufficient to support the use. In general, on
38 passively irrigated lands such as those under spreader dike systems and naturally irrigated
39 bottomlands EC and SAR limits will be applied year-round.
40

41 ***Section (c)(vi)(B) – Tier 2 (background water quality)***
42

43 Tier 2 refers to a process whereby the permit limits may be adjusted to equal background water
44 quality conditions and is intended to be used in situations where the background water quality

1 (EC and SAR) is poorer than the effluent quality. Background water quality is determined by
2 historical data that is sometimes available for larger streams, e.g. perennial and some intermittent
3 streams from gauging stations, or is determined by taking soil samples at the irrigated area(s) and
4 calculating background water quality. It is reasonable to assume that if discharges are regulated
5 in a manner to maintain background water quality, there would be no loss in crop production due
6 to water quality.

7
8 On intermittent and ephemeral stream systems where measured water quality data is rarely
9 available, background water quality can be estimated based upon soil salinity conditions on
10 irrigated lands or bottomlands adjacent to the stream channels. This section provides
11 specifications for conducting soil surveys to be used to estimate background water quality.

12
13 Tier 2 studies are not specific to each discharger but are rather specific to the stream channel.
14 Upon approval by DEQ of a Tier 2 analysis, the results will be used to set effluent limits for all
15 discharges in the drainage where the discharge may reach the associated irrigated lands.

16
17 ***Section (c)(vii)(C) - Tier 3 (no harm analyses)***

18
19 Produced water, of lower quality than background, can often still be used for irrigation without a
20 loss in crop productivity. This circumstance, however, cannot be assumed and must be
21 demonstrated. The Tier 3 level of analyses is intended to be used in circumstances where effluent
22 water quality is worse than background water quality.

23
24 The actual effects of EC and SAR on crop production are variable based upon soil type and
25 chemistry and may be mitigated to some extent by managing irrigation practices. EC and SAR
26 effluent limits may also be established based upon a scientifically defensible site specific study
27 which examines local soil characteristics, natural water quality, expected crop yield, irrigation
28 practices and/or any other relevant factor related to crop production.

29
30 Because of the very site-specific nature of this approach and the number and complexity of
31 variables that may need to be considered, it is not very useful to specify any particular type of
32 analysis in rule. When taking this approach, however, there is a burden of proof placed upon the
33 applicant to demonstrate through a comprehensive study that levels of EC and/or SAR, higher
34 than either the default values or estimated background water quality, would most likely not
35 measurably harm an existing irrigation use. This approach will allow a degree of creativity
36 regarding landowner preferences and management. Refined limits for EC and SAR resulting
37 from a "no harm" analysis should incorporate a reasonable margin of safety to account for
38 variables that cannot be precisely measured or modeled.

39
40 ***Section (c)(vii) – Irrigation Waiver***

41
42 An exception to EC or SAR limits established under the Tier 1, 2 or 3 procedures may be made
43 when affected landowners request use of the water and thereby accept any potential risk to crop
44 production on their lands. Irrigation waivers will only be granted in association with an

1 irrigation management plan that provides reasonable assurance that the lower quality water will
2 be confined to the targeted lands. Irrigation waivers will also only be approved after all affected
3 land owners approve of the conditions by which the produced water will be discharged, and the
4 discharge will not result in any impairment of other designated uses downstream of the
5 discharge.
6

7 ***Section (c)(viii) – Reasonable Access Requirement***

8

9 This section recognizes Wyoming landowner’s rights to provide or deny access to their property
10 and provides alternatives to applicants when access is denied. This issue usually arises because
11 of a Tier 2 analysis when an applicant is denied access needed to obtain site specific data for
12 determining background water quality. If an applicant is unable to obtain access to collect data,
13 Section (c)(viii) stipulates the use of alternate sampling locations, where conditions are expected
14 to be similar in nature, may be used to determine background conditions in lieu of the area being
15 protected. In these cases, WQD will use discretion and best professional judgment to determine
16 if alternative areas are similar in nature.
17
18

19 **Effect of the Rule Revision**

20

21 The WQD anticipates that the result of these proposed revisions will provide a level of surface
22 water protection sufficient to address public health and environmental concerns while allowing
23 the beneficial use of produced water in most circumstances. The revised standards update the
24 Wyoming surface water protection program to meet the most current federal requirements
25 provided in 40 CFR Part 131.
26
27

28 **Public Participation**

29

30 Public notice, announcing DEQ’s intention to revise the Chapter 1 surface water regulations, was
31 released for the purpose of soliciting comment relating to the proposal on July 15, 2002. A
32 public meeting was held via the Wyoming Video Conference System on August 6, 2002 during
33 which the department accepted both oral and written comments. The proposed rules and
34 associated policies underwent an extensive review by the Board which included 5 public
35 meetings and 4 solicitations of public comment over a 2-year period.
36

37 On February 16, 2007, the EQC approved proposed revisions to Chapter 1 except for Appendix
38 H, Agricultural Use Protection, which was removed from the rule and remanded back to DEQ
39 for further directed revisions. In May of 2007, DEQ completed revisions to Appendix H which
40 were received at a June 15, 2007 Board meeting in Casper, Wyoming. On September 14, 2007,
41 the Board held a second meeting in Jackson, Wyoming which included video conference sites at
42 eight other Wyoming municipalities to hear testimony regarding the release of the UW report
43 entitled “Water Quality for Wyoming Livestock and Wildlife”. On December 7, 2007 the Board
44 received additional public comments regarding DEQ’s proposed rule revisions to Chapter 1,

1 Appendix H, Agricultural Use Protection and comments on the response summaries from the
2 previous two Board meetings. On March 28, 2008, the Board considered a final round of public
3 comments and recommended DEQ proceed with formal rulemaking before the EQC. The
4 Environmental Quality Council solicited public comments on the proposed rules on (date of
5 public notice) and held a public hearing on (date of hearings). At the conclusion of the public
6 hearing, the Council opened a meeting to consider final revisions and make a determination on
7 adoption.
8
9

10 **Conclusion.** The Council has determined that the adoption of these rules is necessary to update
11 the Wyoming surface water standards to comply with federal regulations and to carry out the
12 responsibilities of the Department of Environmental Quality in regards to the protection of
13 surface water quality in the state.
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17 EXECUTED THIS _____ DAY OF _____, 2008.
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20 FOR THE ENVIRONMENTAL QUALITY COUNCIL
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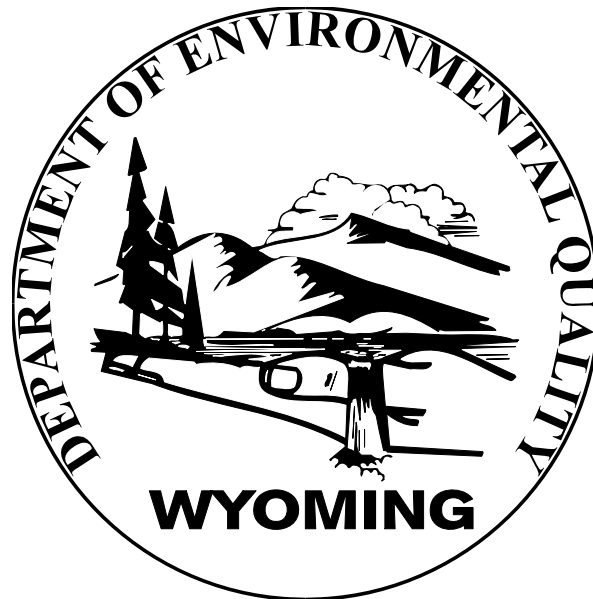
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Implementation Policies

Section 7

**Wyoming
Surface Water Quality Standards**



DRAFT

**Implementation Policies
for**

**Antidegradation
Mixing Zones
Turbidity
Use Attainability Analysis
Agricultural Use Protection**

(Public Notice Date)

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ANTIDEGRADATION IMPLEMENTATION POLICY

I. Purpose

Section 8 of Quality Standards for Wyoming Surface Waters (Water Quality Division Rules and Regulations, Chapter 1) establishes a regulatory policy concerning antidegradation. That regulation provides...

(a) Water uses in existence on or after November 28, 1975 and the level of water quality necessary to protect those uses shall be maintained and protected. Those surface waters not designated as Class 1, but whose quality is better than the standards contained in these regulations, shall be maintained at that higher quality. However, after full intergovernmental coordination and public participation, the Wyoming Department of Environmental Quality may issue a permit for or allow any project or development which would constitute a new source of pollution, or an increased source of pollution, to these waters as long as the following conditions are met:

- (i) The quality is not lowered below these standards;*
 - (ii) All existing water uses are fully maintained and protected;*
 - (iii) The highest statutory and regulatory requirements for all new and existing point sources and all cost effective and reasonable best management practices for nonpoint sources have been achieved; and*
 - (iv) The lowered water quality is necessary to accommodate important economic or social development in the area in which the waters are located.*
- (b) The administrator may require an applicant to submit additional information, including but not limited to an analysis of alternatives to any proposed discharge and relevant economic information before making a determination under this section.*
- (c) The procedures used to implement this section are described in the "Antidegradation Implementation Policy."*

Antidegradation protection is one of the essential elements of the state water quality standards program and is required under Section 303(d)(4)(B) of the federal Clean Water Act. The purpose of this implementation procedure is to disclose the decision-making and public participation processes that will be employed by the Water Quality Division in order to ensure compliance with the requirements of Section 8.

A secondary purpose of this implementation plan is to ensure federal approval of the State's surface water quality standards. Though the State has the primary authority to establish standards, the U.S. EPA has a responsibility to make a determination of whether such standards will achieve the goals and requirements of the federal Act. To a large extent, approval of the standards relies upon approval of an antidegradation implementation procedure.

II. Concepts

The water quality standards designate the uses which are protected on waters of the state and establish criteria that describe maximum pollutant concentrations and other water quality conditions that are necessary to maintain those uses. Many waters in the state have an existing level of water quality that is better than the criteria established to support designated uses. The antidegradation requirements are designed to maintain water quality at the higher levels unless there are good reasons for lowering the water quality.

The federal regulations (40 CFR 131.12) require state standards programs to address 3 levels or "tiers" of antidegradation protection. "Tier 1" is the basic level of protection which applies to all waters. Waters which are afforded tier 1 protection only are waters not generally considered to be high quality, or are not currently supporting designated uses, or where assimilative capacity does not exist for parameters that would be affected by a proposed activity.

"Tier 2" protections apply to high quality waters. These are waters which have an existing quality that is better than the established use-support criteria and where an assimilative capacity exists for parameters that would be affected by a proposed activity. Under tier 2, a lowering of water quality may be allowed if it is determined that the amount of degradation is insignificant or if the lowered water quality is necessary to accommodate important economic or social development in the area. Under no circumstances, however, may water quality be lowered below the criteria established in the standards or below a level that would impair an existing use.

"Tier 3" protections apply to waters that constitute "outstanding national resource waters" (ONRWs)¹. Tier 3 requires maintenance of existing quality with no consideration of assimilative capacity or economic or social development. In certain circumstances, temporary lowering of water quality is allowable, however the general rule is that no new point sources or increased pollutant loading from existing point sources is allowable.

¹The Wyoming water quality protection program has no provision for designating waters that have "national" significance, however, waters designated as Class 1 under the surface water standards are considered to be outstanding resources. Though not designated as ONRWs, Class 1 waters are afforded a level of antidegradation protection which is a functional equivalent of EPA's tier 3 concept.

The antidegradation implementation procedures that follow shall apply to the review of regulated activities involving new or increased discharges of pollution. Regulated activities include individual WYPDES effluent discharge permits, WYPDES stormwater permits for industrial and construction activities and Section 401 water quality certifications. The procedure is organized starting with the highest level of protection applied to Class 1 waters to the basic minimum level applicable to all waters.

III. Class 1 Waters (Outstanding Aquatic Resources)

The qualification requirements for Class 1 waters are listed in Chapter 1, Water Quality Rules and Regulations, Section 4(a). In addition, the general categories of waters (e.g., waters in national parks, etc.) and specific waters designated as Class 1 are listed in Appendix A of Chapter 1.

Class 1 waters are designated by the Environmental Quality Council in rulemaking hearings. Both the Wyoming Administrative Procedures Act and the Department's Continuing Planning Process (CPP) provide for public input during regulatory and planning processes. Any interested person may nominate a water for Class 1 designation through the procedures outlined in those documents.

A. Point Source Discharges.

The Wyoming surface water quality standards prohibit new or increased "end-of-the-pipe", effluent discharges of pollution to Class 1 waters but allow limited discharges associated with stormwater runoff and construction activities. Permits issued by the Department of Environmental Quality (DEQ) for stormwater or construction-related discharges will contain the following safeguards: (1) changes in water quality will be limited to temporary increases in turbidity; (2) turbidity increases will be limited to those allowed in Section 23 of Chapter 1; and (3) necessary controls and monitoring will be required to ensure existing water quality and uses are maintained and protected. Furthermore, the Department will impose whatever controls are necessary on regulated point source discharges to tributaries of Class 1 waters to the extent that the existing quality and uses of the downstream Class 1 segment will be protected and maintained. It is the Department's interpretation that "tributary" means any waters feeding the mainstem and any upstream mainstem segments.

The following procedures and decision-making processes will be used for each of the Water Quality Division's discharge permitting authorizations on Class 1 waters:

1. WYPDES, "end-of-the-pipe" permits:

Permits for new or increased effluent discharges to Class 1 waters will not be issued. This prohibition is not intended to include industrial stormwater permits

for which effluent limits have been established where there is no reasonable potential for a discharge of the associated effluent limitations.

2. WYPDES Stormwater Permits (*Industrial Activities*):

- a. Stormwater permits for industrial activities may be issued with appropriate conditions and monitoring requirements on an individual case-by-case basis on Class 1 waters. An application for an industrial stormwater permit must contain:
 - (1) a list of all pollutants which can reasonably be expected to occur on-site and be exposed to runoff events;
 - (2) a map showing the location of the industrial facility in relation to the Class 1 receiving water and/or tributaries;
 - (3) water quality data that characterizes the existing quality of the receiving Class 1 water and/or its tributaries in relation to the potential on-site pollutants;
 - (4) a stormwater pollution prevention plan that provides:
 - (a) runoff from the industrial site resulting from up to a 100-year storm event will not discharge to a Class 1 water; or
 - (b) runoff which may discharge to a Class 1 water as the result of any storm event will be of equal or better quality than the receiving water; and
 - (5) a monitoring plan designed to ensure compliance with item (4).
- b. Prior to issuing an industrial stormwater permit, the Department will make a determination based upon the information submitted in the application that the potential effects on the Class 1 receiving stream, if any, will be temporary in nature and limited to discharges of clean sediment and turbidity. The Department may also include any additional construction practices, treatment processes, monitoring and reporting requirements or other special conditions as may be necessary to achieve and demonstrate that existing water quality and uses will be maintained.
- c. The Department will conduct a 30-day public notice and comment period prior to the issuance of any industrial stormwater permit on Class 1 waters disclosing its intent to issue a permit for industrial stormwater discharges.

Information received as a result of the public notice will be considered by DEQ and may affect the final determination regarding permit approval.

- d. Existing general stormwater permits for industrial activities will remain in effect for the remainder of their terms. The reauthorization of these permits, however, is not guaranteed and will be subject to the provisions of the revised rule and the implementation policy described above.

3. WYPDES Stormwater Permits (*Construction Activities*):

- a. General stormwater permits for construction activities may be issued with appropriate conditions and monitoring requirements on Class 1 waters. An application for a construction stormwater permit must contain a Notice of Intent (NOI) to discharge stormwater prepared according to the provisions of Appendix B of the Wyoming General Stormwater Permit for Construction Activities. The applicant must submit along with the NOI, a detailed pollution prevention plan which includes sufficient controls on all potential sources of pollution. The pollution prevention plan must demonstrate that the only types of pollution that could reasonably be expected to reach a Class 1 water during a runoff event are limited to turbidity and sediment.
- b. Runoff from ancillary, construction-related facilities such as borrow areas, gravel processing areas, asphalt processing plants, concrete mixing, fuel & solvent storage areas, equipment staging and maintenance areas, and any area which may be a source of pollutants other than turbidity and sediment must be controlled so as not to discharge to any Class 1 water. This provision applies to runoff resulting from up to a 100-year storm event.
- c. The Department shall conduct an in-house review of the NOI and pollution control plan prior to approving coverage under the general stormwater permit. The Department may also include any additional construction practices, monitoring and reporting requirements or other special conditions as may be necessary to achieve and demonstrate that existing water quality and uses will be maintained. The DEQ will not normally conduct a public notice and comment period prior to authorizing specific activities under the stormwater general permit. Public comment was solicited prior to the establishment of the general permit and public notice will be provided at each subsequent renewal (at least once every five years). Upon review of any application for a construction stormwater permit, the Department deny authorization under the general permit and require an individual permit. In such instances, a 30-day public notice will be conducted.

4. 401 Water Quality Certifications.

The Department adopted a policy on October 11, 1996 regarding the issuance of 401 certifications for activities on Class 1 waters. This policy was specifically designed to ensure the protection of existing quality and uses of Class 1 waters and serves as the antidegradation implementation procedure for activities subject to 401 certification on Class 1 waters.

- a. The following classes of construction activities are examples of what may be authorized on Class 1 waters:
 - (1) Habitat Restoration and Enhancement;
 - (2) Repair and Maintenance of Existing Structures;
 - (3) Road Construction and Maintenance;
 - (4) Utility Construction and Maintenance;
 - (5) Streambank Stabilization and Flood Control;
 - (6) Minor Recreational Facilities (boat docks, fishing piers, hiking trails etc.);
 - (7) Environmental Cleanup Activities; and
 - (8) Miscellaneous Development on Isolated Wetlands
- b. Pursuant to the regulations, Chapter 1, Section 7, Certification must be denied on Class 1 waters for the following types of activities if the construction or operation of any new facilities will involve a point source effluent discharge or if the expansion of any existing facility will result in an increase of pollution from an existing discharge. Examples of facilities and activities that commonly involve discharges include wastewater treatment plants, power plants, food processing facilities, gravel processing operations, mining, oil production and refining, fish hatcheries, aquaculture, feedlots etc.
- c. Construction activities can be certified by DEQ if they are designed to meet the following general and activity-specific requirements:
 - (1) Any resultant degradation shall be temporary and all potential negative effects cease at the end of the construction period;

- (2) Potential contaminants are limited to turbidity and sediment. Increases in downstream turbidity are limited to 10 NTUs above the upstream condition at all times on streams that support fisheries or drinking water supplies. Sediment cannot be discharged in amounts that will adversely affect beneficial uses as described in Chapter 1, Section 15;
 - (3) Stream channel integrity and habitat is preserved and maintained. Written concurrence from the Wyoming Game & Fish Dept. that aquatic habitat will not be degraded will be solicited;
 - (4) All existing uses are fully protected and maintained;
 - (5) Existing ambient conditions i.e. dissolved oxygen, pH or temperature are not degraded; and
 - (6) All construction activities must be designed and operated in such a manner that water from dewatering activities, hydrostatic testing of pipelines, gravel washing etc. so as not to allow a surface discharge to a Class 1 water.
- d. 401 Certification shall be denied on Class 1 waters if any of the following applies:
- (1) The project results in degradation of water chemistry, loss of aquatic habitat or a reduction in beneficial use;
 - (2) The application does not contain nor can the certification be conditioned to provide reasonable assurance that turbidity can be controlled within the 10 NTU limit. Sediment will be discharged in amounts that settle to form sludge, bank or bottom deposits;
 - (3) Project may result in channel instability or significant loss of aquatic habitat. Written concurrence from the Game & Fish Dept. is not obtained;
 - (4) Project may result in a loss or reduction of beneficial uses;
 - (5) Existing ambient conditions will be degraded by the activity; or
 - (6) Any surface discharge of process water to a Class 1 water will occur.
- e. In addition to the general requirements above, the following measures apply on an activity-specific basis on Class 1 waters:

(1) Habitat Improvement Activities:

- (a) All projects must be supported by the Wyoming Game & Fish Department;
- (b) Habitat improvement projects should not be designed to trade one beneficial use for another but all uses must be fully maintained, e.g. existing wetlands should not be excavated or inundated to create deep water areas for fish, or stream segments that serve as nursery areas or food sources should not be converted to holding areas for adult fish;
- (c) Special consideration can be given for projects that are part of an approved watershed restoration plan or wetland conservation plan;
- (d) The department must use discretion and professional judgment in determining whether beneficial uses will be impaired in light of the overall project purposes and desired effects.

(2) Repair/Maintenance Activities:

The repair, rehabilitation or replacement of currently serviceable structures provided that the proposed work does not deviate from the original plans, purpose, or use of the structure is acceptable if the general requirements for certification on Class 1 waters are met.

(3) Streambank Stabilization and Flood Control Activities:

Riprap, revetments, jetties and other similar structures can be approved if the purpose of the project is to reduce existing environmental degradation, is necessary to protect human health and safety or to prevent substantial loss of private property and does not significantly and adversely affect beneficial uses.

(4) Roads, Utilities and Minor Recreational Activities:

Existing facilities may be maintained and new facilities constructed either as part of a public project or private development as long as the general requirements for construction on Class 1 waters are met.

- f. Individual 401 certifications are issued on all section 404 permits including the U.S. Army Corps of Engineers' nationwide and statewide general permits on Class 1 waters, and hydropower licenses issued by the

Federal Energy Regulatory Commission (FERC). A joint DEQ/Corps of Engineers public notice is issued by the Corps prior to the issuance of all individual 404 permits. There is no public notice prior to the authorization of any activity under a Section 404 nationwide or statewide general permit on Class 1 waters. The DEQ does not have a joint permitting agreement with FERC, therefore, DEQ shall conduct a separate public notice and comment period prior to issuing 401 certification for FERC licenses and permits on Class 1 waters.

B. Nonpoint Sources.

Nonpoint sources of pollution are not regulated by permits issued by the Department, but are controlled by the voluntary application of cost effective and reasonable best management practices. For Class 1 waters, best management practices will maintain existing quality and water uses.

IV. High Quality Waters - Classes 2AB, 2A, 2B and 2C

- A. The antidegradation procedure under this part applies to the issuance of WYPDES Effluent Permits, Stormwater Permits (*Industrial & Construction Activities*) and Section 401 Certifications of Activities Regulated by the Federal Energy Regulatory Commission (FERC).

Waters classified as 2AB, 2A, 2B or 2C are known to support populations of fish and/or drinking water supplies and are considered to be high quality waters. The Water Quality Division may issue a permit or certification for new or increased discharges to these waters upon making a finding that the amount of resultant degradation is insignificant or that the discharge is necessary to accommodate important economic or social development in the area where the waters are located. The Department must also ensure that the highest statutory and regulatory requirements for all new and existing point sources and all cost effective and reasonable best management practices for nonpoint sources have been achieved. For purposes of antidegradation implementation these may be referred to as "reviewable waters".

Where there are existing regulated point or nonpoint sources located in the area, the Water Quality Division will ensure that compliance with the required controls has been or will be achieved prior to authorizing the proposed regulated activity. This requirement is primarily intended to ensure that proposed activities that will result in water quality degradation for a particular parameter will not be authorized where there are existing unresolved compliance problems involving the same parameter in the zone of influence of the proposed activity. The "zone of influence" is determined as appropriate for the parameter of concern, the characteristics of the receiving water (e.g. lake versus river, etc.), and other relevant factors. Where available, a Total

Maximum Daily Load (TMDL) analysis or other watershed-scale plan will be the basis for identifying the appropriate zone of influence. The Division may conclude that such compliance has not been assured where existing sources are violating their WYPDES permit requirements. However, the existence of schedules of compliance for purposes of WYPDES permit requirements may be taken into consideration in such cases. In other words, required controls on existing regulated sources need not be finally achieved prior to authorizing a proposed activity provided there is reasonable assurance of future compliance.

The antidegradation review under this part consists of three sequential evaluations, 1. Determination of significance; 2. Economic evaluation; and 3. Examination of alternatives.

1. Determination of Significance:

- a. Based upon information submitted in an application for a water quality permit or certification, the Administrator shall make a determination of whether the proposed discharge will result in a significant lowering of water quality with respect to adopted numeric water quality criteria. The significance determination will be based on the chronic numeric standard and flow for the pollutant of concern except for those pollutants which have only acute numeric standards in which case the acute standard and flow will be used. This significance determination shall be made with respect to the net effect of the new or increased water quality impacts of the proposed activity, taking into account any environmental benefits resulting from the activity and any water quality-enhancing mitigation measures impacting the segment or segments under review, if such measures are incorporated with the proposed activity. The activity shall be considered not to result in significant degradation, if:
 - (1) The activity may be permitted under a general permit established by the state for discharges regulated under section 402 or by the Corps of Engineers for discharges regulated under Section 404 of the Clean Water Act; or
 - (2) The new or increased loading from the source under review is less than 10 percent of the existing total load to that segment for critical constituents (e.g. those for which there are stream standards set and which are present in the discharge); provided, that the cumulative impact of increased loadings from all sources does not exceed 10 percent of the baseline total load established for the segment (the baseline total load shall be determined at the time of the first proposed new or increased water quality impacts to the reviewable waters.); or

- (3) The new or increased loading from the source under review will consume, after mixing, less than 20 percent of the available increment between low flow pollutant concentrations and the relevant standards (assimilative capacity), for critical constituents; or
 - (4) The activity will result in only temporary or short term changes in water quality.
 - b. If an activity is considered not to result in significant degradation, no further review will be conducted. General WYPDES permits and 401 certifications of general 404 permits will be issued at this point. In the case of individual permits, the Water Quality Division shall prepare a draft permit and provide opportunity for public comment before the WYPDES permit is issued. Such public notices shall contain a statement describing the rationale for the determination of non-significance. If the permit is issued, the determination may be appealed to the Environmental Quality Council under the provisions of the Wyoming Administrative Procedures Act.
 - c. If a determination is made that a proposed activity is likely to result in significant degradation of reviewable waters, an evaluation shall be made as to whether the degradation is necessary to accommodate important economic or social development in the area in which the waters are located.
- 2. Economic Evaluation: The following provisions shall apply to this determination:
 - a. The "area in which the waters are located" shall be determined from the facts on a case-by-case basis. The area shall include all areas directly impacted by the proposed activity.
 - b. A determination shall be made on the facts on a case-by-case basis whether the proposed activity is important economic or social development. If the applicant submits evidence that the activity is important development, it shall be presumed important unless information to the contrary is submitted in the public review process. The determination shall take into account information received during the public comment period and shall give substantial weight to any applicable determinations by local governments or land use planning authorities.
 - c. If the proposed activity is determined not to be important for economic or social development, authorization for the associated discharge(s) will be denied.

- d. If the proposed activity is determined to be important economic or social development, a determination shall be made whether the degradation that would result from such activity is necessary to accommodate that development.
3. Examination of Alternatives. The degradation shall be considered acceptable if there are no other water quality control alternatives available that:
- a. would result in no degradation or less degradation of the state waters; and
 - b. are determined to be economically, environmentally, and technologically reasonable.
 - c. This determination of whether such alternatives are available, shall be based upon a reasonable level of analysis by the project proponent, consistent with accepted engineering practice, and any information submitted by the public or which is otherwise available to the Administrator. The assessment shall at a minimum, address practical water quality control technologies, the feasibility and availability of which has been demonstrated under field conditions similar to those of the activity under review. The scope of alternatives considered shall be limited to those that would accomplish the proposed activity's purpose.
 - d. In determining the economic reasonableness of water quality control alternatives, the Administrator may use some of the following factors to weigh the reasonableness of the various alternatives.
 - (1) Whether the costs of the alternative significantly exceed the costs of the proposal;
 - (2) For publicly owned treatment works (POTWs), whether user charges resulting from the alternative would significantly exceed user charges for similarly situated POTWs or public water supply projects;
 - (3) For any discharger into waters of the state, whether the treatment alternative represents costs that significantly exceed costs for other similar dischargers to similar stream classes, or standard industry practices.
 - (4) Any other environmental benefits, unrelated to water quality which may result from each of the alternatives examined.

- e. Upon conclusion of the alternatives analysis, the Administrator shall select a preferred alternative and prepare a draft permit and public notice proposing to authorize the selected alternative. The selected alternative shall be the least degrading, reasonable alternative consistent with the social and economic benefits. The public notice shall contain a statement describing the results of the antidegradation review. If the permit is issued, all administrative decisions relating to the antidegradation review or permit issuance may be appealed to the Environmental Quality Council under the provisions of the Wyoming Administrative Procedures Act.

B. Section 401 Certification Individual Section 404 Permits Issued by the U.S. Army Corps of Engineers.

Activities involving a discharge of dredged or fill materials that are considered to have more than minor adverse effects on the aquatic environment are regulated by individual Section 404 Permits. The decision making process relative to the 404 permitting program are contained in the 404(b)(1) guidelines (*40 CFR Part 230*). Prior to issuing a permit under the 404(b)(1) guidelines, the Corps of Engineers must: (1) make a determination that the proposed discharges are unavoidable (*i.e. necessary*); (2) examine alternatives to the proposed activity and authorize only the least damaging practicable alternative; and (3) require mitigation for all impacts associated with the activity. A 404(b)(1) findings document is produced as a result of this procedure and is the basis for the permit decision. Public participation is also provided for in this process.

Because the 404(b)(1) guidelines contain all of the required elements of an antidegradation review, the department will not conduct a separate review for the same activity. Section 401 certifications of individual 404 permits will rely upon the information contained in the 404(b)(1) findings document.

V. **Use Protected Waters - Classes 2D, 3 (all), and 4 (all)**

In general, Class 2D, 3 and 4 waters do not warrant the special protection provided on high quality waters and shall be afforded a basic level of antidegradation protection (EPA tier 1 equivalent). This level of protection is focused on maintaining existing uses and may allow lowering water quality so long as the established criteria for any parameter are not exceeded. The issuance of water quality permits and certifications shall not normally involve an examination of economic necessity or alternatives to the proposed activity, however, the administrator may determine on a case-by-case basis that special circumstances exist in relation to a proposed discharge and conduct a tier 2-type review prior to authorizing the activity. Special circumstances may include but are not limited to exceptional recreational or ecological significance (e.g. location in a park or urban greenway, presence of rare or sensitive plant and animal species, contains unique aquatic features such as wetland fens or geothermal springs etc.).

VI. Existing Use Protection for All Wyoming Surface Waters

Except for the special considerations provided in Chapter 1 of the Wyoming Water Quality Rules and regulations regarding Class 2D, 3D and 4C waters, existing in-stream water uses shall be maintained and protected in all Wyoming surface waters. For Class 1 waters, existing uses will be protected by implementing the requirements described in Section III of this implementation policy. For High Quality and Use Protected Waters, this implementation policy assumes that attainment of the criteria assigned to protect the current waterbody classification will serve to maintain and protect all existing uses. In some cases, however, water quality may have improved in the segment since the classifications were assigned, resulting in an existing use that is higher than the current classification. In other cases, the classifications may have been assigned based on inadequate information, resulting in classifications that do not fully encompass the existing uses of the segment. Where the antidegradation review results in the identification of an existing use that has protection requirements that are clearly defined, but are not addressed in the current classification and criteria, the Division will ensure that such existing uses are fully protected, based on implementation of appropriate numeric or narrative water quality criteria or criteria guidance. For example, where a proposed activity will result in the discharge of a substance for which sufficient data to derive appropriate criteria are available (e.g. §304(a) criteria), but numeric criteria have not been adopted in the Chapter 1 regulations, the Division will develop effluent limitations that will protect the existing use. In cases where there is a proposed discharge where federally-listed threatened or endangered species are present (i.e. aquatic species), the Division will work with the U.S. Fish and Wildlife Service and EPA to gather available information and evaluate whether special existing use protection requirements are necessary to protect the listed species. Where there is a question regarding the appropriate classification of a segment, the applicant may be required to provide information regarding existing uses.

**MIXING ZONE AND
DILUTION ALLOWANCES
IMPLEMENTATION
(Chapter 1, Section 9)**

I. Purpose

Section 9 of Quality Standards for Wyoming Surface Waters (Water' Quality Division Rules and Regulations, Chapter 1) provides for the establishment of a zone of dilution in the vicinity of point source discharges where acute and chronic aquatic life criteria and human health criteria may be exceeded. Section 9 provides...

Except for acute whole effluent toxicity (WET) values and Sections 14, 15, 16, 17, 28 and 29 (b) of these regulations, compliance with water quality standards shall be determined after allowing reasonable time for mixing. Except for the zone of initial dilution, which is the initial 10% of the mixing zone, the mixing zone shall not contain pollutant concentrations that exceed the acute aquatic life values (see Appendix B). In addition, there shall be a zone of passage around the mixing zone which shall not contain pollutant concentrations that exceed the chronic aquatic life values (see Appendix B). Under no circumstance may a mixing zone be established which would allow human health criteria (see Appendix B) to be exceeded within 500 yards of a drinking water supply intake or result in acute lethality to aquatic life. The procedures used to implement this section are described in the "Mixing Zone and Dilution Allowances Policy."

This policy addresses how mixing and dilution of point source discharges in receiving waters will be addressed in developing chemical-specific and whole effluent toxicity discharge limitations for point sources. In all cases, mixing zone and dilution allowances shall be limited as necessary to protect the integrity and designated uses of the receiving water.

II. Concepts

A mixing zone is a limited area within the receiving waterbody where initial dilution of a point source discharge of pollution takes place. The establishment of a mixing zone is not appropriate in all circumstances. For example, in non-perennial or low flow streams, there may not be any dilution available to mix with the discharge. Also, there may be instances where background concentrations of specific pollutants in the receiving stream provide no assimilative capacity. In circumstances like these, acute and chronic criteria would have to be met in the discharge itself.

Where the establishment of a mixing zone is appropriate and possible, the design needs to be based on the following 3 concepts:

1. The size and configuration of the mixing zone shall not impair the integrity of the waterbody as a whole;
2. There shall be no lethality to aquatic organisms through the mixing zone.
3. There shall be no significant health risks to human populations associated with the mixing zone (*e.g. proximity to recreation areas or drinking water intakes*).

The size, configuration and other relevant design considerations shall be based on critical flow conditions for both the stream flow and the effluent flow. This policy addresses mixing zones and dilution allowances where (1) mixing is complete and near instantaneous at the point of discharge; and (2) mixing is incomplete at the point of discharge.

III. Complete Mixing - Dilution Allowances

- A. Where the discharge is to a river or stream, dilution is available at critical conditions, and available information is sufficient to conclude that there is near instantaneous and complete mixing of the discharge with the receiving water, an appropriate dilution allowance may be provided in calculating chemical-specific discharge limitations. An assumption of complete mixing may be based on any of the following:
 1. The mean daily flow of the discharge exceeds the critical in-stream flow;
 2. The presence of an effluent diffuser that covers the entire stream width at critical flow;
 3. A demonstration by the permittee, based on in-stream studies that shows no more than a 10% difference in bank to bank concentrations within a longitudinal distance not greater than 2 stream/river widths; or
 4. Other defensible discharge outlet designs and configurations provided by the permittee.
- B. The basis for concluding that complete mixing occurs will be documented in the rationale for the discharge permit.
- C. The dilution allowance for continuous discharges shall be based on the critical low flow of the receiving stream. Critical low flow can be determined using the methods provided in Chapter 1, Section 11.
- D. For controlled discharges, such as lagoon facilities that discharge only during high ambient flows, the stream flow to be used in determining a dilution allowance shall be the lowest flow expected to occur during the period of discharge.

- E. Where a discharger has installed a diffuser in the receiving stream, that portion of the stream flow affected by the diffuser may be used to calculate a dilution allowance. For example, 50% of the 7Q10 low flow may be used for a diffuser extending halfway across the stream bottom.

IV. Incomplete Mixing - Mixing Zones and Dilution Allowances

- A. Where dilution is available at critical conditions and the discharge does not mix at a near instantaneous and complete rate, an appropriate mixing zone may be designated for purposes of implementing aquatic life and human health criteria in the receiving stream. Where a mixing zone is allowed, its size and shape will be determined on a case-by-case basis as follows:
 - 1. mixing zones for streams and rivers shall not exceed one-half of the cross-sectional area or a length 10 times the stream width at critical low flow, whichever is more limiting;
 - 2. mixing zones in lakes shall not exceed 5% of the lake surface area or 200 feet in radius, whichever is more limiting.
- B. The above limits are intended to establish the maximum allowable size of mixing zones, however, individual mixing zones may be further limited or denied in consideration of designated and existing uses or presence of the following concerns in the area affected by the discharge:
 - 1. bioaccumulation in fish tissues or wildlife;
 - 2. biologically important areas such as fish spawning or nursery areas;
 - 3. low acute to chronic ratio;
 - 4. potential human exposure to pollutants resulting from drinking water or recreational activities;
 - 5. attraction of aquatic life to the effluent plume;
 - 6. toxicity/persistence of the substance discharged;
 - 7. zone of passage for migrating fish or other species, including access to tributaries; and
 - 8. cumulative effects of multiple discharges and mixing zones.

- C. Within the mixing zone designated for a particular substance, the numeric water quality criteria contained in Chapter 1, Appendix B of the Water Quality Rules and Regulations may not apply. However, all mixing zones shall be free from materials that:
1. settle to form objectionable deposits; (*Sections 14 & 15*);
 2. float as debris, scum, oil, or other matter; (*Section 16*);
 3. produce objectionable color, odor, or taste; (*Section 17*);
 4. are acutely lethal; (*Section 9*); and
 5. produce undesirable aquatic life (*Section 28*)
- D. In incomplete mix situations, permit limitations to implement acute whole effluent toxicity (WET) criteria shall be based on meeting such criteria at the end-of-pipe (i.e. without an allowance for dilution). For chemical-specific acute aquatic life criteria, discharge limitations will be based upon meeting such criteria at the edge of the zone of initial dilution (*Section 9*).
- E. The dilution allowance for continuous discharges shall be based on the critical low flow of the receiving stream. Critical low flow can be determined using the methods provided in Chapter 1, Section 11.
- F. For controlled discharges, such as lagoon facilities that discharge only during high ambient flows, the stream flow to be used in determining a dilution allowance shall be the lowest flow expected to occur during the period of discharge.
- G. The requirements and concerns identified in paragraphs B. and C. above may be considered in deciding the portion, if any, of the critical low flow to provide as dilution. The environmental concerns listed in paragraph B. are not intended to establish any bright line tests in which to make risk determinations. Rather, such decisions should be made in consideration of designated and existing uses and relevant site-specific conditions. Each of the concerns is further explained as follows:
1. Bioaccumulation in fish tissues or wildlife: Both potential and existing bioaccumulation concerns should be evaluated. As a general guideline, pollutants with bioconcentration factors (BCF) greater than 300 indicates a potential risk of downstream bioaccumulation;
 2. Biologically important areas such as fish spawning or nursery areas: Information on either the existence of spawning areas within the proposed zone

of influence or a "shore hugging" effluent plume in an aquatic life segment could support a conclusion that allowing dilution or a mixing zone would pose significant risk to a biologically important area. Presence of a threatened or endangered species downstream should also be considered in light of the duration and magnitude of potential exposure of the particular species.;

3. Low acute to chronic ratio: For substances with low acute to chronic ratios, indicating that acute effects may occur at concentrations "close" to those that have been demonstrated to result in chronic effects, restricting or denying a mixing zone or dilution allowance may be appropriate in order to avoid acutely toxic concentrations outside of the zone of initial dilution;
 4. Potential human exposure to pollutants resulting from drinking water or recreational activities: Existence of a drinking water intake or a recreational area within or near the proposed zone of influence would strongly suggest that an allowance for dilution is not appropriate for substances with established human health criteria;
 5. Attraction of aquatic life to the effluent plume: Where available data support a conclusion that fish or other aquatic life are attracted to the effluent plume, it may be appropriate to set discharge limitations at the end-of-pipe;
 6. Toxicity/persistence of the substance discharged: It may be appropriate to deny dilution or a mixing zone for particularly toxic or persistent substances. This factor should be given added weight where the discharge is to an isolated aquatic system where the substance is expected to remain biologically available;
 7. Zone of passage for migrating fish or other species, including access to tributaries: Where available data suggest that allowing dilution or a mixing zone would inhibit migration of fish or other species, it may be appropriate to set discharge limitations at the end-of-pipe. This factor includes consideration of whether the effluent plume will block migration into tributary segments;
 8. Cumulative effects of multiple discharges and mixing zones: In some cases, existence of overlapping effluent plumes may necessitate denying dilution or mixing zones for discharging facilities. Any allowances for dilution should be restricted as necessary to protect the integrity of the receiving water ecosystem and designated water uses.
- H. The mixing zone size limits shall be implemented by calculating allowable dilution consistent with one of the following methods:
1. Default Method: In general, the default method provides a conservative level of allowable dilution and can be used where available data on potential

environmental impacts suggests that a full mixing zone should not be allowed, or available data on the receiving stream or downstream uses is insufficient to determine the appropriate mixing zone dimensions.

- a. Stream/River Discharges: As a general guideline, dilution calculations which use up 10% of the critical low flow may be used for developing effluent limitations for chronic aquatic life criteria and human health criteria. For acute numeric aquatic life criteria, 1% of the critical low flow may be used.
 - b. Lake/Reservoir Discharges: As a general guideline, dilution up to 4:1 (20% effluent) may be provided for developing effluent limitations for chronic aquatic life criteria and human health criteria. For acute numeric aquatic life criteria, a 0.4:1 dilution ratio may be used.
2. Modeling Method: Mixing zones should not exceed one-half the cross-sectional area of the receiving stream or a length 10 times the stream width, whichever is less. These restrictions apply to the stream at critical low flow.

A calculation must first be performed to determine if the discharge mixes within one-half area before or after the length limit. This calculation as well as other mixing zone calculations can be performed using any number of appropriate models including but not limited to STREAMIX I, CORMIX, PLUMES etc.

3. Field Study Method: Field studies which document the actual field characteristics in the receiving water can be used to determine the dilution allowance at critical low flows.

I. Other Considerations.

1. Where dilution flow is not available at critical flow conditions, neither a mixing zone or an allowance for dilution will be provided.
2. All mixing zone and dilution assumptions are subject to review and revision as information on the nature and impacts of the discharge becomes available. Mixing zone and dilution decisions are subject to review and revision along with all other aspects of the discharge permit upon expiration of the permit.
3. For certain pollutants (e.g. ammonia, dissolved oxygen, metals) that may exhibit increased toxicity after dilution and complete mixing within the receiving water, the wasteload allocation shall address such toxicity as necessary to fully protect designated and existing uses.

TURBIDITY IMPLEMENTATION
(Chapter 1, Section 23)

I. Purpose

Section 23 of Quality Standards for Wyoming Surface Waters (Water Quality Division Rules and Regulations, Chapter 1) places the following limits on increases of turbidity in waters of the state:

Section 23. Turbidity.

(a) In all cold water fisheries and drinking water supplies (classes 1, 2AB, 2A, 2B and 2D), the discharge of substances attributable to or influenced by the activities of man shall not be present in quantities which would result in a turbidity increase of more than ten (10) nephelometric turbidity units (NTUs).

(b) In all warm water or nongame fisheries (classes 1, 2AB, 2B and 2C), the discharge of substances attributable to or influenced by the activities of man shall not be present in quantities which would result in a turbidity increase of more than 15 NTUs.

(c) An exception to paragraphs (a) and (b) of this section shall apply to:

(i) The North Platte River from Guernsey Dam to the Nebraska line during the annual "silt run" from Guernsey Dam; and

(ii) Short-term increases of turbidity that have been determined by the administrator to have only a minimal effect on water uses. Such determinations shall be made on a case-by-case basis and shall be subject to whatever controls, monitoring, and best management practices are necessary to fully maintain and protect all water uses. The procedures used to implement this section are described in the "Turbidity Implementation Policy."

When the department is considering the regulation of any point source (through the WYPDES or 401 certification processes), compliance with the numeric turbidity criteria for the various classes of waters has always been required and will continue to be required. It is also recognized that short-term, construction-related exceedences of these standards are often unavoidable and do not necessarily result in any significant degradation of water quality or loss of beneficial uses. In fact, there are many construction activities in streams and rivers which have long-term beneficial effects or provide important economic or social benefits but temporarily increase turbidity during the actual construction period. Though the department recognizes that these circumstances exist, there has not been a formal process for allowing temporary elevated levels of turbidity on projects which are otherwise in the public interest.

The 1999 revision of the surface water quality standards included a provision to allow temporary, elevated levels of turbidity in certain limited circumstances. The purpose of this document is to provide a process and procedure that the department will follow to implement Section 23 (c)(2) of the Chapter 1 Surface Water Standards.

II. Policy

In accordance with Section 23(c)(2), the administrator of the Water Quality Division may authorize temporary increases in turbidity above the numeric criteria in Section 23 (a) and (b) of the Chapter 1 Surface Water Quality Standards in response to an individual application for a specific activity. It is intended that temporary increases in turbidity will be limited to construction-related activities rather than effluent or stormwater discharges. Such authorization may be issued independently or included in an WYPDES permit or 401 water quality certification provided that the applicant can demonstrate and accept the following conditions:

- A. The activities causing the increased turbidity will be limited in time and duration;
- B. All existing water uses will be fully maintained and protected throughout the duration of the activity;
- C. Best available technology and/or best management practices will be employed to maintain turbidity and sedimentation at the lowest practical level;
- D. The authorization for increased turbidity will specify the limits of the authorization and may include a monitoring and reporting schedule to demonstrate compliance with those limits;
- E. Mitigation or stream restoration requirements may be included as conditions in conjunction with any authorization for a temporary increase in turbidity;
- F. An authorization issued under this section does not relieve the applicant of any liability for damages to aquatic life, habitat or other beneficial uses that may result from an increase in turbidity;
- G. An authorization issued under this section does not exempt the applicant from any other federal, state or local laws or regulations, nor does it provide exemption from legal action by private citizens for damage to property that the activity may cause.
- H. The administrator shall publish a notice of intent to authorize an increase of turbidity in a paper of local circulation prior to authorizing the increase. Interested persons may request a public hearing on the proposed authorization.

**USE ATTAINABILITY ANALYSIS (UAA)
IMPLEMENTATION POLICY
(Chapter 1, Sections 33 and 34)**

I. Purpose

The purpose of this document is to describe the process and provide guidance relative to the development of Use Attainability Analyses where they are required under various sections of the Chapter 1 surface water quality standards. A Use Attainability Analysis is defined in the regulations as:

Section 2 (xlix)

"Use attainability analysis (UAA)" means a structured scientific assessment of the factors affecting the attainment of the use . The factors may include physical, chemical, biological, and economic factors as described in Section 33 of these regulations.

A Use Attainability Analysis is generally required prior to changing a water classification or designated use, or establishing site-specific criteria that is different than the adopted statewide criteria for any pollutant.

II. Concepts

Chapter 1 of the Wyoming Water Quality Rules and Regulations - Surface Water Quality Standards establishes use designations on all waters of the state and the criteria necessary to achieve and maintain those uses. Use designations are the goals set for each water and criteria are elements of the standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use. The use designations and criteria adopted in the state standards are intended to comply with the requirements of the federal Clean Water Act and related federal regulations.

At a minimum, uses must be designated in a manner which serves the purposes of the federal Clean Water Act as defined in Sections 101(a)(2), and 303 (c) of that Act. These sections provide that water quality standards should:

- provide wherever attainable, water quality for the protection and propagation of fish, shellfish and wildlife and recreation in and on the water (*fishable/swimmable uses*, § 101(a)(2)); and
- consider the use and value of state waters for public water supplies, propagation of fish and wildlife, recreation, agriculture and industrial purposes, and navigation (§ 303(c)).

Every use is not protected on every water, however, the Clean Water Act requires that each water be designated for those uses actually supported on the water as of November 28, 1975 (*existing uses*) or would be achieved when the effluent limits under CWA. Sections 301 (b) and 306 are imposed on point source discharges and when cost-effective and reasonable best management practices are applied to nonpoint source discharges (*attainable uses*). Furthermore, the federal regulations at 40 CFR Part 131 require that all waters be protected for the fishable/swimmable uses contained in § 101 (a)(2) of the Clean Water Act unless it is specifically demonstrated that those uses are not attainable.

The uses that are protected on Wyoming waters are listed and described in Section 3 of the Surface Water Quality Standards and include Agriculture, Fisheries, Aquatic Life other than Fish, Industry, Drinking Water, Fish Consumption, Recreation, Scenic Value and Wildlife. There are also numerous classifications for surface waters of the state. Except for Class 1, waters are classified according to their designated uses. Class 1 waters are specially designated waters on which the existing water quality is protected regardless of the uses supported by the water. The table that follows shows the uses designated on each of the use-based water classifications.

Water Class	Drinking water	Game Fish	Non-Game Fish	Fish Consumption	Other Aquatic	Life	Recreation	Wildlife	Agriculture	Industry
2AB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2A	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
2B	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2C	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2D	No	When Present	When Present	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3A	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3B	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3C	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
3D	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
4A	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
4B	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
4C	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes

Use Attainability Analyses are required under the following circumstances:

- A. Use Attainability Analyses are required prior to designating any water as Class 4 since these waters are not protected for all the uses specified in Section 101 (a)(2) of the federal Clean Water Act.
- B. A Use Attainability Analysis is required prior to reclassifying any water to a new classification involving the addition, removal or modification of a use designation. Most classification changes generally result in a corresponding change in use designations but not necessarily. For example, a reclassification from 2B to 2A would involve the removal of the fisheries use and, therefore, require a UAA. Changes completely within the Class 3 or Class 4 subcategories, however, do not always involve a change in use protection and may not require UAAs. For example, a change in classification from Class 3A to 3B does not involve a change in use designations, applicable criteria or antidegradation protections. It is instead simply a correction based on information that the water is not an isolated water and is part of a surface tributary system.
- C. A Use Attainability Analysis is required prior to modifying use designations even when the action does not result in a change in classification. For example, the removal of an agricultural or wildlife or recreation use from any water would not involve a classification change but does need to be based on a UAA. Also, a UAA is required when changing from a primary contact recreation designation to secondary contact.
- D. A Use Attainability Analysis is required prior to establishing a site-specific criterion or water body condition that is different than the established statewide standards associated with the water's classification. For example, background concentrations of particular pollutants may exceed the established aquatic life criteria, however, aquatic life may still exist in the water. In these circumstances it would not be appropriate to remove all aquatic life protections but may be sensible to adjust the criteria to be at or near the background conditions. Because criteria are generally established under laboratory conditions, these situations may be found to occur for any designated use in natural settings. This circumstance occurs on all Class 2D and 3D designations. A UAA is required to demonstrate that a water body is effluent dependant, whether or nor it supports a resident fish population and whether there are potential bioconcentrating or bio accumulating hazards associated with the quality of the discharge. Ambient-based criteria may then be established for those waters that are shown to be effluent dependant with no associated hazard.

Use attainability analyses are not required when assigning or removing a Class 1 designation.

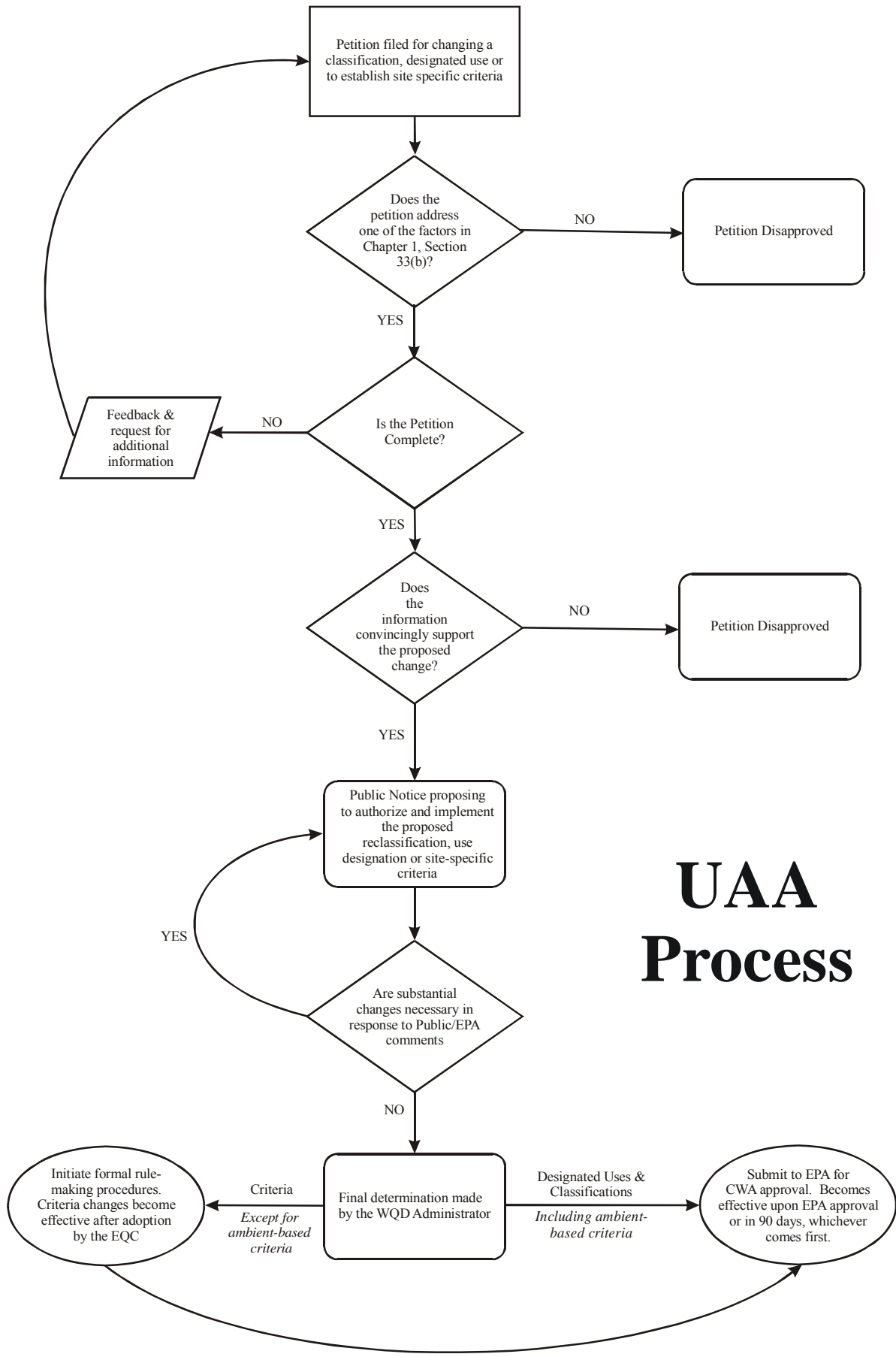
III. Process

Each Use Attainability Analysis involves a site-specific evaluation with varying information requirements. Depending upon individual circumstances and public interest issues, one may involve an exhaustive study while another may only require simple and cursory information. For example, Class 4A applies to man-made canals and ditches yet a UAA is required prior to classification because these waters are not protected for aquatic life uses. All that may be required in this instance is a demonstration that a waterway is an artificially constructed conveyance for an agricultural or industrial use and would normally involve only a minimal amount of information. On the other hand, a use may be removed because natural levels of pollution or human caused pollution that cannot be remedied prevent the attainment of the use. In either of those cases, making a showing that pollutant levels are indeed natural or cannot be remedied may involve a detailed assessment and evaluation of watershed conditions and economic analysis. In all circumstances the following general administrative procedures will apply:

- A. A petition is made for a change in classification, designated use, or criteria. This petition may be made by any person or entity or may originate with DEQ/WQD based on information available to the administrator. The petition must address one or more of the factors listed in Chapter 1, Section 33 (b), (i) through (vi) if the proposal would result in a removal of a designated use or the establishment of less stringent criteria.
- B. The WQD reviews the petition for completeness and provides feedback to the petitioner on the status of the petition and may make requests for additional information or studies if necessary.
- C. Once a petition has been accepted as complete, the WQD evaluates the petition and approves or disapproves the proposed change in use designation, classification or site-specific criteria. In instances where a petition is disapproved, the decision may be appealed to the Wyoming Environmental Quality Council pursuant to the provisions of the Wyoming Administrative Procedures Act (WS 16-3-101 through 16-3-115).
- D. In instances where a petition for a revised classification or use is approved, the administrator shall prepare a public notice proposing to authorize and implement the proposed change. The public notice shall contain the rationale supporting the decision and will also be submitted to EPA for a 30-day review period requesting comment and recommendations. WQD may modify its initial approval determination based on public comments and EPA recommendations and issue a final administrative decision relative to the petition..
- E. If the final administrative decision is substantially changed from that which was proposed, the administrator shall prepare a second 30-day public notice. Otherwise, the administrative decision shall be considered final and submitted to EPA for

- approval as a revised standard for Clean Water Act purposes as provided in Chapter 1, Section 34. This decision may be appealed to the Wyoming Environmental Quality Council pursuant to the provisions of the Wyoming Administrative Procedures Act (WS 16-3-101 through 16-3-115).
- F. In instances where a petition for revised water quality criteria is approved, the Department shall initiate formal rule making procedures to amend the appropriate section(s) of the Chapter 1 Water Quality Rules and Regulations. Changes in criteria shall not become effective until adopted by the Environmental Quality Council and filed with the Secretary of State. This administrative process does not apply to the establishment of site-specific criteria on Class 2D and 3D waters.

 - G. Site-specific criteria may be established by the Water Quality Division Administrator on Class 2D and 3D waters without additional rule making procedures as provided in Chapter 1, Section 36.



UAA Process

IV. Petitions

Except for Class 1 designations, all petitions for water reclassifications must be made in accordance with the provisions of Section 33 of the Chapter 1 Surface Water Standards.

- A. Lowering Protections. Those petitions that involve lowering a classification, removing a use designation or establishing site-specific criteria that are less stringent than the adopted statewide standards must contain a Use Attainability Analysis (UAA) addressing one or more of the factors listed in Section 33 (b), paragraphs (i) through (vi) which states:

(Section 33. Reclassifications)...

(b) The Water Quality Administrator may lower a classification, remove a designated use which is not an existing use or an attainable use, or make a recommendation to the Environmental Quality Council to establish sub-categories of a use, or establish site-specific criteria if it can be demonstrated through a Use Attainability Analysis (UAA) that the original classification and/or designated use or water quality criteria are not feasible because:

(i) Naturally occurring pollutant concentrations prevent the attainment of the classification or use; or

(ii) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met; or

(iii) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(iv) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the classification or use, and it is not feasible to restore the water body to its original condition or to operate such modification in such a way that would result in the attainment of the classification or use; or

(v) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of the classification or use; or

(vi) Controls more stringent than those required by Sections 301(b) and 306 of the Federal Act would result in substantial and widespread economic and social impact. This subsection shall not apply to the derivation of site-specific criteria.

- B. Increasing Protections. Those petitions that involve adding a use designation or establishing site-specific criteria that are more stringent than the established standards are not subject to the Section 33 (b) factors listed above. Instead, the UAA must demonstrate that the proposed new designated uses are either existing uses or may be attained with the imposition of more stringent controls or management practices. In order to establish more stringent site-specific criteria, a petition should demonstrate that the approved statewide criteria are not sufficiently protective of the currently designated uses.

V. Completeness

Prior to evaluating a petition on its merits, the WQD must conclude that a petition is complete and contains the necessary water quality data and other information to make a valid determination. As mentioned in Section III. above, the degree of information necessary will depend upon the nature of the petition and the associated Section 33 (b) factor. In most cases, petitions should contain the following general information to be considered complete.

A. Petition Contents - General Requirements

1. A narrative explaining the nature and purpose of the petition. As mentioned in Section IV above, if the proposal would result in the lowering of protections the narrative must address one of the factors listed in Chapter 1, Section 33 (b). It should explain the reasons for the requested use removal, classification change, or site-specific criteria including any adverse effects that would occur if the petition is denied. Adverse effects could include any harm to business operations, commerce, private property rights, development opportunities, the environment, or any other public or private interest. Adverse effects should be tangible rather than speculative. For example, an unattainable water quality criterion that obstructs a proposed private or public action or causes unnecessary delay or expense is a tangible adverse effect. Speculative adverse effects would be associated with activities that are neither proposed nor have a reasonable potential to be proposed in the foreseeable future.

This step is necessary to help prioritize the department's actions and resources. The approach taken in the water quality standards is to designate aquatic life and recreation uses on all waters by default. These uses would be removed as appropriate upon the completion of the required use attainability analyses. Though it is not necessary to have a "tangible adverse effect" in order to make an appropriate designation, those with

tangible effects need to be addressed with more urgency.

2. The name and general description of the subject water body(s). This may be a single stream segment or a collection of stream segments making up a watershed or sub-watershed, lake, pond, or other still water body, or isolated water.
3. The specific location of the subject water body(s). Legal descriptions should be provided for the beginning and end of stream segments. Stream segments may also be described from tributary confluence to tributary confluence. Generally, WQD will not approve criteria or use designation changes on small segments of main stem streams.
4. Maps of the subject water body containing the necessary features and adequate detail to support the proposal. For example, if the intent of the petition is to show that normal stream flows are not sufficient to support aquatic life, National Wetlands Inventory, 7.5 minute quad maps depicting wetland occurrences along the entire waterbody should be used. However, if the intent of the petition is to remove a fisheries use, a more general map depicting the stream reach and its tributaries may be adequate. The maps should also indicate sample locations, photo points and any other features that are germane to the petition.
5. Photographs that adequately characterize the water body for the purposes of the petition. These should be taken at points along the water body where there are changes in flow volumes or pattern, springs, wetlands, tributaries, diversions etc. in a sufficient number to clearly illustrate the resource. Each photo point should also be indicated on the maps submitted under (4) above. Each photograph should be accompanied by information including a photo ID number, name of photographer, date and time taken, location and direction from which the photo was taken and a narrative describing what the photo is intended to depict.

B. Petition Contents - Specific Requirements

In addition to the General Requirements, each UAA must contain information and or data that is specific to the petition being made and to the associated Section 33 (b) factor where relevant. The required detail and quality of this information will vary case-by-case and it is not the purpose of this section to provide guidance on every possible situation. The basic requirement is that the UAA contains defensible information that convincingly supports the purposes of the petition.

Except when increasing protections, a Use Attainability Analysis must make a demonstration that a certain condition exists and that the reason it exists is due to

one of the factors in Chapter 1, Section 33 (b). Most commonly, UAAs will be developed to support a petition to lower a water classification involving the removal of a use designation and/or a site-specific adjustment to the applicable water quality criteria. The list that follows shows examples of classification changes involving the removal of a use and the general demonstration that must be made. It is not meant to be exhaustive since there may be other situations, but these are the most common.

Classification changes:

2AB to 2A: Demonstration that the source water for an existing drinking water supply does not and cannot support fish for one or more of the reasons provided in Chapter 1, Section 33(b).

2AB to 2B: Demonstration that a known game fishery or perennial water that is tributary to a known game fishery cannot reasonably support a drinking water supply for one or more of the reasons provided in Chapter 1, Section 33(b).

2AB to 2C: Demonstration that the water is known to support only non-game fish species or is a perennial tributary to a water known only to support non-game species; and cannot reasonably support a drinking water supply for one or more of the reasons provided in Chapter 1, Section 33(b).

2B to 2C: Demonstration that the overwhelming composition of fish species is non-game for one or more of the reasons provided in Chapter 1, Section 33(b). Incidental or occasional use of the water by game species does not require the 2B classification.

Class 2 (all) to Class 3A or Class 3B: Demonstration that the water is either isolated or is an intermittent or ephemeral tributary; and is not capable of supporting fish for one or more of the reasons provided in Chapter 1, Section 33(b).

Class 2 (all) to Class 3C: Demonstration that the water is a perennial tributary stream that cannot support fish or drinking water supplies for one or more of the reasons provided in Chapter 1, Section 33(b).

Class 2D & 3D designations

1. Demonstration that 100% of the flow or standing water is attributable to permitted effluent discharges except for occasional snow melt and storm events (*Chapter 1, Section 33 (b)(iii)*);
2. There is a “Net Environmental Benefit” (NEB) associated with the created waterbody;

3. The quality of the water does not pose a hazard to humans, wildlife or livestock that may be exposed to it; and
4. There is a credible threat to remove the discharge.

More detailed guidance is provided in Section VI “Effluent Dependant Waters” (Classes 2D and 3 D).

All Class 4 designations:

- 4A: Demonstration that the water body is an artificially constructed conveyance for an agricultural or industrial water supply.
- 4B: Demonstration that the water is not capable of supporting aquatic life because natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use (*Chapter 1, Section 33 (b)(ii)*).
- 4C: Demonstration that the water is an isolated water and 100% of the flow or standing water is attributable to permitted effluent discharges except for occasional snow melt and storm events (*Chapter 1, Section 33 (b)(iii)*).

Recreation Use Classes

The Chapter 1 regulations establish 2 categories of recreational use protection applicable to all waters in the state; “primary” and “secondary” contact. All waters in Table A of the Wyoming Surface Classification List are designated for primary contact recreation unless identified as a secondary contact water by an "(s)" notation. Waters not listed on Table A are assigned a secondary contact use designation by default. A Use Attainability Analysis is required in order to change any of the default designations. Because this may be a very common practice, a separate policy (Section VII) regarding the implementation of Chapter 1, Section 27 has been developed.

A Use Attainability Analysis is also required prior to establishing site-specific criteria that are less stringent than the adopted statewide criteria for any particular use designation or classification without removing the use or changing the classification. Demonstrations relative to this action must show that the adopted criteria cannot be attained for one or more of the reasons provided in Chapter 1, Section 33 (b). Additionally, each specific criterion must be evaluated separately.

Use Attainability Analyses intended to add a designated use must contain sufficient information to conclude that a use is an existing use or otherwise attainable by the imposition of more stringent controls on pollutant sources.

In order to establish more stringent site-specific criteria, the UAA must demonstrate that the

approved statewide criteria are not sufficiently protective of the currently designated uses.

Section 33 (b) Factors

Chapter 1, Section 33 (b), paragraphs (i) through (vi) provide the allowable rationale for removing a use designation or establishing less stringent water quality criteria on a site-specific basis. Except when related to a Class 4A designation, all UAAs must address one or more of these factors. A 4A classification is based solely on the fact that the waterbody is an artificial canal or ditch that is not known to support fish populations and it is not necessary to establish the 33(b) factor beyond that finding. Each factor is discussed below and guidance provided as to the current thinking of DEQ on what type of information is needed to justify a determination.

Naturally occurring pollutant concentrations prevent the attainment of the classification or use;

The UAA must establish that ambient water quality exceeds the adopted criteria and that the source of the pollution is not attributable to human activities. The natural source of pollution or natural condition that prevents the attainment of the designated use needs to be identified and quantified. Human activities in the area such as land uses, developments, discharges etc. need to be examined and reasonably eliminated as a cause of non-attainment.

A designated use may be removed on the basis of a single pollutant constituent or condition. For example, naturally occurring levels of copper in the water may prevent the attainment of a fisheries use and when demonstrated, may be sufficient cause to remove that use. A UAA would not necessarily have to evaluate all other potential constituents that might also contribute to the non-attainment. Information on other constituents, however, would help to support a final determination.

The establishment of this factor needs to be supported by sufficient data to characterize pollutant concentrations and water body conditions on a year-round basis. Consideration must be given to seasonal variations in flow, temperature, climate, land uses, non point sources of pollution and any other pertinent factor.

Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met;

The establishment of this factor needs to be supported by sufficient data to characterize actual flow conditions on a year-round basis. Consideration must be given to seasonal variations in flow, climate and consumptive water use.

In general, this factor applies to the removal of drinking water, fisheries, primary contact

recreation or aquatic life uses. In relation to fisheries, it may serve as the basis for establishing seasonal criteria on waters that support fish only part of the year or for removing the fishery designation on intermittent and ephemeral waters that have been "misclassified" in relation to the provisions of Chapter 1, Section 4 (b). In relation to drinking water, the UAA needs to demonstrate that water availability is not sufficient to support community or non-community drinking water supplies as defined under the federal Safe Drinking Water Act. In relation to recreation uses, it is an important factor in determining whether a primary or secondary recreation use designation is appropriate.

Most commonly, this is the factor relied on to classify waters as 4B. As provided in Chapter 1, Section 4, the occurrence of wetlands in or adjacent to stream channels will be used as an indicator of whether or not normal flow conditions are sufficient to support aquatic life. In general, areas that are inundated or saturated to the surface for as little as 7 days during the growing season will develop wetland characteristics. Stream channels that lack a significant wetland component may be considered to have insufficient hydrology to support aquatic life.

In order to establish this factor, the UAA should address entire stream reaches, not just isolated segments. The objective is to show that wetlands are either non-existent or occur so infrequently that the hydrologic potential of the stream to support aquatic life is insignificant. Significance is not precisely defined and will be determined on a case-by-case basis after consideration of the ratio of wetland acres to stream length in addition to wetland functions and values.

National Wetland Inventory (NWI) maps produced by the U.S. Fish and Wildlife Service may be used to identify wetland occurrences and to calculate acreages. Wetlands are defined in Wyoming statute as areas having all 3 essential characteristics including hydrophytic vegetation, hydric soils and wetland hydrology. The NWI maps depict and classify both wetlands and deep water habitats and all of the features shown on the maps do not necessarily delineate as wetlands under the Wyoming definition or the delineation methods used by the U.S. Army Corps of Engineers for Clean Water Act purposes. When identifying wetlands using the NWI maps, unvegetated systems need to be separated from the vegetated ones since unvegetated systems are not wetlands. Unvegetated sub-classes may be found in both the lacustrine and riverine systems classified on the NWI maps. All sub-classes of the palustrine system should be considered wetlands. Interpretation of the Cowardin classification system, photographs and/or on site-delineations may all be used to differentiate between riverine and lacustrine subclasses that are wetlands and those that are not.

After the amount of wetlands has been identified, the significance of that amount needs to be determined. If no wetlands have been identified, the UAA may conclude that aquatic life uses are not attainable. In all other cases, the UAA must present the rationale for determining that the amount of wetlands that are present are of such minor consequence that the stream system as a whole cannot be considered to sustain aquatic life.

When using wetland occurrence to establish this factor, it must be remembered that wetlands

are used as a surrogate measurement to determine actual hydrologic conditions over an extended period of time. Its best use is to separate truly dry stream channels from those that are not without having to directly measure flows through all seasons of the year. The extent of wetland occurrence cannot be used to remove aquatic life protections from waterbodies that are known to normally contain water for extended periods even though they do not exhibit a significant amount of wetlands. Examples of these waterbodies would be bedrock stream channels and steep-sided rivers, lakes and ponds that have the hydrology to support aquatic life but not the substrate necessary for wetlands to establish.

Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place;

This factor is relevant when non-attainment of a designated use is known to be caused by human activities or simply when the cause of non-attainment cannot be shown to be natural in origin. It contains two tests, either of which can be used to justify the removal of a designated use.

The first test is to show that a use is not existing and the reason(s) for its non-attainment cannot be remedied. An analysis of economic and technological factors must be conducted in order to make a determination under this factor. Other legal, social and cultural factors can also be considered and used as supporting information. The level of analysis and information required may vary from one situation to another depending upon the nature and severity of the source pollution and the overall environmental benefit of restoring the use.

The second test is to show that the available remedy would cause more environmental harm than to leave the pollution source in place. Most commonly, this is the factor relied on to classify waters as 2D, 3D or 4C. These categories of waters are comprised of essentially 100% effluent discharges. Without the discharge, a stream channel would not support aquatic life and would be classified 4B and in the case of isolated ponds, would not exist at all. Since the effluent is the only available water, it is roughly analogous to a natural background condition. It can be assumed that any aquatic life that colonizes the water is tolerant to the chemical and physical conditions that prevail even if they exceed the adopted aquatic life criteria for particular constituents. Requiring full aquatic life protections in these circumstances would often result in a loss of the discharge and of the aquatic community it supports. Non-aquatic wildlife and livestock are often the greatest beneficiary of these types of systems in the arid areas of Wyoming and these uses would also be lost. Unless there is convincing evidence to the contrary, it will be assumed that removing discharges in effluent dependant situations does result in greater environmental harm than leaving the discharge in place without requiring full aquatic life protection.

The information necessary to establish this factor for the purpose of classifying an isolated pond as 4C or a stream channel as 2D or 3D should consist of sufficient data to show that except for occasional snowmelt and precipitation runoff, 100% of the available water

consists of a permitted effluent discharge and there is no environmental hazard associated with the quality of the discharge.

Dams, diversions, or other types of hydrologic modifications preclude the attainment of the classification or use, and it is not feasible to restore the water body to its original condition or to operate such modification in such a way that would result in the attainment of the classification or use;

This factor applies to dams, diversions, or other hydrologic modifications that were constructed prior to November 28, 1975 and resulted in the loss of a fisheries, aquatic life or recreational use in the waters on which they were constructed. Uses that existed on the waters after that date would be considered "existing uses" and would still have to be designated. It is not necessary to protect waters for the applicable uses that were lost if it can be shown that restoration is not feasible. The information required to establish this factor is similar to what is required for human caused sources of pollution that cannot be remedied. An analysis of economic and technological factors must be conducted in order to make a determination. Other legal, social and cultural factors can also be considered and used as supporting information. The level of analysis and information required may vary from one situation to another depending upon the nature of the hydrologic modification and the overall environmental benefit of restoring the use.

Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of the classification or use;

This factor applies mainly to the removal of fisheries, aquatic life and primary contact recreation uses since these are normally the only uses where the expressed physical habitat parameters are relevant. The critical point that must be established by the information in the UAA is that the lack of habitat or recreational opportunity is a natural condition and not caused by hydrologic modifications, land uses, or other human activities. In this respect the requirements are similar to those used to establish that naturally occurring pollution prevents the attainment of the use. The basic difference is that one refers primarily to chemical parameters and the other to physical parameters.

Controls more stringent than those required by Sections 301(b) and 306 of the federal Act would result in substantial and widespread economic and social impact.

This is probably the most difficult factor to establish and has the most limited application. The referenced controls required by Sections 301 and 306 of the Clean Water Act are industry-specific effluent limitations and treatment technologies. They establish basic levels of required water quality treatment that is more related to best available technology than to water quality and water uses. This factor is intended to be applied in circumstances where it is known that the application of the technology-based requirements will not achieve the

water quality standards applicable to the receiving water and additional requirements to meet the water quality standards will result in unacceptable social or economic impacts.

The essence of a determination under this factor is that the activity causing the impact is of such great economic or social importance that it supersedes the goal of maintaining the water use. The UAA must establish that the imposition of the water quality standards would result in "widespread" social and economic impacts. This is an extremely subjective term and can only be defined on a case-by-case basis after full public participation. An economic impact analysis must be completed including an examination of alternatives that would lessen or mitigate both economic and environmental impacts. The level of analysis and information required must be comprehensive since the object is to quantify "widespread" economic or social impact in relation to the value of the water use that would be removed.

VI. UAA procedures for Effluent Dependant Waters (Classes 2D and 3D)

The justification for classifying a water as either 2D or 3D and assigning ambient-based criteria is based on the Section 33(b)(iii) factor described above. The specific rationale is that effluent dependant waters create environmental benefits that would be lost if the discharge is discontinued. Since there is no natural source of water, there would be no pre-existing aquatic life that could be damaged by the quality of the discharge. Any aquatic life that develops because of the effluent discharge is necessarily tolerant of the ambient conditions.

Though the habitats that are created in effluent dependant circumstances pose no real threat to the species of aquatic life that colonize them, there is a potential that they may pose a hazard to terrestrial and semi-aquatic wildlife species that may be attracted to them. The greatest concern is the possibility of bioconcentrating or bioaccumulating chemicals moving through the food chain at levels that create a risk to livestock, wildlife or humans. Therefore, part of the process of classifying a waterbody as 2D or 3D involves assessing a discharge for the presence of those types of pollutants and establishing appropriate criteria.

Therefore, the complete process for designating a water as either class 2D or 3D contains three parts. The first is completing a Use Attainability Analysis (UAA) that demonstrates that the subject waterbody is in fact effluent dependant and eligible for site-specific, ambient-based criteria. This part includes a demonstration that there is an environmental benefit associated with the discharge and a credible threat to remove the discharge. The second part is a hazard analysis that includes a specific screening of the discharge for the presence of bioaccumulating and bioconcentrating pollutants and a more general analysis to identify the pollutants for which ambient-based criteria will be established. The final part is to calculate and establish site-specific ambient-based criteria for those parameters that exceed the otherwise adopted statewide criteria (Chapter 1, Appendix B).

Part 1 – Effluent Dependency

The basic point is to show convincingly, through a weight of evidence approach, that a waterbody is comprised of essentially 100% permitted effluent and that without the effluent there would be no significant aquatic resource. There is no one best way to make this demonstration but the determination will be most convincing if multiple factors are assessed. These can include direct flow measurements, vegetation and wetland analysis upstream and downstream of the discharge, precipitation information, paired watershed analysis, historic information & testimony, etc.

This part also involves demonstrating an environmental benefit. It shall be presumed that water on the surface does have an environmental benefit for the aquatic life that colonizes it and for the habitat and food sources that surface water bodies provide to semi-aquatic and terrestrial wildlife species. Other consumptive uses such as livestock watering, irrigation and industrial uses are also important benefits along with non-consumptive recreational and scenic values. Because these benefits are presumed, it is not mandatory that the UAA exhaustively identifies and measures each actual benefit that occurs associated with the waterbody but should make an effort to generally characterize the natural and human uses of the water.

This presumption of environmental benefits, however, is not absolute and may be overridden where the quality or condition of the effluent-dependant waterbody poses a threat or hazard to non-aquatic wildlife, livestock or industrial uses or human health.

There is also a requirement to show a credible threat to remove the discharge. The basis for this requirement is in the concept of “Net Environmental Benefit” that weighs the potential for loss of a permitted effluent against the benefits of instream flow. It infers that there is some possibility that the discharge could be discontinued.

The demonstration of a credible threat to remove the discharge from oil and gas production operations is presumed to be satisfied based on 1) consideration that alternatives to surface discharge is the norm for the industry with an exemption applicable only west of the 98th meridian; and 2) an economic analysis done by EPA Headquarters showing that available treatment options for this industry are, as a general matter, more expensive than available non-discharge options.

For other types of discharges, the credible threat demonstration would have to be made either on a case-by-case basis or on a categorical basis as with the oil and gas industry.

Part 2 – Hazard Analysis and Chemical Screening

In order to be certain that there are in fact “net environmental benefits” associated with the

creation or continued existence of an effluent-dependant waterbody, the UAA must evaluate actual or probable hazards to wildlife, livestock and human health. This evaluation shall address the potential for accumulation of pollutants contained in the effluent discharge to levels considered to be hazardous in the environment or hazardous to wildlife, livestock or humans by means of bio-accumulation through the food chain.

The evaluation of hazards should focus on the:

- Level of pollutant (actual or modeled)
- Risk of exposure to target use (wildlife, livestock, and humans)
e.g. mercury in 2D waters may be a greater hazard than in 3D waters because of potential exposure to humans through fish consumption.
- Background concentration of contaminant

Evaluation:

The first step in the hazard evaluation shall consist of an initial screening of the permitted effluent for pollutants of concern. The screening parameters may be different from one type of discharge to another because of differences in the relative probability of the occurrence of bio-accumulative materials associated with the industry or activity. For example, the vast majority of waters in Wyoming that would be candidates for an effluent-dependant classification are created by the discharge of groundwater to the surface as a result of oil and gas production or mining activities. The types of pollutants that could reasonably be expected to occur are inorganic metals and salts. Of these, only selenium and mercury need to be investigated to determine the hazard potential to wildlife, livestock or humans.

A relatively small number of 2D and 3D candidate waters may be created from municipal wastewater treatment plants, industrial facilities such as oil refineries or power generating facilities, and various types of manufacturing operations. Depending upon the circumstances of the discharge, effluents from these facilities may have a higher probability of containing synthetic and organic bio-accumulative materials. In these situations, initial screening parameters will be determined on a case-by-case basis. Because effluent-dependant waters created by these types of discharges will be relatively uncommon and addressed on a case-by-case basis, the remainder of this guidance will focus on those circumstances involving the discharge of groundwater to the surface.

Selenium: The hazards associated with selenium bio-accumulation are related to mortality and impaired reproduction in waterfowl, shorebirds and piscivorous birds and selenium poisoning in livestock and terrestrial wildlife. Exposure to humans is not a consideration because Class 2D and 3D waters are not designated and protected as

drinking water supplies.

Birds: Where the initial screening indicates that the effluent concentration of selenium exceeds the Appendix B aquatic life chronic value, whole body fish and/or macroinvertebrate tissue analysis will be required. If whole body tissue concentrations are less than or equal to 7.9 µg/g dry weight, the water shall not be considered a hazard to waterfowl, shorebirds and piscivorous birds. A whole body tissue criterion of 7.9 µg/g dry weight selenium will be established for the stream segment along with an ambient-based water column value calculated as provided in Part 3 of this procedure.

Where the effluent water column concentration exceeds the Appendix B chronic aquatic life criterion and whole body tissue concentrations are greater than 7.9 µg/g dry weight, the water shall be considered a hazard to waterfowl, shorebirds and piscivorous birds. A whole body tissue criterion of 7.9 µg/g dry weight selenium will be established for the stream segment and site-specific ambient-based criteria for selenium shall not be established. The stream segment shall be listed as impaired on the state 303(d) list and a TMDL developed to address the tissue based criterion.

Livestock & Wildlife: The hazard of selenium poisoning shall be considered to be the same for livestock and wildlife and one group is not considered to be more tolerant or susceptible than the other. This hazard analysis is intended to address the use of the water by mammals.

Selenium poisoning can occur in livestock raised on vegetation grown in selenium bearing soils which are common in Wyoming and in some areas contain up to 30 mg/kg of selenium. "In water, 400 to 500 µg/L of selenium is believed to be non-toxic to cattle. Such water may contribute to selenium poisoning, but the selenium content of the feed is a more critical factor." (McKee & Wolf, 1963).

Water used for irrigation may contain up to 10,000 µg/L of selenium with no anticipated toxicity to plants.

Clearly, the identification of environmental hazards associated with selenium in effluent-dependant waterbodies can be focused on an evaluation of impacts to birds. It can be assumed that where there is little or no hazard to birds, the water is safe for all other designated uses.

Mercury: Mercury in trace amounts is acutely toxic to aquatic life and also presents a significant health hazard to human populations. The primary exposure pathway to humans is through the consumption of mercury contaminated fish. Most other human exposure pathways such as through drinking water or general environmental exposure are considered negligible though a safe drinking Water Act Maximum Contaminant Level (MCL) of 2 µg/L has been established for the protection of drinking water supplies. The identification of mercury-related hazards in effluent-dependant waters needs to consider the following:

1. The likelihood of bio-accumulation in fish tissue in the immediate Class 2D receiving waters and downstream class 2 waters;
2. The contamination of groundwater aquifers to levels above 2 µg/L;
3. The accumulation of mercury in sediments to levels above the State's guidelines for remediation of contaminated soils.

Where the initial screening indicates that the effluent concentration of mercury exceeds the Appendix B aquatic life chronic value and the discharge can be expected to reach a fish bearing water, whole body fish tissue analysis will be required. If whole body tissue concentrations are less than or equal to 0.3mg methylmercury/kg fish the water shall not be considered a hazard to fish or fish consumption. A whole body tissue criterion of 0.3 mg methylmercury/kg fish will be established for the stream segment along with an ambient-based water column value calculated as provided in Part 3 of this procedure.

Where the effluent water column concentration exceeds the Appendix B chronic aquatic life criterion and whole body tissue concentrations are greater than 0.3mg methylmercury/kg fish, the water shall be considered a hazard to fish, wildlife and fish consumption. A whole body tissue criterion of 0.3 mg methylmercury/kg fish will be established for the stream segment and site-specific ambient-based criteria for mercury shall not be established. The stream segment shall be listed as impaired on the state 303(d) list and a TMDL developed to address the tissue based criterion.

Where the initial screening indicates that the effluent concentration of mercury exceeds the Appendix B aquatic life chronic value and the discharge is not expected to reach a fish bearing water, sediment analysis may be required. Ambient-based water quality criteria may be established where sediment concentrations are less than or equal to 23 mg/kg inorganic mercury and 26 mg/kg methylmercury. In no circumstance shall an ambient-based water column criterion exceed 2 µg/L total recoverable mercury.

In addition to hazard screening for bioaccumulative constituents, a more general screening of all parameters that could reasonably be expected to be found in the discharge should also be conducted. This information will be used in the subsequent procedure for establishing the ambient criteria. Site-specific ambient criteria will only be established for those parameters that exceed the statewide criteria listed in Chapter 1, Appendix B. This screening is important to identify which pollutants require a site specific modification. The exact list of screening parameters will depend upon the type of discharge. For oil & gas produced water discharges the following list should be used:

Arsenic
Cadmium
Chromium (III)
Copper
Lead
Mercury*
Nickel
Selenium*
Silver
Zinc
Aluminum (pH 6.5-9.0 only)*
Chloride
Iron
Manganese
Sulfide-Hydrogen Sulfide (S²⁻, HS⁻)
hardness (CaCO₃) Mg/L

** Required for hazard analysis*

Part 3 – Establishing Ambient-based Criteria

Chapter 1, Section 36 provides a procedure by which the adopted statewide numeric criteria may be modified to reflect ambient conditions on effluent dependant waters. Ambient-based criteria can be established only for those parameters where the discharge effluent quality exceeds the values in Chapter 1, Appendix B.

Criteria modification based on a finding of net environmental benefit is authorized where a UAA described in parts 1 and 2 above satisfactorily demonstrates that::

1. The waterbody is effluent dependant;
2. The discharge has been shown to create an environmental benefit and removal of the discharge would cause more environmental harm than leaving it in place;

3. There is a credible threat to remove the discharge; and
4. Appropriate safeguards are in place, ensuring that downstream uses will be protected and the discharge will pose no health risk or hazard to humans, livestock or wildlife.

Pursuant to an approved UAA and reclassification to either Class 2D or 3D, site-specific criteria for eligible constituents shall be calculated to be equal to the background concentration for each constituent plus a margin of error.

1. The background concentration shall be the highest concentration recorded over the course of a one year period where samples have been taken at least once in each month. In circumstances where water is not present 12 months out of the year, additional samples must be collected in the months when water is present to obtain a minimum data set of at least 12 samples.
2. The margin of error shall be one standard deviation calculated from the same data set used to establish background.
3. Depending upon the circumstances, samples may be collected either at the discharge outfall or from a representative point in the stream channel downstream from the permitted outfall. For example, where the effluent dependent water is created by a single discharge, it is acceptable to sample the outfall for this analysis. Where an effluent dependent water is created from multiple outfalls, samples should be collected in-stream at a representative point after mixing of the various outfalls has occurred.
4. End-of-pipe sampling and analysis shall be done in conformance with WYPDES analytical requirements for the particular constituents and in-stream sampling and analysis shall be conducted in conformance with the "*Wyoming Manual of Standard Operating Procedures for Sample Collection and Analysis*".

The WYPDES permittee responsible for the discharge shall be required to collect and submit the water quality data necessary make the above calculations.

VII. UAA procedures for Recreation Designations

Purpose

Section 27 of Chapter 1 of the Wyoming Water Quality Rules and Regulations (Surface Water Standards) creates two recreational use categories for all bodies of surface water in the state. A

“Primary Contact Recreation” designation is intended to apply to those waters where there is a reasonable potential for people to engage in full body contact with the water and/or a potential to ingest small quantities. The “Secondary Contact Recreation” designation is intended to apply to all other waters where those circumstances do not occur.

The purpose of this policy is to provide guidance on how to appropriately designate specific waters as either primary or secondary contact waters.

Concepts

The basic concept of recreational use protection is to ensure that surface waters of the state are maintained at a quality that does not pose a significant risk of disease to human populations that may be exposed to them. The factors contributing to human health risk include the concentration of disease causing organisms in the water and the relative level of human exposure to that water.

Along with the use classification categories, Section 27 also provides the criteria that apply to each. The criteria are based on concentrations of E.coli bacteria which serve as an indicator of the probability that the water may also contain populations of other waterborne disease causing bacteria and viruses. These criteria are used as the basis for effluent limits on permitted discharges (WYPDES permits) and Section 303(d) listings and subsequent TMDL or watershed planning targets.

All surface waters are assigned either a primary or secondary contact recreation designation. By default, waters that appear on Table A of the “Wyoming Surface Water Classification List” are primary contact waters and those that do not appear on Table A are secondary contact waters. In general, Table A is a listing of waters that are named on the USGS 1:500,000 hydrologic map of Wyoming. These are the larger mainstem streams, lakes and reservoirs that have a higher probability of having persistent flows and some attraction for recreational use. Most of the waterbodies not listed on Table A exhibit intermittent or ephemeral flows and are less likely to provide primary contact recreational opportunity. This is not a perfect system for classification but it is a manageable one. Its usefulness is contingent upon having clear and simple procedures for making appropriate adjustments to the default designations.

Though primary contact is the default designation for Table A waters, some listed waters will be specifically designated as secondary contact waters. All of these, however, must be supported by a Use Attainability Analysis that provides the rationale for the lower designation. Similarly, waters not currently listed on Table A will be added based on UAAs demonstrating that primary contact is the appropriate designation for the previously unlisted water.

The decision as to whether a water is most appropriately designated for primary or secondary recreation protection is not intended to be a difficult one. It is based solely on the relative potential of exposure to human populations. There are only a few factors relating to water availability, access and recreational opportunity that need to be considered. The entire UAA process will in most cases be very simple and will not require any special expertise to complete.

It is also important to note that a recreational use designation is not intended to imply that the owner of property adjacent to any waterbody would allow access for any kind of recreational use. The application of recreation classifications does not create any rights of access on or across private property for purposes of recreation on such waters. The classification is intended only to affect which water quality criteria will be used in the implementation of the pollution control programs required under the federal Clean Water Act and the Wyoming Environmental Quality Act.

Factors Affecting Recreational Use Designations

- All waters, regardless of flow regime, located within federal, state or local parks and recreation areas will be designated for primary contact recreation. Federal, state or local parks should not be construed to mean all public lands, but rather specifically developed and/or designated recreational use areas such as campgrounds, picnic grounds, trailheads, greenways etc.
- Waters known to be used for primary contact activities such as swimming, rafting, floating, canoeing or kayaking shall be designated as primary contact waters.
- All lakes and reservoirs located in the state are already used or have the potential to be used for primary recreation and will be designated as such.
- Waters located within or flow through municipalities or high density housing areas will generally be designated as primary contact waters.
- Larger perennial streams and game fisheries will generally be designated for primary contact because of their potential to attract sportsmen and other recreationists.
- Except for waters located in or flowing through parks, recreation areas or urban areas, intermittent and ephemeral waters will generally be designated for secondary contact uses.
- Segmentation of streams into multiple primary and secondary designations is possible but will only be approved where the benefits of more specific segmentation outweigh the drawbacks of an increasingly segmented system.

Variances

Section 27(d) provides an ability to grant variances to the numeric criteria in instances where the source of bacterial contamination is found to be natural in origin (wildlife), unavoidable (off-channel stock watering pits) or when less stringent criteria is shown to be in the public interest. An approval of a variance does not change the use designation of the affected water. It may

change the limits and conditions of an WYPDES permit, TMDL or watershed plan. The process for granting a variance is a site-specific action and does not require a Use Attainability Analysis. The rationale for a variance will be documented in either the statement of basis on an associated WYPDES permit action or in an associated TMDL or watershed plan document.

**Recreational Use Designations
Use Attainability Analysis (UAA) Worksheet**

A recreational Use Attainability Analysis is required to support any change in the recreational use designation of a surface water of the state, either to a more stringent or less stringent classification. Completion of a UAA is recommended in cases where there is significant uncertainty about whether or not the current classification is appropriate. As a procedural matter, the Water Quality Division will compile all completed UAAs and make the appropriate classification determination and required submittal to EPA on a semi-annual basis.

There are three circumstances where it makes sense to complete a UAA and revise the recreation use classification. The first is whenever a stream is currently listed or proposed to be listed as impaired or threatened on the state's 303(d) list. This is to ensure that the proposed listing is based on an assessment using the appropriate pathogen criteria. The Water Quality Division will routinely complete a UAA as part of the listing documentation.

The second reason is to raise the classification from secondary contact to primary contact on waters that are not currently listed on Table A of the Wyoming Surface Water Classification List but are currently being used or have a high potential to be used for recreational purposes.

The third reason is to ensure that pathogen limits on new or revised WYPDES permits are based upon the appropriate criteria for the receiving water.

I. Name & Location: Identify where the stream segment starts and ends.

Waterbody name: _____ Watershed (HUC): _____

Upstream Location: ¼, ¼ Section _____; SEC _____; TWP _____; RNG _____

Downstream Location: ¼, ¼ Section _____; SEC _____; TWP _____; RNG _____

II. Maps & Photographs

Attach a map of adequate scale and detail to accurately depict the waterbody that is the subject of the reclassification proposal. Also attach photographs that adequately characterize the water body for the purposes of the petition. These should be taken at points that are typical of the stream channel or lake in a sufficient number to clearly illustrate the resource. Each photo point location should also be indicated on the UAA map. The photographs should be accompanied by information including a photo ID number, name of photographer, date and time taken, location and direction from which the photo was taken and a narrative describing what the photo is intended to depict.

III. Primary use Factors: If any of the following factors apply, the water should be designated for primary contact recreation. If none of the factors apply the water is a candidate for a secondary use designation.

Check all that apply:

- Water is located within or flows through a federal, state, or local park or recreation area. Federal, state or local parks should not be construed to mean all public lands, but rather specifically developed and/or designated recreational use areas such as campgrounds, picnic grounds, trailheads, greenways, etc..
- Water is a lake, reservoir or other still body of water. (*Exclude small stock watering ponds*).
- Water is within or flows through a municipality or unincorporated high density housing area.
- Water is a larger perennial stream or game fishery known to be used by sportsmen or other recreationists.
- Water is used or can be used for primary contact activities such as swimming, floating, rafting, canoeing or kayaking.

IV. Use Removal Factors (*only necessary when downgrading from a primary to a secondary use designation*).

Chapter 1, Section 33(b) requires that all petitions to lower a classification or criteria must be based on one or more of the use removal factors listed in Section 33(b)(i) through (vi). Most commonly, the factors that apply to reclassifying a water from a primary to a secondary contact designation are 33(b)(ii) or (v) though there may be unique circumstances where one of the other factors is most appropriate.

Those petitions intending to raise a classification from secondary to primary contact are not subject to the Section 33 (b) factors. Instead, the UAA should demonstrate that primary contact recreation is either an existing use or may be attained with the imposition of more stringent controls or management practices.

Check one or more of the following use removal factors and attach a brief narrative explaining why each checked factor applies to the subject water. If the purpose of the

UAA is to raise a classification from secondary to primary, do not check any factor but still provide a narrative explanation of the justification for the increased level of protection.

- (i) Naturally occurring pollutant concentrations prevent the attainment of the classification or use; or
- (ii) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met; or
- (iii) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
- (iv) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the classification or use, and it is not feasible to restore the water body to its original condition or to operate such modification in such a way that would result in the attainment of the classification or use; or
- (v) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of the classification or use; or
- (vi) Controls more stringent than those required by Sections 301(b) and 306 of the Federal Act would result in substantial and widespread economic and social impact. This subsection shall not apply to the derivation of site-specific criteria.

Explanation (*attach additional sheets if necessary*):

Petitioner

Date

VIII. Implementation

A. Classifications and Use Designations

Upon a final approval by the Administrator for changes in classifications or use designations, the results of a Use Attainability Analysis will be submitted to EPA for approval as a revised water quality standard for CWA purposes. The revised standard will become effective upon EPA approval or 90 days after submittal, whichever comes first. The final determination by the Administrator is an action that may be appealed to the Environmental Quality Council pursuant to Chapter 1, Section 16 of the Rules of Practice and Procedure.

B. Criteria

Site-specific changes in water quality criteria can only be implemented administratively by the Water Quality Division on effluent dependant waters. On all other waters where a Use Attainability Analysis which would result in the establishment of site-specific criteria for any pollutant has been approved, the DEQ shall recommend such revised criteria to the Wyoming Environmental Quality Council for adoption pursuant to formal rule-making procedures. The revised criteria shall not become effective until adopted by the Council and filed with the Secretary of State as revised rules.

AGRICULTURAL USE PROTECTION POLICY
(Chapter 1, Section 20)

Requirements and end-of-pipe effluent limits associated with permitting produced water discharges for agricultural use protection are covered in Chapter 1 of the Water Quality Rules and Regulations, Section 20 and Appendix H. There are also basic effluent limitations provided in the WYPDES permit regulations (Chapter 2 of the Water Quality Rules and Regulations) that are intended to ensure that discharge water is safe for livestock to drink.

In addition to the basic effluent limitations for livestock watering in Chapter 1, Appendix H and Chapter 2, the following limits for livestock protection may be incorporated into WYPDES permits when there is reason to believe they may be associated with a discharge:

<u>Boron</u>	<u>5,000 µg/L</u>	<u>Dissolved</u>
<u>Cadmium</u>	<u>50 µg/L</u>	<u>Dissolved</u>
<u>Chromium</u>	<u>1,000 µg/L</u>	<u>Dissolved</u>
<u>Copper</u>	<u>500 µg/L</u>	<u>Dissolved</u>
<u>Fluoride</u>	<u>4,000 µg/L</u>	<u>Dissolved</u>
<u>Lead</u>	<u>100 µg/L</u>	<u>Dissolved</u>
<u>Mercury</u>	<u>10 µg/L</u>	<u>Dissolved</u>
<u>Selenium</u>	<u>100 µg/L</u>	<u>Dissolved</u>
<u>Zinc</u>	<u>2,500 µg/L</u>	<u>Dissolved</u>

When ambient background water quality is demonstrated to be above the limits listed above, effluent limits may be set to that ambient background water quality.

Livestock watering waiver - An exception to the limits above may be made whenever the background water quality of the receiving water is of poorer quality than the value listed for the associated pollutant and the landowner requests use of the water and thereby accepts any potential risk to his livestock.

(Note to Council members) – Following is a list of parameters included in the previous rule proposal:

Arsenic 20 µg/L (TR)	Chromium 1,000 µg/L (D)	Lead 100 µg/L (D)
Boron 5,000 µg/L (D)	Copper 500 µg/L (D)	Mercury 10 µg/L (D)
Cadmium 50 µg/L (D)	Fluoride 4,000 µg/L (D)	Selenium 50 µg/L (TR)
		Zinc 2,500 µg/L (D)

- (D) – Dissolved, (TR) – Total Recoverable.

Response Summary for June 15, 2007

WWAB Meeting

Section 8

ANALYSIS OF COMMENTS

Subject: Comments received and Wyoming DEQ/WQD responses relative to the 2nd Draft of the Agricultural Use Protection document from comments received at the Water and Waste Advisory Board (Board) meeting on June 15, 2007 in Casper, Wyoming.

In connection with proposed revisions to the Chapter 1 Water Quality Rules and Regulations, the DEQ/WQD is proposing to incorporate the revised Agricultural Use Protection document as a rule. The purpose of this document is to interpret the narrative standard for the protection of Agricultural uses of surface water contained in Chapter 1, Section 20.

On February 16, 2007, the EQC approved proposed revisions to Chapter 1 except for Appendix H, Agricultural Use Protection, which was removed from the rule and remanded back to DEQ for further directed revisions. In May of 2007, proposed revisions to Appendix H were posted on the DEQ website and public notice was published in the Casper Star Tribune. Comments were received at a Board meeting on June 15, 2007 in Casper, Wyoming. On September 14, 2007, the Board held a second meeting in Jackson, Wyoming which included video conference sites at eight other Wyoming municipalities. At the Jackson meeting, testimony was heard and comments were received on the previously published University of Wyoming (UW) report entitled "Water Quality for Wyoming Livestock and Wildlife" which discussed recommended safe drinking water levels for Wyoming livestock and wildlife. On December 7, 2007 the Board will receive comments on the response summaries from the previous two Board meetings and receive proposed rule revisions to Chapter 1, Appendix H, Agricultural Use.

This document summarizes the comments received and includes the Water Quality Division's responses. The tables that follow are a compilation of these comments and DEQ/WQD responses. In the tables, the comments have been organized according to topics and paraphrased to create a manageable summary. Comments received are formatted in normal typeface and the agency responses are in italics. A list of commentors is also included to help track the comments.

List of Commentors

1	Bill Bensel	BB
2	Lois M. Cox	LC
3	Devon Energy Production Company, L.P.	DE
4	Holland & Hart	HH
5	Jorden Bischoff & Hiser, P.L.C. for Yates Petroleum Corporation (Yates)	JBH
6	Meeteetse Conservation District	MCD
7	Rev. Dr. Robert F. Miller / Diana Sabo Miller RN, ANP	RM
8	Pennaco Energy, Subsidiary of Marathon Oil	PE
9	Petroleum Association of Wyoming	PAW
10	Prariana Farms	PF
11	Powder River Basin Resource Council	PRBRC
12	Rocky Mountain Energy Reporter	RMER
13	Williams Production RMT Company	WP
14	Wyoming Mining Association	WMA

General

MCD, JBH	<p>1. Comment: MCD comments, the current draft threatens the future ability to use produced water. Section 20 must provide local flexibility to produce and utilize future water resources associated with mineral development and falls short of protecting the agricultural industry and local agricultural producers. Yates comments that in essence, Appendix H causes more harm to existing uses and the environment than it would prevent and urges the Water Quality Division (WQD) to evaluate these impacts more carefully before implementing Appendix H as a rule or policy.</p> <p>Response: <i>The proposed Appendix H provides several alternatives for ensuring that produced water is of sufficient quality to protect designated agricultural uses and can be utilized for beneficial uses whenever possible. It provides these protections through a tiered approach for permitting discharges which includes Tier 1 default effluent limits for discharges with exceptional water quality, Tier 2 effluent limits based on background water quality, or Tier 3 effluent limits based on a comprehensive no harm analysis. When a permit effluent limit can not be met under the tiered approach, permission can be sought from affected landowners who desire to use the produced water, as long as the landowner is willing to take the risks of receiving the lesser quality water. Furthermore, to date we are finding that producers are able to meet these permit conditions in most cases.</i></p> <p><i>The impacts of implementing Appendix H as a rule/policy have been evaluated during the process of several revised drafts. During this process, the public has supplied comments that were considered and resulted in several revisions. The WQD also sought outside input from soil scientists and reviewed accompanying scientific literature. We believe that the rule being proposed takes into consideration the needs of the agricultural industry to obtain water for beneficial uses, while ensuring that the provisions of Chapter 1, Section 20 are being met.</i></p>
PF	<p>2. Comment: Other methods currently in use for disposal of produced water, such as injection, or piping to appropriate streams, should be more widely employed to ensure protection of agricultural uses.</p> <p>Response: <i>Oil and gas produced water in Wyoming is a very valuable resource which historically has been put to many beneficial uses including irrigation, livestock watering and development of wildlife habitat. It would not be good public policy to simply eliminate the use of those resources. Certainly there are limits to what can be allowed and the purpose of this proposed rule is to express and enforce those limits. In those cases where effluent limits and permit provisions can not be met, then appropriate alternative methods of disposal are encouraged.</i></p>
PF	<p>3. Comment: The Wyoming Department of Environment Quality (DEQ) uses the phrase “within reach of a discharge, diversion, or irrigation field” to avoid treatment of produced water for agricultural protection purposes. They have</p>

PF	<p>repeatedly said they have no authority over the quantity of water so how can they assure us that the water will not reach irrigated fields or diversions?</p> <p>Response: <i>Generally, if a discharge occurs into a tributary channel which contains irrigated lands, the assumption is made that it will reach those lands. This may be rebutted on a case by-case basis depending site-specific water management.</i></p> <p>4. Comment: How about a policy that protects livestock production and crop production by simply stating: “No produced water shall be released on pasture lands or croplands without the express consent of the landowner or landowners. This water will not be allowed to flow onto the surface of non-consenting landowners.”</p> <p>Response: <i>Wyoming law allows discharges into any waterway provided the discharges are permitted by the WQD. The courts have established that no landowner may “veto” the discharge into a waterway even if that waterway crosses his or her private land.</i></p>
PRBRC, PF	<p>5. Comment: Agricultural uses are not fully protected because <u>production</u> of livestock and crops is not addressed as a component of protection.</p> <p>Response: <i>Protecting production has been an integral part of developing the currently proposed provisions of Appendix H. Considerations given to the proposed livestock watering limits are based in part on both health and production data from the University of Wyoming report by Dr. Merl Raisbeck and anecdotal information from the ranching community. Tier 1 default limits for irrigation are derived for the most sensitive crop as indicated by the USDA Agricultural Research Service (ARS) National Salinity Laboratory tolerance levels and are based on 100% crop production. Other tiered approaches for setting irrigation limits are based on site-specific conditions which may also include an evaluation of crop production.</i></p>
DE	<p>6. Comment: The Water and Waste Advisory Board (Advisory Board) should not endorse the current draft of Appendix H because WQD has not submitted relevant and reliable evidence that the proposed rule is necessary, it has not addressed the elements of the Wyoming Environmental Quality Act, Section 35-11-302, because the EQC directed the WQD to begin over with the rule from scratch or at minimum address the following: clarify historical definitions and irrigation, effluent limits for agricultural lands and provide supporting evidence for the scientific basis of WQD’s decisions, and because a state wide rule should not be based on the complaints of a few land owners.</p> <p>Response: <i>The rule which is currently being proposed was initiated in 2002 as part of the triennial review for water quality standards and required by Section 303(c) of the Federal Clean Water Act. It was determined during this review process, with input from the Advisory Board and the public, that a policy would be developed to clarify how discharges of produced water which are used for</i></p>

agricultural purposes would be permitted. This process was largely driven by the increased development of coal bed methane (CBM) in certain areas of the state. As the policy developed through several revisions and public meetings, it was suggested that the policy looked more like a rule and should therefore be proposed as a rule. After internal review, DEQ agreed. On February 5, 2006, the Advisory Board took comments and deliberated about DEQ's intentions to incorporate the Agricultural Use Protection Policy into Chapter 1, Appendix H. During a hearing before the Environmental Quality Council (EQC) on February 15 and 16, 2007, Appendix H of Chapter 1 was remanded back to DEQ for additional revisions and to allow time for further public consideration and deliberation as a rule instead of a policy. We believe that the directives given by the EQC have been addressed.

Regarding compliance with W.S. 35-11-302(a)(v1), the statute provides:

“(vi) In recommending any standards, rules, regulations, or permits, the administrator and advisory board shall consider all the facts and circumstances bearing upon the reasonableness of the pollution involved including:

- (A) The character and degree of injury to or interference with the health and well being of the people, animals, wildlife, aquatic life and plant life affected;*
- (B) The social and economic value of the source of pollution;*
- (C) The priority of location in the area involved;*
- (D) The technical practicability and economic reasonableness of reducing or eliminating the source of pollution; and*
- (E) The effect upon the environment.”*

We believe, we have complied with all of the conditions of WS 35-11-302 (a)(vii) in the establishment of the proposed rules and are continuing to do so through this Advisory Board process. This public process that we are currently engaged in is specifically designed to meet those provisions of the statute. The provisions of the proposed rules were largely developed in a previous rulemaking process containing a lengthy administrative record documenting 5 draft iterations, 5 Advisory Board public meetings and 4 solicitations of written public comment in which all of the above were considered. A brief summary of the relevant considerations is as follows:

A) The proposed rule addresses the character and degree of injury to crops and native plants that may be irrigated with produced water and the degree of injury to livestock that may drink the water. It creates the data requirements and procedures for calculating discharge water quality limits to an extent that ensures no measurable decrease in crop or livestock production. In past comments, CBM industry representatives contended that prohibiting the discharge of new water is injurious to wildlife that would otherwise use the habitat that would be created. However, the document doesn't prohibit the discharge of water, it regulates the quality of the water being discharged and it only regulates that quality to the extent

that livestock and wildlife will not be harmed. They also contend that by requiring water quality that will support irrigation harms livestock and wildlife because it will result in less water being discharged. In this, they ask the agency to choose between irrigated agriculture and livestock and wildlife. Instead, we chose to protect them all by regulating water quality sufficient to support all of the uses as is contemplated by the statute and the regulations. We have considered the potential impact to water uses that have developed around historic discharges and structured the document in a way that will allow those discharges to continue. We have also included provisions that will allow the discharge of poorer quality water if the affected water users accept the risks associated with the poorer quality water.

B) The source of pollution is oil and gas development and the social and economic importance of that industry has clearly been considered in the formation of the proposed rule. Indeed, oil & gas development has flourished under the agency's past interpretation of the Section 20 standard and will continue to flourish under the proposed new appendix to the rule. The opponents of CBM development have argued that we considered too much the economic importance of energy development at the expense of local agriculture in the formulation of the proposed rule. We believe we have struck an appropriate balance evidenced by the fact that the provisions of the rule have already been implemented in part through the permitting policy. Throughout this implementation, the energy industry remains vibrant in the state and significant degradation of water quality has not occurred.

C) We have considered the priority of location in the area involved. This proposed rule contains the necessary flexibility to assign appropriate water quality limits on a site-specific basis. The Tier 2 procedures allow the adjustment of effluent limits to equal the many differing background water qualities in different receiving waters across the state. The Tier 3 provisions allow further modifications based on site-specific geologies, soils and management practices.

D) The proposed rule addresses the technical practicability of reducing or eliminating the source of pollution. The 3-tiered approach is specifically designed to address technical practicability. The purpose of Tier 1 is to alleviate requirements for detailed studies in circumstances where the quality of the discharge is exceptionally good or the affected crops are salt-tolerant. It provides a clear and simple means of assigning EC and SAR values that are supported by scientific literature. Tier 2 allows effluent limits to be adjusted to equal background water quality and provides specific procedures that can be used to estimate background water quality. The industry often points out that the CBM produced water is of a better quality than background. Wherever this is true, there is no technical problem in meeting the requirements of the proposed rule. Wherever the produced water is worse than background, the assumption must be made that the lower water quality will have a depressing effect on crop production. Tier 3 allows this assumption to be rebutted by a study or demonstration by the permit applicant that the lower water quality can be managed in a way that maintains crop productivity. These approaches were developed with input from a

	<p><i>technical workgroup that included industry and university agricultural experts. The techniques involved in each of the tiers are all considered to be economically feasible and have been routinely employed by CBM operators and consultants.</i></p> <p><i>E) The proposed rule in its entirety considers the effects upon agricultural uses which are the parts of the environment intended to be addressed by Section 20.</i></p>
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Policy vs. Rule

<p>RMER</p>	<p>7. Comment: The changes and various modifications have been difficult for the public to follow. The EQC must carefully consider how the rule will play out in various parts of the State, and must notice the rule with the appropriate period of review and discussion.</p> <p>Response: <i>It's understandable that various modifications to the rule may have been difficult for the public to follow. It has gone through several revisions based on input from the public, industry, academia, agriculture, and industry experts, the Advisory Board, and the EQC. We do, on the other hand, believe that appropriate review and discussion has been given to the development of the rule, which began in 2002 and included 5 public meetings and one hearing before the EQC. Since that time, 2 additional public meetings have been held and at least one additional public meeting is anticipated in front of the Advisory Board before the document is sent back to the EQC for a second hearing.</i></p>
<p>RMER</p>	<p>8. Comment: Adopting the proposed rule will not alleviate future conflicts. Down stream land owners will be able to dictate conditions of discharges within a watershed, depriving others who want produced water. A mediation program could mean a new start in crafting solutions that are beneficial to everyone.</p> <p>Response: <i>Issues associated with permitting produced water which is both wanted and unwanted by property owners will undoubtedly result in continued conflict as long as there are the competing interests. That is one of the primary reasons why the process of reevaluating a way to implement the requirements of Chapter 1, Section 20 were initiated. It is correct that mediation is a crucial element of resolving conflict and is taking place between industry and landowners. For example, permit applicants who are unable to meet Tier 2 background water quality limits have the option of working with down stream landowners using managed irrigation or other Tier 3 approaches. Landowners do not typically allow an unconditional discharge of produced water for agricultural uses but instead choose to make informed decisions based on the information that is presented to them and the risk involved.</i></p>
<p>JBH, MCD</p>	<p>9. Comment: Appendix H should remain a policy instead of a rule to provide the WQD with the flexibility needed for administration of the provisions and for making better site related decisions.</p>

	<p>Response: <i>The proposed rule does have utility as policy and has been used in that capacity for developing permit effluent limits. When evaluating the implications of these procedures as a policy or a rule, the primary reason for this procedure remaining as a policy is to maintain a certain degree of flexibility to accommodate site specific conditions, while the primary reason for developing these procedures as a rule is to ensure a degree of enforceability.</i></p> <p><i>The current draft has been through several revisions, with input from all known stakeholder groups who will likely be affected by these decisions. The current process for developing permit effluent limits for agricultural uses has been used since the mid 1990s and revised periodically to address various issues as they arose. Furthermore, the potential effects on designated uses and land owners have been discussed and debated to the extent that many of the comments contained in this document are the same or similar in nature to those for which we have already provided a response. We believe that the comments and concerns which have been brought to our attention have been addressed and resulted in an updated procedure that allows a good degree of flexibility for both applicants who need an effective way to surface discharge produced water, and for land owners to use that water for beneficial uses when that water is protective of designated agricultural uses.</i></p> <p><i>On the other hand, the one component that is not addressed in a policy is the ability to enforce these procedures with the effect provided by a rule. Although it will be a more cumbersome process to proceed with changes to a rule, we believe that most issues have been addressed, whereas the needs for enforcing agricultural use protection is best addressed if approved as a rule. It should be noted that DEQ has recently received appeals for produced water discharge permits based on the fact that the proposed rule is currently a policy.</i></p>
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Historic Discharges

<p>WP, WMA, DE</p>	<p>10. Comment: WP comments that Appendix H arbitrarily protects certain historical conventional oil and gas discharges while expressly targeting coal bed natural gas operations with new, more stringent standards and does not present any rationale for selecting January 1, 1997 as the cut-off date. WMA comments that Appendix H should only apply to permits issued after 2006 because applying the provisions to earlier permits would force many operations to recreate water quality that did not previously exist or to not degrade waters that are currently superior to those in 1997. DE comments that DEQ failed to provide any scientific basis or other justification for applying different standards to discharges beginning after January 1, 1997.</p> <p>Response: <i>Increased development by the CBM industry has resulted in the need to readdress irrigation uses that until that time were considered to be protective and in accordance with Chapter I, Section 20. January 1, 1997 was chosen as the cut-off date when all permits would require more stringent standards because it was</i></p>
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the time frame when DEQ began observing an increase in the planned development of CBM production in certain areas of the state. Based on the comments received, we have since taken a closer look at this trend of development and determined that the more appropriate date to begin requiring more stringent limits should begin with those discharges that were permitted after January 1, 1998.

Wyoming began experiencing an unprecedented boom in natural gas production beginning around 1998. Prior to this time, the total number of oil and gas outfalls was approximately 470 at any one time. Today there are over 8000 and almost all of this growth is attributable to CBM discharges.

This rapid growth in coal bed methane production has raised legitimate concerns over the effects that such large development may have on agricultural production, and is the primary impetus for the development of the Agricultural Use Protection Policy. On the other hand, comments from agricultural producers, who have been utilizing discharge water over the years from discharges from the historic conventional oil and gas discharges, have been overwhelmingly in favor of retaining those discharges. In response to those comments, the policy that was proposed for adoption as a rule in February 2007 contained a provision that would have exempted those historic discharges from meeting the new agricultural protection criteria. The relevant language in the proposed rule stated: "Effluent limits on historic discharges of produced water will not be affected by this policy in relation to the protection of agricultural uses. Where discharges have been occurring for many years, the permitted quality of those discharges shall be considered to be "background" conditions and be fully protective of the agricultural uses that have developed around them. Therefore, it is not necessary to modify those discharges in order to achieve the goal of "no measurable decrease" in crop or livestock production. It would only be necessary to maintain the existing quality of the discharge."

When considering adoption of the above proposed language, the EQC concluded that the terms "historic discharge" and "occurring for many years" needed to be better defined. We have done so by modifying the original language to read:

"Effluent limits on discharges that began prior to January 1, 1998 will not be affected by this Appendix in relation to the protection of agricultural uses. Where discharges have been occurring prior to that date with no prior indication or complaint of reduced agricultural production, it will be assumed that the discharge has had no adverse effect on production. Therefore, it is not necessary to modify those discharges in order to achieve the goal of "no measurable decrease" in crop or livestock production. It would only be necessary to maintain the existing quality of the discharge. It is important to note, however, that effluent limits on historic discharges may be made where the quality of the discharge is shown to constitute a threat to any other designated uses described in Chapter 1 of the Wyoming Water Quality Rules and Regulations."

We believe that the inclusion of the 1998 cutoff date achieves the original purpose of separating those historic discharges which have been demonstrated to be useful for agricultural purposes from the more recent coal bed methane discharges which present new risks and challenges to agricultural productivity. January 1, 1998 is the year that marks the beginning of the current expansion of produced water discharges.

Some commenters argue that the proposed rule and cutoff date for grandfathering discharges unfairly singles out coal bed methane for overly restrictive regulation. We do not agree that the proposed rule is unfair. The current state of energy development is unlike anything that has occurred historically. The impact of these historically produced water discharges on agriculture (primarily ranching) is mitigated to a great extent by the fact that it includes only approximately 470 outfalls distributed across the entire state. In just the past 10 years, coalbed methane has accounted for approximately 8000 outfalls in just the greater Powder River development area. The sheer scale of the development requires new concepts in regulation. Additionally, the proposed rule is not specific to CBM but applies equally to all discharges of produced water including conventional oil & gas development and mining.

Some commenters contend that the grandfathering provisions contained in the proposed rule should apply to all current discharge permits and not be retroactive to permits issued after January 1, 1997 (now January 1, 1998). Taking this approach would render some of the important concepts in the rule as meaningless. For example, DEQ did not apply irrigation protections to naturally irrigated lands (bottom lands) until 2006. This was identified as a major defect in DEQ's regulatory approach during the development of the Agricultural Protection Policy which has since been remedied. To grandfather all of the current permits would continue to leave most of the naturally irrigated lands in the Powder River development area without appropriate protection from potential effects of elevated salinity and SAR. Therefore, we have concluded that January 1, 1998 is the appropriate point to delineate the regulation of grandfathered discharges.

RM

11. Comment: We urge DEQ to avoid complete exemptions for older discharges when land use and surface ownership change.

Response: *Permits approved prior to January 1, 1998 (see comment 10) met all conditions and requirements of Chapter 1, Section 20 which were in effect at the time. The historic quality of these discharges is assumed to be fully protective of the agricultural uses that have developed around them. We would not require more stringent permit conditions or limits for those discharges as long as they met all the conditions in paragraph 5 of Section (a) which stipulates that these permit conditions will remain the same as long as there have been no prior indications or complaint of reduced agricultural production, and there is no threat to any designated uses described in Chapter 1 of the Wyoming Water Quality Rules and*

WMA	<p><i>Regulations.</i></p> <p>12. Comment: The proposed rule excludes discharges of “produced water” that began prior to January 1, 1997. Does that only apply to produced water as stated or does it also apply to runoff water, treated waste water or excess water?</p> <p>Response: <i>The proposed rule applies to all dischargers regardless of type or source. The proposed rule has been revised to state in Section (a), paragraph 5:</i></p> <p>“Effluent limits on discharges that began prior to January 1, 1998...”</p>
WMA	<p>13. Comment: Further clarification must be provided as to what constitutes a hazard to humans, livestock or wildlife in Appendix H, Section (a), paragraph five.</p> <p>Response: <i>When determining whether to modify a permit with historic discharge limits, “hazard to humans, livestock, or wildlife” refers to all other designated uses in Chapter 1. For this reason, this section is being revised.</i></p> <p><i>The provision now states:</i></p> <p>“It is important to note, however, that effluent limits on historic discharges may be made where the quality of the discharge is shown to constitute a <u>threat to any other designated uses described in Chapter 1 of the Wyoming Water Quality Rules and Regulations.</u>”</p>
WMA	<p>14. Comment: For a complaint to be considered regarding a discharge that has occurred for at least 10 years, the complainant should be required to provide proof of reduced agriculture production before being given any credibility.</p> <p>Response: <i>Upon receiving a complaint about reduced agricultural production, we would look at all the facts surrounding the complaint before concluding it warrants alteration of the current permit conditions. This provision of the proposed rule recognizes that permit requirements may need to be revised to ensure protection of agricultural uses, but is not meant to be a trigger for automatic revocation of those historical limits.</i></p>

Naturally Irrigated Lands

RM, LC, PF, PRBRC, BB	<p>15. Comment: RM comments, we would encourage inclusion of productive draws in vital grazing/bottom lands less than 20 acres and withdraw arbitrary size limits. LC also comments that small grazing lands should not be excluded from protection as naturally irrigated lands. PF comments that DEQ’s proposed limits ignore non-irrigated forage pastures, but should be included because of the definition of “Agriculture” in Section 3, which is broader than the two examples,</p>
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“irrigation” and “stock watering”, used in the definition. PF also comments that the criterion that may be used to exclude naturally irrigated lands, the lack of a persistent channel, seems to exclude ephemeral drainages from protection and would exclude their entire upland pastures from protection. PRBRC comments that the definition of which lands require protection is overly narrow, unjustified and arbitrary, and that the qualifications required for a strict 20 acre by 50 foot wide tract do not realistically portray the dissected topography managed by ranchers of the Powder River Basin. BB makes a similar comment to PRBRC, stating that the minimum 20 acre by 50 feet wide tract does not realistically portray the arid range lands found in Wyoming. All who commented above discuss, in part, the importance of these areas of land for the production and protection of livestock, wildlife and vegetation production.

Response: *The 20 acre threshold for naturally irrigated lands was arrived at by an interpretation of color infra-red photography of a number of watersheds where the protection of naturally irrigated bottomlands was raised as an issue in the past and DEQ included such protection in the permits that were issued. Through an analysis of aerial photography, the presence of 20-acre parcels was identified as a common occurrence in all of those watersheds and should be appropriate for determining which watersheds contain an agriculturally significant amount of naturally irrigated lands in most cases.*

DEQ has added the following language to Section (c)(i)(B) to ensure all types of applicable methods for analyzing the presence of naturally irrigated lands are available:

“Naturally irrigated lands may be identified by an evaluation of infra-red aerial imagery, surficial geologic maps, wetland mapping, landowner testimony, site specific assessment, or any combination of that information or other types of evaluations.”

MCD

16. Comment: Attempts to use the classification “naturally irrigated lands” must be eliminated due to varying soil and vegetative conditions, and the ambiguity and subjectivity of defining and determining measurable decrease in crop production which will lead to a myriad of law suits. This will be exacerbated by the ability of unaffected third parties to sue on behalf of or against public land management agencies.

Response: *The protection of naturally irrigated lands (bottomlands) is one of the more controversial issues in the proposed rule. During the development of the approach, some commented that bottomlands should not be protected at all. The opposing viewpoint is that all stream channels should have the same EC and SAR limits as artificially irrigated lands. Both of these positions are at the extreme ends of the issue and neither would produce a practical or reasonable water quality regulatory procedure.*

We continue to believe that naturally irrigated lands produce a significant amount of forage for both livestock and wildlife. The enhanced vegetative productivity found may be adversely affected by increases in EC and SAR the same as artificially irrigated lands and, therefore, the DEQ needs to identify where

	<p><i>significant naturally irrigated vegetation occurs and apply appropriate water quality limits on produced water discharges.</i></p> <p><i>We believe the policy appropriately balances the two competing perspectives by providing a practical and clearly understandable procedure for identifying which bottomlands will receive protection and the flexibility to establish the appropriate effluent limits in each circumstance.</i></p>
JBH	<p>17. Comment: Appendix H should specifically define “naturally irrigated lands” and “agriculturally significant plants.” “Naturally irrigated lands” should be limited to lands which are irrigated at least once a year and that the plants grown are cropped or otherwise managed to improve yields of desirable species.</p> <p>Response: <i>We do not believe that these terms require any further definition than is commonly understood or otherwise described in the proposed rule. Naturally irrigated lands are areas of land which have the capacity for crop production or for feeding livestock. The definition also provides the factors which will be used to determine whether or not effluent limits protective of agricultural uses will be included in a permit. Agriculturally significant plants in the context of the previously proposed rule are those plants that can be utilized for crop production or for feeding livestock. For better clarification, we have made the following revision to Section (c)(i)(B), second sentence:</i></p> <p>“Naturally irrigated lands are those lands where a stream channel is underlain by unconsolidated material and on which the combination of stream flow and channel geometry provides enhanced productivity of <u>plants used for agricultural purposes.</u>”</p> <p><i>There is no benefit in determining the frequency of a naturally occurring event that produces naturally irrigated lands. It is important to determine where naturally irrigated lands occur in order to determine whether effluent limits protective of agricultural uses are needed.</i></p>
DE	<p>18. Comment: DE disagrees with the provisions that include “naturally irrigated lands” as protected agricultural uses. The restrictions contemplated for the protection of such lands necessarily involve the regulation of the quantity of water discharged, regardless of quality. In addition, such restrictions fail to account for the state’s easement in all watercourses, thereby limiting the ability of downstream landowners to utilize the water for its highest preferred use under Wyoming law: drinking water for both man and beast. <i>See, WYO STAT. § 41-3-102(b)(i).</i></p> <p>Response: <i>The treatment of “naturally irrigated lands” in the proposed rule does not address the quantity of allowable discharge. It is only used to identify the type of lands which will be treated as irrigated and subject to appropriate EC and SAR limits.</i></p>

Containment of Discharges

<p>RM, PRBRC, BB, PF, LC</p>	<p>19. Comment: RM comments, it is imperative that CBM effluent be contained year round. PRBRC and BB comment similarly that allowing discharges to continue during times of freezing temperatures only postpones impacts until thaw. PF comments that damages occur due to allowing discharges during icing weather, which leaves salts behind and causes soil damage in many cases. LC also comments that CBM effluents should be contained year-round until guaranteed that the discharge will do no harm.</p> <p>Response: <i>In canal and lateral irrigation systems where the water is actively controlled through headgates, the irrigation season is easy to delineate. In passive systems like spreader dikes where water is applied to the land whenever there are sufficient flows and there is no control over when those flows might occur, the irrigation season is assumed to be year-round. Sections (c)(ii) and (c)(iii) stipulate that where discharges will reach either artificially or naturally irrigated lands, then appropriate EC and SAR limits will be applied. If a threat to agricultural uses is determined because of off-season discharges, the WQD will place appropriate EC and SAR limits in the permit to deter any threats to agricultural uses. In some instances, in-stream monitoring points (IMPs) will be used to monitor the potential for negative effects to irrigation uses. If it is determined that irrigation uses are threatened during a permit term after review of IMP data, DEQ has the ability to reopen a permit and address the threat with more stringent limits and/or additional permit conditions.</i></p>
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Livestock Watering

<p>PAW</p>	<p>20. Comment: Results of a literature review completed by a consultant of PAW suggests that the current limit for arsenic should be revised for drinking water in livestock from 20 ug/L total recoverable to 200 ug/L dissolved based on the results of their findings.</p> <p>Response: <i>Livestock watering limits have been revised based on information from the University of Wyoming report and additional information submitted during the September 14, 2007 Advisory Board meeting. Arsenic has been removed from the list of constituents of concern for livestock and wildlife watering. Please see the Statement of Principle Reasons which is being released for public comment with these responses for additional information.</i></p>
<p>MCD</p>	<p>21. Comment: Having this hearing prior to the conclusion of the Raisebeck review of effects of sulfates on livestock is premature. The ability of Wyoming residents to actively participate has been limited, and this process does not satisfy the requirements of Wyoming Statute 35-11-302.</p> <p>Response: <i>Potential revisions to livestock watering limits were not evaluated by</i></p>

WMA	<p><i>DEQ prior to the release of the University of Wyoming report by Dr. Merl Raisbeck and other university staff and students. The report has since been released to the public for review and was discussed at the Advisory Board meeting on September 14, 2007. The public will have an opportunity to comment and make suggestions about DEQ's proposed limits during a scheduled meeting with the Advisory Board on December 7, 2007. Additional opportunity will be given for public comment during at least one additional EQC hearing.</i></p> <p>22. Comment: Discharges from mines with limits for TDS, sulfate, and chlorides should be exempt during significant precipitation events (10 year – 24 hour) since mines are required to discharge water from required sediment control reservoirs in order to maintain the reservoir storage volume and make up a small portion of the total runoff volume following a precipitation event.</p> <p>Response: <i>Because sedimentation ponds at mines discharge infrequently and because TDS, sulfates, and chlorides have not been determined to be significant parameters in mine sediment ponds, permits for such discharges do not contain limits for these parameters.</i></p>
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Tier 1 – EC and SAR Limits

LC, RM, PRBRC	<p>23. Comment: The maximum default SAR limit should be set at 6 and that EC should not exceed 1300. LC comments that this is essential for existing and future irrigation projects, while RM comments that the agency will ultimately be liable for decisions made to the contrary. PRBRC comments that default limits should not exceed an SAR of 5 and an EC of 1330 based on a study by Donald L. Suarez, James D. Wood, and Scott Lesch with the USDA Salinity Lab that speaks about a decrease of water infiltration in clay soils with SARs of 2 to 5.</p> <p>Response: <i>The proposed default SAR cap of 10 was established based upon a very thorough review of the issue during the development of the Agricultural Use Protection Policy. We believe that the cap of 10 is adequately protective and also supported by the scientific literature. The commenters provided no additional information that has not been previously considered.</i></p>
PRBRC, BB	<p>24. Comment: The DEQ proposal states in Section (c)(vi)(A)(II) that effluent limits “may” be set below Tier 1 default levels if background water quality is significantly better. We would propose the word “shall” rather than “may” in order to ensure background water quality is met and agricultural uses are protected.</p> <p>Response: <i>If background water quality is better than indicated by a Tier 1 default limit, then the Tier 1 limit may be applied to protect agricultural uses when other designated uses such as drinking water do not dictate a more stringent limit. In all</i></p>

<p>RMER</p>	<p>cases, Tier 1 default limits are considered protective of agricultural uses but must take into account background water quality where that information is available. Therefore, when a situation like this occurs, DEQ needs a level of flexibility to make a site-specific permit action decision that is captured by the word “may” instead of “shall.”</p> <p>Furthermore, Using the word “shall” might lead to an interpretation that the rule intends to set limits equal to background quality. We do not intend to implement a separate antidegradation concept in relation to agricultural uses. The limits on degradation of high quality waters will be made after consideration of all of the affected water uses and according to the provisions of the Antidegradation policy.</p> <p>25. Comment: The consequences to operators and landowners who desire the use of CBM and/or other sources of produced water far outweigh any as yet unproven benefits by the proposed rule. Producers given “default limits” in the permit for EC and SAR that CBM produced water typically cannot meet, unless the producer is willing and can convince the landowner that all reservoirs they discharge into would contain <u>all of the produced water and all of the 50 year / 24 hour flood event</u>. Or the producer can conduct extensive downstream soil and vegetation, and water quality “Section 20” work to essentially prove to WYDEQ that the limits they set in the default are too conservative. A statewide rule with general applications will not fit the majority of landowners, and will deny adjudicated water rights to those who depend upon produced water for their operations.</p> <p>Response: <i>Adjudicated water rights are protected by the State Engineer’s Office requirements placed on reservoirs (i.e. bypasses), so that surface water that has been adjudicated is not impounded and prevented from reaching the downstream water right holder. The DEQ is responsible for ensuring that the quality of produced water discharged to the surface does not impact any downstream uses, such as irrigation. 50 year containment is only one option provided (permit is exempt from irrigation protection limits if contained to a 50 year-event), and was never intended to be used in all cases where operators could not or did not want to meet irrigation effluent limits. Operators who do not contain a 50 year event have the option of meeting Tier 1 default limits (through treatment if necessary), establishing site specific limits (Tier 2), conducting a Tier 3 no harm analysis study or potentially obtain a waiver. The operator also has the option of reinjection, subsurface drip irrigation, off channel containment, or piping the effluent below the irrigation area. With these options, this proposed rule provides flexibility for the operators to work with the landowners on a case-by-case basis.</i></p>
<p>PE</p>	<p>26. Comment: Default limits should be EC 2700 µS/cm and SAR 16 as derived from expert opinion of Mr. Kevin Harvey, which he explained in two letters and the board subsequently approved.</p> <p>Response: <i>Because of differing opinions and interpretations of the scientific</i></p>

literature among agricultural experts, we are not convinced that it is appropriate to set a statewide default limit above 10.

For example, some soil scientists argue that 15 is only an acceptable exchangeable sodium percentage (ESP) for soils that are irrigated with saline waters and for lands irrigated with high quality water, an ESP of 5-7 is more realistic. It is also somewhat doubtful that arid land soils always release sufficient Ca and Mg upon wetting to counteract the negative influence of exchangeable sodium, particularly if the applied water has an elevated pH (such as that commonly found in CBM effluents, downstream of the discharge points). DEQ's observation has been that in elevated pH conditions, calcium and magnesium may be precipitated from, rather than dissolved into, discharged effluent. This is confirmed by the current industry practice of reducing pH through addition of sulfur, and supplementing calcium through addition of gypsum to lands currently irrigated with CBM water on a managed basis. If there were enough soluble native calcium available in the soils upon wetting with the discharge water, to mitigate impacts from sodium, this practice would not be necessary

Because the concept of a default limit is the amount that will be considered safe in all circumstances without the need for site-specific studies, and there is certainly a debate among experts on how to interpret the science, we believe it is necessary to err on the conservative side by maintaining a default SAR cap of 10. We understand that this approach severely limits the usefulness of the Tier 1 procedure for CBM discharges in the Powder River and Tongue River drainages, but it does not eliminate the potential to discharge or the ability to put the produced water to beneficial use.

RMER

27. Comment: The DEQ has not met the burden of proof by providing credible peer reviewed scientific evidence for the default limits proposed, followed by public review. The DEQ has chosen instead to base the Agricultural Use Protection Policy on what has been termed “erring on the side of conservatism”. The DEQ should be held to the highest standard of proof and accountability.

Response: *These issues have been discussed and debated widely over the last several years. We have received input from several experts in the field of soils science and will continue to develop permit effluent limits based on scientifically sound, peer reviewed scientific literature or site specific analysis. It is correct that Tier 1 default limits are necessarily conservative because they are intended to be protective in all circumstances.*

The DEQ has a responsibility to be conservative in circumstances where there is little factual data upon which to make a decision. It is the applicant that bears a “burden of proof” to demonstrate that his proposed discharge will comply with all applicable standards. The proposed rule describes the acceptable methods for making that demonstration.

PF	<p>28. Comment: End-of-pipe limits will not protect crops down the draws or at the end of drainages, because water picks up harmful constituents as it flows over the land so that it reaches the crops much higher than the standard at the end of pipe.</p> <p>Response: <i>Effluent limits are established at the end-of-pipe because that is the point where they can be controlled and enforced. However, in addition to establishing end-of-pipe limits, WYPDES permits establish in-stream monitoring requirements. When a facility is located upstream of irrigation, permit requirements include monitoring at a location downstream of the outfalls but upstream of the irrigation activity (i.e. irrigation monitoring point, IMP). Based on the results of the IMP monitoring, the DEQ may re-open the permit and modify effluent limits or permit requirements such that the downstream use is protected.</i></p>
PE	<p>29. Comment: Effluent limits for Tiers I, II, III should be imposed at relevant Irrigation Compliance Points (ICPs) as the WQD has done previously in many permits, because they are only important at the nearest upstream location where irrigation occurs. Proposed end-of-pipe limits rather than ICPs, is not consistent with WQD’s duty under the Environmental Quality Act, Wyo. Stat. § 35-11-302 (a)(vi).</p> <p>Response: <i>ICPs have been used in the past as part of the agency's permitting strategy. Though we would not completely rule out their potential use, their applicability is extremely limited because of difficulties with enforcement. We have concluded it is better to monitor the downstream effects of a discharge and adjust the end-of-pipe limits if down stream monitoring indicates such adjustments are necessary.</i></p>
PE	<p>30. Comment: Produced water discharged into on-channel reservoirs – as distinct from outflows that reach irrigation diversions – can have no adverse impact on the “health or well being of people, animals, wildlife, aquatic life and plant life” as stated in Wyo. Stat. § 35-11-302 (a)(vi). With this balancing test, it makes little sense to require CBM produced water discharges that flow into impoundments to meet Tier I, II, or III standards for EC and SAR that would be protective of down stream irrigated crops and soils.</p> <p>Response: <i>Operators have claimed that if an overtopping reservoir (one that can only discharge due to a storm event of any size) releases water during a storm event, that there will be sufficient dilution in order to achieve water quality that is protective of downstream uses. ICPs have been monitored in the past near the point of irrigation use or diversion and are required to be monitored when flow from a CBM discharge reaches that point. The data that has been collected shows that the established irrigation criteria (EC and SAR) are exceeded 50 – 80 percent of the time. Therefore, we have concluded that it is only appropriate to exempt a permit from irrigation limits based on reservoir containment when the reservoir is designed and operated to contain all CBM discharge in addition to the runoff</i></p>

PAW	<p><i>generated from a 50-year, 24 hour precipitation event. This condition ensures that the contained CBM discharge is effectively isolated from any irrigation use except during extreme runoff events.</i></p> <p>31. Comment: Under Irrigation, Section (c)(ii and iii), the statement that effluent limits for EC and SAR will be applied in all instances where the produced water discharges may reach any artificially irrigated lands should be changed to state where discharges may compose a significant portion of the irrigation supply for naturally or artificially irrigated lands. To do otherwise would place unnecessary limits on dischargers when the discharged water would only reach irrigated areas in combination with runoff water or natural stream flow.</p> <p>Response: <i>In the event that a reliable source of dilution water is available within the receiving stream (as in the case of perennial streams being used for irrigation), effluent limits for EC and SAR can be adjusted to account for the available dilution. If the effluent could constitute the entire source of irrigation water, it must be of a quality that is protective of the irrigation use.</i></p>
PAW	<p>32. Comment: The rules should be revised to allow a period when discharges can occur without having to meet irrigation standards. During the winter months, discharges should be allowed since the ground is generally frozen. There should also be allowances in the rules for short periods when treatment systems are inadvertently not operating.</p> <p>Response: <i>Soils are still vulnerable to salt and sodium impacts in the non-irrigation season. Furthermore, there is still the potential for carrying these loads to irrigated lands during periods of thawing.</i></p> <p><i>Impacts to water bodies are not determined based on the ability of a treatment system to function properly. These proposed rules have been developed to ensure the protection of all designated uses. If a treatment system is not able to function properly then it becomes a matter of enforcement discretion regarding the nature and severity of the infraction(s) of the permit.</i></p>
PAW	<p>33. Comment: Section (c)(vi)(A), default limits are based on published soil EC tolerance values for the most sensitive crop. This is overly conservative, and should be instead based on the weighted average of the actual crops present.</p> <p>Response: <i>Allowing some measurable decrease in production of the most sensitive crop species does not comply with Chapter 1, Section 20 requirements. The purpose of establishing effluent limits for irrigated crops is to ensure that there is no measurable decrease in crop production.</i></p>
PAW	<p>34. Comment: Section (c)(vi)(A)(I), the tier 1 standards are based on 100% crop yield. This is unrealistic and overly conservative. Crop yield should be based on actual historic yield.</p>

PAW	<p>Response: <i>The Tier 1 procedure is intended to provide conservative effluent limits that will be protective in all circumstances across the state. For this reason we believe that basing Tier 1 limits on a 100% theoretical yield is appropriate. The Tier 2 procedure is intended to allow those limits to be adjusted to maintain the actual background water quality and associated attainable level of yield in a more site-specific fashion.</i></p> <p>35. Comment: Section (c)(vi)(A)(II), “However, in circumstances where the background water quality of the receiving water(s) is known to be significantly better than would otherwise be required based on a theoretical 100% yield, effluent limits may be set to maintain that higher quality,” should be struck. This is unnecessarily conservative and overly burdensome on industry.</p> <p>Response: <i>Where background water is of exceptionally high quality, it can support uses other than irrigation. It is DEQ’s obligation to preserve that higher quality and ensure the support of all designated uses, not just irrigation uses.</i></p>
JBH	<p>36. Comment: The scientific evidence demonstrates that default effluent limits for irrigation should be based on more state-specific data (such as the Bridger Plant Material Center study) and not generalized studies that do not take into account Wyoming soil characteristics.</p> <p>Response: <i>The primary function of the Bridger Plant Materials Center is to assist in the release of forage and ground cover varieties for land management purposes. Despite some early confusion on the matter, the facility has not conducted research on full root zone salinity impacts to crops. As it turns out, very little work at the Bridger facility is related directly to salinity at all, and their staff recommends against citing their work for any type of regulatory purpose.</i></p> <p><i>According to their staff, the few salt tolerance trials that were done at the Bridger facility were cursory in nature, and only investigated, by design, salinity within the top 6 inches of soil. These screenings were only for their own plant variety development purposes, and were not intended to have broad applicability in assessing potential impacts to crop production in general. The top 6 inch layer of soil is not representative, on its own, of the full 48-60 inch root zone affecting crop production. It is important to note that none of the commenters have disputed the need for evaluating the full 48-60 inch root zone (contemplated in the proposed rule) when characterizing crop salt tolerance. The salt tolerance research conducted at the U.S. Salinity Lab is more comprehensive and conclusive for purposes relating to DEQ’s efforts in this case.</i></p>

Tier 2 – Background Water Quality

PF	<p>37. Comment: Will soil samples taken to estimate water quality in ephemeral and intermittent streams, where no prior data exists, be liberal in order to benefit industry or conservative in order to preserve surface land?</p> <p>Response: <i>The purpose of the soil sampling for a Tier 2 study is to accurately characterize background irrigation water quality on a site-specific basis.</i></p>
PRBRC	<p>38. Comment: Tier 2 studies conducted by industry and accepted by DEQ have approved an SAR up to 26 and an EC over 6000 as protective of soil and vegetation. The focus of this policy should be to avoid impacts upon native vegetation and cultivated crops and the underlying soil medium. We request that Tier 2 be eliminated from any proposed Agricultural Protection Policy.</p> <p>Response: <i>The Tier 2 study that the PRBRC refers to was conducted on irrigated fields in Middle Prong, Wild Horse Creek. Based on our review of the study, the protocol established in the policy was followed, and therefore, in the absence of any other information, we would consider the data to be appropriate and representative of historical irrigation water quality in this drainage. However, in circumstances where the actual discharge is significantly better than background soil salinity would otherwise require, effluent limits are established near the level of the actual produced water quality.</i></p>

Tier 3 – No Harm Analysis

RM	<p>39. Comment: We oppose the Tier 3 No Harm Analysis. DEQ is the agency that will be ultimately liable for decisions made to the contrary.</p> <p>Response: <i>We believe that the Tier 3 approach for determining effluent limits is an appropriate. Tier 3 allows for cooperation between the CBM producer and affected landowner by allowing the implementation of innovative water management techniques to achieve common goals.</i></p>
PF	<p>40. Comment: Section (c)(vi)(C), which could allow exceedance of default standards based on analyses, contains the following “weasel” words: “...demonstrate through a comprehensive study that levels of EC and/or SAR, higher than either the default values or estimated background water quality, would MOST LIKELY not MEASURABLY harm an existing irrigation use...” These sections should be tightened to minimize wiggle room.</p> <p>Response: <i>These words were changed due to a comment that was received during a previous comment period. We believe the current language will provide the needed assurance that any studies resulting in higher effluent limits will be protective of agriculture uses.</i></p>

Irrigation Waivers

PF	<p>41. Comment: Section (c)(vii), which could allow exceedance of default standards based on analyses, contains the following “weasel” words: “Irrigation waivers will only be granted in association with an irrigation management plan that provides REASONABLE ASSURANCE that the lower quality water will be confined to the targeted lands.” These sections should be tightened to minimize wiggle room.</p> <p>Response: <i>A reasonable assurance, if demonstrated and approved, should ensure that agricultural uses down stream are being protected. If this criterion is not met then additional conditions would need to be met or a waiver would not be granted.</i></p>
BB	<p>42. Comment: Allowing discharges to be put to beneficial use is commendable and desirable. However, if an adjoining neighbor chooses to irrigate or otherwise use effluent flows, I would like full assurance that these waters do no damage to my land and existing uses. DEQ must plan, manage or review and approve any irrigation use to assure responsible protections of downstream property use rights.</p> <p>Response: <i>Irrigation waivers will only be approved after all affected land owners approve of the conditions by which the produced water will be discharged. Anyone affected down stream of a proposed discharge will have the opportunity, if a waiver is proposed by the applicant, to determine the conditions whereby produced water is acceptable for personal use above prescribed permit limits. However, when water quality is able to meet permit requirements, it should be noted that the courts have determined that if an effluent is contained within a defined channel, the discharge may cross private lands even if the landowner objects.</i></p>

Reasonable Access Requirement

WP	<p>43. Comment: In order to prove that no measurable decrease in agricultural production will occur, the applicant must have access to collect data to meet that burden. Williams believes that some minimal but important revisions are required to ensure that a permit is based upon the best information that can reasonably be obtained by the applicant.</p> <p>Response: <i>We acknowledge that there will be circumstances where a permit applicant cannot obtain the legal access to collect specific data. Those circumstances will have to be handled on a case-by-case basis. In order to provide additional guidance as to what may occur in these circumstances, Appendix H (C)(vii) has been revised to indicate what kind of measures may be taken.</i></p>
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<p>WP, JBH</p>	<p><i>The provision now states:</i></p> <p>“(vii) Reasonable Access Requirement. In circumstances where a landowner chooses to deny access for the purpose of developing a Section 20 analysis, EC and SAR limits will be based upon the best information that can be reasonably obtained <u>for developing permit limits. This circumstance may involve utilizing alternate sampling locations where conditions are expected to be similar in nature to the inaccessible area.</u>”</p> <p>44. Comment: Identification of naturally irrigated lands should not be made solely on the basis of landowner testimony in the absence of granting an applicant reasonable access to determine the extent of the claimed naturally irrigated lands. Yates has concerns that Appendix H provides little or no protection for regulated entities to conduct Tier 2 or Tier 3 analysis where denied landowner access, and comments that a landowner should not be able to assert that “naturally irrigated lands” exist without additional documentation that can be obtained by the applicant seeking access.</p> <p>Response: <i>The identification of “naturally irrigated lands” is not intended to be based solely on landowner testimony. Section (c)(i)(B) indicates that naturally irrigated lands can be identified in a number of ways including an evaluation of infra-red imagery, surficial geologic maps, wetland mapping, landowner testimony or any combination of that information. Landowner assertions of the existence of naturally irrigated bottomlands can usually be easily verified by an evaluation of the other sources of information.</i></p> <p><i>The basic property rights of a landowner to grant or deny trespass cannot be undone by these regulations. The circumstances where it is necessary to conduct a tier 2 analysis but access is denied by the landowner are addressed in section (c)(viii) of the proposed rule. When access is denied to any specific piece of property, EC and SAR limits can be based upon the best information that can be reasonably obtained. It is our experience that since it is usually in the best interest of both the landowner and discharger to obtain the best information regarding irrigation water quality requirements, the denial of access to collect that information occurs rarely.</i></p> <p><i>The concept of tier 3 is that water of a lower quality than background can sometimes be successfully used to irrigate without adverse effects by implementing various water and irrigation management techniques. This concept implies cooperation between the affected parties because there is no management technique that can be forced upon a landowner without his consent.</i></p>
<p>PRBRC, BB, PF</p>	<p>45. Comment: PRBRC and BB write similar comments: Landowners should not be threatened with the specter of your regulatory agency placing inadequate and non-protective default limits when the landowner chooses to deny access. PF</p>

states, the provision in the reasonable access requirement which states “EC and SAR limits will be based on the best information that can be reasonably obtained and **MAY BE LESS STRINGENT THAN TIER 1 DEFAULT LIMITS**,” leads a reasonable person to question whether DEQ is truly in the business of providing agricultural protections. A landowner must be allowed to select the consultant for the purpose of conducting soil surveys or related data collection during completion of a Section 20, Tier 2 or Tier 3 analysis. The analytical lab that is used should be selected with input from the landowner.

Response: *When access is denied to develop a Section 20 analysis, DEQ will attempt to set the most appropriate limits based on the information available. These will not necessarily be the default limits provided in a Tier 1 analysis. Property rights are not affected by this policy. A property owner maintains the ability to allow or deny access on his terms; however, he can not reasonably expect that his agricultural uses will be protected to his desired level if he denies the ability to actually assess those uses.*

There are circumstances where analysis by a third party can be useful to reach resolution on particularly contentious issues and the policy does not preclude that approach. However, we do not believe that obtaining third party involvement is always possible or advantageous and would not make it a standard requirement.

DHW/bb/7-0953

Response Summary for September 14, 2007

WWAB Meeting

Section 9

ANALYSIS OF COMMENTS

Subject: Comments received and Wyoming DEQ/WQD responses relative to the 2nd Draft of the Agricultural Use Protection document from comments received at the Water and Waste Advisory Board (Board) meeting on September 14, 2007 in Jackson, Wyoming.

In connection with proposed revisions to the Chapter 1 Water Quality Rules and Regulations, the DEQ/WQD is proposing to incorporate the revised Agricultural Use Protection document as a rule. The purpose of this document is to interpret the narrative standard for the protection of Agricultural uses of surface water contained in Chapter 1, Section 20.

On February 16, 2007, the EQC approved proposed revisions to Chapter 1 except for Appendix H, Agricultural Use Protection, which was removed from the rule and remanded back to DEQ for further directed revisions. In May of 2007, proposed revisions to Appendix H were posted on the DEQ website and public notice was published in the Casper Star Tribune. Comments were received at a Board meeting on June 15, 2007 in Casper, Wyoming. On September 14, 2007, the Board held a second meeting in Jackson, Wyoming which included video conference sites at eight other Wyoming municipalities. At the Jackson meeting, testimony was heard and comments were received on the previously published University of Wyoming (UW) report entitled "Water Quality for Wyoming Livestock and Wildlife" which discussed recommended safe drinking water levels for Wyoming livestock and wildlife. On December 7, 2007 the Board will receive comments on the response summaries from the previous two Board meetings and receive proposed rule revisions to Chapter 1, Appendix H, Agricultural Use.

This document summarizes the comments received and includes the Water Quality Division's responses. The tables that follow are a compilation of these comments and DEQ/WQD responses. In the tables, the comments have been organized according to topics and paraphrased to create a manageable summary. Comments received are formatted in normal typeface and the agency responses are in italics. A list of commentors is also included to help track the comments.

List of Commentors

1	Davis & Cannon	DC
2	Devon Energy Production Company, L.P.	DE
3	Flitner Ranch and Hideout Adventures	FRHA
4	Hot Springs Conservation District	HSCD
5	Hot Springs County Commissioners	HSCC
6	Larsen Ranch Company	LRC
7	Marathon Oil Company	MOC
8	Meeteetse Conservation District	MCD
9	Petroleum Association of Wyoming	PAW
10	US Fish and Wildlife Service	FWS

General

FWS	<p>1. Comment: The report should include a section on basic toxicology: biomagnification, bioaccumulation, various types of toxicology (acute, chronic, and sublethal), terminology (ppm, ppb, LD50), species variation to toxicity, and other general toxicological concepts. Also recommend including information on applicable regulations such as the Clean Water Act, to clarify when discharge permits are required in Wyoming.</p> <p>Response: <i>The University of Wyoming report has been completed and is not open to being revised. This project did meet DEQ's expectations to conduct a critical review of the scientific literature relating to water quality for Wyoming livestock and wildlife. If the University of Wyoming is contracted to expand on the findings of the current report, these suggestions will be forwarded.</i></p>
FWS	<p>2. Comment: An executive summary stating the purpose of the report would be useful, and should state clearly that the information pertains primarily to horses, beef cattle, sheep, deer, elk, and antelope. The last paragraph on page 5 could be used in the executive summary.</p> <p>Response: <i>The University of Wyoming report has been completed and is not open to being revised. This project did meet DEQ's expectations to conduct a critical review of the scientific literature relating to water quality for Wyoming livestock and wildlife. If the University of Wyoming is contracted to expand on the findings of the current report, these suggestions will be forwarded.</i></p>
FWS	<p>3. Comment: The title of the report may lead a reader to believe the information on water quality applies to all wildlife including migratory birds when in fact; the report is limited to big game wildlife. The title of the report should be modified to avoid misinterpretation.</p> <p>Response: <i>The University of Wyoming report has been completed and is not open to being revised. This project did meet DEQ's expectations to conduct a critical review of the scientific literature relating to water quality for Wyoming livestock and wildlife. If the University of Wyoming is contracted to expand on the findings of the current report, these suggestions will be forwarded. However, this information has been added to the Statement of Principal Reasons for additional clarity.</i></p>
HSCD, LRC, MCD, HSCC	<p>4. Comment: HSCD recommends that the Wyoming Water and Waste Advisory Board (WWAB) commission additional scientific studies, review of studies and literature and field investigations prior to formulating recommendations on water quality standards for livestock and wildlife. LRC states, as a rancher, LRC believes the University of Wyoming report has been beneficial as a starting point for developing water quality standards for livestock and wildlife; however, believes there are still many variables that</p>

MCD	<p>have not been addressed, including: the availability and quality of existing forage, the amount of time that livestock actually drink the produced water, whether the livestock are able to utilize other “cleaner” water sources or if this is the sole source of water, and whether or not the water is diluted by the addition of non-produced water. The bottom line is although “perfect” water is preferred; the reality is that slightly less than perfect water is better than no water at all. HSCC suggests the University of Wyoming report represents about 30% of the information needed to make a recommendation on water quality standards. MCD states, thorough review by the veterinary community (veterinarians familiar with range livestock and livestock consuming produced water) of the report and the proposed limits is needed before instituting the proposed standards. LRC and MCD believe that further study using real world conditions are called for.</p> <p><i>Response: We have concluded that the underlying scientific research and analysis in the University of Wyoming report forms a strong scientific foundation to develop effluent limits for the parameters that were researched and analyzed. That is not to say that it was the only determining factor for developing the proposed limits. We have also incorporated anecdotal information from public comments to assist in making our decisions. For example, we concluded that the current limit for fluoride is appropriate due to the nature of the risk primarily being dental fluorosis at the concentrations seen in produced water discharges, but also take into consideration the fact that there have been no strong indications of dental fluorosis affecting livestock or wildlife production in Wyoming. Sulfate limits have been reduced from 3,000 mg/L to 2,000 mg/L based on the significant health risks to livestock and wildlife, but were not reduced to the level recommended in the University of Wyoming report based in part on anecdotal data from the ranching community.</i></p>
	<p>5. Comment: Effects on land owners, and the local community may be immense if the recommended changes are made, especially on those discharges that have been occurring for years and even decades. The WWAB must adhere to requirements of Wyoming Statute 35-11-302 requiring the state to consider and evaluate social and economic impacts of proposed rules or regulations. HSC is concerned that the proposed water quality standards will have a greater effect on conventional oil/gas and mining operations than coal bed methane operations primarily in the Powder River Basin.</p> <p><i>Response: The vast majority of existing conventional oil and gas producers will be able to meet the prescribed effluent limits in the proposed rule through the provision that grandfathers those permit conditions if approved prior to January 1, 1998 or by meeting the proposed effluent limits.</i></p> <p><i>Our review of the records indicate that statewide, only 39 oil treater permits, issued post January 1, 1998, will be required to meet the newly proposed</i></p>

DE	<p><i>permit limits for the most restrictive parameters, sulfate at 2,000 mg/L (formerly 3,000 mg/L) and sodium at 1,000 mg/L (formerly not a permit limit). Of the 39 post January 1, 1998 issued permits, DEQ has sulfates data on 10, and sodium data on 11. They are all able to meet the new proposed effluent limits.</i></p> <p><i>DEQ reviewed discharge monitoring report data for the 1,228 active coal bed methane (CBM) permits which are unable to meet the grandfathering provision. This data indicates that 4 permits were unable to meet the proposed sulfate limit for at least one sample, and 25 permits were unable to meet the proposed sodium limit in at least one sample.</i></p> <p><i>Because sediment ponds at mines discharge infrequently and because TDS, sulfates, and chlorides have not been determined to be significant parameters in mine sediment ponds, permits for such discharges do not contain limits for these parameters.</i></p> <p><i>Furthermore, we have added a new section to Appendix H, (b)(ii) which allows permit limits to be set to ambient background conditions, similar to what is allowed to develop EC and SAR limits for irrigation uses.</i></p> <p>6. Comment: The Environmental Quality Council (EQC) directed DEQ to remove the livestock and wildlife watering issues from the policy, and start from scratch, writing a rule limited to the protection of irrigation and obtaining the Advisory Board’s input, then to bring back a tight, focused regulation that is supported by good science. DEQ has not complied with the EQC’s order; instead they made only minor modifications, and failed to clarify any provisions. DEQ failed to remove the water quality standards for livestock and wildlife and has not provided additional scientific evidence to support the Agricultural Use policy/rule.</p> <p><i>Response: Some parts of this statement are correct and some are not. The EQC did direct DEQ to remove livestock and wildlife limits, but only until completion of the University of Wyoming report. The statement misinterprets the discussion about starting from scratch, to write a rule limited to protection of irrigation, and to remove water quality standards for livestock and wildlife; however, we agree that additional clarification is needed.</i></p> <p><i>The EQC remanded Appendix H back to DEQ to address, at minimum, four areas of the policy before bringing it back before the EQC for a rulemaking hearing. Those four areas included: 1) putting the policy into rule form; 2) dealing with protection of irrigation uses; 3) setting default standards with regard to SAR and EC; and 4) developing livestock and wildlife watering limits following completion of the University of Wyoming Report. It was later voted on and passed 4 to 3, to set irrigation limits in the policy / proposed rule at a default of 10 SAR and to include the USDA Agricultural Research Service</i></p>
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<p>DE, PAW</p>	<p><i>(ARS) Salt Tolerance Database as the primary source for determining Tier I default limits, with the expectation that the revised Appendix H would be brought back to the Advisory Board for full consideration by the public and Advisory Board. The EQC also directed DEQ to give a progress report after the next scheduled Advisory Board meeting.</i></p> <p><i>The initial draft that was released after the EQC hearing occurred before completion of the University of Wyoming report and primarily focused on revising the policy to reflect rule form, to address the definition of historic discharges, and to revise the EC and SAR limits to reflect the directives of the EQC. We believe that the current draft is supported by an underlying foundation of science but that the reasoning behind our decisions should be better clarified. For that reason, the Statement of Principal Reasons has been revised to better clarify our decisions.</i></p> <p>7. Comment: To evaluate the current livestock water quality standards or consider changes to those standards, DEQ must complete a comprehensive risk management decision making process which should have five steps: 1) identify the potential problem, 2) collect data, 3) assess risk, 4) evaluate alternatives, and 5) select the alternative. While the Raisbeck Report is a start in data collection, it is not sufficient for the adoption of new water quality standards.</p> <p>Response: <i>The components of a comprehensive risk management decision process are compatible with the process for developing rules such as the one currently proposed. However, we have concluded that these components have been addressed through a long history of developing permits for produced water as well as the process which has taken place for developing this proposed rule.</i></p> <p><i>The problem with the previous oil and gas permit limits became apparent with the increasing number of outfalls that resulted from coal bed methane production. Wyoming began experiencing an unprecedented boom in natural gas production beginning around 1997. Prior to this time, the total number of oil and gas outfalls was approximately 470 at any one time. Today there are over 8000, and almost all of this growth is attributable to CBM discharges. Many of the historic 470 outfalls pre-dated the existence of DEQ.</i></p> <p><i>The University of Wyoming report was contracted by the DEQ to better evaluate whether the current limits are appropriate for protecting livestock watering uses. DEQ incorporated public input, including anecdotal information, into the decision making process. We also looked at the effects to beneficial users and industry by analyzing how often previous dischargers were able to meet the newly proposed effluent limits.</i></p> <p><i>Prior to the start of major CBM production, protection of irrigation was not an issue of concern. However, with the need for irrigation protection, the process</i></p>
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FRHA	<p><i>used for developing this proposed rule resulted in adding some significant new provisions based on public comments and input from experts in soils and irrigation. Some of those provisions include setting permit limits based on background conditions, conducting comprehensive no harm analysis studies, and providing an optional waiver for those discharges which are unable to meet any limits under the tiered approach by obtaining permission from down stream users who are willing to accept the risk of receiving lesser quality water.</i></p> <p>8. Comment: FRHA provides a table of livestock weaning rates for the Flitner ranches and comments that their production data shows that weaning weights for their calves drinking from a stream with produced water outperform other pastures with only natural water sources. As the result of personal experience, they suggest the following: 1) any policy formulated should not interfere with landowners or permittees on Federal and State leases who desire to use produced water to improve their property or sustain a livestock operation; 2) the policy should allow landowners to use and receive water even if it does not meet DEQ’s “standards;” 3) the landowners/ranchers are in the best position to evaluate the impact on their livestock even if the water does not meet DEQ standards and is in a better position to evaluate whether that exceeds the “standard” is beneficial to his land and livestock; 4) historic water use could easily be disrupted by imposing unrealistically rigorous water quality standards, which would be devastating to livestock, wild horse and wildlife populations; and 5) water quality standards should be based on Wyoming open range conditions, not on feedlot studies.</p> <p><i>Response: Information such as that provided by the Flitner Ranch has been very helpful with adding real world perspective to the currently proposed rule. We have incorporated this type of information into the decision making process which has resulted in deviating from some of the recommend limits offered by the University of Wyoming report as discussed in the response to comment number 4. These proposed limits and permit conditions are applicable to protecting agricultural uses for all land owners (public or private) within Wyoming. The provision which allows for a waiver from effluent limits for both livestock watering and irrigation uses was proposed during early drafts of this document and allows water to be discharged above the DEQ determined limits when all landowners down stream are willing to accept the risk of receiving the lower quality water. During the development of this document, we have sought to set limits at the highest possible level that are protective of agricultural uses based on the scientific literature discussed in the University of Wyoming report, public input such as provided with this comment, input from various experts in this field of science and our experience developing and approving permits for produced water. We have also looked at how these proposed limits will affect the approval of permits as discussed in the previous comment. We too, want to see this valuable resource used at every opportunity for beneficial use but not at the expense of the agricultural</i></p>
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MOC	<p><i>uses which they protect.</i></p> <p><i>To better define who the livestock watering waiver is applicable to, DEQ has revised Section (b)(iii) to change the term livestock producer to the landowner. The provision now states:</i></p> <p><i>“An exception to the limits above may be made whenever the background water quality of the receiving water is of poorer quality than the value listed for the associated pollutant and the <u>landowner</u> requests...”</i></p> <p>9. Comment: MOC submitted two letters from the U.S. Bureau of Land Management (BLM) that were addressed to MOC. In the letter, BLM explains the benefits of produced water discharges to thousands of acres of lands, and concludes with, “they would view any effort to stop the surface discharges as a negative environmental impact, since the produced water directly benefits a variety of BLM resources and uses.”</p> <p><i>Response: We agree that produced water from oil and gas operations provides a substantial benefit for several beneficial uses and do not propose preventing those uses from occurring. However, Wyoming’s water quality standards have been put in place to ensure that those beneficial uses are protected, in this case, by ensuring that water quality is protective of irrigation and livestock watering uses. We believe that this proposed rule will ensure that those uses are protected, and that in most cases, the oil and gas industry is provided the best possible opportunity, through a number of options, to meet the proposed requirements.</i></p>
HSCC	<p>10. Comment: The report does not take into account the potential effects of CBM produced discharge water having been filtered through sub-bituminous Wyoming coal.</p> <p><i>Response: Although physical conditions below the surface may result in discharging better quality water from wells, limits are determined by the quality of the water discharged at the end-of-pipe.</i></p>
DC	<p>11. Comment: DC’s comment describes the basis for initiating a study to reevaluate livestock and wildlife watering limits. In December of 2005 the Powder River Basin Resource Council (PRBRC) petitioned the EQC to lower TDS and sulfate limits and to add barium. The petitioners agreed that better data would make for a more informed decision and the University of Wyoming report followed with an expectation by the EQC that after the study was completed, DEQ would proceed with proposed rules as appropriate. PRBRC supports DEQ’s efforts to implement appropriate standards according to science.</p> <p><i>Response: We believe the proposed rule is supported in large part by the</i></p>

	<i>University of Wyoming report, plus information submitted anecdotally by the ranching community, industry, academia, a review of the impacts of proposing these limits, input from the public, the WWAB, and the EQC, and more than three decades of permitting produced water discharges.</i>
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Chemicals of Interest

FWS	<p>12. Comment: We are concerned that “attractive nuisances” for migratory birds could be inadvertently created at excavated stock ponds (stock tanks) or natural depressions by the report recommended protective value for selenium in livestock water at 0.1 mg/L. Several studies have shown that waterborne selenium concentrations above 2 µg/L pose a bioaccumulation risk to sensitive species of fish and aquatic migratory birds and can lead to impaired reproduction and mortality.</p> <p>Response: <i>the purpose of the proposed rule is to interpret and apply Section 20 which is concerned with livestock watering. We understand that bird species will be more sensitive than livestock and would address impacts to wildlife from selenium in discharges when they are encountered.</i></p>
MCD	<p>13. Comment: What evidence for chronic osteo-dental fluorosis in cattle exists in Wyoming range cattle or wildlife using produced water exceeding 2.0 mg F-/L? If evidence for chronic osteo-dental fluorsis exists, then that would be evidence supporting the standard. If non-existent, then strong consideration should be given to an increased limit.</p> <p>Response: <i>the University of Wyoming report has supplied the needed foundation of scientific literature which has been instrumental with determining the proposed effluent limits for livestock watering. The body of scientific literature for fluoride includes a large number of studies that are adaptive to Wyoming livestock and wildlife. However, we have proposed to retain the current limit based on the reasons discussed in the Statement of Principal Reasons which includes anecdotal evidence from the ranching community who support the current limit.</i></p>
MCD	<p>14. Comment: Anecdotal evidence from local livestock producers indicates the ability of livestock to utilize much higher sulfate content than the 1000/1800 mg/L recommendations. Though anecdotal, this information is still evidence that should be considered and properly evaluated. Local veterinarians involved with herd health issues should be able to comment on this standard without breaching confidentiality at the least, and with permission of the client for full disclosure at best.</p>

MCD	<p>Response: <i>We agree that anecdotal evidence is a valid consideration for determining appropriate livestock water limits. The proposed value of 2,000 mg/L for sulfates is based in part on that evidence. However, there is a large body of scientific evidence that indicates that this value should be lower than the current limit, especially in areas of Wyoming where livestock are moved from locations with high quality water (low concentrations of sulfates) to locations with lower quality water (high concentrations of sulfates). The reasoning behind the proposed sulfate limit is discussed further in the Statement of Principal Reasons.</i></p> <p>15. Comment: It is disturbing the authors do not include further work with sulfates' effects on livestock, under range conditions, in the summary of research needs, yet do include a need for further work with wildlife. MCD encourages the WWAB to support further research regarding sulfates' effects on both livestock and wildlife.</p> <p>Response: <i>As described in the University of Wyoming report, "The data used in compiling this report are drawn primarily from the scientific literature, including refereed journals, texts, proceedings, abstracts and theses, with an emphasis on material published during the last 20 years. The basic strategy consisted of 1) searching biomedical databases (e.g. Medline, CAB, etc.) for reports of toxicity in any species, 2) examining the bibliographies of relevant papers for new leads, and, finally 3) forward searching (e.g. Science Citation Index) for more recent papers that cite earlier work on a given topic. We also solicited well-documented anecdotal data (i.e. field reports) from colleagues at other research and/or diagnostic institutions." The section on sulfates references more than 50 citations from various types of studies including livestock under range conditions and is appropriate for assisting to determine effluent limits and is given greater validity by Dr. Raisbeck's (and co-authors) personal experience with the subject matter and Wyoming livestock conditions.</i></p>
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DHW/bb/7-0954

Response Summary for March 28, 2008

WWAB Meeting

Section 10

ANALYSIS OF COMMENTS

Subject: Public comments and Wyoming DEQ/WQD responses resulting in the 3rd Draft of the Agricultural Use Protection document. This document has been prepared for deliberation at the Water and Waste Advisory Board (Board) meeting on March 28, 2008 in Casper, Wyoming.

In connection with proposed revisions to the Chapter 1 Water Quality Rules and Regulations, the Department of Environmental Quality (DEQ), Water Quality Division (WQD) is proposing to incorporate the revised Agricultural Use Protection document into a new appendix (Appendix H) of the rule. The purpose of this document is to interpret the narrative standard which protects agricultural uses and is contained in Chapter 1, Section 20.

On February 16, 2007, the EQC approved proposed revisions to Chapter 1 except for Appendix H, Agricultural Use Protection, which was removed from the rule and remanded back to DEQ for further directed revisions. In May of 2007, proposed revisions to Appendix H were posted on the DEQ website and public notice was published in the Casper Star Tribune. Comments were received at a Board meeting on June 15, 2007 in Casper, Wyoming. On September 14, 2007, the Board held a second meeting in Jackson, Wyoming. At the Jackson meeting, testimony was heard and comments were received on the previously published University of Wyoming (UW) report entitled "Water Quality for Wyoming Livestock and Wildlife" which discusses recommended safe drinking water levels for Wyoming livestock and wildlife. On December 7, 2007 the Board received comments on revisions to Appendix H due to comments received at the previous two Board meetings. At this meeting the Board closed the comment period. On March 28, 2008 the Board plans to hear responses to comments made during the December meeting before making recommendations and giving direction to the WQD.

This document summarizes the comments received and includes the WQD's responses. The tables that follow are a compilation of these comments and DEQ/WQD responses. In the tables, the comments have been organized according to topics and paraphrased to create a manageable summary. Comments received are formatted in normal typeface and the agency responses are in italics. A list of commenters is also included to help track the comments.

List of Commenters

1	Park County	PC
2	Flitner Ranch and The Hideout, Outdoor Adventures	FR
3	Hot Springs County Commissioners	HSCC
4	Meeteetse Conservation District	MCD
5	Petroleum Association of Wyoming	PAW
6	Powder River Basin Resource Council	PRBRC
7	Rocky Mountain Farmers Union	RMFU
8	Wyoming Farm Bureau Federation	WFBF
9	Wyoming Stock Growers Association	WSGA
10	Wyoming Wool Growers Association	WWGA

General

MCD	<p>1. Comment: The ability of Wyoming’s citizens to benefit from the use of natural resources, including those people making their living through agriculture, must be protected through adoption of properly crafted policy. Now more than ever, the MCD believes that the draft revised section 20 threatens the future ability to use water produced and discharged in conjunction with extraction of hydrocarbons.</p> <p>Response: <i>The WQD has reviewed the potential impacts to end users from produced water discharges. The WQD has concluded that the proposed rules will have minimal to no impact on industry’s ability to obtain a permit for surface water discharges based on the current body of evaluated data, past experience developing permits containing agricultural use protections, and several public meetings and comment periods where stakeholder concerns were received and addressed. This comment highlights a common misconception about the impacts of adopting the proposed revisions to Chapter 1. Earlier responses to comments, discussions at previous meetings, and more recent sampling at outfalls where permit applicants would be required to meet more stringent livestock watering limits, indicates that producers applying for a surface water discharge permit will be able to meet the proposed limits in most cases. When unable to meet default effluent limits, livestock watering limits can be set to background water quality to address site specific conditions. The tiered approach offers several alternatives for developing appropriate irrigation limits, and several years of implementing these requirements as an internal policy indicates that most operators are able to obtain a permit through a combination of permit requirements and limits. The proposed rule also provides a waiver from effluent limits when affected landowners are willing to accept any additional risk of receiving lower quality water.</i></p>
MCD	<p>2. Comment: Section 20 should remain a policy and should not be implemented as a rule. Policy will have more flexibility and allow the DEQ</p>

to make better site-related decisions. The flexibility should provide Wyoming to manage its water resources in harmony with local and regional custom and culture.

Response: *As discussed in the June 15, 2007 response summary, the proposed rule does have utility as policy and has been used in that capacity for developing permit effluent limits. When evaluating the implications of these procedures as a policy or a rule, the primary reason for this procedure remaining as a policy is to maintain a certain degree of flexibility to accommodate site specific conditions, while the primary reason for developing these procedures as a rule is to ensure a degree of enforceability.*

The current draft has been through several revisions, with input from all known stakeholder groups who will likely be affected by these decisions. The current process for developing permit effluent limits for agricultural uses has been used since the mid 1990s and revised periodically to address various issues as they arose. Furthermore, the potential effects on designated uses and land owners have been discussed and debated to the extent that many of the comments contained in this document are the same or similar in nature to those for which we have already provided a response. We believe that the comments and concerns which have been brought to our attention have been addressed and resulted in an updated procedure that allows a good degree of flexibility for both applicants who need an effective way to surface discharge produced water, and for land owners to use that water for beneficial uses when that water is protective of designated agricultural uses.

On the other hand, the one component that is not addressed in a policy is the ability to enforce these procedures with the effect provided by a rule. Although it will be a more cumbersome process to proceed with changes to a rule, we believe that most issues have been addressed, whereas the needs for enforcing agricultural use protection is best addressed if approved as a rule. It should be noted that DEQ has recently received appeals for produced water discharge permits based on the fact that the proposed rule is currently a policy.

MCD

3. **Comment:** At the present time, [the rulemaking] process falls short of satisfying the requirements of Wyoming Statute 35-11-302 requiring the state to consider and evaluate social and economic impacts of proposed rules or regulations.

Response: *As discussed in the June 15, 2007 response summary, regarding compliance with W.S. 35-11-302(a)(vi), the statute provides:*

“(vi) In recommending any standards, rules, regulations, or permits, the administrator and advisory board shall consider all the facts and circumstances bearing upon the reasonableness of the pollution

involved including:

- (A) The character and degree of injury to or interference with the health and well being of the people, animals, wildlife, aquatic life and plant life affected;*
- (B) The social and economic value of the source of pollution;*
- (C) The priority of location in the area involved;*
- (D) The technical practicability and economic reasonableness of reducing or eliminating the source of pollution; and*
- (E) The effect upon the environment.”*

We believe, we have complied with all of the conditions of WS 35-11-302 (a) (vi) in the establishment of the proposed rules and are continuing to do so through this Board process. This public process that we are currently engaged in is specifically designed to meet those provisions of the statute. The provisions of the proposed rules were largely developed in a previous rulemaking process containing a lengthy administrative record documenting 5 draft iterations, 5 Board public meetings and 4 solicitations of written public comment in which all of the above were considered. A brief summary of the relevant considerations is as follows:

A) The proposed rule addresses the character and degree of injury to crops and native plants that may be irrigated with produced water and the degree of injury to livestock that may drink the water. It creates the data requirements and procedures for calculating discharge water quality limits to an extent that ensures no measurable decrease in crop or livestock production. In past comments, coal bed methane (CBM) industry representatives contended that prohibiting the discharge of new water is injurious to wildlife that would otherwise use the habitat that would be created. However, the document doesn't prohibit the discharge of water, it regulates the quality of the water being discharged and it only regulates that quality to the extent that livestock and wildlife will not be harmed. They also contend that by requiring water quality that will support irrigation harms livestock and wildlife because it will result in less water being discharged. In this, they ask the agency to choose between irrigated agriculture and livestock and wildlife. Instead, we chose to protect them all by regulating water quality sufficient to support all of the uses as is contemplated by the statute and the regulations. We have considered the potential impact to water uses that have developed around historic discharges and structured the document in a way that will allow those discharges to continue. We have also included provisions that will allow the discharge of poorer quality water if the affected water users accept the risks associated with the poorer quality water.

B) The source of pollution is primarily oil and gas development and the social and economic importance of that industry has clearly been considered

in the formation of the proposed rule. Indeed, oil & gas development has flourished under the agency's past interpretation of the Section 20 standard and will continue to flourish under the proposed new appendix to the rule. The opponents of CBM development have argued that we considered too much the economic importance of energy development at the expense of local agriculture in the formulation of the proposed rule. We believe we have struck an appropriate balance evidenced by the fact that the provisions of the rule have already been implemented in part through the permitting policy. Throughout this implementation, the energy industry remains vibrant in the state and significant degradation of water quality has not occurred.

C) We have considered the priority of location in the area involved. This proposed rule contains the necessary flexibility to assign appropriate water quality limits on a site-specific basis. The Tier 2 procedures allow the adjustment of effluent limits for irrigation use to equal the many differing background water qualities in different receiving waters across the state. The Tier 3 provisions allow further modifications based on site-specific geologies, soils and management practices. Regarding proposed livestock watering effluent limits, many of the same provisions provided for assigning limits for irrigation uses are also provided to determining appropriate limits for the livestock watering use. Default limits can be adjusted to background levels to account for natural conditions of a particular area of the state.

D) The proposed rule addresses the technical practicability of reducing or eliminating the source of pollution. The 3-tiered approach is specifically designed to address technical practicability. The purpose of Tier 1 is to alleviate requirements for detailed studies in circumstances where the quality of the discharge is exceptionally good or the affected crops are salt-tolerant. It provides a clear and simple means of assigning EC and SAR values that are supported by scientific literature. Tier 2 allows effluent limits to be adjusted to equal background water quality and provides specific procedures that can be used to estimate background water quality. The industry often points out that the CBM produced water is of a better quality than background. Wherever this is true, there is no technical problem in meeting the requirements of the proposed rule. Wherever the produced water is worse than background, the assumption must be made that the lower water quality will have a depressing effect on crop production. Tier 3 allows this assumption to be rebutted by a study or demonstration by the permit applicant that the lower water quality can be managed in a way that maintains crop productivity. These approaches were developed with input from a technical workgroup that included industry and university agricultural experts. The techniques involved in each of the tiers are all considered to be economically feasible and have been routinely employed by CBM operators and consultants. The technical practicability has also been evaluated with regard to the provisions of setting effluent limits for livestock watering uses. Default limits would be appropriate in most cases and have

	<p><i>been shown to be achievable by producers in most instances. When background conditions are demonstrated to exceed default values then effluent limits may be adjusted to ensure the background conditions are protected.</i></p> <p><i>E) The proposed rule in its entirety considers the effects upon agricultural uses which are the parts of the environment intended to be addressed by Section 20.</i></p>
MCD	<p>4. Comment: The MCD believes that agricultural use protection is important enough that the State of Wyoming should Commission a cost-benefit analysis of the impact of the Agricultural Use Protection document to ensure that agricultural use protection will be achieved.</p> <p>Response: <i>Proposed revisions to Chapter 1 were developed for compliance with W.S. 35-11-302(a)(vi) as discussed in the previous response. The WQD has evaluated the number of discharges which would be affected by the proposed rule. The results of this assessment suggests approximately two oil treater facilities which are unable to meet the grandfathering clause are also unable to meet the proposed effluent limits for sodium and sulfate. Review of over 24,000 CBM discharge samples suggests approximately 2% of the discharges will be unable to meet the sodium limit, and approximately 1% will exceed the sulfate limit. The data which has been reviewed and discussed at a number of public meetings and in public comments has resulted in important revisions which address impacts to the use of produced water for agricultural purposes. We believe a cost benefit analysis would not offer any additional information that has not already been considered or discussed in a public forum or technical workgroup setting.</i></p>
MCD	<p>5. Comment: The MCD believes, as it continues to review evidence submitted during the course of the process, that the Agricultural Use Protection document is a regulatory scheme that places significant additional and incremental burdens on the agricultural producer, the agricultural community, the local community, and the State of Wyoming.</p> <p>Response: <i>We believe that the proposed revisions will provide the water quality protection necessary to protect agricultural uses and ensure the use of produced water for agricultural producers in most cases. Please see responses to comments 4, 9, 24, 25, 26, and 27 for more detail.</i></p>
RMFU	<p>6. Comment: We have concerns in the use of “grandfathering” to permits issued before a certain date. It is our understanding that this practice is being challenged in other chapter(s). We would feel more comfortable if this issue was settled legally or the Environmental Protection Agency (EPA) has approved this practice before utilizing it in this chapter.</p>

PAW	<p>PAW supports the grandfathering clause for protecting discharges that have been occurring for years; however, we are concerned how the WQD will allow for continued discharges if the clause is challenged. If the clause is removed, the proposed limits would most likely then apply to all NPDES permits.</p> <p>Response: <i>Grandfathering clauses are a common feature of rules and regulations. They are used to denote the timeframe when new regulations are needed to protect a recognized threat while also recognizing new regulations/requirements may be unachievable or cost prohibitive with the technology used to meet the previous regulations. Furthermore, the grandfathering clause recognizes that some kind of significant impact is likely or will occur (e.g. social, economic, and/or environmental) if historical facilities are obligated to meet the new regulations/requirements.</i></p> <p><i>Regarding the proposed grandfathering waiver in the Agricultural Use Protection document, we have determined that the presence of those discharges occurring prior to January 1, 1998, many of which occurred before the founding of DEQ, have resulted in an established beneficial use and would create a significant impact to those uses if removed. Furthermore, the existing uses of those watercourses are largely established and defined by the quality of those historical discharges being grandfathered. On the other hand, the combination of oil and CBM (predominantly CBM) discharges occurring after January 1, 1998 increased in number from approximately 470 outfalls prior to 1998 to more than over 8,000 outfalls in the Powder River drainage alone. It was this increased number of discharges which resulted in the growing awareness of potential impacts to agricultural uses and the need to reevaluate current agricultural use protection regulations. Through this evaluation, we learned that agricultural uses should be provided with additional protections. Furthermore, it was discovered that the majority of discharges from permits issued after January 1, 1998 would be able to meet the more stringent proposed effluent limits. We believe the proposed grandfather waiver is appropriate and recognizes the need to more closely monitor and regulate a growing number of activities that could affect agricultural uses, while also recognizing the established and existing uses that were established prior to January 1, 1998.</i></p>
PC	<p>7. Comment: Representing the Park County board of Commissioners, it is my understanding that Wyoming currently has policies regarding water used for livestock and irrigation uses and that these policies have worked well across the state until CBM drilling began. Where the majority of ranchers and farmers will not be adversely affected by the proposed rules, there will be an effect on ranchers in Park County who depend on water produced from oil/gas operations. I would suggest to continue with policies rather than rules to allow for more flexibility and possibly send out questionnaires</p>

to some ranchers and farmers across the State as to whether these rules would affect their operations and if so, how. I think we all agree that farmers and ranchers are not going to risk making their cattle sick or jeopardize their crops by using “bad water.” It is my belief that these rules will have far reaching adverse effects to the future of agriculture in Wyoming, be it raising livestock or irrigating crops. Where water quality has not been detrimental to crops or livestock, if Wyoming farmers and ranchers are unable to use the water, they will be forced to develop the property or sell out to developers or big corporations.

Response: *As stated in the response to comment number 2, the proposed rule does have utility as a policy and has been used in that capacity over the past several years for developing permit limits. Additionally, the policy has been refined over the years to address many of the site specific situations that occur throughout the state. This experience has resulted in an approach to developing permits which takes into account changing conditions throughout the state. On the other hand, the policy does not offer a mechanism that is needed to ensure that permit limits can be enforced. For example, DEQ has recently received appeals for produced water discharge permits based on the fact that the proposed rule is currently a policy.*

PAW

8. **Comment:** PAW appreciates the intent of the Division by allowing landowner waivers. The practical application of landowner waivers does not seem feasible in all circumstances. The WQD has possibly, given any landowner in any given drainage basin the power to prevent any water from flowing to their neighbor downstream. Clearly, the problems associated with this type of solution could very easily render it moot to those who would try to implement it. The policy/rule does not address how discharges prior to January 1, 1998 will be affected by this provision. PAW requests the WQD clarify this situation.

Response: *The application of a landowner waiver is most easily applied when a single landowner manages the land within the drainage area. When more than one landowner will be affected by the quality of discharge water which is unable to meet the prescribed effluent limits, then all landowners must be in agreement as to what quality of water is appropriately protective of their personal agricultural uses. This provision was developed as an alternative to the tiered approach for those landowners who are willing to accept lesser quality water for agricultural uses and are willing to accept the added risk. It is not meant to force produced water on landowners who are unwilling to accept the additional risk. In those circumstances where a landowner(s) is unwilling to accept the additional risk, then a waiver will not be granted.*

The provision in Section (a) addresses discharges permitted prior to January 1, 1998 and states, “Effluent limits on discharges of produced water that

FR	<p><i>began prior to January 1, 1998 will not be affected by this Appendix in relation to the protection of agricultural uses.” Conditions for approving a waiver include (1) discharges have been occurring prior to that date with no prior indication or complaint of reduced agricultural production, and (2) that effluent limits on historic discharges may be made where the quality of the discharge is shown to constitute a threat to any other designated uses described in Chapter 1 of the Wyoming Water Quality Rules and Regulations. If these conditions are met then it will not be necessary to modify permit limits issued prior to January 1, 1998, and would include the limits/conditions of the approved waiver.</i></p> <p>9. Comment: Agriculture in Wyoming hangs by a narrow thread. Please do not support and recommend unrealistic regulations that are destined to fail in meeting hypothetical goals due to the lack of solid scientific data. Any promulgations of unrealistic water quality regulations will have potentially devastating affect on agriculture in this state as we know it and will only lead to accelerated failures of our business.</p> <p>Response: <i>The proposed revisions to Chapter 1 have been evaluated by the WQD to address impacts to a discharger’s ability to meet permit requirements associated with agricultural uses. Effluent limits for irrigation purposes have been developed to ensure that this use is protected while at the same time addressing the need of landowners to use the produced water for agricultural purposes. Site specific conditions are addressed by other alternatives in both the irrigation and livestock watering sections of the proposed rule. When Tier 1 default effluent limits are over-conservative then background conditions or site specific studies can be used to better define the appropriate effluent limits. Livestock watering limits offer similar alternatives as those provided for developing irrigation limits. In both cases a waiver can be obtained by landowners who desire to use the water for agricultural purposes if they are willing to accept any added risk of accepting lower quality water.</i></p> <p><i>Where the irrigation policy has been adjusted and revised over the past several years to address unknown conditions, and is currently being used to set permit limits, more recent review of proposed revisions to the livestock watering limits indicates that the primary constituents with the highest probability for being exceeded (sodium and sulfate) will not be a factor for most applicants seeking to obtain a surface discharge permit.</i></p> <p><i>Regarding livestock watering, of approximately 39 total oil treater discharges which are unable to meet the grandfathering provisions (and there was no data for during the previous board meeting) all have been recently inspected to assess their ability to meet the more problematic proposed livestock watering limits (sodium and sulfate). Of those, 20 are able to meet the proposed limits, two exceeded either the proposed sulfate or</i></p>
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FR	<p><i>sodium limit, 10 have never had their discharge outfall(s) constructed, two are no longer being used, four were not sampled during the inspection because the outfalls were frozen or not discharging, and we are awaiting chemical analysis for one. One of the two outfalls exceeded the proposed sulfate limit of 2,000 mg/L (at 2,670 mg/L) in Crooke county, the second was taken from a representative outfall and exceeded the proposed sodium limit of 1,000 mg/L (at 1,377 mg/L) in Albany county. Based on past experience developing effluent limits for oil and CBM discharges, input received during the public meeting and public comment process, and more recent data, it is unlikely that there will be significant impacts to an applicant's ability to obtain a surface discharge permit due the proposed agricultural use protection requirements.</i></p> <p>10. Comment: the “flows” from the Oregon Basin wells are a cornerstone of our grazing program effecting over 150,000 acres of rangeland and some twenty <u>ranch</u> employees. The recreational business called the Hideout is our “Cowboy Adventure” program utilizing the same water and area. The business employs <u>another</u> thirty employees and their families, many of whom live on the ranch.</p> <p>Response: <i>We believe that the proposed revisions will provide the water quality protection necessary to protect agricultural uses and ensures the continued use of produced water in most cases.</i></p>
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Irrigation

MCD	<p>11. Comment: The attempts to use the classification “naturally irrigated lands” must be eliminated. Local soil and vegetative conditions coupled with the ambiguity and subjectivity of determining and defining measurable decrease in “plants for agricultural purposes” on “naturally irrigated lands” will inevitably lead to a myriad of lawsuits and to a game of controlling watersheds through control of strategic parcels. Usual, ordinary typical changes in land ownership may cause wide disruption as well. This will be exacerbated by the ability of unaffected third parties to sue on behalf or against public land management agencies.</p> <p>Response: <i>Several aspects of the above comment have been addressed during previous comment periods. The classification of “naturally irrigated lands” was added after receiving public comments about potential impacts to irrigated lands not covered by previous versions of the Agricultural Use Protection document. We believe it is appropriate to regulate discharges to the extent that ensures productivity is not negatively affected and the proposed protections are consistent with the intent of Chapter 1, Section 20. The 20 acre threshold for naturally irrigated lands</i></p>
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	<p><i>was arrived at by an interpretation of color infra-red photography of a number of watersheds where the protection of naturally irrigated bottomlands was raised as an issue in the past and DEQ included such protection in the permits that were issued. Through analysis of aerial photographs, the presence of 20-acre parcels was identified as a common occurrence in all of those watersheds and it appears to be a simple, easily measured criterion for determining which watersheds contain an appreciable amount of naturally irrigated lands. Other methods for determining the presence of 20-acre parcels are also described in this section and may be employed as needed to make the correct determinations.</i></p> <p><i>The terminology “plants for agricultural purposes,” was revised due to a comment received during the June 15, 2007 comment period. We believe the revised language more clearly expresses that any plants used for agricultural purposes are subject to being protected. The broader language also addresses differing soil and vegetative conditions and allows determinations of significance to be made on a site specific basis.</i></p>
PRBRC	<p>12. Comment: The proposed policy fails to comply with the language of Chapter 1 Section 20, which (1) refers to “All Wyoming surface waters,” and (2) prohibits degradation of such waters to “such an extent to cause a measurable decrease in crop or livestock production.” Chapter 1, Section 20 does NOT limit this protection to livestock watering and irrigation. The Ag Use protection policy should protect livestock production and crop production as well. The proposed policy explicitly allows production to be sacrificed.</p> <p>Response: <i>As discussed in the June 15, 2007 response summary, protecting production has been an integral part of developing the currently proposed provisions of Appendix H. Considerations given to the proposed livestock watering limits are based in part on both health and production data from the UW report by Dr. Merl Raisbeck et al. and anecdotal information from the ranching community. Tier 1 default limits for irrigation are derived for the most sensitive crop as indicated by the USDA Agricultural Research Service (ARS) National Salinity Laboratory tolerance levels and are based on 100% crop production. Other tiered approaches for setting irrigation limits are based on site-specific conditions which may also include an evaluation of crop production.</i></p> <p><i>The proposed rule was developed specifically to address all Wyoming surface waters by developing conservative default values that can then be adjusted to address site specific conditions.</i></p>
PRBRC	<p>13. Comment: Regarding Tier 1 default limits for EC and SAR, the DEQ proposal states that effluent limits “may” be set if background water quality</p>

	<p>is significantly better. We would propose the word “shall” rather than “may” in order to ensure background water quality is maintained and agricultural uses are protected.</p> <p>Response: <i>As discussed in the June 15, 2007 response summary, if background water quality is better than indicated by a Tier 1 default limit, then the Tier 1 limit may be applied to protect agricultural uses when other designated uses such as drinking water do not dictate a more stringent limit. In all cases, Tier 1 default limits are considered protective of agricultural uses but must take into account background water quality where that information is available. Therefore, when a situation like this occurs, DEQ needs a level of flexibility to make a site-specific permit action decision that is captured by the word “may” instead of “shall.”</i></p> <p><i>Furthermore, using the word “shall” might lead to an interpretation that the rule intends to set limits equal to background quality. We do not intend to implement a separate antidegradation concept in relation to agricultural uses. The limits on degradation of high quality waters will be made after consideration of all of the affected water uses and according to the provisions of the Antidegradation policy</i></p>
PRBRC	<p>14. Comment: Regarding Tier 1 default limits for EC and SAR, we continue to stand by our earlier recommendations based on scientific literature that clearly demonstrates the need for more protective default limits. We again propose default limits not to exceed an SAR of 5 and an EC of 1330 to provide protection on current and existing agricultural uses. PRBRC then goes on to site a USDA Salinity Laboratory study based on Powder River Basin soils and states that these bare clay soils are significantly impacted at SAR levels of 2 to 6.</p> <p>Response: <i>As discussed in the June 15, 2007 response summary, the proposed default SAR cap of 10 was established based upon a very thorough review of the issue during the development of the Agricultural Use Protection Policy. We believe that the cap of 10 is adequately protective and also supported by the scientific literature. The commenters provided no additional information that has not been previously considered.</i></p>
PRBRC	<p>15. Comment: Regarding Tier 2 limits, we continue to reject the legitimacy and questionable science proposed for determining background water quality through soil sampling for Tier 2 and Section 20 Studies. Tier 2 studies have been approved by DEQ with an SAR up to 26 and EC over 6,000. The focus of the policy should be to AVOID impacts upon native vegetation and cultivated crops and the underlying soil medium, instead of salt loading ephemeral systems, drainages, draws and perennial streams as proposed. Existing and current uses have priority and must be protected</p>

	<p>under the Clean Water Act and requires that DEQ’s Tier 2 Concept be eliminated.</p> <p>Response: <i>As discussed in the June 15, 2007 response summary, the Tier 2 study that the PRBRC refers to was conducted on irrigated fields in Middle Prong, Wild Horse Creek. Based on our review of the study, the protocol established in the policy was followed, and therefore, in the absence of any other information, we would consider the data to be appropriate and representative of historical irrigation water quality in this drainage. However, in circumstances where the actual discharge is significantly better than background soil salinity would otherwise require, effluent limits are established near the level of the actual produced water quality.</i></p> <p><i>We believe the proposed revisions to Chapter 1 have been developed in compliance with all aspects of the Clean Water Act.</i></p>
PRBRC	<p>16. Comment: Regarding “Naturally Irrigated Lands,” the DEQ definition of which lands require protection is overly narrow, unjustified and arbitrary. These highly productive lowlands are especially important in early season grazing for lactating mother cows, ewes and a host wildlife species. The qualifications required for a strict 20 acre by 50 feet wide tract do not realistically portray the dissected topography managed by ranchers in the Powder River Basin. Furthermore, many critical range bottomlands do not have an “active channel or unconsolidated floodplain.” Nevertheless, in the real world, they are important components of the rangeland ecosystem, and they will continue to be degraded, destroyed and removed from production as long as they are used to convey effluent. This practice must be recognized as detrimental to existing uses and must be halted. Alternative solutions such as piping discharges away from bottomlands, well-managed subsurface drip irrigation or re-injection must find increased use in order to protect grazing lands and other existing uses.</p> <p>Response: <i>As discussed in the June 15, 2007 response summary, The 20 acre threshold for naturally irrigated lands was arrived at by an interpretation of color infra-red photography of a number of watersheds where the protection of naturally irrigated bottomlands was raised as an issue in the past and DEQ included such protection in the permits to ensure degradation of such waters shall not be of such an extent to cause a measurable decrease in crop or livestock production. Through an analysis of aerial photography, the presence of 20-acre parcels was identified as a common occurrence in all of those watersheds and should be appropriate for determining which watersheds contain agriculturally significant naturally irrigated lands in most cases.</i></p>
PRBRC	<p>17. Comment: Regarding “Naturally Irrigated Lands,” allowing</p>

<p>PRBRC</p>	<p>discharges to continue during times of freezing temperatures and icing only postpones impacts until thaw. Winter spreading of CBM water due to ice damming, bank and soil profile storage of effluent in draws and bottomlands results in even larger areas of damage and more detrimental vegetative changes.</p> <p>Results: <i>As discussed in the June 15, 2007 response summary, in canal and lateral irrigation systems where the water is actively controlled through headgates, the irrigation season is easy to delineate. In passive systems like spreader dikes where water is applied to the land whenever there are sufficient flows and there is no control over when those flows might occur, the irrigation season is assumed to be year-round. Sections (c)(ii) and (c)(iii) stipulate that where discharges will reach either artificially or naturally irrigated lands, then appropriate EC and SAR limits will be applied. If a threat to agricultural uses is determined because of off-season discharges, the WQD will place appropriate EC and SAR limits in the permit to deter any threats to agricultural uses. In some instances, in-stream monitoring points (IMPs) will be used to monitor the potential for negative effects to irrigation uses. If it is determined that irrigation uses are threatened during a permit term after review of IMP data, DEQ has the ability to reopen a permit and address the threat with more stringent limits and/or additional permit conditions.</i></p> <p>18. Comment: Regarding Tier 3, DEQ’s “no harm analysis” puts forth the ridiculous proposition that irrigation can be managed to mitigate the damaging effects of high EC and SAR upon soils. In the Powder River Basin, most irrigation depends upon flood events and snow melt. To choose not to irrigate under the design of passive systems has no place for consideration in this policy.</p> <p>We continue to question the legitimacy and questionable science proposed in determination of background water quality through soil sampling for Tier 3 and for Section 20 studies. Enforcing conservative levels for SAR and EC must be made the goal in order to avoid continuing damage to existing soils and vegetation. If this is truly to be an “agricultural use protection policy,” existing uses must have priority of protection and high EC and SAR limits should not be approved. Tier 3 – like Tier 2 – should be eliminated and this board should adopt rules that truly protect all existing agricultural and wildlife uses.</p> <p>Response: <i>A Tier 3 analysis allows an applicant to conduct a site specific scientifically defensible study and recognizes that default values and site specific soil conditions may not be the only factors affecting crop productivity. It is not limited to an analysis of irrigation practices. It does allow cooperation between discharge producers and landowners desiring beneficial use of produced water to demonstrate that water quality will not</i></p>
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<p>PRBRC</p>	<p><i>cause a measurable decrease in crop production. Some examples of what factors might be evaluated in a Tier 3 study include a more comprehensive evaluation of soil conditions and/or natural water quality conditions, enhanced irrigation management practices, review of historical and expected crop yields or other relevant factors related to crop production.</i></p> <p>19. Comment: Landowners should not be threatened with the specter of a regulatory agency placing inadequate and non-protective default limits on discharges if the landowner chooses to exercise his legal right to deny access. A landowner must be allowed to select the consultant of his choice for the purpose of performing a Section 20 analysis, Tier 2 or Tier 3 soil surveys or related data collection purposes of determining water and soils chemistry standards under a WYPDES permit. The analytical lab used for purposes of water and soils analysis should be selected with input from the landowner. These accommodations made for the landowner provide participation in the process and ownership in the results and allow for review and choice in assuring accuracy and legitimacy of scientific data, which will have a major effect upon property rights and existing uses.</p> <p>Response: <i>As discussed in the June 15, 2007 response summary, When access is denied to develop a Section 20 analysis, DEQ will attempt to set the most appropriate limits based on the information available. These will not necessarily be the default limits provided in a Tier 1 analysis. Property rights are not affected by this policy. A property owner maintains the ability to allow or deny access on his terms; however, he can not reasonably expect that his agricultural uses will be protected to his desired level if he denies the ability to actually assess those uses.</i></p> <p><i>There are circumstances where analysis by a third party can be useful to reach resolution on particularly contentious issues and the policy does not preclude that approach. However, we do not believe that obtaining third party involvement is always possible or advantageous and would not make it a standard requirement.</i></p>
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Livestock Watering

<p>WSGA</p>	<p>20. Comment: Livestock producers must maintain the ability to make decisions on the acceptability of a water supply with good information and maximum flexibility. In our view, current DEQ quantitative and narrative standards maintain this needed flexibility without negative impacts. WSGA requests that WQD not proceed with the release of new water quality recommendations for livestock watering at this time.</p> <p>Response: <i>Chapter 1, Appendix H takes into account the need for flexibility when developing permit limits and requirements which are protective of</i></p>
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<p>WWGA</p>	<p><i>livestock watering uses. Limits can be set to background water quality if default limits are not achievable. A waiver can be obtained when default and background limits are not achievable if all affected landowners are willing to accept the risk of the lower water quality. It is also important to note that review of current data from DMRs, inspection reports, and initial sampling reports indicates that it is unlikely that permit applicants will be unable to meet the proposed default limits if the rule is adopted as proposed.</i></p> <p>21. Comment: We believe much of the information in the UW report is not relevant to Wyoming conditions. Based upon the lack of reports we have received from our members, we do not believe there is a level of risk to livestock or wildlife from produced water discharges that warrant ANY change to the current standards. To the contrary, we believe the loss of produced water as a drinking water source for livestock and wildlife poses a much greater risk to our members, livestock, and wildlife.</p> <p>We are in the process of trying to ascertain the number of cases attributable to deaths or illness from produced water discharges. While our research is not complete, we have determined that if any problems exist they are negligible or insignificant.</p> <p>Response: <i>In December of 2005 the PRBRC petitioned the EQC to lower TDS and sulfate limits and to add barium. Everyone involved agreed that better data would make for a more informed decision and the University of Wyoming report followed with an expectation by the EQC that after the study was completed, DEQ would proceed with proposed rules as appropriate.</i></p> <p><i>The current livestock watering limits were developed through a review of scientific literature by the WQD in the 1970's. They were based in large part from a study contracted by the State of California to the California Institute of Technology in 1951 and later updated in 1963. Similar to the report released by California Institute of Technology, the conclusions of the UW report were taken from a number of scientific studies conducted in the United States and abroad to recommend safe drinking water levels for the most sensitive livestock species studied.</i></p> <p><i>The UW report elaborates on safe drinking water levels as determined through evaluation of a large number of applicable laboratory and field studies. The report was peer reviewed and received input from other professionals in this field of science. Furthermore, the WQD has taken into consideration anecdotal information supplied by stakeholder groups who expressed the need for agricultural use of the produced water. We believe the culmination of scientific review and input from affected landowners strikes the appropriate balance between insuring no measurable decrease in livestock production while taking into account the need for this important resource. As has been discussed at previous Board meetings and in</i></p>
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<p>WWGA</p>	<p><i>responses to public comments, the proposed limits are unlikely to impact an applicant's ability to obtain a permit for a surface water discharge of produced water. At the same time the proposed limits represent the most current scientific data and should be protective of the livestock watering use.</i></p> <p>22. Comment: Both Dr. Raisebeck et al. and the DEQ/WQD should have extensive awareness and knowledge of our existence and function, yet neither contacted us either prior to the publication of the UW report, nor after the report was published. Hopefully, this lack of effort will be rectified in the very near future.</p> <p>Response: <i>The scientific literature review of safe drinking water levels was contracted to the University of Wyoming due in part to the extensive knowledge of Wyoming conditions by the authors. However, the primary purpose of the study was to conduct a scientific literature review of field and laboratory studies that have resulted in a better understanding of impacts to livestock from toxic compounds commonly found in Wyoming. The public comment period and associated public meetings were meant to be the mechanism for obtaining stakeholder input which has also been an important part of determining appropriate effluent limits for Wyoming.</i></p>
<p>WFBF</p>	<p>23. Comment: The proposed livestock watering limits are in response to the UW report which could have an economic impact on livestock production. The study also focuses on wildlife, but acknowledges there was limited or no information available to review regarding safety levels. Therefore, we feel the review has limited applicability for wildlife and should not be used for that purpose.</p> <p>Response: <i>All surface waters in the state are designated for both livestock watering and wildlife uses. One of the purposes of the new Appendix H is to provide water quality limits deemed to be acceptable for livestock use to the degree necessary to achieve the Section 20 goal of "no measurable decrease in livestock production."</i></p> <p><i>The values expressed in Appendix H, Section (b)(i) are livestock values and are not intended to address all wildlife, aquatic life, human health, or any other designated uses. We recognize that the UW report is somewhat limited in regards to wildlife uses in that it does not try to address water quality requirements of all species of wildlife. It does provide some reasonable assurance that the water quality sufficient for livestock is also sufficient for larger ungulate wildlife such as deer, elk, and antelope, and the DEQ is justified in determining that those species of wildlife are not threatened by discharge limits set to provide safe livestock use.</i></p> <p><i>We are not proposing to use Appendix H livestock values as adequate protection for all wildlife. For example, on waters where use by waterfowl is</i></p>

<p>WFBF, RMFU</p>	<p><i>a concern, selenium concentrations of discharges may be set significantly lower in order to protect both wildlife and waterfowl.</i></p> <p>24. Comment: Two of the standards which have potential impacts for current producers are those established for sulfate and sodium. Data from DEQ indicates that some current dischargers would violate the proposed sulfate standard absent some type of exception from the standard and seem to be located in areas where livestock producers are currently utilizing the discharges for livestock production. The ability to fully analyze the impact on these producers is limited by the information available, the time needed to contact these producers and the ability to withstand legal challenges on the grandfather rule. Because of these uncertainties, we feel the best course of action at this time would be to not proceed with changes to the livestock standards until a better understanding of the consequences can be analyzed and understood.</p> <p>Response: <i>The WQD evaluated 24,295 samples taken from 608 CBM permits to evaluate permit compliance with the proposed effluent limit for sodium. Data from these samples indicates that approximately 98% of the discharges will be able to meet the proposed sodium limit of 1,000 mg/L. This data includes multiple samples taken from single outfalls and is likely over-conservative. The sodium concentration at the 75th percentile is well below the 1,000 mg/L limit (at 535 mg/L). The reported concentration at the 99th percentile is 1,070 mg/L, and a maximum concentration is reported at 1,590 mg/L.</i></p> <p><i>The WQD evaluated 24,401 samples taken from 704 CBM permits to evaluate permit compliance with the proposed effluent limit for sulfate. Data taken from DMRs suggests that approximately 99% of the discharges will be able to meet the proposed limit of 2,000 mg/L. This data includes multiple samples taken from single outfalls and is likely over-conservative. The sulfate concentration at the 99th percentile of the 704 permits evaluated is 384 mg/L, and a maximum concentration was reported at 3,870 mg/L.</i></p> <p><i>Of approximately 39 total oil treater permits which are unable to meet the grandfathering provisions, and we did not have data for during the previous board meeting, all have been recently inspected to assess their ability to meet the proposed livestock watering limits. Of those, 20 are able to meet the proposed limits based on discharge monitoring reports (DMRs) application data or recent sampling, two exceeded either the proposed sulfate or sodium limit, 10 have never had their discharge outfall(s) constructed, two are no longer being used, four were not sampled during the site visit because the outfalls were frozen or not discharging, and we are awaiting chemical analysis for one. One of the two outfalls exceeded the proposed sulfate limit of 2,000 mg/L (at 2,670 mg/L) in Crook County, the second was taken from a representative outfall and exceeded the proposed sodium limit of 1,000 mg/L</i></p>
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<p>MCD</p>	<p><i>(at 1,377 mg/L) in Albany County. Based on past experience developing permit limits and more recent data, it is unlikely that there will be significant impacts to an applicant's ability to obtain a surface discharge permit.</i></p> <p><i>Please see the response to comment number 6 which addresses concerns about challenges to the grandfathering rule/provision.</i></p> <p>25. Comment: It would appear that extensive research currently in progress makes it premature to arbitrarily reduce the effluent limit on sulfates from 3,000 mg/L to 2,000 mg/L based on ongoing research, in part as a result of increased brewer's grain and ethanol production in the upper Midwest. Additional studies indicate that detrimental effects on cow/calf herds present themselves at concentrations of 2,700 mg/L in one study and 3,000 ppm in another. After a discussion with a University of Wyoming Assistant Professor, she related that with respect to sulfate toxicity, there is no "hard and fast rule right now."</p> <p>Dr. Ken Olson with South Dakota State University and Dr. Kristi Cammack with the University of Wyoming, each having experience with range livestock and range-based research, stated that on the basis of the information that I presented them, they believe that instituting a 2,000 mg/L effluent limit at the present would be too restrictive and premature, given the potential results of ongoing research.</p> <p>The MCD urges the Water and Waste Advisory Board (WWAB) to recognize that there is a very real risk to the agricultural producer of completely losing an existing water source under the proposed 2,000 mg/L effluent limit for sulfate, and to recognize that the greater agricultural use protection may come from the ability to use a water source with sulfate content of up to 3,000 mg/L.</p> <p>In order to provide agricultural use protection, the MCD urges the WWAB to continue to use the existing 3,000 mg/L sulfate effluent limit until further research validates a real need for change, based on locally confirmed production losses.</p> <p>Response: <i>There is currently a robust source of scientific literature regarding health effects associated with sulfur intake by livestock. Collectively, the scientific literature suggests the appropriate safe livestock drinking water level for sulfate is somewhere around 1,000 mg/L. The WQD chose an effluent limit of 2,000 mg/L because of testimony from the agricultural community who said no negative effects were observed among their livestock at the current limit of 3,000 mg/L. We also heard testimony from Dr. Raisebeck and others that cattle are able to drink water at higher concentrations when they have been acclimated slowly to the higher concentrated water without serious health effects. However, the scientific</i></p>
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	<p><i>literature taken from both field and laboratory studies clearly indicates that livestock can and are affected by sulfate containing water below 3,000 mg/L. The WQD has chosen to strike a balance between the scientific literature and the observations by the agricultural community. The 2,000 mg/L sulfate limit has been shown during previous Board meetings and in responses to previous comments to be attainable by approximately a proportion of the discharges from CBM gas production. Of the approximately 39 oil treater dischargers who are unable to obtain the grandfather waiver and we have data for, only two dischargers obtained samples resulting in an exceedance of the proposed sulfate limit.</i></p>
RMFU	<p>26. Comment: Currently no standard exists for molybdenum or sodium and it is our understanding that discharge permittees and agencies doing water quality sampling do not test for the existence or levels of these two constituents in their samples. Without water quality test data to indicate the concentrations in existence in background levels and in permitted discharges, we have no way of knowing if water sources currently used by livestock producers could be in jeopardy. While the default levels of these standards would be ambient background water quality in streams where exceedance exists. We are concerned if sampling can be done in a timely manner to ensure continued discharges in areas with high background levels.</p> <p>Response: <i>The WQD evaluated 24,295 samples taken from 608 CBM permits to evaluate permit compliance with the proposed effluent limit for sodium. Data from these samples suggests that approximately 98% of the discharges will be able to meet the proposed sodium limit of 1,000 mg/L. This data includes multiple samples taken from single outfalls and is likely over-conservative. The sodium concentration at the 75th percentile is 535 mg/L, 1,070 mg/L at the 99th percentile, and a maximum concentration reported at 1,590 mg/L. Regarding oil treater discharges, 39 oil treaters will be unable to obtain the grandfather waiver. Of those, one was unable to meet the proposed sodium limit. Of the remaining 38 permits, 20 met the proposed limit, one exceeded the sulfate limit, 10 were not constructed, and two were no longer being used. We were unable to obtain samples at two outfalls because they were frozen, two because they were not discharging, and we are awaiting chemical analysis for one.</i></p> <p><i>It is correct the WQD does not have monitoring data for molybdenum. Adding this constituent to the list of metals requiring an effluent limit of 300µg/L is based solely on the scientific literature which suggests the potential for considerable health and production effects from molybdenum toxicity if the proposed limit is exceeded. However, initial monitoring by the University of Wyoming suggests concentrations of molybdenum from produced water discharges are likely below 10µg/L.</i></p>
RMFU	<p>27. Comment: There is little data available to determine the impact to the</p>

<p>RMFU</p>	<p>use of produced water from exceedances to the proposed sulfate limit. In our meeting with DEQ staff, the information presented on which current dischargers would be effected didn't provide sufficient information as to the amount of water being discharged, percentage of total flow the discharge made up and if additional water sources exists in close proximity to replace a discharge that can't meet the new limits as a source of livestock water.</p> <p>Response: <i>Our evaluation is primarily based on an applicant's ability to meet the proposed effluent limit. Since the last Board meeting in December, the WQD has sent inspectors to all of the 39 oil treater outfalls which were unable to meet the requirements for obtaining a grandfather waiver and the WQD did not have data for. Of those, one was unable to meet the proposed sodium limit. Of the remaining outfalls, 20 met the proposed limit and one exceeded the proposed sulfate limit, 10 were not constructed, and two were no longer being used. We were unable to obtain samples at two outfalls because they were frozen, two because they were not discharging, and we are awaiting chemical analysis for one.</i></p> <p><i>The estimated flow from the oil treater outfall which is unable to meet the proposed sulfate limit is between .003 mgd (≈ 2.0 gpm) to .00924 mgd (≈ 6.0 gpm).</i></p> <p><i>The WQD evaluated 24,401 samples taken from 704 CBM permits to evaluate permit compliance with the proposed effluent limit for sulfate. Data taken from DMRs suggests that approximately 99% of the discharges will be able to meet the proposed limit of 2,000 mg/L. This data includes multiple samples taken from single outfalls and is likely over-conservative. The sulfate concentration at the 99th percentile of the 704 permits evaluated is 384 mg/L, and a maximum concentration was reported at 3,870 mg/L.</i></p> <p><i>Estimating the average flow from CBM outfalls is more difficult to quantify due to the varying characteristics of each discharge. Flows ranged from 0.0 mgd to 2.36 mgd (≈ 1,638 gpm) for the nine of 704 permits which exceed the proposed sulfate limit, but flow rates can fluctuate dramatically depending on any number of CBM production conditions. Following are flow rates taken from the nine permits in mgd: 0.0, 0.04, 0.042, 0.05, 0.14, 0.2003, 1.7, and 2.36. Of the nine permits exceeding the proposed limit, two are unable to meet the current limit of 3,000 mg/L and have flows reported at 2.36 and 0.2003 mgd.</i></p> <p>28. Comment: We feel that any changes to the current standards for livestock and wildlife use would be premature at this time. Until more information is available on the number of permits controlling discharges these proposed changes would impact, we don't see a rush for change to the current standards.</p>
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	<p>Response: <i>We believe that we have addressed this concern through an evaluation of how many applicants will be affected by the proposed effluent limits. The reasoning behind our decision is discussed in response to questions 4, 9, 24, 25, 26, and 27 above.</i></p>
PAW	<p>29. Comment: PAW recommends the livestock watering limits be removed from the proposed policy/rule.</p> <p>Response: <i>We believe the proposed livestock watering effluent limits serve an important purpose for protecting drinking water quality for livestock and reflect the purpose and intent of the Section 20 narrative standard, which requires degradation of surface waters shall not be of such an extent to cause a measurable decrease in crop or livestock production. The WQD understands that produced water is an important resource for agricultural uses and has developed the proposed rule to offer every available opportunity for providing approval of surface water discharges.</i></p>
PAW	<p>30. Comment: Under Livestock Watering (b)(i) PAW has concerns with the paragraph that begins “In addition...”. PAW is concerned that this provision in the policy/rule is too broad. As written, it does not specify where the limits will need to be met. This section does not take into account naturally occurring constituents and needs to be further explained and detailed.</p> <p>Response: <i>The end-of-pipe requirements for TDS, sulfate and sodium expressed in the first paragraph of (b)(i) originate in Chapter 2 of the Water Quality Rules and regulations and are repeated for those same parameters in the proposed Appendix H. The remaining parameters of concern listed under the second paragraph are not Chapter 2 constituents and are not regulated the same. These values represent what is considered to be useable for livestock watering at the point of use. In practice, permit effluent limits for these constituents will be enforced at the end-of-pipe though the actual limits on any particular permit may be different than the values listed. The end-of-pipe values may be modified after consideration of other programmatic procedures such as mixing calculations and antidegradation.</i></p> <p><i>Regarding naturally occurring constituents, default effluent limits if adopted as proposed would be included in all effluent discharge permits affecting agricultural uses where these metals may be present in the discharge and other more stringent limits are not required due to a shared use designation. The metals in (b)(i) may be added to the permit for various reasons including there is a known waste stream containing the constituents (as might be indicated through initial monitoring) or an indication that the geologic source of the waste stream contains a given constituent. The current language allows flexibility for permitting staff to evaluate the site specific circumstances of proposed surface discharges and to require that effluent limits are placed in a permit when there are indications that these</i></p>

PAW	<p><i>constituents need to be regulated.</i></p> <p>31. Comment: In the Statement of Principal Reasons, the WQD explains that 99% of coal bed natural gas wells are able to meet the limits for sulfate and sodium, and between 75% and 99% of oil discharges are able to meet the same limits. This only underlines the suggestion that the existing standards are and have been properly protective.</p> <p>Response: <i>The percentages referred to in the comment and described in the SOPR refer to the ability of producers to comply with the proposed livestock watering limits not the current limits. We see no correlation between the <u>numbers</u> of produced water dischargers meeting the proposed limits and the <u>quality</u> of water which is protective of livestock water consumption. The SOPR discusses the reasoning behind the WQD’s decision to revise or retain rule requirements and limits. We evaluated the ability of producers to meet the proposed limits to ensure compliance with WS 35-11-302(a)(vi) and to evaluate whether or not the proposed rule allows every opportunity for agricultural use of produced water. If producers are able to meet the proposed limits then the agricultural use should be protected. In most cases producers will be able to meet the proposed limits even though some effluent limits are proposed to become stringent.</i></p>
PAW	<p>32. Comment: In the table on page H-2, three new constituents have been added to the list for possible permit limits: boron, chromium, and molybdenum. PAW does not understand why the new limits are being proposed. How will these limits affect oil producers? The WQD admits in the SOPR that the data necessary to determine if these limits will be necessary is unavailable at this time. How can anyone assess how these constituents will affect production if no data is available? PAW requests these constituents be removed from the list that may be applied to a discharge, “if there is reason to believe they may be associated with a discharge”.</p> <p>Response: <i>There is no proposal to revise the boron and chromium limits. These parameters were not evaluated for permit compliance. It is correct the WQD does not have monitoring data for molybdenum. Adding this constituent to the list of metals, with an effluent limit of 300µg/L, is based solely on the scientific literature which suggests the potential for considerable health and production effects from molybdenum toxicity if the proposed limit is exceeded. However, initial monitoring by the University of Wyoming suggests concentrations of molybdenum from CBM produced water discharges are likely below 10µg/L.</i></p>
PAW	<p>33. Comment: PAW requests (b)(iii) be revised to read, “...pollutant and the landowner <u>livestock operator</u> requests...” PAW believes the landowner could be a state or federal agency for which the request may not be easily</p>

FR	<p>obtained. By allowing for livestock operator, the confusion would be eliminated.</p> <p>The proposed change in wording from <i>livestock</i> to <i>landowner</i>, could be very dangerous. The wording should remain the same as the June 2007 draft. Leaving the livestock producers at the whim of the State and Federal land “owners” is a most unsettling option. The livestock owners know best how to deal with the health of his or her livestock.</p> <p>Response: <i>Wyoming law clearly recognizes the right of landowners to make decisions regarding the use of their property. It is appropriate to recognize that a decision about the quality of water being discharged for agricultural use lies with the landowner rather than the individual leasing or using the property. This has previously been recognized and included in the other sections of Agricultural Use Protection document including the provisions for irrigation waivers and the reasonable access requirements. When land is entrusted to a federal agency then the federal agency is ultimately responsible for determining the appropriate use of that land.</i></p>
PAW	<p>34. Comment: In reviewing the WQD’s response to comments PAW does not see that Ms. Penny Hunter’s testimony was addressed for the most recent meeting in Jackson. PAW suggests strongly the WQD review Ms. Hunter’s testimony and all field reports regarding the risk management approach to setting new livestock and wildlife drinking water limits and reissue a revised response to comments.</p> <p>Response: <i>Ms. Penny Hunter’s testimony and associated report “Risk Management Considerations for Wyoming Livestock Water Quality Criteria” was reviewed and considered after it was received at the September 14, 2007 Board meeting. The premise of the report was addressed in a response to a comment authored by Devon Energy and also in a comment by PAW. Both discuss Penny Hunter’s premise that “in effect, the state requires a risk management evaluation before setting water quality criteria” to be compliant with W.S. 35-11-302(vi). As discussed in the September 14, 2007 response summary:</i></p> <p><i>“The components of a comprehensive risk management decision process are compatible with the process for developing rules such as the one currently proposed. However, we have concluded that these components have been addressed through a long history of developing permits for produced water as well as the process which has taken place for developing this proposed rule.</i></p> <p><i>The problem with the previous oil and gas permit limits became apparent with the increasing number of outfalls that resulted from CBM production. Wyoming began experiencing an unprecedented boom in natural gas</i></p>

production beginning around 1997. Prior to this time, the total number of oil and gas outfalls was approximately 470 at any one time. Today there are over 8000, and almost all of this growth is attributable to CBM discharges. Many of the historic 470 outfalls pre-dated the existence of DEQ.

The UW report was contracted by the DEQ to better evaluate whether the current limits are appropriate for protecting livestock watering uses. DEQ incorporated public input, including anecdotal information, into the decision making process. We also looked at the effects to beneficial users and industry by analyzing how often previous dischargers were able to meet the newly proposed effluent limits.

Prior to the start of major CBM production, protection of irrigation was not an issue of concern. However, with the need for irrigation protection, the process used for developing this proposed rule resulted in adding some significant new provisions based on public comments and input from experts in soils and irrigation. Some of those provisions include setting permit limits based on background conditions, conducting comprehensive no harm analysis studies, and providing an optional waiver for those discharges which are unable to meet any limits under the tiered approach by obtaining permission from down stream users who are willing to accept the risk of receiving lesser quality water.”

Compliance with W.S. 35-11-302 was also discussed in the June 15, 2007 response summary and has been added to this response summary in response to comment 3.

PAW

35. Comment: To better protect the livestock and wildlife that are or will be allowed to use the available water; PAW suggests the WQD remove the proposed livestock and wildlife drinking water standards listed in the proposed policy/rule. The Division’s SOPR demonstrates that there is no need to change the standards. If most of the active discharges will not be affected, the standards that have been in place prior to this rulemaking must have been protective. The WQD already has standards for livestock and wildlife in Chapter 2, appendix H, and these standards should continue to be followed.

Response: *The SOPR serves as the document which discusses the reasoning for decisions made by the DEQ to revise rules and regulations, in this case, livestock watering effluent limits. The decision to revise the limits was made largely due to the conclusions of the UW report which suggests that some constituents should be more protective. Others constituents in this section have been shown to be protective at their current limits or were removed because the concentrations observed in discharges are unlikely to be present in concentrations which threaten a measurable decrease in livestock health and production. We see no correlation between a producer’s ability to meet*

<p>HSCC</p>	<p><i>the proposed effluent limits and the qualitative aspects of the proposed limits being protective of this agricultural use.</i></p> <p>36. Comment: Hot Springs County Commissioners comment in two separate letters both dated December 4, 2007. The premise of their concerns are related to the impacts to Hot Springs County from adopting any limits, but more particularly the proposed livestock watering sulfate limit, which may have significant impact on the social and economic welfare of Hot Springs county and its residents. They make particular note about DEQ’s responsibility to meet the statutory requirements of WS 35-11-302. They are also concerned about legal challenges to the grandfathering provisions which allows for permittees who were issued permits prior to January 1, 1998 to retain their permit requirements and limits.</p> <p>Response: <i>The WQD has evaluated the oil and CBM gas discharges currently permitted in Hot Springs County. Review of that data suggests all dischargers will be able to meet the proposed livestock watering limits for the most problematic constituents, sulfate and sodium. Evaluation of this data indicates there are currently no active CBM discharge permits in the county. We found 33 oil discharger permits which are currently active or are being processed for approval in the county, some having more than one outfall. Of the 33 permits, all have been able to meet the proposed sulfate limit of 2,000 mg/L. Three permits had at least one sample which exceeded the proposed sodium limit of 1,000 mg/L, but all three would be captured by the grandfathering provision.</i></p> <p><i>Concerns about legal challenges are addressed in response to comment number 6. Concerns and questions about meeting the statutory requirements of WS 35-11-302 are addressed in response to comment number 3.</i></p>
<p>FR</p>	<p>37. Comment: Please do not change the livestock “protection standards” that were in the Previous, i.e., “Old Policy”.</p> <p>Response: <i>The proposed effluent limits were developed based on a scientific literature review of safe drinking water levels for livestock and should be protective for that use. Further review of an applicant’s ability to obtain a surface water discharge permit if this proposed rule is adopted suggests the majority of all applicants will be able to obtain a permit. Please see responses to comments 4, 9, 24, 25, 26, and 27 for more detail.</i></p>
<p>FR</p>	<p>38. Comment: The proposed draft embodies language that places limits on several new constituents. There is little or no data available to evaluate the effects on our basic Wyoming industries: agriculture, oil and gas. There is no available data on over 70% of our current water discharges in Wyoming to date.</p>

Only eleven of thirty-nine of the past discharges since 1 June 1998 have any data at all and they all meet the newly proposed limits. It is a dangerous assumption to work with such limited data when there is so much economic value at stake in various livestock and wildlife enterprises depending on the water. Remember, this water has posed no animal health threat at all in the past or present. Our ranch and the previous owners have used the Dry Creek water for over nearly a century with no ill effects!

Response: *The WQD is not aware of how the commenter came up with the figure of 70%. The WQD obtained data from representative samples for each of the parameters which are being revised or added, except for molybdenum, which is discussed in response to comment numbers 26 and 32. The data was taken from DMRs, applications, review of individual permits, and/or inspection reports. We have since expanded the evaluation of oil treaters who are unable to obtain a grandfathering waiver. We know now from inspections or sampling data for each of the sites that only two of the 39 facilities sampled have been unable to meet the proposed effluent limits for sulfate or sodium. It should be noted that two of the 39 could not be sampled during recent facility inspections because of frozen discharge outfalls, two were not discharging, and we are still awaiting chemical analysis for one. The results of the WQD's evaluation are discussed further in responses to comment numbers 4, 9, 24, 25, 26, and 27.*

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