

WATER QUALITY RULES AND REGULATIONS

Chapter 1

WYOMING SURFACE WATER QUALITY STANDARDS

TABLE OF CONTENTS

Section 1.	Authority	1
Section 2.	Definitions	1
Section 3.	Water Uses	8
Section 4.	Surface Water Classes and Uses	9
Section 5.	Standards Enforcement	13
Section 6.	Interstate Compacts, Court Decrees and Water Rights	13
Section 7.	Class 1 Waters	13
Section 8.	Antidegradation	14
Section 9.	Mixing Zones	14
Section 10.	Testing Procedures	14
Section 11.	Flow Conditions	15
Section 12.	Protection of Wetlands	15
Section 13.	Toxic Materials	16
Section 14.	Dead Animals and Solid Waste	16
Section 15.	Settleable Solids	16
Section 16.	Floating and Suspended Solids	16
Section 17.	Taste, Odor and Color	16
Section 18.	Human Health	17
Section 19.	Industrial Water Supply	17
Section 20.	Agricultural Water Supply	17
Section 21.	Protection of Aquatic Life	17
Section 22.	Radioactive Material	19
Section 23.	Turbidity.....	20
Section 24.	Dissolved Oxygen	20
Section 25.	Temperature	20
Section 26.	pH	21
Section 27.	<i>E.coli</i> Bacteria	21
Section 28.	Undesirable Aquatic Life	22

Section 29.	Oil and Grease	22
Section 30.	Total Dissolved Gases	22
Section 31.	Colorado Basin Salinity	22
Section 32.	Biological Criteria.	22
Section 33.	Reclassifications and Site-Specific Criteria	23
Section 34.	Use Attainability Analysis	24
Section 35.	Credible Data.	24
Section 36.	Effluent Dependent Criteria	25
Section 37.	Discharger Specific Variance	26
Appendix A.	Wyoming Surface Water Classifications	A-1
Appendix B.	Water Quality Criteria	B-1
Appendix C.	Ammonia Toxicity Criteria	C-1
Appendix D.	Dissolved Oxygen Criteria	D-1
Appendix E.	References to Develop Site-Specific Criteria and Bioassays	E-1
Appendix F.	Conversion Factors and Equations for Hardness Dependent Metals	F-1
Appendix G.	Equations For pH Dependent Parameters	G-1

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46

Chapter 1

WYOMING SURFACE WATER QUALITY STANDARDS

Section 1. Authority. These regulations are promulgated pursuant to Wyoming Statutes (W.S.) 35-11-101 through 35-11-1803, 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, defined at W.S. 35-11-103(a)(xiii) and 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 W.S. 35-11-103(a) and (c) of the Wyoming Environmental Quality Act apply to these rules. For example:

(i) “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;

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

(iii) “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;

(iv) “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;

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

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

(vii) “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);

(viii) “Point source” means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure,

47 container, rolling stock, concentrated animal feeding operation or vessel or other floating craft,
48 from which pollutants are or may be discharged;

49
50 (ix) "Pollution" means contamination or other alteration of the physical,
51 chemical or biological properties of any waters of the state, including change in temperature,
52 taste, color, turbidity or odor of the waters or any discharge of any acid or toxic material,
53 chemical or chemical compound, whether it be liquid, gaseous, solid, radioactive or other
54 substance, including wastes, into any waters of the state which creates a nuisance or renders any
55 waters harmful, detrimental or injurious to public health, safety or welfare, to domestic,
56 commercial, industrial, agricultural, recreational or other legitimate beneficial uses, or to
57 livestock, wildlife or aquatic life, or which degrades the water for its intended use, or adversely
58 affects the environment. This term does not mean water, gas or other material which is injected
59 into a well to facilitate production of oil, or gas or water, derived in association with oil or gas
60 production and disposed of in a well, if the well used either to facilitate production or for
61 disposal purposes is approved by authority of the state, and if the state determines that such
62 injection or disposal well will not result in the degradation of ground or surface or water
63 resources;

64
65 (x) "Wastes" means sewage, industrial waste and all other liquid, gaseous,
66 solid, radioactive, or other substances which may pollute any waters of the state;

67
68 (xi) "Waters of the state" means all surface and groundwater, including waters
69 associated with wetlands, within Wyoming;

70
71 (xii) "Wetlands" means those areas in Wyoming having all three (3) essential
72 characteristics:

73
74 (A) Hydrophytic vegetation;

75
76 (B) Hydric soils; and

77
78 (C) Wetland hydrology.

79
80 (xiii) "Wetland value" means those socially significant attributes of wetlands
81 such as uniqueness, heritage, recreation, aesthetics and a variety of economic values.

82
83 (b) The following definitions supplement those definitions contained in W.S. 35-11-
84 103 of the Wyoming Environmental Quality Act.

85
86 (i) "Acute value" means the one hour average concentration. The EPA has
87 determined that this value, if not exceeded more than once every three years on average, should
88 not result in unacceptable effects on freshwater aquatic organisms and their uses. Acute values
89 represent a response to a stimulus severe enough to induce a rapid reaction, typically in 96 hours
90 or less. Appendix B contains acute values for certain pollutants.

91

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

96
97 (iii) “Ambient-based criteria” means water quality criteria that are calculated
98 based upon actual ambient or background water body conditions.
99

100 (iv) “Aquatic life” means fish, invertebrates, amphibians and other flora and
101 fauna which inhabit waters of the state at some stage of their life cycles. Aquatic life does not
102 include human pathogens or insect pests, aquatic invasive species or other organisms which may
103 be considered “undesirable” by the Wyoming Game and Fish Department or U.S. Fish and
104 Wildlife Service within their appropriate jurisdictions.
105

106 (v) “Best management practices (BMPs)” means a practice or combination of
107 practices that after problem assessment, examination of alternative practices, and in some cases
108 public participation, are determined to be the most technologically and economically feasible
109 means of managing, preventing or reducing nonpoint source pollution.
110

111 (vi) “Chronic value” means the four day average concentration. The EPA has
112 determined that this value, if not exceeded more than once every three years on average, should
113 not result in unacceptable effects on freshwater aquatic organisms and their uses. Chronic values
114 represent a response to a continuous, long-term stimulus. Appendix B contains chronic values for
115 certain pollutants.
116

117 (vii) “Cold water game fish” means burbot (genus *Lota*), grayling (genus
118 *Thymallus*), trout, salmon and char (genera *Salmo*, *Oncorhynchus* and *Salvelinus*) and whitefish
119 (genus *Prosopium*).
120

121 (viii) “Construction-related discharge” means discharges of sediment or
122 turbidity related to construction activities in or along waters of the state. Generally, these
123 discharges include, but are not limited to, construction site dewatering, temporary diversions,
124 runoff from construction sites, excavation or equipment operation beneath the water’s surface,
125 the discharge of dredged or fill material and placement of structural members such as bridge
126 abutments, culverts, pipelines, etc. into or across any water of the state.
127

128 (ix) “Designated uses” means those uses specified in water quality standards
129 for each water body or segment whether or not they are being attained.
130

131 (x) [“Discharger specific variance” means a time-limited designated use and](#)
132 [water quality criteria granted to a specific permittee that reflects the highest attainable condition](#)
133 [during the duration of the variance.](#)
134

135 (xi) “Dissolved oxygen” means a measure of the amount of free oxygen in
136 water.
137

138 (xi) “*E. coli*” means any of the bacterium in the family Enterobacteriaceae
139 named *Escherichia* (genus) *coli* (species).
140

141 (xii) “Effluent dependent water” means a water body with insufficient natural
142 flow to support aquatic life, but which has perennial or intermittent flows for all or a portion of
143 its length as the result of the discharge of wastewater.
144

145 (xiii) “Effluent limitations” means any restriction established by the state or by
146 the administrator of the Environmental Protection Agency on quantities, rates and concentrations
147 of chemical, physical, biological and other constituents which are discharged from point sources
148 into waters of the state, including schedules of compliance.
149

150 (xiv) “Environmental Protection Agency” means the federal Environmental
151 Protection Agency (EPA).
152

153 (xv) “Ephemeral stream” means a stream which flows only in direct response
154 to a single precipitation event in the immediate watershed or in response to a single snow melt
155 event, and which has a channel bottom that is always above the prevailing water table.
156

157 (xvi) “Eutrophic” means the condition whereby waters or environments
158 saturated with water become nutrient enriched (especially with phosphorus or nitrogen). This
159 action leads to those waters becoming oxygen depleted or anaerobic.
160

161 (xvii) “Existing quality” as used in these regulations refers only to Class 1
162 waters and means the established chemical, physical and biological water quality as of the date
163 the specific water segment was designated Class 1 with recognition that water quality will
164 fluctuate on a seasonal and year-to-year basis depending upon natural variations in water
165 quantity.
166

167 (xviii) “Existing use” means those uses actually attained in the water body on or
168 after November 28, 1975, whether or not they are included in the water quality standards.
169

170 (xix) “Federal Act” means the Federal Water Pollution Control Act (Clean
171 Water Act) and amendments as of November 27, 2002.
172

173 (xx) “Full body contact water recreation” means any recreational or other
174 surface water use in which there is contact with the water sufficient to pose a significant health
175 hazard (i.e. water skiing, swimming).
176

177 (xxi) “Game fish” means bass (genera *Micropterus* and *Ambloplites*), catfish
178 and bullheads (genera *Ameiurus*, *Ictalurus* and *Noturus*), crappie (genus *Pomoxis*), freshwater
179 drum (genus *Aplodinotus*), grayling (genus *Thymallus*), burbot (genus *Lota*), pike (genus *Esox*),
180 yellow perch (genus *Perca*), sturgeon (genus *Scaphirhynchus*), sunfish (genus *Lepomis*), trout,
181 salmon and char (genera *Salmo*, *Oncorhynchus* and *Salvelinus*), walleye and sauger (genus
182 *Sander*) and whitefish (genus *Prosopium*).
183

184 (xxiii) “Highest attainable condition” means the designated use and water quality
 185 criteria or effluent condition closest to the underlying designated use and water quality criteria or
 186 water quality-based effluent limit that is feasible to achieve without causing substantial and
 187 widespread economic and social impacts.

188
 189 (xxiv) “Historic data” means scientifically valid data that are more than five
 190 years old or qualitative information that adds some factual information on the historic conditions
 191 of a water body. This historic qualitative information may include photographs, journals and
 192 factual testimony of persons who have lived near or relied upon the water body, and old records
 193 on water use and water conditions.

194
 195 (xxv) “Hydric soil” means a soil that formed under conditions of saturation,
 196 flooding or ponding long enough during the growing season to develop anaerobic conditions in
 197 the upper part.

198
 199 (xxvi) “Hydrophytic vegetation” means a community of plants where, under
 200 normal circumstances, more than 50 percent of the composition of the dominant species from all
 201 strata are obligate wetland (OBL), facultative wetland (FACW), and/or facultative (FAC)
 202 species; or a frequency analysis of all species within the community yields a prevalence index
 203 value of less than 3.0 (where OBL = 1.0, FACW = 2.0, FAC = 3.0, FACU (facultative upland) =
 204 4.0, and UPL (upland species) = 5.0).

205
 206 (xxvii) “Intermittent stream” means a stream or part of a stream where the
 207 channel bottom is above the local water table for some part of the year, but is not a perennial
 208 stream.

209
 210 (xxviii) “Isolated water” means any surface water of the state which is not
 211 connected by a defined channel to a surface tributary system, is not within the 100 year flood
 212 plain of any river or stream and does not occupy the fringe of any still water body which is
 213 connected by a defined channel to a surface tributary system.

214
 215 (xxix) “Main stem” means the major channel of a river or stream as
 216 shown on the latest and most detailed records of the Wyoming State Engineer.

217
 218 (xxx) “Micrograms per liter (µg/L)” means micrograms of solute per liter
 219 of solution equivalent to parts per billion (ppb) in liquids, assuming unit density.

220
 221 (xxxi) “Milligrams per liter (mg/L)” means milligrams of solute per liter of
 222 solution equivalent to parts per million (ppm) in liquids, assuming unit density.

223
 224 (xxxii) “Mixing zone” means limited area or volume of a surface water body
 225 within which an effluent becomes thoroughly mixed with the water body.

226
 227 (xxxiii) “Natural” means that condition which would exist without the measurable
 228 influence of man's activities.

229

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

234
 235 (xxxiv~~ii~~) “Natural water quality” means that quality of water which would
 236 exist without the measurable influence of man's activities.

237
 238 (xxxv~~i~~) “Nephelometric turbidity unit (NTU)” means the standard unit
 239 used to measure the optical property that causes light to be scattered and absorbed rather than
 240 transmitted in straight lines through water, as measured by a nephelometer.

241
 242 (xxxv~~ii~~) “Net environmental benefit (NEB)” means a risk management
 243 approach to derive site-specific criteria for effluent dependent water bodies that weighs the
 244 potential for loss of a permitted effluent discharge against the benefits of augmented flow. A net
 245 environmental benefit is demonstrated where there is a credible threat to remove the permitted
 246 discharge, the discharge has been shown to create an environmental benefit, removal of the
 247 discharge would cause more environmental harm than leaving it in place and the discharge will
 248 not pose a health risk to humans, livestock or wildlife.

249
 250 (xxxviii) “Nongame fish” means all fish species except those listed in
 251 Section 2(b)(xxi) above.

252
 253 (xxxix) “Non-priority pollutant” means any substance or combination of
 254 substances other than those listed by EPA under Section 307(a) of the Clean Water Act.

255
 256 (xxxix~~iii~~) “Perennial stream” means a stream or part of a stream that flows
 257 continually during all of the calendar year as the result of a groundwater discharge or surface
 258 runoff.

259
 260 (xli~~xxxix~~) “pH” means a term used to express the intensity of acidic or
 261 alkaline conditions. pH is a measure of the hydrogen ion activity in a water sample. It is
 262 mathematically related to hydrogen ion activity according to the expression: $\text{pH} = -\log_{10}(\text{H}^+)$,
 263 where (H^+) is the hydrogen ion activity. A pH value of 7 at 25 degrees Celsius is neutral, with
 264 pHs less than 7 progressively more acidic and pHs greater than 7 progressively more basic
 265 (alkaline).

266
 267 (xlii) “PicoCuries per liter (pCi/L)” means a term describing the radiation level
 268 of water or solutions. A picocurie is equal to 10^{-12} curie; a curie is defined as 3.7×10^{10}
 269 disintegrations per second.

270
 271 (xliii) “Pollutant minimization program” means a structured set of activities
 272 intended to maintain and/or improve treatment processes and pollutant controls to prevent and
 273 reduce pollutant loadings.

274

275 (xlv) “Priority pollutants” means those substances or combination of substances
276 that are listed by EPA under Section 307(a) of the Clean Water Act.
277

278 (xlv) “Primary contact recreation” means any recreational or other surface water
279 use that could be expected to result in ingestion of the water or immersion (full body contact).
280

281 (xlvii) “Salinity” means the total mineral dissolved constituents, after carbonates
282 have been converted to oxides, organics have been oxidized and bromine and iodine have been
283 replaced by chloride. This term is often used interchangeably with the term total dissolved solids.
284

285 (xlviii) “Seasonal fishery” means a water body, or portion thereof, which supports
286 game and/or nongame fish or spawning for only a portion of the year, but does not have the
287 natural physical conditions necessary to support those uses on a year round basis. Seasonal
288 fisheries may include intermittent and ephemeral streams, shallow reservoirs, lakes or ponds,
289 which either naturally recruit fish from adjacent perennial water bodies or are managed as put-
290 and-take fisheries.
291

292 (xlviii) “Secondary contact recreation” means any recreational or other surface
293 water use in which contact with water is either incidental or accidental and that would not be
294 expected to result in ingestion of the water or immersion.
295

296 (xlix) “Storm water”, for the purposes of Section 7 of these regulations, means
297 surface runoff from construction sites or industrial activities which are regulated under Section
298 402(p) of the Clean Water Act and Chapter 2 of the Wyoming Water Quality Rules and
299 Regulations. Excluded from this definition are those storm water discharges associated with
300 industrial activities which are subject to an existing federal effluent limitation guideline
301 addressing storm water and where the constituents listed in the federal effluent limitations have a
302 reasonable potential to affect the receiving waters.
303

304 (xlvii) “Surface waters of the state” means all perennial, intermittent and
305 ephemeral defined drainages, lakes, reservoirs and wetlands which are not man-made retention
306 ponds used for the treatment of municipal, agricultural or industrial waste; and all other bodies of
307 surface water, either public or private which are wholly or partially within the boundaries of the
308 state. Nothing in this definition is intended to expand the scope of the Environmental Quality
309 Act, as limited in W.S. 35-11-1104.
310

311 (xlviii) “Toxic materials” means those materials or combinations of materials
312 including disease causing agents, which, after discharge and upon exposure, ingestion, inhalation
313 or assimilation into any organism, either directly from the environment or indirectly by ingestion
314 through food chains, will, on the basis of information available to the director of the Wyoming
315 Department of Environmental Quality (department), cause death, disease, behavioral
316 abnormalities, cancer, genetic malfunctions, physiological malfunctions (including malfunctions
317 in reproduction) or physical deformations in such organisms or their offspring.
318

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

322
 323 (l~~ii~~) “Undesirable aquatic life” means organisms generally associated with
 324 degraded or eutrophic conditions. These may include the following organisms where they have
 325 replaced members of the natural biotic community: insect pests, aquatic invasive species or
 326 other organisms which may be considered “undesirable” by the Wyoming Game and Fish
 327 Department or the U.S. Fish and Wildlife Service within their appropriate jurisdictions.

328
 329 (l~~iv~~) “Use attainability analysis (UAA)” means a structured scientific
 330 assessment of the factors affecting the attainment of the use. The factors may include physical,
 331 chemical, biological and economic factors as described in Section 33 of these regulations.

332
 333 (l~~iv~~) “Warm water game fish” means bass (genera *Micropterus* and
 334 *Ambloplites*), catfish and bullheads (genera *Ameiurus*, *Ictalurus* and *Noturus*), crappie (genus
 335 *Pomoxis*), yellow perch (genus *Perca*), sunfish (genus *Lepomis*), walleye and sauger (genus
 336 *Sander*), pike (genus *Esox*), sturgeon (genus *Scaphirhynchus*) and freshwater drum (genus
 337 *Aplodinotus*).

338
 339 (l~~iv~~) “Wetland hydrology” means the presence of water on or near the land
 340 surface at a frequency and duration to cause the formation of hydric soils and support a
 341 prevalence of vegetation typically adapted to saturated and/or inundated conditions.

342
 343 (l~~iv~~) “Wyoming Continuing Planning Process (CPP)” means a planning process
 344 provided for under Section 303(e)(1) of the Clean Water Act developed through public
 345 participation and consisting of policies, procedures and programs that result in the definition and
 346 implementation of actions that lead to the prevention, reduction and abatement of water pollution
 347 and for the protection and enhancement of water uses in the State of Wyoming. The CPP is
 348 continuous in time and is designed to respond to changes in conditions and attitudes. The CPP is
 349 adopted by resolution of the Water and Waste Advisory Board and is certified by the Governor.

350
 351 (l~~vi~~) “Wyoming surface waters” shall have the same meaning as “surface
 352 waters of the state” defined in Section 2(b)(xlvii).

353
 354 (l~~x~~) “Zone of passage” means a continuous water route which joins segments
 355 of a surface water body above and below a mixing zone.

356
 357 (l~~x~~) “404 permit” means a permit issued pursuant to Section 404 of the Clean
 358 Water Act to regulate the discharge of dredged or fill materials into surface waters of the United
 359 States.

360
 361 **Section 3. Water Uses.** The objectives of the Wyoming water pollution control
 362 program are described in W.S. 35-11-102. These objectives are designed to serve the interests of
 363 the state and achieve the related goals, objectives and policies of the Clean Water Act. The

364 objectives of the Wyoming program are to provide, wherever attainable, the highest possible
365 water quality commensurate with the following uses:

366
367 (a) Agriculture. For purposes of water pollution control, agricultural uses include
368 irrigation and/or livestock watering.

369
370 (b) Fisheries. The fisheries use includes water quality, habitat conditions, spawning
371 and nursery areas, and food sources necessary to sustain populations of cold water game fish,
372 warm water game fish and nongame fish. This use does not include the protection of aquatic
373 invasive species or other fish which may be considered “undesirable” by the Wyoming Game
374 and Fish Department or the U.S. Fish and Wildlife Service within their appropriate jurisdictions.

375
376 (c) Industry. Industrial use protection involves maintaining a level of water quality
377 useful for industrial purposes.

378
379 (d) Drinking water. The drinking water use involves maintaining a level of water
380 quality that is suitable for potable water or intended to be suitable after receiving conventional
381 drinking water treatment.

382
383 (e) Recreation. Recreational use protection involves maintaining a level of water
384 quality which is safe for human contact. It does not guarantee the availability of water for any
385 recreational purpose. The recreation designated use includes primary contact recreation and
386 secondary contact recreation subcategories.

387
388 (f) Scenic value. Scenic value use involves the aesthetics of the aquatic systems
389 themselves (odor, color, taste, settleable solids, floating solids, suspended solids and solid waste)
390 and is not necessarily related to general landscape appearance.

391
392 (g) Aquatic life other than fish. This use includes water quality and habitat necessary
393 to sustain populations of organisms other than fish in proportions which make up diverse aquatic
394 communities common to the waters of the state. This use does not include the protection of
395 human pathogens, insect pests, aquatic invasive species or other organisms which may be
396 considered “undesirable” by the Wyoming Game and Fish Department or the U.S. Fish and
397 Wildlife Service within their appropriate jurisdictions.

398
399 (h) Wildlife. The wildlife use includes protection of water quality to a level which is
400 safe for contact and consumption by avian and terrestrial wildlife species.

401
402 (i) Fish consumption. The fish consumption use involves maintaining a level of
403 water quality that will prevent any unpalatable flavor and/or accumulation of harmful substances
404 in fish tissue.

405
406 **Section 4. Surface Water Classes and Uses.** The following water classes are a
407 hierarchical categorization of waters according to existing and designated uses. Except for Class
408 1 waters, each classification is protected for its specified uses plus all the uses contained in each
409 lower classification. Class 1 designations are based on value determinations rather than use

410 support and are protected for all uses in existence at the time or after designation. There are four
411 major classes of surface water in Wyoming with various subcategories within each class (see
412 *Wyoming Surface Water Classification List* for current classifications).

413

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

424

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

430

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

442

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

448

449 (iii) Class 2B. Class 2B waters are those known to support or have the
450 potential to support game fish populations or spawning and nursery areas at least seasonally and
451 all their perennial tributaries and adjacent wetlands and where it has been shown that drinking
452 water uses are not attainable pursuant to the provisions of Section 33. Class 2B waters include
453 permanent and seasonal game fisheries and can be either “cold water” or “warm water”
454 depending upon the predominance of cold water or warm water species present. All Class 2B
455 waters are designated as cold water game fisheries unless identified as a warm water game

456 fishery by a “ww” notation in the *Wyoming Surface Water Classification List*. Uses designated
457 on Class 2B waters include game and nongame fisheries, fish consumption, aquatic life other
458 than fish, recreation, wildlife, industry, agriculture and scenic value.

459

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

466

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

475

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

486

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

490

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

499

500 (iii) Class 3C. Class 3C waters are perennial streams without the natural water
501 quality potential to support fish or drinking water supplies but do support wetland characteristics.

502 These may include geothermal waters and waters with naturally high concentrations of dissolved
503 salts or metals or pH extremes.

504

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

511

512 (d) Class 4, Agriculture, Industry, Recreation and Wildlife. Class 4 waters are waters,
513 other than those designated as Class 1, where it has been determined that aquatic life uses are not
514 attainable pursuant to the provisions of Section 33 of these regulations. Uses designated on Class
515 4 waters include recreation, wildlife, industry, agriculture and scenic value.

516

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

519

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

526

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

533

534 (e) Specific stream segment classifications are contained in a separate document
535 entitled *Wyoming Surface Water Classification List* which is published by the department and
536 periodically revised and updated according to the provisions of Sections 4, 33, 34, 35 and
537 Appendix A of this chapter. Class 1 waters are those waters that have been specifically
538 designated by the council. Class 2AB, 2A, 2B and 2C designations are based upon the fisheries
539 information contained in the Wyoming Game and Fish Department's *Streams and Lakes*
540 *Database* submitted to the department in June 2000. This database represents the best available
541 information and is considered conclusive. Class 2D and 3D designations are based upon use
542 attainability analyses demonstrating that the waters are effluent dependent and do not pose a
543 hazard to humans, wildlife or livestock. Class 4 designations are based upon knowledge that a
544 water body is an artificial, man-made conveyance, or has been determined not to support aquatic
545 life uses through an approved use attainability analysis. All other waters are designated as Class
546 3A, 3B or 3C. Section 27 of these regulations describes how recreation use designations are
547 made for specific water bodies.

548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591

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 and Dilution Allowances, Turbidity and Use Attainability Analysis*, 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 Section 7(b) of these regulations, 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.

592 **Section 8. Antidegradation.**

593

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

601

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

603

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

605

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

609

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

612

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

617

618 (c) The procedures used to implement this section are described in the
619 *Antidegradation Implementation Policy*.

620

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

632

633 **Section 10. Testing Procedures.** For determination of the parameters involved in the
634 standards, analyses will be in accordance with test procedures defined pursuant to: Title 40, Code
635 of Federal Regulations, Part 136, or any modifications thereto. For test procedures not listed in
636 the Code of Federal Regulations, test procedures outlined in the latest editions of: *EPA Methods*

637 *for Chemical Analysis of Water and Wastes; Standard Methods for the Examination of Water*
638 *and Wastewaters; or ASTM Standards shall be used.*

639
640 Where standard methods of testing have not been established, the suitability of testing
641 procedures shall be determined by the department and the EPA using defensible scientific
642 methods.

643
644 Numeric criteria included in the standards represent levels necessary to protect
645 designated uses and do not necessarily reflect detection limits that can be achieved using
646 standard analytical techniques. Standard analytical techniques are considered during
647 development of discharge permits and evaluation of water quality data. Sampling entities should
648 consult with the department to determine reporting limit needs to ensure that adequate testing
649 procedures and reporting limits are requested from the laboratory.

650
651 **Section 11. Flow Conditions.**

652
653 (a) Numeric water quality standards shall be enforced at all times except during
654 periods below low flow. Low flow can be determined by the following methods:

655
656 (i) Using the 7Q10 (the minimum seven (7) consecutive day flow which has
657 the probability of occurring once in ten (10) years);

658
659 (ii) The EPA's biologically based flow method which determines a four (4)
660 day, three (3) year low flow for chronic exposures and a one (1) day, three (3) year low flow for
661 acute exposures (*Technical Guidance Manual For Performing Waste Load Allocation, Book VI,*
662 *Design Conditions: Chapter 1, Stream Design Flow for Steady-State Modeling, August 1986, US*
663 *EPA*); or

664
665 (iii) Other defensible scientific methods.

666
667 For all methods, application of the standards will conform to the magnitude, duration and
668 frequency provisions described in these regulations.

669
670 (b) During periods when stream flows are less than the minimums described above,
671 the department may, in consultation with the Wyoming Game and Fish Department and the
672 affected discharger(s), require permittees to institute operational modifications as necessary to
673 insure the protection of aquatic life. This section should not be interpreted as requiring the
674 maintenance of any particular stream flow.

675
676 (c) The narrative water quality standards in Sections 14, 15, 16, 17, 28 and 29(b) of
677 these regulations shall be enforced at all streamflow conditions.

678
679 **Section 12. Protection of Wetlands.** Point or nonpoint sources of pollution shall not
680 cause the destruction, damage, or impairment of naturally occurring wetlands except when
681 mitigated through an authorized wetlands mitigation process. When approving mitigation, the

682 department may consider both the ecological functions and the wetland value of the disturbed
683 wetland.

684

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

691

692 **Section 13. Toxic Materials.** Except for those substances referenced in Sections 21(e)
693 and (f) of these regulations, toxic materials attributable to or influenced by the activities of man
694 shall not be present in any Wyoming surface water in concentrations or combinations which
695 constitute “pollution”.

696

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

703

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

707

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

713

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

719

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

723

724 (a) Of themselves or in combination, impart an unpalatable or off-flavor in fish flesh;

725

726 (b) Visibly alter the natural color of the water or impart color to skin, clothing,

727 vessels or structures;

728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772

(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 Consumption of Fish and Drinking Water” values listed in Appendix B of these regulations shall not be exceeded. In all Class 2B, 2C and 2D waters, the “Human Health Consumption of Fish” (consumption of aquatic organisms) values 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 established using the site-specific procedures outlined in the references listed in Appendix E or other scientifically defensible methods.

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.

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 tables in Appendix C of these regulations. The numeric ammonia criteria in Appendix C apply to all Class 1, 2AB, 2A, 2B and 2C waters.

773 (ii) In all Class 2D and 3 waters, concentrations of ammonia attributable to or
774 influenced by human activities shall not be present in concentrations which could result in
775 harmful acute or chronic effects to aquatic life, or which would not fully support existing and
776 designated uses.

777
778 (b) Specific numeric standards for a number of toxicants are listed in the “Aquatic
779 Life Acute Value” and “Aquatic Life Chronic Value” columns in Appendix B of these
780 regulations. These standards apply to all Class 1, 2 and 3 waters. For these pollutants, the chronic
781 value (four (4) day average concentration) and the acute value (one (1) hour average
782 concentration) shall not be exceeded more than once every three (3) years.

783
784 (c) Others. For those pollutants not listed in Appendix B or C of these regulations,
785 maximum allowable concentrations on Class 1, 2 and 3 waters shall be determined through the
786 bioassay procedures outlined in the references listed in Appendix E of these regulations.

787
788 (d) In certain waters, the criteria listed in Appendix B or C of these regulations may
789 not be appropriate due to unique physical or chemical conditions. In such cases, acute and
790 chronic values may be determined using the site-specific procedures outlined in the references
791 listed in Appendix E or other scientifically defensible methods.

792
793 (e) Aquatic pesticides specifically designed to kill, repel or mitigate aquatic pest
794 problems (e.g. mosquito larvae or heavy plant growth in irrigation ditches) may be added to
795 surface waters of the state if the use and application is in compliance with the following:

796
797 (i) The pesticide used is a product which has been registered with the EPA
798 and the Wyoming Department of Agriculture for use in the state, in accordance with W.S. 35-7-
799 356;

800
801 (ii) The application is conducted by a person licensed by the Wyoming
802 Department of Agriculture to purchase and apply restricted use pesticides in the state;

803
804 (iii) All applications of aquatic pesticides must be administered in accordance
805 with label directions. However, compliance with label directions shall not exempt any person or
806 agency from the penalty provisions of W.S. 35-11-901 should non-target species or non-target
807 areas be affected.

808
809 (f) This section shall not apply to the use of fish toxicants if the use and application is
810 in compliance with the following:

811
812 (i) The pesticide used is a product which has been registered with the EPA
813 and the Wyoming Department of Agriculture for use in the state, in accordance with W.S. 35-7-
814 356;

815
816 (ii) The application is conducted by a person licensed by the Wyoming
817 Department of Agriculture to purchase and apply restricted use pesticides in the state;

818

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

823
824 (iv) The Wyoming Game and Fish Department may apply fish toxicants to any
825 surface water of the state provided that prior notice is made to the department and after receipt of
826 verification from the Water Quality Division that the proposed application is in compliance with
827 this section.

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

835
836 (vi) Private certified pesticide applicators for restricted use pesticides may
837 apply fish toxicants only to waters located entirely on private property where there is no surface
838 outlet to waters of the state provided that prior notice is made to the department and after receipt
839 of verification from the Water Quality Division that the proposed application is in compliance
840 with this section. Approval, including any necessary permits, from the Wyoming Game and Fish
841 Department is also required prior to application of fish toxicants to insure protection of fish and
842 wildlife resources.

843
844 (vii) Pesticide applications must be conducted in a manner that minimizes to
845 the extent practicable, the magnitude of any change in the concentration of the parameters
846 affected by the activity and the length of time during which any change may occur. The
847 application must include measures that prevent significant risk to public health and ensure that
848 existing and designated uses of the water are protected and maintained upon the completion of
849 the activity.

850
851 (viii) Except for the circumstances described in (i) through (vii) above, no other
852 agency or person may apply fish toxicants in any water of the state.

853
854 **Section 22. Radioactive Material.**

855
856 (a) In Class 1, 2AB and 2A waters, radiological limits of 5 pCi/L for combined
857 radium-226 and radium-228, 15 pCi/L for gross alpha particle activity (excluding radon and
858 uranium), 30 µg/L for uranium and 4 millirems per year (mrem/year) for beta particle and photon
859 radioactivity shall not be exceeded.

860
861 (b) In Class 2B, 2C, 2D, 3 and 4 waters, the total radium-226 concentration shall not
862 exceed 60 pCi/L.

863

864 (c) In all Wyoming surface waters, radioactive materials attributable or influenced by
865 the activities of man shall not be present in the water or in the sediments in amounts which could
866 cause harmful accumulations of radioactivity in plant, wildlife, livestock or aquatic life.
867

868 **Section 23. Turbidity.**
869

870 (a) In all cold water fisheries and/or drinking water supplies (Classes 1, 2AB, 2A and
871 2B), the discharge of substances attributable to or influenced by the activities of man shall not be
872 present in quantities which would result in a turbidity increase of more than ten (10)
873 nephelometric turbidity units (NTUs).
874

875 (b) In all warm water or nongame fisheries (Classes 1, 2AB, 2B and 2C), the
876 discharge of substances attributable to or influenced by the activities of man shall not be present
877 in quantities which would result in a turbidity increase of more than 15 NTUs.
878

879 (c) An exception to paragraphs (a) and (b) of this section shall apply to:
880

881 (i) The North Platte River from Guernsey Dam to the Nebraska line during
882 the annual "silt run" from Guernsey Dam; and
883

884 (ii) Short-term increases of turbidity that have been determined by the
885 administrator to have only a minimal effect on water uses. Such determinations shall be made on
886 a case-by-case basis and shall be subject to whatever controls, monitoring and best management
887 practices are necessary to fully maintain and protect all water uses. The procedures used to
888 implement this section are described in the *Turbidity Implementation Policy*.
889

890 **Section 24. Dissolved Oxygen.** In all Class 2A, 2D and 3 waters, pollution attributable
891 to the activities of man shall not deplete dissolved oxygen amounts to a level which will result in
892 harmful acute or chronic effects to aquatic life, or which would not fully support existing and
893 designated uses.
894

895 In all Class 1, 2AB, 2B and 2C waters, pollution attributable to the activities of man shall
896 not result in a dissolved oxygen content of less than that presented on the chart in Appendix D of
897 these regulations.
898

899 **Section 25. Temperature.**
900

901 (a) For Class 1, 2 and 3 waters, pollution attributable to the activities of man shall not
902 change ambient water temperatures to levels which result in harmful acute or chronic effects to
903 aquatic life, or which would not fully support existing and designated uses.
904

905 (b) When ambient temperatures are above 60 degrees Fahrenheit (15.6 degrees
906 Celsius) in all Class 1, 2AB and 2B waters which are cold water fisheries, pollution attributable
907 to the activities of man shall not result in an increase of more than 2 degrees Fahrenheit (1.1
908 degree Celsius) in existing temperatures.
909

910 (c) When ambient temperatures are above 60 degrees Fahrenheit (15.6 degrees
911 Celsius) in all Class 1, 2AB, 2B and 2C waters which are warm water fisheries, pollution
912 attributable to the activities of man shall not result in an increase of more than 4 degrees
913 Fahrenheit (2.2 degrees Celsius) in existing temperatures.

914
915 (d) Except on Class 2D, 3 and 4 waters, the maximum allowable stream temperature
916 will be the maximum natural daily stream temperature plus the allowable change, provided that
917 this temperature is not lethal to existing fish life and under no circumstance shall pollution
918 attributable to the activities of man result in a temperature that exceeds 68 degrees Fahrenheit
919 (20 degrees Celsius) in the case of cold water fisheries and 86 degrees Fahrenheit (30 degrees
920 Celsius) in the case of warm water fisheries.

921
922 (e) With the exception of the provisions of Sections 9 and 11 of these regulations and
923 other natural conditions, temperature standards shall apply at all times and at all depths of the
924 receiving water and may not be violated at any time or at any depth.

925
926 (f) The various requirements of this section may be waived only under the provisions
927 of Section 316(a) of the Clean Water Act.

928
929 **Section 26. pH.**

930
931 (a) For all Wyoming surface waters, pollution attributable to the activities of man
932 shall not be present in amounts which will cause the pH to be less than 6.5 or greater than 9.0
933 standard units.

934
935 (b) For all Class 1, 2 and 3 waters, pollution attributable to the activities of man shall
936 not change the pH to levels which result in harmful acute or chronic effects to aquatic life,
937 directly or in conjunction with other chemical constituents, or which would not fully support
938 existing and designated uses.

939
940 **Section 27. *E. coli* Bacteria.**

941
942 (a) Primary Contact Recreation. In all waters designated for primary contact
943 recreation, during the summer recreation season (May 1 through September 30), concentrations
944 of *E. coli* bacteria shall not exceed a geometric mean of 126 organisms per 100 milliliters during
945 any consecutive 60-day period. Primary contact waters are identified in the *Wyoming Surface*
946 *Water Classification List*.

947
948 (b) Secondary Contact Recreation. In all waters designated for secondary contact
949 recreation and in waters designated for primary contact recreation during the winter recreation
950 season (October 1 through April 30), concentrations of *E. coli* bacteria shall not exceed a
951 geometric mean of 630 organisms per 100 milliliters during any consecutive 60-day period.
952 Waters will be designated for secondary contact recreation through the reclassification and use
953 attainability analysis process outlined in Sections 33 and 34 of these regulations. Secondary
954 contact waters are identified in the *Wyoming Surface Water Classification List*.

955

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

- 959
- 960 (i) High use swimming areas - 235 organisms per 100 milliliters
 - 961
 - 962 (ii) Moderate full body contact - 298 organisms per 100 milliliters
 - 963
 - 964 (iii) Lightly used full body contact - 410 organisms per 100 milliliters
 - 965
 - 966 (iv) Infrequently used full body contact - 576 organisms per 100 milliliters
 - 967

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

976

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

980

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

- 983
- 984 (a) The oil and grease content to exceed 10 mg/L; or
 - 985
 - 986 (b) The formation of a visible sheen or visible deposits on the bottom or shoreline, or
 - 987 damage or impairment of the normal growth, function or reproduction of human, animal, plant or
 - 988 aquatic life.
 - 989

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

993

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

998

999 **Section 32. Biological Criteria.** Class 1, 2 and 3 waters of the state must be free from
 1000 substances, whether attributable to human-induced point source discharges or nonpoint source

1001 activities, in concentrations or combinations which will adversely alter the structure and function
1002 of indigenous or intentionally introduced aquatic communities.

1003

1004 **Section 33. Reclassifications and Site-Specific Criteria.**

1005

1006 (a) Any person at any time may petition the department or the council to change the
1007 classification, add or remove a designated use or establish site-specific criteria on any surface
1008 water.

1009

1010 (b) The administrator may lower a classification, remove a designated use which is
1011 not an existing nor attainable use, establish ambient-based criteria on effluent dependent waters,
1012 make a recommendation to the council to establish sub-categories of a use or establish site-
1013 specific criteria if it can be demonstrated through a use attainability analysis (UAA) that the
1014 original classification, designated use or water quality criteria are not feasible because:

1015

1016 (i) Naturally occurring pollutant concentrations prevent the attainment of the
1017 classification or use; or

1018

1019 (ii) Natural, ephemeral, intermittent or low flow conditions or water levels
1020 prevent the attainment of the use, unless these conditions may be compensated for by the
1021 discharge of sufficient volume of effluent discharges without violating state water conservation
1022 requirements to enable uses to be met; or

1023

1024 (iii) Human caused conditions or sources of pollution prevent the attainment of
1025 the use and cannot be remedied or would cause more environmental damage to correct than to
1026 leave in place; or

1027

1028 (iv) Dams, diversions or other types of hydrologic modifications preclude the
1029 attainment of the classification or use, and it is not feasible to restore the water body to its
1030 original condition or to operate such modification in such a way that would result in the
1031 attainment of the classification or use; or

1032

1033 (v) Physical conditions related to the natural features of the water body, such
1034 as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water
1035 quality, preclude attainment of an aquatic life use; or

1036

1037 (vi) Controls more stringent than those required by Sections 301(b) and 306 of
1038 the Clean Water Act would result in substantial and widespread economic and social impact.
1039 This subsection shall not apply to the derivation of site-specific criteria.

1040

1041 (c) The administrator may raise a classification, add a designated use or make a
1042 recommendation to the council to establish sub-categories of a use or site-specific criteria, if it
1043 can be demonstrated through a use attainability analysis (UAA) that such uses are existing uses
1044 or may be attained with the imposition of more stringent controls or management practices.

1045

1046 (d) The procedures used to implement this section are described in the *Use*
1047 *Attainability Analysis Implementation Policy*.

1048
1049 (e) The provisions of subsections (b) and (c) above are not applicable to Class 1
1050 designations. Class 1 designations may be added or removed in accordance with the provisions
1051 of the Environmental Quality Act, the Wyoming Administrative Procedures Act and Section 4(a)
1052 of these regulations.

1053
1054 **Section 34. Use Attainability Analysis.** The administrator shall review all petitions
1055 submitted under Section 33 of these regulations and make a determination based upon the
1056 technical merits of the use attainability analysis. Public notice and opportunity for comment shall
1057 be provided prior to making this determination.

1058
1059 (a) Any changes in water classifications or use designations resulting from the
1060 administrator's determination shall be submitted to EPA for approval as revised water quality
1061 standards for Clean Water Act purposes and shall become effective either upon EPA approval or
1062 90 days after submittal, whichever comes first. If within 90 days of submittal, the EPA
1063 determines that any such revised or new standard is not consistent with the applicable
1064 requirements of the Clean Water Act and specifies the changes needed to meet such
1065 requirements, the administrator may consider EPA's recommendations and publish a revised
1066 final determination. All determinations made under this subsection are considered final actions
1067 of the administrator and may be appealed pursuant to Chapter 1, Section 16 of the Rules of
1068 Practice and Procedure.

1069
1070 (b) Except for ambient-based criteria on effluent dependent waters, proposed changes
1071 in water quality criteria that result from the administrator's findings shall be recommended to the
1072 council for adoption as revised rules. Ambient-based criteria for effluent dependent waters shall
1073 be established according to the provisions of Section 36 of these rules. If adopted by the council,
1074 the revised rules shall be filed with the secretary of state and shall become effective 90 days after
1075 filing. The revised rules shall also be concurrently submitted to EPA for approval as revised
1076 water quality standards for Clean Water Act purposes. If within 90 days of submittal, the EPA
1077 determines that any such revised or new standard is not consistent with the applicable
1078 requirements of the Clean Water Act and specifies the changes needed to meet such
1079 requirements, the department may recommend a new standard incorporating EPA's
1080 specifications to the council for adoption.

1081
1082 **Section 35. Credible Data.**

1083
1084 (a) Development of scientifically valid chemical, physical and biological monitoring
1085 data shall:

1086
1087 (i) Consist of data collection using accepted referenced laboratory and field
1088 methods employed by a person who has received specialized training and has field experience in
1089 developing a monitoring plan, a quality assurance plan, and employing the methods outlined in
1090 such plans or works under the supervision of a person who has these qualifications. Specialized
1091 training includes a thorough knowledge of written sampling protocols and field methods such

1092 that the data collection and interpretation are reproducible, scientifically defensible and free from
1093 preconceived bias; and

1094
1095 (ii) Includes documented quality assurance consisting of a plan that details
1096 how environmental data operations are planned, implemented and assessed with respect to
1097 quality during the duration of the project.

1098
1099 (b) Credible data shall be collected on each water body, as required in this section,
1100 and shall be considered for purposes of characterizing the integrity of the water body including
1101 consideration of soil, geology, hydrology, geomorphology, climate, stream succession and the
1102 influences of man upon the system. These data in combination with other available and
1103 applicable information shall be used through a weight-of-evidence approach to designate uses
1104 and determine whether those uses are being attained. In those instances where numerical
1105 standards contained in these rules are exceeded or on ephemeral and intermittent water bodies
1106 where chemical and biological sampling may not be practical or feasible, less than a complete set
1107 of data may be used to make a decision on attainment.

1108
1109 (c) All changes to use designations after the effective date of this rule shall include
1110 the consideration of credible data relevant to the decision. Changes which involve the removal of
1111 a use designation or the replacement of a designation shall be supported by a use attainability
1112 analysis (UAA).

1113
1114 (d) After the effective date of this rule, credible data shall be utilized in determining a
1115 water body's attainment of designated uses.

1116
1117 **Section 36. Effluent Dependent Criteria.** In addition to the provisions of Section 33
1118 of these regulations, the administrator may make modifications to the numeric criteria for
1119 pollutants listed in Appendix B on Class 2D and 3D waters. These modifications may be made
1120 on a categorical or site-specific basis by application of the following process:

1121
1122 (a) The adopted statewide numeric criteria may be modified on Class 2D and 3D
1123 waters to reflect ambient conditions by developing a UAA demonstrating that the water body is
1124 effluent dependent and that continued discharge of a permitted effluent to the water body has
1125 been shown to create a net environmental benefit. Criteria modification based on a finding of net
1126 environmental benefit is authorized where:

1127
1128 (i) The water body is effluent dependent;

1129
1130 (ii) The discharge has been shown to create an environmental benefit and
1131 removal of the discharge would cause more environmental harm than leaving it in place;

1132
1133 (iii) There is a credible threat to remove the discharge; and

1134
1135 (iv) Appropriate safeguards are in place, ensuring that downstream uses will
1136 be protected and the discharge will pose no health risk or hazard to humans, livestock or wildlife.

1137

1138 (b) Where the above factors have been satisfied, site-specific criteria may be set equal
1139 to the background concentration plus a margin of error for each parameter where the highest
1140 background concentration exceeds the statewide numeric criteria. Such site-specific criteria will
1141 be implemented as instantaneous maximum values.

1142
1143 (i) The background concentration shall be the highest concentration recorded
1144 over the course of a one year period where samples have been taken at least once in each month.

1145
1146 (ii) The margin of error shall be one standard deviation calculated from the
1147 same data set used to establish background.

1148
1149 (iii) In addition to water column values, aquatic life tissue criteria shall also be
1150 established for all parameters known to be bioaccumulating and where recommended criteria
1151 have been developed by EPA. Such criteria shall be at least equal to the nationally recommended
1152 tissue criteria published by EPA under Section 304(a) of the Clean Water Act.

1153
1154 (c) The procedures used to implement this section are described in the *Use*
1155 *Attainability Analysis Implementation Policy*.

1156
1157 **Section 37. Discharger Specific Variances.**

1158
1159 (a) Following public notice and opportunity for comment, including at least one
1160 public hearing with a minimum of 45-day notice, the administrator may grant a permittee a
1161 variance to a designated use and water quality criteria for ammonia and/or nutrients (e.g., total
1162 nitrogen, total phosphorus). The administrator may also grant subsequent variances consistent
1163 with this section.

1164
1165 (b) A variance shall not be granted if:

1166
1167 (i) the ammonia and/or nutrient water quality-based effluent limit can be
1168 achieved by implementing technology-based effluent limits under sections 301(b) and 306 of
1169 the Clean Water Act; or

1170
1171 (ii) the variance will result in an increase in the discharge of the pollutant.

1172
1173 (c) A variance may be granted in circumstances where:

1174
1175 (i) a comprehensive alternatives analysis demonstrates that the most cost-
1176 effective pollutant removal alternative capable of achieving the water quality-based effluent
1177 limit would create substantial and widespread economic and social impacts; and

1178
1179 (ii) the permittee implements actions necessary to achieve the highest
1180 attainable condition of the receiving water. The highest attainable condition shall be identified
1181 through a comprehensive alternatives analysis and/or other supporting documentation at the
1182 time the variance is granted or during any reevaluation and shall include:

1184 (A) meeting an interim effluent condition that represents the greatest
1185 pollutant reduction achievable; and

1186
1187 (B) developing and implementing a pollutant minimization program.
1188

1189 (d) The duration of the variance shall only be as long as necessary to achieve the
1190 highest attainable condition as specified in Sections 2(b)(xxiii) and 37(c)(ii).

1191
1192 (e) Once granted, the variance shall only apply for the purpose of developing
1193 interim effluent limits. A discharge permit based on a variance shall include the interim
1194 effluent limit identified in the variance and any limitations and requirements identified in the
1195 variance as enforceable conditions of the permit.

1196
1197 (f) All discharger specific variances granted by the administrator are considered
1198 final actions and may be appealed pursuant to the Rules of Practice and Procedure, Chapter 1,
1199 Section 8.

1200
1201 (g) Following administrator approval and opportunity for appeal, the variance shall
1202 be submitted to EPA pursuant to the Clean Water Act. The variance shall become effective
1203 either upon EPA approval or 90 days after submittal, whichever comes first.

1204
1205 (h) The department shall reevaluate each variance at least every five years using all
1206 existing and readily available information. The department may also initiate a reevaluation at
1207 any time.

1208
1209 (i) Upon notification that the department is initiating a reevaluation, or 180
1210 days prior to permit expiration, the permittee shall submit:

1211
1212 (A) Information on how the permittee did or did not comply with the
1213 conditions of the variance;

1214
1215 (B) Information indicating that the most cost-effective pollutant
1216 removal alternative capable of achieving the water quality-based effluent limit continues to
1217 create substantial and widespread economic and social impacts; and

1218
1219 (C) Information sufficient to determine whether the highest attainable
1220 condition, as specified in Sections 2(b)(xxiii) and 37(c)(ii) should be modified.

1221
1222 (D) If the requirements identified in Section 37(i) are not met, the
1223 variance shall expire and the permittee shall be required to meet the water quality-based
1224 effluent limit.

1225
1226 (ii) In circumstances where the reevaluation concludes that a modification to
1227 the interim effluent condition is necessary, the department shall modify the discharge permit

1228 accordingly.

1229

1230 (iii) Following public notice, the public shall be provided a minimum of 30
1231 days to review and comment on the reevaluation. Each completed reevaluation is considered a
1232 final action of the administrator and may be appealed pursuant to the Rules of Practice and
1233 Procedure, Chapter 1, Section 8.

1234

1235 (iv) The administrator may terminate any variance for good cause following
1236 opportunity for public comment.

1237

1238 (v) The department shall submit the reevaluation to EPA within 30 days of
1239 completion or the variance shall expire and the permittee shall be required to meet the water
1240 quality-based effluent limit.

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 North Fork of the Tongue River, the main stem of the South Fork of the Tongue River and the main stem 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 and recreational use designations are listed in the most current version of the *Wyoming Surface Water Classification List*. The list is published by the department and periodically revised and updated according to the provisions of Sections 4, 33, 34 and 35. 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. A 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:

(A) 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 in June 2000 are classified as 2AB;

(B) 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 in June 2000 are classified as 2C;

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

(I) 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;

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

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

(IV) 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.

Appendix B

Water Quality Criteria⁽¹⁾

(a) Priority Pollutants.

Priority Pollutant	Aquatic Life		Human Health Consumption of	
	Acute Value (µg/L)	Chronic Value (µg/L)	Fish and Drinking Water ⁽²⁾ (µg/L)	Fish ⁽⁸⁾ (µg/L)
Acenaphthene			20 ⁽⁷⁾	990
Acrolein	3	3	6	9
Acrylonitrile			0.051 ⁽³⁾	0.25 ⁽³⁾
Benzene			2.2 ⁽³⁾	51 ⁽³⁾
Benzidine			0.000086 ⁽³⁾	0.00020 ⁽³⁾
Carbon tetrachloride (Tetrachloromethane)			0.23 ⁽³⁾	1.6 ⁽³⁾
Chlorobenzene (Monochlorobenzene)			20 ⁽⁷⁾	1,600
1,2,4-Trichlorobenzene			35	70
Hexachlorobenzene			0.00028 ⁽³⁾	0.00029 ⁽³⁾
1,2-Dichloroethane			0.38 ⁽³⁾	37 ⁽³⁾
1,1,1-Trichloroethane			200 ⁽⁹⁾	
Hexachloroethane			1.4 ⁽³⁾	3.3 ⁽³⁾
1,1,2-Trichloroethane			0.59 ⁽³⁾	16 ⁽³⁾
1,1,2,2-Tetrachloroethane			0.17 ⁽³⁾	4 ⁽³⁾
Bis(2-chloroethyl) ether			0.030 ⁽³⁾	0.53 ⁽³⁾
2-Chloronaphthalene			1,000	1,600
2,4,6-Trichlorophenol			1.4 ⁽³⁾	2.4 ⁽³⁾
4-Chloro-3-methylphenol (3-Methyl-4-chlorophenol) (p-Chloro-m-cresol)			3,000 ⁽⁷⁾	
Chloroform (Trichloromethane)			5.7 ⁽³⁾	470 ⁽³⁾
2-Chlorophenol			0.1 ⁽⁷⁾	150
1,2-Dichlorobenzene			420	1,300
1,3-Dichlorobenzene			320	960
1,4-Dichlorobenzene			63	190
3,3'-Dichlorobenzidine			0.021 ⁽³⁾	0.028 ⁽³⁾
1,1-Dichloroethylene			7 ⁽⁹⁾	7,100
1,2-trans-Dichloroethylene			100 ⁽⁹⁾	10,000
2,4-Dichlorophenol			0.3 ⁽⁷⁾	290

Priority Pollutant	Aquatic Life		Human Health Consumption of	
	Acute Value (µg/L)	Chronic Value (µg/L)	Fish and Drinking Water ⁽²⁾ (µg/L)	Fish ⁽⁸⁾ (µg/L)
1,2-Dichloropropane			0.50 ⁽³⁾	15 ⁽³⁾
1,3-Dichloropropene (1,3-Dichloropropylene) (cis and trans isomers)			0.34 ⁽³⁾	21 ⁽³⁾
2,4-Dimethylphenol			380	850
2,4-Dinitrotoluene			0.11 ⁽³⁾	3.4 ⁽³⁾
1,2-Diphenylhydrazine			0.036 ⁽³⁾	0.20 ⁽³⁾
Ethylbenzene			530	2,100
Fluoranthene			130	140
Bis(2-chloroisopropyl) ether			1,400	65,000
Methylene chloride (Dichloromethane)			4.6 ⁽³⁾	590 ⁽³⁾
Methyl bromide (Bromomethane)			47	1,500
Bromoform (Tribromomethane)			4.3 ⁽³⁾	140 ⁽³⁾
Dichlorobromomethane			0.55 ⁽³⁾	17 ⁽³⁾
Chlorodibromomethane			0.40 ⁽³⁾	13 ⁽³⁾
Hexachlorobutadiene			0.44 ⁽³⁾	18 ⁽³⁾
Hexachlorocyclopentadiene			1 ⁽⁷⁾	1,100
Isophorone			35 ⁽³⁾	960 ⁽³⁾
Nitrobenzene			17	690
2,4-Dinitrophenol			69	5,300
4,6-Dinitro-2-methylphenol (2-Methyl-4,6- dinitrophenol) (4,6-Dinitro-o-cresol)			13	280
N-Nitrosodimethylamine			0.00069 ⁽³⁾	3 ⁽³⁾
N-Nitrosodiphenylamine			3.3 ⁽³⁾	6 ⁽³⁾
N-Nitrosodi-n-propylamine			0.005 ⁽³⁾	0.51 ⁽³⁾
Pentachlorophenol	19 ⁽⁵⁾	15 ⁽⁵⁾	0.27 ⁽³⁾	3 ⁽³⁾
Phenol			300 ⁽⁷⁾	860,000
Bis(2-ethylhexyl) phthalate			1.2 ⁽³⁾	2.2 ⁽³⁾
Butylbenzyl phthalate			1,500	1,900
Di-n-butyl phthalate			2,000	4,500
Diethyl phthalate			17,000	44,000
Dimethyl phthalate			270,000	1,100,000

Priority Pollutant	Aquatic Life		Human Health Consumption of	
	Acute Value (µg/L)	Chronic Value (µg/L)	Fish and Drinking Water ⁽²⁾ (µg/L)	Fish ⁽⁸⁾ (µg/L)
Benzo(a)anthracene(1,2-Benzanthracene)			0.0038 ⁽³⁾	0.018 ⁽³⁾
Benzo(a)pyrene (3,4-Benzopyrene)			0.0038 ⁽³⁾	0.018 ⁽³⁾
Benzo(b)fluoranthene (3,4-Benzofluoranthene)			0.0038 ⁽³⁾	0.018 ⁽³⁾
Benzo(k)fluoranthene(1,1,2-Benzofluoranthene)			0.0038 ⁽³⁾	0.018 ⁽³⁾
Chrysene			0.0038 ⁽³⁾	0.018 ⁽³⁾
Anthracene			8,300	40,000
Fluorene			1,100	5,300
Dibenzo(a,h)anthracene(1,2,5,6-Dibenzanthracene)			0.0038 ⁽³⁾	0.018 ⁽³⁾
Indeno(1,2,3-cd)pyrene			0.0038 ⁽³⁾	0.018 ⁽³⁾
Pyrene			830	4,000
Tetrachloroethylene			0.69 ⁽³⁾	3.3 ⁽³⁾
Toluene			1,000 ⁽⁹⁾	15,000
Trichloroethylene			2.5 ⁽³⁾	30 ⁽³⁾
Vinyl chloride (Chloroethylene)			0.025 ⁽³⁾	2.4 ⁽³⁾
Aldrin	1.5 ⁽¹⁶⁾		0.000049 ⁽³⁾	0.000050 ⁽³⁾
Dieldrin	0.24	0.056	0.000052 ⁽³⁾	0.000054 ⁽³⁾
Chlordane	1.2 ⁽¹⁶⁾	0.0043	0.00080 ⁽³⁾	0.00081 ⁽³⁾
4,4'-DDT	0.55 ⁽¹⁶⁾	0.001	0.00022 ⁽³⁾	0.00022 ⁽³⁾
4,4'-DDE			0.00022 ⁽³⁾	0.00022 ⁽³⁾
4,4'-DDD			0.00031 ⁽³⁾	0.00031 ⁽³⁾
alpha-Endosulfan	0.11 ⁽¹⁶⁾	0.056	62	89
beta-Endosulfan	0.11 ⁽¹⁶⁾	0.056	62	89
Endosulfan sulfate			62	89
Endrin	0.086	0.036	0.059	0.060
Endrin aldehyde			0.29	0.30
Heptachlor	0.26 ⁽¹⁶⁾	0.0038	0.000079 ⁽³⁾	0.000079 ⁽³⁾
Heptachlor epoxide	0.26 ⁽¹⁶⁾	0.0038	0.000039 ⁽³⁾	0.000039 ⁽³⁾
alpha-BHC (Hexachlorocyclohexane-alpha)			0.0026 ⁽³⁾	0.0049 ⁽³⁾

Priority Pollutant	Aquatic Life		Human Health Consumption of	
	Acute Value (µg/L)	Chronic Value (µg/L)	Fish and Drinking Water ⁽²⁾ (µg/L)	Fish ⁽⁸⁾ (µg/L)
beta-BHC (Hexachlorocyclohexane- beta)			0.0091 ⁽³⁾	0.017 ⁽³⁾
gamma-BHC (Lindane) (Hexachlorocyclohexane- gamma)	0.95		0.2 ⁽⁹⁾	1.8
Polychlorinated biphenyls (PCBs)		0.014 ⁽¹³⁾	0.000064 ⁽³⁾⁽¹³⁾	0.000064 ⁽³⁾⁽¹³⁾
Toxaphene	0.73	0.0002	0.00028 ⁽³⁾	0.00028 ⁽³⁾
Antimony			5.6	640
Arsenic	340	150	10 ⁽³⁾⁽⁹⁾	10 ⁽³⁾⁽⁹⁾
Asbestos			7,000,000 fibers/L ⁽⁹⁾	
Beryllium			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	140 ⁽⁶⁾	140 ⁽⁶⁾
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⁾	610	4,600
Selenium	20 ⁽¹⁰⁾	5 ⁽¹⁰⁾	50 ⁽⁹⁾	4,200
Silver	1.7 ⁽⁴⁾⁽¹⁶⁾		100 ⁽¹¹⁾	
Thallium			0.24	0.47
Zinc	117.2 ⁽⁴⁾	118.1 ⁽⁴⁾	5,000 ⁽⁷⁾	26,000
Dioxin (2,3,7,8-TCDD)			0.000000005 ⁽³⁾	0.000000005 ⁽³⁾

(b) Non-Priority Pollutants.

Non-Priority Pollutant	Aquatic Life		Human Health Consumption of	
	Acute Value ($\mu\text{g/L}$)	Chronic Value ($\mu\text{g/L}$)	Fish and Drinking Water ⁽²⁾ ($\mu\text{g/L}$)	Fish ⁽⁸⁾ ($\mu\text{g/L}$)
Alachlor			2 ⁽⁹⁾	
Aluminum (pH 6.5-9.0 only)	750	87 ⁽¹⁴⁾		
Ammonia	See Appendix C			
Atrazine			3 ⁽⁹⁾	
Barium			2,000 ⁽⁹⁾	
Bis(chloromethyl) ether			0.00010 ⁽³⁾	0.00029 ⁽³⁾
Bromate			10 ⁽⁹⁾	
Carbofuran			40 ⁽⁹⁾	
Chloride	860,000 ⁽¹⁵⁾	230,000 ⁽¹⁵⁾		
Chlorine (total residual)	19	11		
Chlorite			1,000 ⁽⁹⁾	
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⁾	
Diazinon	0.17	0.17		
Dibromochloropropane (DBCP)			0.2 ⁽⁹⁾	
cis-1,2-Dichloroethylene			70 ⁽⁹⁾	
Dinoseb			7 ⁽⁹⁾	
Dinitrophenols			69	5,300
Dissolved Gases		100% Sat.		
Dissolved Oxygen		See Appendix D		
<i>E. coli</i>			See Section 27	
Diquat			20 ⁽⁹⁾	
Endothall			100 ⁽⁹⁾	
Ethylene dibromide (EDB)			0.05 ⁽⁹⁾	
Fluoride			2000 ⁽¹¹⁾	
Glyphosate			700 ⁽⁹⁾	

Non-Priority Pollutant	Aquatic Life		Human Health Consumption of	
	Acute Value (µg/L)	Chronic Value (µg/L)	Fish and Drinking Water ⁽²⁾ (µg/L)	Fish ⁽⁸⁾ (µg/L)
Guthion		0.01		
Haloacetic acids			60 ⁽⁹⁾	
Hexachlorocyclo-hexane - technical			0.0123 ⁽³⁾	0.0414 ⁽³⁾
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 ⁽³⁾	0.22 ⁽³⁾
Nitrosodiethylamine, N			0.0008 ⁽³⁾	1.24 ⁽³⁾
Nitrosopyrrolidine, N			0.016 ⁽³⁾	34 ⁽³⁾
Nonylphenol	28	6.6		
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⁾	
Hydrogen Sulfide (H ₂ S; Undissociated)		2		
1,2,4,5-Tetrachlorobenzene			0.97	1.1
Tributyltin (TBT)	0.46	0.072		
2,4,5-Trichlorophenol			1.0 ⁽⁷⁾	3,600
Total trihalomethanes (TTHM)			80 ⁽⁹⁾	
2,4,5-TP (2,4,5- trichlorophenoxy) Propionic acid			50 ⁽⁹⁾	
Xylenes			10,000 ⁽⁹⁾	

⁽¹⁾Except for the aquatic life values for metals and where otherwise indicated, the values given in Appendix B 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 17.5 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 criterion. Value given is an example only and is based on a CaCO₃ hardness of 100 mg/L. Criteria for hardness concentrations other than 100 mg/L as CaCO₃ must be calculated using the formulas in Appendix F.

⁽⁵⁾pH dependent criterion. Value given is an example only and is based on a pH of 7.8. Criteria for pH values other than 7.8 must be calculated using the formulas in Appendix G.

⁽⁶⁾Criterion expressed as total cyanide, even though the method used to derive the criterion is based on free cyanide. If a substantial fraction of the cyanide present in a water body is present in a complexed form (e.g. Fe₄[Fe(CN)₆]₃), this criterion may be overly conservative.

⁽⁷⁾Criterion 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 17.5 grams per day.

⁽⁹⁾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 a conversion factor (0.996 for the acute and 0.922 for the chronic) to convert this number to a value that is expressed in terms of a dissolved metal. Using these conversion factors, the aquatic life acute value for selenium is 19.92 µg/L as a dissolved metal and the aquatic life chronic value for selenium is 4.61 µg/L as a dissolved metal.

⁽¹¹⁾ Criterion is based on Safe Drinking Water Act secondary standards and is intended to prevent undesirable cosmetic or aesthetic effects. Value represents the dissolved amount of each substance rather than the total amount. Criterion only applies where drinking water is an actual use.

⁽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 or homolog or Aroclor 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 mg/L 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). EPA is also aware of field data indicating that many high quality waters in the U.S. contain more than 87 µg/L when either 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 will implement the 87 µg/L chronic criterion for aluminum as follows: the 87 µg/L chronic criterion will apply except where the receiving water after mixing has a pH greater than or equal to 7.0 and a hardness (as CaCO₃) greater than or equal to 50 mg/L. Where the receiving stream after mixing has a pH greater than or equal to 7.0 and a hardness (as CaCO₃) greater than or equal to 50 mg/L, the 750 µg/L acute criterion will apply. 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.

⁽¹⁶⁾Criterion has been divided by two to be comparable with other acute values derived using an averaging period. Value can be multiplied by two if criterion is to be used as an instantaneous maximum or end of pipe value, as the original criterion was derived using EPA's 1980 guidelines as a not to be exceeded instantaneous maximum.

(c) Site-Specific Criteria. The criteria in this section are applicable only to the waters and/or locations specified and replaces similar criteria expressed elsewhere in these regulations.

(i) Belle Fourche Drainage

(A) 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;

(B) 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.

(ii) Big Horn River Drainage

(A) 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.

(iii) Cheyenne River Drainage

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

(B) 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.

(iv) Little Powder River Drainage

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

(v) North Platte River Drainage

(A) 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.

(vi) Powder River Drainage

(A) 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:

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

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

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

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

(B) 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.

(C) 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.

(D) 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.

This page intentionally left blank.

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, 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 Appendix C.

(i) 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

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

Temperature (°C)										
pH	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

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

Temperature (°C)										
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 °C 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 tables above, ammonia toxicity criteria can be calculated as follows:

(i) Criterion maximum concentration (CMC) when salmonids or other sensitive cold water species are present:

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

(ii) Criterion maximum concentration (CMC) when salmonids or other sensitive cold water species are 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:

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

(iv) Criterion continuous concentration (CCC) when fish early life stages are absent:

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

⁽¹⁾Criterion maximum concentration (CMC) refers to the one-hour average concentration of total ammonia nitrogen (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 (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 water body.

Appendix D

Minimum Dissolved Oxygen Criteria* (mg/L)

	Cold Water Criteria		Class 2C and Warm Water Criteria	
	Early Life Stages ⁽¹⁾⁽²⁾	Other Life Stages	Early Life Stages ⁽²⁾	Other Life Stages
30 Day Mean	n/a ⁽³⁾	6.5	n/a ⁽³⁾	5.5
7 Day Mean	9.5 (6.5)	n/a ⁽³⁾	6.0	n/a ⁽³⁾
7 Day Mean Minimum ⁽⁴⁾	n/a ⁽³⁾	5.0	n/a ⁽³⁾	4.0
1 Day Minimum ⁽⁴⁾	8.0 (5.0)	4.0	5.0	3.0

*These limitations apply to Class 1, 2AB, 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. Criteria derived from: *U.S. EPA. 1986. Ambient Water Quality Criteria. EPA 440/5-86-003. National Technical Service, Springfield, VA.*

⁽¹⁾These are water column concentrations recommended to achieve the required inter-gravel 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⁾n/a (not applicable).

⁽⁴⁾All minima should be considered as instantaneous concentrations to be achieved at all times.

This page intentionally left blank.

Appendix E

References to Develop Site-Specific Criteria and Bioassays

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.

U.S. Environmental Protection Agency: Aquatic Life Ambient Freshwater Quality Criteria-Copper. EPA-822-R-07-001. U.S. EPA, 2007.

This page intentionally left blank.

Appendix F

Conversion Factors to Change Total Recoverable Metal Values to Dissolved Values and Equations For Hardness Dependent Metals

(a) Conversion Factors. Aquatic life values for the following metals are based on the dissolved amount of each substance. The recommended aquatic life value was calculated by using previous 304(a) aquatic life values expressed in terms of total recoverable metal and multiplying it by a conversion factor (CF). The conversion factors provided below are necessary to convert a metal value expressed as the total recoverable fraction in the water column to the dissolved fraction in the water column.

The toxicity of these metals also varies with hardness and the total recoverable value must be calculated based on the hardness (mg/L of CaCO₃) prior to multiplying by the conversion factor (CF).

(i) 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

(ii) The conversion factors (CF) for cadmium and lead are not constant but vary with hardness (mg/L of CaCO₃). Conversion factors can be calculated using the following equations, although when an ambient hardness of less than 25 mg/L (as CaCO₃) is used to establish criteria for lead or cadmium, the conversion factor should not exceed one^(a):

- (A) Cadmium Acute: $CF = 1.136672 - [(\ln \text{hardness})(0.041838)]$
- (B) Cadmium Chronic: $CF = 1.101672 - [(\ln \text{hardness})(0.041838)]$
- (C) Lead Acute and Chronic: $CF = 1.46203 - [(\ln \text{hardness})(0.145712)]$

(b) Equations for Hardness Dependent Metals. Aquatic life values at various hardness^(b) concentrations can be calculated using the formulas below. The formulas include the conversion factors to derive dissolved metal values:

Parameter	Acute 1-Hour Average Concentration (µg/L)	Chronic 4-Day Average Concentration (µg/L)
Cadmium	$e^{(1.0166[\ln(\text{hardness})] - 3.924)}(\text{CF})$	$e^{(0.7409[\ln(\text{hardness})] - 4.719)}(\text{CF})$
Chromium (III)	$e^{(0.8190[\ln(\text{hardness})] + 3.7256)}(0.316)$	$e^{(0.8190[\ln(\text{hardness})] + 0.6848)}(0.860)$
Copper	$e^{(0.9422[\ln(\text{hardness})] - 1.700)}(0.960)$	$e^{(0.8545[\ln(\text{hardness})] - 1.702)}(0.960)$
Lead	$e^{(1.273[\ln(\text{hardness})] - 1.460)}(\text{CF})$	$e^{(1.273[\ln(\text{hardness})] - 4.705)}(\text{CF})$
Manganese	$e^{(0.7693[\ln(\text{hardness})] + 4.4995)}$	$e^{(0.5434[\ln(\text{hardness})] + 4.7850)}$
Nickel	$e^{(0.8460[\ln(\text{hardness})] + 2.255)}(0.998)$	$e^{(0.8460[\ln(\text{hardness})] + 0.0584)}(0.997)$
Silver	$e^{(1.72[\ln(\text{hardness})] - 6.52)}(0.85)(0.5)^{(c)}$	n/a
Zinc	$e^{(0.8473[\ln(\text{hardness})] + 0.884)}(0.978)$	$e^{(0.8473[\ln(\text{hardness})] + 0.884)}(0.986)$

^(a)Based on Guidance on the Calculation of Hardness-Dependent Metals Criteria presented in: *U.S. EPA. 2002. National Recommended Water Quality Criteria. EPA-822-R-02-47.*

^(b)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.

^(c)Criterion multiplied by 0.5 to be comparable with other acute values derived using an averaging period. Value does not need to be multiplied by 0.5 if criterion is to be used as an instantaneous maximum or end of pipe value, as the original criterion was derived using EPA's 1980 guidelines as a not to be exceeded instantaneous maximum.

Appendix G

Equations For pH Dependent Parameters

Parameter	Acute 1-Hour Average Concentration (µg/L)	Chronic 4-Day Average Concentration (µg/L)
Pentachlorophenol	$e^{[1.005(\text{pH}) - 4.830]}$	$e^{[1.005(\text{pH}) - 5.290]}$

17-0797

This page intentionally left blank.