COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

WATER QUALITY CONTROL COMMISSION

5 CCR 1002-41

REGULATION NO. 41

THE BASIC STANDARDS FOR GROUND WATER

ADOPTED: January 5, 1987
EFFECTIVE: March 2, 1987
AMENDED: August 7, 1989
EFFECTIVE: September 30, 1989
AMENDED: September 11, 1990
EFFECTIVE: October 30, 1990
AMENDED: October 8, 1991
EFFECTIVE: November 30, 1991
AMENDED: December 6, 1993
EFFECTIVE: January 31, 1994
AMENDED: February 8, 1994
EFFECTIVE: March 30, 1994
AMENDED: January 10, 1995
EFFECTIVE: March 2, 1995
AMENDED: March 13, 1996
EFFECTIVE: April 30, 1996
AMENDED: January 13, 1997
EFFECTIVE: March 3, 1997
AMENDED: July 14, 1997
EFFECTIVE: August 30, 1997
AMENDED: January 11, 1999
EFFECTIVE: March 2, 1999
TRIENNIAL REVIEW: October 10, 2000
AMENDED: November 13, 2001
EFFECTIVE: December 30, 2001
AMENDED: November 8, 2004
EFFECTIVE: March 22, 2005
AMENDED: January 14, 2008
EFFECTIVE: May 31, 2008
AMENDED: October 13, 2009
EFFECTIVE: November 30, 2009
AMENDED: September 11, 2012
EFFECTIVE: January 31, 2013
AMENDED: May 9, 2016
EFFECTIVE: June 30, 2016

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COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

WATER QUALITY CONTROL COMMISSION

5 CCR 1002-41

REGULATION NO. 41

THE BASIC STANDARDS FOR GROUND WATER

41.1 AUTHORITY

These regulations are promulgated pursuant to the Colorado Water Quality Control Act, sections 25-8-101 through 25-8-703 C.R.S., (1982 and 1985 Supp.). In particular, they are promulgated under the following sections 25-8-202, 25-8-203, and 25-8-204.

41.2 PURPOSE

The purpose of these regulations is to establish statewide standards and a system for classifying ground water and adopting water quality standards for such classifications to protect existing and potential beneficial uses of ground waters.

41.3 DEFINITIONS

The following definitions are applicable to these regulations.

1. "Activity" is any operation that may discharge or cause a discharge of pollutants to ground waters including but not limited to, point source discharges, pits, ponds, and lagoons used for storage, treatment and/or disposal of pollutants, land application of wastewater, and non-point source discharges. Activity shall not include related operations, no matter how closely integrated physically or legally.

2. "Agricultural Uses" are the existing or potential future uses of ground water for the cultivation of soil, the production of crops, and/or the raising of livestock.

3. "Background Level" is the level of any parameter in the ground water within a specified area as determined by representative measurements of the ground water quality unaffected by the activity.

4. "Contamination" is that condition where the concentration level of a pollutant exceeds naturally occurring background levels.

5. "Domestic Uses" are those existing or potential future uses of ground water for household or family use, including, but not limited to: drinking, gardening, municipal, and/or farmstead uses.

6. "Existing Activity" means any activity whose plans and specifications have been approved by the Division, or which has commenced or completed construction, prior to the effective date of the 1990 amendments to this regulation.

7. "Ground Water" are subsurface waters in a zone of saturation which are or can be brought to the surface of the ground or to surface waters through wells, springs, seeps or other discharge areas.

8. “New Activity” means any activity that does not qualify as an existing activity.

9. “Parameter” is the physical, chemical, biological, or radiological constituent or characteristic of the ground water such as; temperature, pH, and ground water level.

10. “Point Of Compliance” means a vertical surface that is located at some specified distance hydrologically downgradient of the activity being monitored for compliance; provided that the Commission may establish a point of compliance other than a vertical surface on a site-specific basis pursuant to section 41.6 (E).

11. “Site Boundary” means the outermost perimeter of the property or lease boundary of a facility for which the owner and/or operator has control.

12. “Specified Area” is that area within which the ground water is classified.

13. “Standard” is a narrative and/or numeric restriction established by these regulations and applied to ground waters to protect one or more existing or potential future uses.

14. “TDS” is the total dissolved solids in water.

41.4 CLASSIFICATION OF GROUND WATERS

A. Ground Water Classifications

The Commission hereby establishes the following classifications for ground water:

1. Domestic Use - Quality

2. Agricultural Use - Quality

3. Surface Water Quality Protection

4. Potentially Usable Quality

5. Limited Use and Quality

B. Criteria Used to Identify Classifications for Ground Water

The ground water classifications shall be implemented and applied to ground waters within a specified area (as determined in accordance with section 41.4(c) based upon use, quality and other information demonstrating the following:

1. Ground water within a specified area shall be classified “Domestic Use - Quality” when:

    a. Ground water is used for domestic use within the specified area; or

    b. If ground water is not currently used for domestic use within the specified area, the available information, including information regarding background levels, demonstrates that future domestic use of water within the specified area is reasonably probable; or

    c. The most recent State Engineer's well records or applicable water court decrees reveal that ground water is permitted or decreed for domestic use within the

specified area, unless other information demonstrates that domestic use is not being made of the ground water and is not likely to be made; or

d. The background levels are generally adequate to assure compliance with the Human Health Standards listed in Table 1 and TDS levels are less than 10,000 mg/l.

The determination of whether or not background levels are generally adequate shall be made considering the number of parameters that meet or exceed table Values, the extent of any exceedances of table Values, the risk to the public health associated with any such exceedance, and the adequacy of the database available for such determinations.

2. Ground water within a specified area shall be classified “Agricultural Use - Quality” when:

a. Ground water is used for agricultural use within the specified area; or

b. If ground water is not used for agricultural use within the specified area, the available information, including information regarding background levels, demonstrates that future agricultural use of water within the specified area is reasonably probable; or

c. The most recent State Engineer's well records or applicable water court decrees reveal that ground water is permitted or decreed for agricultural use within the specified area, unless other information demonstrates that agricultural use is not being made of the ground water and is not likely to be made; or

d. The background levels are generally adequate to assure compliance with the Agricultural Standards listed in Table 3 and TDS levels are less than 10,000 mg/l.

The determination of whether or not background levels are generally adequate shall be made considering the number of parameters that meet or exceed table values, the extent of any exceedances of table values, the risk to crops and/or livestock associated with any such exceedance, and the adequacy of the database available for such determinations.

3. Ground water within a specified area shall be classified “Surface Water Quality Protection” when:

A proposed or existing activity does or will impact ground waters such that water quality standards of classified surface water bodies within the specified area will be exceeded.

4. Ground water within a specified area shall be classified “Potentially Usable Quality” when:

a. TDS levels are less than 10,000 mg/l; and

b. Ground water is not used for domestic or agricultural uses within the specified area; and

c. Background levels are generally not adequate to assure compliance with the Human Health and Agricultural Standards listed in Tables 1 and 3, or the information is insufficient to make such a determination; and

d. Domestic or agricultural use of the ground water can be reasonably expected in the future, considering background levels of water quality; geologic and hydrologic conditions; the degree to which any particular types of pollutants present are subject to treatment; the economic reasonableness of such treatment; the impact of treatment requirements on water quantity; whether or not pollution arises from natural sources; and other relevant factors.

5. Ground water within a specified area shall be classified “Limited Use and Quality” when:

a. TDS levels are equal to or in excess of 10,000 mg/l; or

b. The ground water has been exempted under Rule 324(B) of the “Rules and Regulations, Rules of Practice and Procedure” (2 CCR 404-1) of the Oil and Gas Conservation Commission, pursuant to the Colorado Oil and Gas Conservation Act, Title 60, Article 34, C.R.S. (1982); or

c. The criteria specified in sections 41.4(B)1, 2, 3, or 4 are not met.

C. Specified Area

1. When an activity exists or is proposed, the shape, depth, boundaries, and extent of a specified area shall be determined by considering:

a. the presence, extent, and nature of existing uses of ground water that may be affected by the activity, and the nature of reasonably expected future uses of ground water that may be affected by the activity; and

b. the nature and location of the activity and of its discharge; and

c. existing ground water quality that may be affected by the activity; and

d. relevant geologic and hydrogeologic conditions, including but not limited to the presence of ground water hydrologically connected to surface waters and recharge areas.

2. In the absence of an existing or proposed activity, the shape, depth, boundaries, and extent of a specified area may be determined by considering:

a. the presence, extent, and nature of existing uses of ground water and the nature of reasonably expected future uses of ground water; and

b. existing ground water quality; and

c. relevant geologic and hydrogeologic conditions, including but not limited to the presence of ground water hydrologically connected to surface waters and recharge areas.

41.5 GROUND WATER QUALITY STANDARDS

The water quality standards specified in subsection B below are deemed necessary and appropriate to protect ground water uses as specified in section 41.4, and shall be adopted to protect such classified uses. The standards specified in subsections A and C apply to all State ground waters, unless alternative site-specific standards have been adopted for a specified area pursuant to subsection D below.

A. Narrative Standards

1. Ground Water shall be free from pollutants not listed in the tables referred to in section 41.5(B), which alone or in combination with other substances, are in concentrations shown to be:

   a. Carcinogenic, mutagenic, teratogenic, or toxic to human beings, and/or,

   b. A danger to the public health, safety, or welfare.

2. Determinations made pursuant to section 41.7 of specific numerical limitations under this subsection shall be based upon the best scientific information currently available.

B. Numeric Standards

1. The numeric standards shall be measured as total concentrations unless otherwise specified in Tables 1 through 4.

2. When a ground water has a multi-use classification, the most restrictive standard for a parameter shall apply.

3. The following numeric standards shall apply:

   a. “Domestic Use-Quality” - The Human Health and Secondary Drinking Water Standards listed in Tables 1 and 2, respectively, except as specified in section 41.5(B)5 or 41.5(B)(6).

   b. “Agricultural Use - Quality” - The Agricultural Standards listed in Table 3, except as specified in section 41.5(B)5.

   c. “Surface Water Quality Protection” - The standards necessary to prevent the exceedance of surface waters standards.

   d. “Potentially Usable Quality” - appropriate standards considering those factors listed in section 41.4(B)(4)(d).

4. The TDS limitation listed in Table 4 shall apply to the following classes:

   “Agricultural Use - Quality”

   “Surface Water Quality Protection”

   “Potentially Usable Quality”

5. For ground water classified “Domestic Use - Quality” or “Agricultural Use - Quality,” where a table value is exceeded by the background level, the applicable standard for that parameter shall be either 1) the table value or 2) the background level for that parameter. This determination shall be made considering the increased risk to public health, crops, or livestock associated with the background levels, the extent of the exceedance above the table value, the degree to which the pollution is deemed correctable and subject to treatment; and the economic reasonableness of such treatment requirements.

6. The Commission may adopt site-specific standards in lieu of those listed in Tables 1 and 2 taking into account the factors prescribed in Section 25-8-204(4), C.R.S. and section 41.4. The downgrading factors described in Regulation No. 31, section 6(2)(B) of the Basic Standards and Methodology for Surface Water shall not apply to the establishment of site-specific standards under this subsection.

C. Statewide Standards

1. Radioactive materials and Organic pollutants in ground waters shall not exceed the following levels, unless alternative, site-specific standards for these substances have been adopted by the Commission:

   a. For radioactive materials and organic pollutants listed in subsections 2 and 3 below, levels shall not exceed those specified in those subsections.

   b. For all other radioactive materials and organic pollutants, they shall be maintained at the lowest practical level.

   c. Where site-specific standards have been adopted, they shall apply in lieu of the standards set forth in this subsection.

2. Radioactive Materials Standards:

Radioactive Materials Standards[1]

Parameter	Standard
Americium[2]	0.15 pCi/l
Cesium 134	80 pCi/l
Plutonium 239[2], and 240[2]	0.15 pCi/l
Radium 226[2] and 228[2]	5 pCi/l
Strontium 90[2]	8 pCi/l
Thorium 230[2] and 232[2]	60 pCi/l
Tritium	20,000 pCi/l

pCi/l = Picocuries Per Liter

[1]In site-specific cases, when it has been demonstrated that there are negligible differences between the results of dissolved (filtered) samples and total (unfiltered) samples, then dissolved results may be utilized for implementing the radioactive material standards.

[2]Radionuclide samples for these materials should be analyzed using unfiltered (total) samples.

3. Interim Organic Pollutant Standards:

   Note that all standards in table A are being adopted as “interim standards.” These interim standards will remain in effect until alternative permanent standards are adopted by the Commission in revisions to this regulation or site-specific standards determinations. Although fully effective with respect to current regulatory applications, these interim standards shall not be considered final or permanent standards subject to restrictions such as antibacksliding or downgrading.

TABLE A

GROUND WATER ORGANIC CHEMICAL STANDARDS

(in micrograms per liter)

Parameter	CAS No.	STANDARD[1]
Acenaphthene	83-32-9	420

TABLE A

GROUND WATER ORGANIC CHEMICAL STANDARDS

(in micrograms per liter)

Parameter	**CAS No.**	**STANDARD[1]**
Acetochlor	34256-82-1	140
Acetone	67-64-1	6300
Acrolein	107-02-8	3.5
Acrylamide[C,8]	79-06-1	0.022
Acrylonitrile[C]	107-13-1	0.065
Alachlor	15972-60-8	2.0[M]
Aldicarb	116-06-3	7.0[M]
Aldicarb Sulfone	1646-88-4	7.0[M]
Aldicarb Sulfoxide	1646-87-3	7.0[M]
Aldrin[C]	309-00-2	0.0021
Aniline[C]	62-53-3	6.1
Anthracene (PAH)	120-12-7	2100
Aramite[C]	140-57-8	1.4
Atrazine	1912-24-9	3.0[M]
Azobenzene[C]	103-33-3	0.32
Benzene[C,2]	71-43-2	5.0[M]
Benzidine[C]	92-87-5	0.00015
Benzo(a)anthracene (PAH)[C]	56-55-3	0.0048
Benzo(a)pyrene (PAH)[C, 6]	50-32-8	0.0048 to 0.2[M]
Benzo(b)fluoranthene (PAH)[C]	205-99-2	0.0048
Benzo(k)fluoranthene (PAH)[C]	207-08-9	0.0048
Benzotrichloride[C]	98-07-7	0.0027

TABLE A

GROUND WATER ORGANIC CHEMICAL STANDARDS

(in micrograms per liter)

Parameter	**CAS No.**	**STANDARD[1]**
Benzyl chloride[C]	100-44-7	0.21
Biphenyl	92-52-4	4.4
Bis(chloromethyl)ether (BCME)[C]	542-88-1	0.00016
Bromate[C]	15541-45-4	0.05
Bromobenzene	108-86-1	56
Bromodichloromethane (THM)[C, 7]	75-27-4	0.56
Bromoform (THM)[C, 7]	75-25-2	4
Butyl benzyl phthalate	85-68-7	1,400
Carbofuran[6]	1563-66-2	35 to 40[M]
Carbon tetrachloride[C, 6]	56-23-5	0.5 to 5[M]
Chlordane[C, 6]	57-74-9	0.10 to 2[M]
Chlordecone [C]	143-50-0	.0035
Chlorethyl ether (BIS-2)[C]	111-44-4	0.032
4-Chloro-3-methylphenol	59-50-7	210
Chlorobenzene	108-90-7	100[M]
Chloroform (THM)[C, 7]	67-66-3	3.5
Chloroisopropyl ether (BIS-2)	108-60-1	280
Chloronapthalene	91-58-7	560
Chlorophenol, 2-	95-57-8	35
Chlorphrifos	2921-88-2	21
Chrysene (PAH)[C]	218-01-9	0.0048
Dalapon	75-99-0	200[M]

TABLE A

GROUND WATER ORGANIC CHEMICAL STANDARDS

(in micrograms per liter)

Parameter	**CAS No.**	**STANDARD[1]**
DDD[C]	72-54-8	0.15
DDE[C]	72-55-9	0.1
DDT[C]	50-29-3	0.1
Di(2-ethylhexyl)adipate	103-23-1	400[M]
Dibenzo(a,h)anthracene (PAH)[C]	53-70-3	0.0048
1,2-Dibromo-3-Chloropropane (DBCP)	96-12-8	0.2[M]
Dibromochloromethane (THM)[3, 7]	124-48-1	14
Dibromoethane 1,2[C]	106-93-4	0.018
Dicamba	1918-00-9	210
Dichloroacetic acid[C]	79-43-6	0.7
Dichlorobenzene 1,2	95-50-1	600[M]
Dichlorobenzene 1,3	541-73-1	94
Dichlorobenzene 1,4	106-46-7	75[M]
Dichloroethane 1,2[C, 6]	107-06-2	0.38 to 5[M]
Dichloroethylene 1,1	75-35-4	7[M]
Dichloroethylene 1,2-cis[6]	156-59-2	14 to 70[M]
Dichloroethylene 1,2-trans[6]	156-60-5	140 or 100[M]
Dichloromethane (methylene chloride) [C,6,8]	75-09-2	5.6 or 5[M]
Dichlorophenol 2,4	120-83-2	21
Dichlorophenoxyacetic acid (2,4-D)	94-75-7	70[M]
Dichloropropane 1,2[C, 6]	78-87-5	0.52 to 5[M]
Dichlorvos[C]	62-73-7	0.12

TABLE A

GROUND WATER ORGANIC CHEMICAL STANDARDS

(in micrograms per liter)

Parameter	**CAS No.**	**STANDARD[1]**
Diclorobenzidine[C]	91-94-1	0.078
Dieldrin[C]	60-57-1	0.002
Diethyl phthalate	84-66-2	5,600
Diisopropylmethylphosphonate (DIMP)[4]	1445-75-6	8
Dimethylphenol 2,4	105-67-9	140
Di-n-butyl phthalate	84-74-2	700
Dinitro-o-cresol 4,6	534-52-1	0.27
Dinitrophenol 2,4	51-28-5	14
Dinitrotoluene 2,4[C]	121-14-2	0.11
Dinoseb	88-85-7	7[M]
Dioxane 1,4-[C]	123-91-1	0.35
Dioxin (2,3,7,8 TCDD)[C, 6]	1746-01-6	2.2×10^{-7} to 3.0×10^{-5}, [M]
Diphenylhydrazine 1,2[C]	122-66-7	0.044
Diquat[6]	85-00-7	15 to 20[M]
Endosulfan	115-29-7	42
Endosulfan sulfate	1031-07-8	42
Endosulfan, alpha	959-98-8	42
Endosulfan, beta	33213-65-9	42
Endothall	145-73-3	100[M]
Endrin	72-20-8	2[M]
Endrin aldehyde	7421-93-4	2.1
Epichlorohydrin[C]	106-89-8	3.5

TABLE A

GROUND WATER ORGANIC CHEMICAL STANDARDS

(in micrograms per liter)

Parameter	**CAS No.**	**STANDARD[1]**
Ethylbenzene	100-41-4	700[M]
Ethylene Dibromide[C, 6] (1,2-dibromoehtane)	106-93-4	0.02 to 0.05[M]
Ethylene glycol monobutyl ether (EGBE) (2-Butoxyethanol)	111-76-2	700
Ethylhexyl phthalate (BIS-2)[C, 6](DEHP)	117-81-7	2.5 to 6[M]
Fluoranthene (PAH)	206-44-0	280
Fluorene (PAH)	86-73-7	280
Folpet[C]	133-07-3	10
Furmecyclox[C]	60568-05-0	1.2
Glyphosate	1071-83-6	700[M]
Heptachlor[C, 6]	76-44-8	0.008 to 0.4[M]
Heptachlor epoxide[C, 6]	1024-57-3	0.004 to 0.2[M]
Hexachlorobenzene[C, 6]	118-74-1	0.022 to 1.0[M]
Hexachlorobutadiene	87-68-3	0.45
Hexachlorocyclohexane, Alpha[C]	319-84-6	0.0056
Hexachlorocyclohexane, Gamma (Lindane)	58-89-9	0.2[M]
Hexachlorocyclopentadiene[6] 50[M]	77-47-4	42 to 50[M]
Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-hcdd)[C]	19408-74-3	5.60E-06
Hexachloroethane[C]	67-72-1	0.88
Hexanone 2	591-78-6	35
Hydrazine/Hydrazine sulfate[C]	302-01-2	0.012
Indeno (1,2,3-cd) pyrene (PAH)[C]	193-39-5	0.0048

TABLE A

GROUND WATER ORGANIC CHEMICAL STANDARDS

(in micrograms per liter)

Parameter	**CAS No.**	**STANDARD[1]**
Isophorone[3]	78-59-1	140
Malathion	121-75-5	140
Methanol	67-56-1	14,000
Methoxychlor[6]	72-43-5	35 to 40[M]
Methylene bis(N,N'-dimethyl)aniline 4,4'[C]	101-61-1	0.76
Metribuzin	21087-64-9	180
Mirex	2385-85-5	1.4
Naphthalene (PAH)	91-20-3	140
Nitrobenzene	98-95-3	14
Nitrophenol 4	100-02-7	56
Nitrosodimethylamine N[C](NDMA)	62-75-9	0.00069
Nitrosodiphenylamine N[C]	86-30-6	7.1
N-Nitrosodiethanolamine[C]	1116-54-7	0.013
N-Nitrosodi-n-propylamine[C]	621-64-7	0.005
N-Nitroso-N-Methylethylamine[C]	10595-95-6	0.0016
Oxamyl (vydate)[6]	23135-22-0	175 to 200[M]
PCBs[C, 5, 6]	1336-36-3	0.0175 to 0.5[M]
Pentachlorobenzene	608-93-5	5.6
Pentachlorophenol[C, 6]	87-86-5	0.088 to 1.0[M]
Perchlorate	7790-98-9	4.9
Phenol	108-95-2	2,100
Picloram	1918-02-1	490

TABLE A

GROUND WATER ORGANIC CHEMICAL STANDARDS

(in micrograms per liter)

Parameter	**CAS No.**	**STANDARD[1]**
Prometon	1610-18-0	100
Propylene oxide[C]	75-56-9	0.15
Pyrene (PAH)	129-00-0	210
Quinoline[C]	91-22-5	0.012
Simazine	122-34-9	4[M]
Styrene	100-42-5	100[M]
Tetrachlorobenzene 1,2,4,5	95-94-3	2.1
Tetrachloroethane 1,1,2,2	79-34-5	0.18
Tetrachloroethylene (PCE)[6]	127-18-4	17 or 5[M]
Tetrahydrofuran	109-99-9	6,300
Toluene[6]	108-88-3	560 to 1,000[M]
Total Trihalomethanes (TTHMs)[7]	N/A	80[M]
Toxaphene[C, 6]	8001-35-2	0.032 to 3[M]
Trichlorobenzene 1,2,4	120-82-1	70[M]
Trichloroacetic acid[C]	76-03-9	0.52
Trichloroethane 1,1,1 (1,1,1-TCA)[6]	71-55-6	14,000 or 200[M]
Trichloroethane 1,1,2[3, 6] (1,1,2-TCA)	79-00-5	2.8 to 5[M]
Trichloroethylene (TCE)	79-01-6	5[M]
Trichloropropane 1,2,3[C,8]	96-18-4	3.7E-4
Trichlorophenol 2,4,5	95-95-4	700
Trichlorophenol 2,4,6[C]	88-06-2	3.2

TABLE A

GROUND WATER ORGANIC CHEMICAL STANDARDS

(in micrograms per liter)

Parameter	**CAS No.**	**STANDARD[1]**
Trichlorophenoxyproprionic acid (2,4,5-tp) (Silvex)	93-72-1	50[M]
Vinyl Chloride[C, 6]	75-01-4	0.023 to2[M]
Xylenes (total)[6]	1330-20-7	1,400 to 10,000[M]

Notes and Abbreviations:

[1]All standards are chronic or 30-day standards. They are based on information contained in EPA's Integrated Risk Information System (IRIS) and/or EPA lifetime health advisories for drinking water using a 10^{-6} incremental risk factor unless otherwise noted.

[2]The standard for Benzene has been established at the MCL (q.v. 41.17)

[3]Standards for Group C compounds that have both published toxicity and carcinogenic risk data are calculated based on toxicity data and then adjusted downward using an uncertainty factor of 10.

[4]The Diisopropylmethylphosphonate (DIMP) standard was adopted in 1993 (q.v. 41.16)

[5]PCBs are a class of chemicals that include aroclors, 1242, 1254, 1221, 1232, 1248, 1260, and 1016, CAS numbers 53469-21-9, 11097-69-1, 11104-28-2, 11141-16-5, 12672-29-6, 11096-82-5, and 12674-11-2 respectively. The human-health criteria apply to total PCBs, i.e. the sum of all congener or all isomer analyses.

[6]Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. The Commission intends that control requirements for this chemical be implemented to attain a level of ambient water quality that is at least equal to the first number in the range except as follows:

- Wherever the Commission has adopted alternative, site-specific standards for the chemical, the site-specific standards shall apply instead of these statewide standards.

- The implementing agency has determined that setting the protection level to the second number in the range is consistent with the current and reasonably anticipated future uses of the groundwater, factoring in site-specific information, such as: existing prohibitions on groundwater use; whether the location is within the boundaries of an existing or reasonably anticipated public water supply; the proximity of the site to existing and reasonably anticipated water wells; whether or not the aquifer can produce water at a rate capable of supporting the anticipated use; or it can be demonstrated that access to groundwater is prohibited, unavailable or present at insufficient quantities for reliable use.

The Commission does not intend the adoption of this range of standards to result in changes to clean-up requirements previously established by an implementing agency, unless such change is mandated by the implementing agency pursuant to its independent statutory authority.

[7]For aquifer storage and recovery facilities, if the source of this chemical in ground water is potable water provided by a drinking water system with a Colorado PWSID that meets all applicable federal Safe Drinking Water Act and corresponding State requirements at the time that it is utilized for aquifer storage and recovery or artificial recharge, then the separate total trihalomethane standard will apply to the ground water in question, rather than the individual standards for bromodichloromethane, bromoform, chloroform, and/or dibromochloromethane. For any parameter for which there is a Maximum Containment Level (MCL) established by the Safe Drinking Water Act, as identified in Table A with Footnote "M", the MCL shall apply as the standard for groundwater when potable water is used for ASR or artificial recharge.

[8]Mutagenic compound, age dependent factors were used in calculating standard.

N/A – not applicable

[C]Carcinogens classified by the EPA as A, B1, or B2.

[M]Drinking water MCL.

CAS No. - Chemical Abstracts Service Registry Number

THM - Halomethanes

4. Whenever the practical quantitation limit, or PQL, for a pollutant is higher (less stringent) than a standard listed in subsection 2 or 3 above, the PQL shall be used in regulating specific activities. PQL's may be established by the applicable implementing agency or in consultation with the Water Quality Control Division.

5. Nothing in this regulation shall be interpreted to preclude:

   a. An agency responsible for implementation of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. 9601, et seq., as amended, from selecting a remedial action and a point of compliance that are more or less stringent than would be achieved by compliance with the statewide numerical standards established in this subsection, or alternative site-specific standards adopted by the Commission, where a determination is made that such a variation is authorized pursuant to the applicable provisions of CERCLA; or

   b. An agency responsible for implementation of Subtitle C of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901, et seq., as amended, or the Colorado Hazardous Waste Act, C.R.S. 25-15-101, et seq., as amended, from applying background levels or establishing "alternate concentration limits" and a point of compliance that differ from the statewide numerical standards established in this subsection, or alternative site-specific standards adopted by the Commission, for purposes of establishing hazardous waste management or corrective action requirements, where a determination is made that such background levels or alternate concentration limits are authorized by the regulations adopted pursuant to these statutory authorities; or

   c. An agency responsible for implementation of a storage tank (ST) program, pursuant to C.R.S. 25-18-101 et seq., as amended, from issuing a regulatory determination, including a point of compliance, that is more or less stringent than would be achieved by compliance with the statewide numerical standards established in this subsection, or alternative site-specific standards adopted by the Commission, where a determination is made that the ground water quality protection criteria identified in applicable ST regulations are satisfied.

6. Interim Narrative Standard

   a. The "Interim Narrative Standard" in 41.5(C)(6)(b)(i) below is applicable to all ground water, to which standards have not already been assigned in the state, with the exception of those areas where the total dissolved solids (TDS) are equal to or exceed 10,000 mg/l. This standard is applicable independent of and in addition to the statewide standards for radioactive materials and organic pollutants established in this section 41.5.C.

      b. i.Until such time as use classifications and numerical standards are adopted for the ground water on a site-specific basis throughout the state, and subject to the provisions of subsection (ii) below, ground-water quality shall be maintained for each parameter at whichever of the following levels is less restrictive:

         (A) existing ambient quality as of January 31, 1994, or

         (B) that quality which meets the most stringent criteria set forth in Tables 1 through 4 of "The Basic Standards for Ground Water."

ii. The interim standard shall not be interpreted or applied as defining or limiting the potential need for remediation of contaminated ground water where remedial requirements are established under state or federal law. It is the Commission's intent that, to the maximum degree technically feasible and economically reasonable, remedial efforts should be directed at cleaning up ground water contaminated by human activities to a degree such that it is usable for all existing and potential beneficial uses; this interim narrative standard is not intended to define when such remediation is or is not feasible. Where contamination already exists, this interim standard is merely intended to assure that conditions are not allowed to deteriorate further pending remedial action. The appropriate level of clean-up to be achieved may be addressed by this Commission in a future classification and standard-setting proceeding, or by other agencies with jurisdiction over remedial actions.

iii. In applying this interim narrative standard, the Commission intends that agencies with authority to implement this standard will exercise their best professional judgment as to what constitutes adequate information to determine or estimate existing ambient quality, taking into account the location, sampling date, and quality of all available data. Data generated subsequent to January 31, 1994, shall be presumed to be representative of existing quality as of January 31, 1994, if the available information indicates that there have been no new or increased sources of ground water contamination initiated in the area in question subsequent to that date. If available information is not adequate to otherwise determine or estimate existing ambient quality as of January 31, 1994, such ground water quality for each parameter shall be assumed to be no worse that the most stringent levels provided for in Tables 1 through 4 of “The Basic Standards for Ground Water,” unless the Commission has adopted alternative numerical standards for a given specified area.

D. Site-specific radioactive materials and organic pollutant standards

1. In determining whether to adopt site-specific standards to apply in lieu of the statewide standards established in subsection C above, the Commission shall first determine the appropriate ground water classifications within a specified area, in accordance with section 41.4.

2. The Commission shall then determine whether numerical standards other than some or all of the statewide standards established in subsection C above would be more appropriate for protection of the classified uses, taking into account the factors prescribed in section 25-8-204(4), C.R.S. and section 41.4. The downgrading factors described in Regulation No. 31, section 6(2)(B) of the Basic Standards and Methodologies for Surface Water shall not apply to the establishment of site-specific standards under this subsection.

41.6 POINT OF COMPLIANCE

A. In order to effect compliance with ground water standards, one or more points of compliance shall be established. The term “point of compliance” shall be assumed to cover situations with one or several points of compliance. An activity shall comply with ground water quality standards established under section 41.5 at the point of compliance. The establishment of a point of compliance shall not be required at the time of classification of any ground water pursuant to section 41.4. The point of compliance for those activities regulated by an implementing agency is discussed in subsection B of this section. Unless modified by the applicable implementing agency or the Commission, the criteria for establishing a point of compliance for the statewide standards established in section 41.5(C)(2) and (3) are set forth in subsection (C) of this section. For those activities regulated by the Water Quality Control Division through permit or control regulations, the point of compliance shall be established under the provisions of subsection (D) of this section. Nothing in this regulation shall lessen the Division's existing authority to consider these ground

water standards when setting limits for surface water discharges which impact ground water. The Commission may establish points of compliance in lieu of those established by the Division or this rule, on a case-by-case basis as described in subsection (E).

B. For the purposes of this subsection, the following agencies are referred to as “implementing agencies”:

> The Division of Reclamation, Mining and Safety; the State Engineer; the Oil and Gas Conservation Commission; and the state agencies responsible for activities related to the federal “Resource Conservation and Recovery Act of 1976”, as amended, and related state programs.

Per the provisions of section 25-8-202 C.R.S., implementing agencies shall establish the point of compliance for those activities under their control. The points of compliance established in section 41.6 (C) and (D) of this regulation shall not apply to activities regulated by an implementing agency, unless the Commission has determined after rulemaking that the point of compliance established by the implementing agency is not adequate to satisfy the requirements of section 25-8-202(7). The Commission may then establish, through rulemaking, a site-specific point of compliance which shall supersede any point of compliance established by the implementing agencies.

C. In the absence of a point of compliance established by the Division, and unless modified by the Commission in accordance with section 41.6 (E) or subject to alternative regulatory requirements in accordance with section 41.5 (C)(5), the point of compliance for the statewide standards established in section 41.5 (C)(2) and (3) shall be located as follows.

1. For facilities at which ground water contamination existed as of September 30, 1989:

   a. If the contamination is identified and reported to the division or other appropriate implementing agency on or before September 30, 1992, then the point of compliance shall be at whichever of the following locations is closest to the contamination source:

      i. The site boundary; or

      ii. The hydrologically downgradient limit of the area in which contamination exists when identified.

   b. If the contamination is not identified and reported to the division or other appropriate implementing agency on or before September 30, 1992, then the point of compliance shall be at whichever of the following locations is closest to the contamination source:

      i. The site boundary; or

      ii. The hydrologically downgradient limit of the area in which contamination exists as of September 30, 1989; or

      iii. If the location specified in (ii) can not be identified, then at the hydrologically downgradient limit of the area below the activity potentially impacting ground water quality.

2. For all other facilities, at the hydrologically downgradient limit of the area below the activity potentially impacting ground water quality.

D. Within a specified area for which ground water quality classifications have been established and unless modified by the Commission in a site-specific hearing in accordance with section 41.6 (E), the point of compliance for those activities regulated by the Division through discharge permit regulations or control regulations shall be established by the Water Quality Control Division in accordance with the following criteria.

1. For all existing activities the point of compliance will be set as follows:

a. Except for surface water discharges, at some distance hydrologically downgradient from the activity that is causing, or which has the potential to cause, the contamination, based on one of the following criteria, and selecting that distance closest to the activity:

i. A specified distance, as determined by (b) below; or

ii. The hydrologically downgradient limit of the area in which contamination has been identified; or

iii. The site boundary.

b. In determining a specified distance the division shall take into consideration the following factors;

i. The classified use, established by the Commission, for any ground water or surface water which could be impacted by contamination from the activity;

ii. The geologic and hydrologic characteristics of the site, such as depth to ground water, ground water flow direction and velocity, soil types, surface water impacts, and climate;

iii. The toxicity, mobility, and persistence in the environment of contaminants used or stored at the facility or discharged from the facility;

iv. Established wellhead protection areas;

v. The potential of the site as an aquifer recharge area; and

vi. Recommendations submitted by the facility owner or operator, including technical and economic feasibility.

c. For surface water discharges that impact ground water, the point of compliance shall be established in accordance with the provisions of the Colorado Discharge Permit System Regulations, Regulation No. 61 (5 CCR 1002-61).

2. For any new activity the point of compliance will be set as follows:

a. Unless modified by the division as specified in (b) below, the point of compliance will be set at the hydrologically downgradient limit of the area below the activity potentially impacting ground water quality.

b. The point of compliance determined in (a) above may be modified by the Division on a case-by-case basis with consideration of the following factors:

i. The classified use, established by the Commission, for any ground water or surface water which could be impacted by contamination from the activity;

ii. The geologic and hydrologic characteristics of the site, such as depth to ground water, ground water flow direction and velocity, soil types, surface water impacts, and climate;

iii. The toxicity, mobility, and persistence in the environment of contaminants used or stored at the facility or discharged from the facility;

iv. Established wellhead protection areas;

v. The potential of the site as an aquifer recharge area; and

vi. Recommendations submitted by the facility owner or operator, including technical and economic feasibility.

E. When considering a request to adopt a site-specific point of compliance to apply in lieu of that established in subsection (C) or (D) above:

1. The Commission shall establish a more stringent site-specific point of compliance where determined necessary to protect human health and the environment, taking into account the potential for vertical migration of contamination, the number, quantity, nature, and persistence in the environment of the contaminants present, technological feasibility, economic reasonableness, upgradient levels of contamination, geohydrological data and features, the classified uses established by the Commission for any ground water or surface water which would be impacted by contamination from the activity, and other environmental data or other relevant information as determined by the Commission; or

2. If the Commission determines that a less stringent point of compliance would protect human health and the environment, and the point of compliance established pursuant to subsection (C) or (D) is technologically infeasible or economically unreasonable, it shall establish an alternate site-specific point of compliance, taking into account the potential for vertical migration of contamination, the number, quantity, nature, and persistence in the environment of the contaminants present, technological feasibility, economic reasonableness, upgradient levels of contamination, point of use treatment, geohydrological data and features, the classified uses established by the Commission for any ground water or surface water which would be impacted by contamination from the activity, and other environmental data or other relevant information as determined by the Commission.

41.7 IMPLEMENTATION

A. Except for sections 41.5(C) and 41.6(A) and (B), these regulations shall not be deemed automatically applicable to any ground waters of the State.

B. The Commission is responsible for classifying the ground waters of the State and promulgating water quality standards as set forth in sections 25-8-202(1)(a), 25-8-203 and 25-8-204, C.R.S.

The Commission may classify ground waters and promulgate water quality standards in accordance with the provisions of sections 41.4 and 41.5 of the regulations, upon its own motion or upon petition submitted by the division, any other state agency, or any interested person, including a regulated entity or a person who may be affected by ground water quality.

C. The determination to accept or deny a petition for consideration under this section, and the scheduling of such petitions for hearing, shall be at the discretion of the Commission, provided, however, that the Commission shall be required to hear any petition for a sitespecific standard or a site-specific point of compliance for radioactive materials and organic pollutant standards submitted pursuant to section 41.5(D). In making such determinations the Commission shall consider the hardship or impact that inaction may have upon the petitioner, other interested persons, and the ground waters of the State; the relative hardships or impacts that may be caused where more than one petition is submitted or is pending; the stage of development of an appropriate data base for decision-making; the Commission's workload and priorities for action; and other relevant factors.

D. Hearings under this section shall be held in accordance with section 24-4-103, C.R.S. and the Commission's Procedural Regulations.

E. The Commission may consider a change in classifications or water quality standards based upon substantial new information demonstrating that the current classifications or standards should no longer apply. The determination to accept or deny a petition for consideration under this subsection shall be made in accordance with subsection B, above, provided that no ground waters shall be considered for reclassification or changes in water quality standards more than once in any twelve month period.

F. The Commission may grant variances from the standards specified in section 41.5 of these regulations on a case-by-case basis considering the factors listed in section 25-8-204(4) C.R.S., and where it is demonstrated by a preponderance of the evidence that a variance from the water quality standards specified in section 41.5 is most appropriate to the protection of the classified uses. The extent and duration of any such variance shall be made on a case-by-case basis.

G. When the Commission has established statewide standards or classification(s) and standards for ground water in a specified area, those classifications and standards shall be used with respect to the regulation and subsequent enforcement of specific activities by the Commission, the Administration and other State agencies, consistent with applicable law.

H. When the Commission has not established classification(s) and standards for ground water in a specified area, the Commission recommends the classifications and standards set forth in these regulations as guidance for use by other State agencies in the implementation of ground water protection responsibilities, on a case-by-case basis, consistent with applicable law. This shall not be construed as a delegation by the Commission of its authority to classify ground water and promulgate water quality standards.

I. Existing discharges of pollutants to ground water shall be deemed “activities” as defined in section 41.3(1), and are not exempt from regulation, unless specific statutory or regulatory provisions require otherwise.

41.8 SEVERABILITY

The provisions of these regulations are severable, and if any provisions or the application of the provisions to any circumstances is held invalid, the application of such provision to other circumstances, and the remainder of these regulations, shall not be affected thereby.

TABLE 1 Domestic Water Supply – Human Health Standards	
Parameter	**Standard[1]**
Biological	
Total Coliforms (30 day	2.2 [a]org/100 ml

average)	
Total Coliforms (max in 30 days)	23org/100 ml
Inorganic	
Antimony (Sb)[d, M]	0.006mg/l
Asbestos [M]	7,000,000fibers/Liter
Arsenic (As)[d, M]	0.01mg/l
Barium (Ba)[d, M]	2.0mg/l
Beryllium (Be)[d, M]	0.004mg/l
Cadmium (Cd)[d, M]	0.005mg/l
Chromium (Cr)[c, d, M]	0.1mg/l
Cyanide [Free] (CN)[M]	0.2mg/l
Fluoride (F)[d, M]	4.0mg/l
Lead (Pb)[d]	0.05mg/l
Mercury (inorganic) (Hg)[d,M]	0.002mg/l
Molybdenum (Mo) [d]	0.21mg/l
Nickel (Ni)[d]	0.1mg/l
Nitrate (NO3)[d, M]	10.0mg/l as N
Nitrite (NO2)[d, M]	1.0mg/l as N
Total Nitrate+Nitrite (NO_2+NO_3-N)[d, f]	10.0mg/l as N
Selenium (Se)[d, M]	0.05mg/l
Silver (Ag)[d]	0.05mg/l
Thallium (Tl)[d, M]	0.002mg/l
Uranium (U) [d, 2]	0.0168 to 0.03[M]mg/l
Radiological[b, d]	
Gross Alpha Particle Activity[i, M]	15pCi/l
Beta and Photon Emitters[e]	4mrem/year

TABLE 2
Domestic Water Supply – Drinking Water Standards

Parameter	**Standard**
Chlorophenol	0.0002mg/l
Chloride (Cl)[d]	250mg/l
Color	15color units
Copper (Cu)[d]	1mg/l
Corrosivity	Noncorrosive
Foaming Agents	0.5mg/l
Iron (Fe)[d]	0.3mg/l
Manganese (Mn)[d]	0.05mg/l
Odor	3threshold odor numbers
pH	6.5 - 8.5
Phenol	0.3mg/l

TABLE 2
Domestic Water Supply – Drinking Water Standards

Sulfate (SO_4)[d]	250 mg/l
Zinc (Zn)[d]	5 mg/l

Table 3
Agricultural Standards

Parameter	**Standard**
Aluminum (Al)[d, f]	5 mg/l
Arsenic (As)[d]	0.1 mg/l
Beryllium (Be)[d]	0.1 mg/l
Boron (B)[d, g]	0.75 mg/l
Cadmium (Cd)[d]	0.01 mg/l
Chromium (Cr)[d]	0.1 mg/l
Cobalt (Co)[d]	0.05 mg/l
Copper (Cu)[d]	0.2 mg/l
Fluoride (F)[d]	2 mg/l
Iron (Fe)[d]	5 mg/l
Lead (Pb)[d, f]	0.1 mg/l
Lithium (Li)[d, h]	2.5 mg/l
Manganese (Mn)[d, j]	0.2 mg/l
Mercury (Hg)[d, f]	0.01 mg/l
Nickel (Ni)[d]	0.2 mg/l
Nitrite (NO2-N)[d, f]	10 mg/l as N
Nitrite & Nitrate(NO2 +NO3-N)[d, f]	100 mg/l as N
Selenium (Se)[d]	0.02 mg/l
Vanadium (V)[d]	0.1 mg/l
Zinc (Zn)[d]	2 mg/l
pH	6.5 - 8.5

TABLE 4
TDS Water Quality Standards

Background TDS Value (mg/l)	**Maximum Allowable TDS Concentrations**
0 - 500	400 mg/l or 1.25 times the background level, whichever is least restrictive
501 - 10,000	1.25 times the background value
10,001 or greater	No limit

[1] Chronic or 30-day standard based on information contained in EPA's Integrated Risk Information System (IRIS) using a 10^{-6} incremental risk factor.

[2] Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. The Commission intends that control requirements for this chemical be implemented to attain a level of ambient water quality that is at least equal to the first number in the range except as follows:

- Where ground water quality exceeds the first number in the range due to a release of contaminants that occurred prior to September 15, 2012, (regardless of the date of discovery or subsequent migration of such contaminants) clean-up levels for the entire contaminant plume shall be no more restrictive than the second number in the range or the ground water quality resulting from such release, whichever is more protective.
- Wherever the Commission has adopted alternative, site-specific standards for the chemical, the site-specific standards shall apply instead of these statewide standards.

The Commission does not intend the adoption of this range of standards to result in changes to clean-up requirements previously established by an implementing agency, unless such change is mandated by the implementing agency pursuant to its independent statutory authority.

[a]. When the Membrane Filter Technique is used for analysis, the average of all samples taken within thirty days must be less than 1 organism per 100 milliliters of sample. When the Multiple Tube Fermentation Method is used for analysis, the limit is less than 2.2 org/100 ml.

[b]If the identity and concentration of each radionuclide in a mixture are known, the limiting value would be derived as follows: Determine, for each radionuclide in the mixture, the ratio between the quantity present in the mixture and the limit specified. The sum of such ratios for all radionuclides in the mixture shall not exceed "1" (i.e. unity). A radionuclide may be considered as not present in a mixture if the ratio of the concentration to the limit does not exceed 1/10 and the sum of such ratios for all radionuclides considered as not present in the mixture does not exceed 1/4.

[c]The chromium standard is based on the total concentration of both trivalent and hexavalent forms of dissolved chromium.

[d]Measured as dissolved concentration. The sample water shall be filtered through a 0.45 micron membrane filter prior to preservation. The total concentration (not filtered) may be required on a case-by-case basis if deemed necessary to characterize the pollution caused by the activity.

[e]If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 mrem per year. Except for Tritium and Strontium 90 the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents shall be calculated on the basis of a 2 liter per day drinking water intake using the 168-hour data listed in "Maximum Permissible Body Burden and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69, as amended, August 1963, US Department of Commerce.

[f]These more stringent levels are necessary to protect livestock watering. Levels for parameters without this footnote are set to protect irrigated crops at the same level. Where a party can demonstrate that a livestock watering use of ground water is not reasonably expected, the applicable standard for lead is 5.0 mg/l.

[g]This level is set to protect the following plants in ascending order of sensitivity: Pecan, Black Walnut, Persian (English) Walnut, Jerusalem Artichoke, Navy Bean, American Elm, Plum, Pear, Apple, Grape (Sultanina and Malaga), Kadota Fig, Persimmon, Cherry, Peach, Apricot, Thornless Blackberry, Orange, Avocado, Grapefruit, Lemon. Where a party can demonstrate that a crop watering use of ground water is not reasonably expected, the applicable standard for boron is 5.0 mg/l.

[h]This level protects all crops, except citrus which do not grow in Colorado and therefore a more stringent level of protection is not required.

[i]The Gross Alpha Activity standard excludes alpha activity due to Radon and Uranium.

[j] This standard is only appropriate where irrigation water is applied to soils with pH values lower than 6.0.

[M]Drinking water MCL.

41.9 Reserved.

41.10 Reserved.

41.11 Reserved.

41.12 STATEMENT OF BASIS AND PURPOSE

Statement of Basis and Purpose for adopting the Regulations entitled: “The Basic Standards for Ground Waters”. In accordance with 24-4-103(4), CRS (1982 and 1985 Supp.), the Commission adopts this Statement of Basis and Purpose.

PURPOSE

“The Basic Standards for Ground Waters” establishes a system of classifications (classes) for determining the appropriate degree of protection (standards) necessary to maintain beneficial uses of ground waters. These standards and classes are intended to complement regulations 3.1.0, “The Basic Standards and

Methodologies" which are primarily applicable to surface waters. Together, regulations 3.1.0 and 3.11.0 protect all state waters as defined in Section 25-8-203, CRS (1982). Separate regulations for surface and ground waters are appropriate, because the surface water classification system is not easily adopted to ground waters.

These regulations are the first step in developing a comprehensive, statewide ground water protection program. The complete program will include control regulations which will enforce the water quality standards. These additional regulations may include amending the current CDPS permit regulations and adopting activity-specific control regulations.

It is not the intent of the Commission to control existing or future uses of ground water (i.e., domestic, agricultural, or industrial uses). The intent is to protect ground water quality from uncontrolled degradation and thereby protect existing and future uses of ground water.

It is not the intent of the Commission or the Division by virtue of adoption of these regulations or subsequent control regulations, to duplicate ground water regulations adopted by other state or federal programs. When an activity that impacts ground water appears to be unregulated or inadequately regulated with respect to those impacts, the Division will conduct a thorough review of any applicable authorities prior to proposing a control regulation.

NEED FOR REGULATIONS

Ground water is the primary water source for seventy-five percent of the public water supply systems of the state (defined in the Colorado Primary Drinking Water Regulations).

There are approximately 825,000 people in Colorado that rely either wholly or partially on ground water. Ground water use to support new urban areas is increasing as surface water supplies become more difficult to obtain in some metropolitan areas. Agriculture also relies heavily on ground water for the production of crops and livestock. An estimated 1.5 million acres are presently being irrigated with ground water and approximately 12,500 well permits have been issued for livestock watering.

Currently, public water supply systems using ground water are not required to treat the water prior to distribution except for disinfection. In 1974, the federal "Safe Drinking Water Act" (SDWA) was passed which required regular testing of public water supplies to ensure compliance with the maximum contaminant levels (MCLs). However, the regulations do not require testing for even 1% of the synthetic chemicals in use in the nation today. The 1986 amendments to the Safe Drinking Water Act will increase the number of chemicals to be tested by public water systems. However, neither the SDWA nor the 1986 amendments required testing of private or agricultural supply wells.

Although the state's lack of a comprehensive data base prevents demonstrating a widespread contamination problem, there are many reasons for adopting a regulation which creates a framework for further ground water quality protection. These reasons are:

1. The increasing reliance on ground water by public and private water supply systems in a water-short state mandates protection of subsurface water quality. There may not be any alternative surface supplies available in the event of contamination.

2. Severe ground water contamination has occurred in several specific locations in Colorado. This regulation is a necessary step to prevent a proliferation of ground water problems.

3. The high expense of clean up of already polluted ground water fully justifies a strong, thorough effort to prevent any contamination which will impair the usefulness of ground water.

4. The Commission has been recognized, at the state level, as the agency responsible for coordinating a state ground water protection program. Examples of this responsibility include:

i. By its enabling statute, the Water Quality Control Commission is the ultimate state agency authority for the protection of the waters of the State, including subsurface waters.

ii. In an executive order issued on July 15, 1985, Governor Lamm stated that the Colorado Department of Health is given primary responsibility for coordinating the state's ground water quality protection effort.

5. Coordination of various federal and state ground water protection programs is consistent with federal policy. In 1984, EPA developed a ground water protection strategy. One of the main objectives of the strategy was to achieve greater consistency in decision making on ground water protection and clean-up. EPA is providing the Water Quality Control Division with technical and financial support for the development and implementation of a ground water protection program. In 1986, Congress amended the Safe Drinking Water Act so as to encourage state programs for well head protection.

6. Since other state agencies (and counties) are required to protect ground water incidental to regulating other activities, the Commission should assume-at the least-a coordinating role in assuring consistent protection of ground water quality. By promulgating a definition of the various uses of ground water and the numerical maximum chemical concentrations necessary to protect those uses, the Commission is establishing a common denominator such that ground waters will be classified and protected.

7. In the future, other causes of ground water contamination which are not now regulated may be found. A regulatory structure in place now which defines the level of risk of contamination and levels of control required will be useful when addressing future problems. Relying upon a framework of uses to be protected, future legislation, control regulations by the Commission, or regulations by other agencies, may be developed to address presently unregulated causes of contamination.

8. With standards defined to protect uses, the Division will be able to develop permit limits for surface and subsurface discharges to ground water, where other regulations authorize Division control of such surface activity.

PUBLIC INPUT AND COMMISSION GOAL

The Commission and Division appointed an AD Hoc Ground Water Advisory Committee in 1982. The Committee represented the various entities who would be most affected by a ground water protection program. On May 15, 1984, the Committee recommended, and the Colorado Water Quality Control Commission adopted, the following statement pertaining to ground water protection:

> "The goal of the Water Quality Control Commission is to provide maximum beneficial use of ground water resources, while assuring the safety of the users by preventing or controlling those activities which have the potential to impair existing or future beneficial uses of ground water or to adversely affect the public health. The necessary program is to be instituted in a manner that is consistent with and complementary to the provisions of the Colorado Water Quality Control Act."

This Basic Standards Regulation for ground water, which is adopted after exhaustive public rulemaking hearings, is consistent with this goal. The focus of the Basic Standards Regulation for ground water is the identification of ground water use or uses and the quality level to be maintained to assure its usefulness. This is a framework around which existing and future licensing and permitting regulations revolve in authorizing, conditioning, limiting and denying activities which could impair existing or future beneficial uses of ground water.

DISCUSSION OF REGULATIONS

Classification System

The classification system is a framework of uses of ground water which are to be assigned on a site-specific basis by the Commission so that standards for chemical pollutants can be assigned on a site-specific basis by the Commission so that standards for chemical pollutants can be assigned at levels necessary to protect the use.

A five (5) class system was developed for these regulations. This system is based on existing and potential future uses and actual water quality data.

1. Domestic Use - Quality

2. Agricultural Use - Quality

3. Surface Water Quality Protection

4. Potentially Usable Quality

5. Limited Use and Quality

Ground water may be assigned more than one class because it may have more than one existing or potential use.

While selection of any of these classes for a specific site is to protect the quality of the water for that beneficial use, because the classification may be based on a potential use, the classification is no warranty that the existing quality is entirely fit for that use by one who does or intends to put it to such use.

The selection of classifications for particular ground water within a specified area shall be by the Commission. The selection of particular classes shall be based upon specific criteria found in the regulations which describe each class.

The regulations provide that ground water may be classified “Domestic Use - Quality” or “Agricultural Use - Quality” if the ground water is either “used” or reasonably likely to be used for domestic or agricultural purposes within the specified area, or if the most recent state engineer's well records or applicable court decrees reveal that ground water is “permitted” or “decreed” for such uses within the specified area. For purposes of classification of ground water pursuant to these two provisions, the Commission presumes (1) that the “use” of ground water is after a legal withdrawal, and (2) that the pertinent state engineer's well record reveals a valid permit, and that the applicable court decree is perfected. If a domestic or agricultural use classification is based solely upon well records or court decrees, that classification may be rebutted by information demonstrating that domestic or agricultural use of ground water is not being made and is not likely to be made in the future.

Selection of applicable classes for a specified area shall occur when there is an activity which affects or has the potential to affect ground water quality within a specified area, and when a specified area for that activity is determined. Upon identification of the activity and determination of the specified area by the Commission, the owner/operator of the activity gathers information within the specified area. The owner/operator of the activity then submits this information to the Commission, pursuant to Section 3.11.7.

SPECIFIED AREA

The specified area is that area within which the ground water is classified. The Commission must determine the appropriate shape, depth, boundaries, and extent of a specified area such that existing and potential uses of ground waters are identified and protected from discharges to ground water by activities.

A specified area will be determined as early as possible after an activity has been identified. The Commission assumes that the specified area may be modified as more hydrologic and geologic information is acquired. The Commission may determine a specified area in the absence of an activity.

A conservative area of two lateral miles around the activity in question will presumptively be used as the initial specified area. The Commission finds this area to be reasonable for the following reasons:

a. Geraghty and Miller, Inc. performed a national survey, for USEPA Headquarters, of 68 ground water contamination sites. The study revealed that 95% of the plumes of contamination were limited to within 2 miles of the source. Geraghty and Miller, Inc. performed an in-house survey of 73 more such sites (a total of 141 sites) which also revealed that 95% of these plumes of contamination were limited to 2 miles from the source;

b. The ICF Corporation performed a national survey, for USEPA Headquarters, of 150 RCRA sites. In this study, ICF found that 95% of the distances from the source to ground water discharge boundries were within 2 miles.

c. Geraghty and Miller, Inc. performed a national survey, for USEPA Headquarters, of large ground water pumping systems (i.e., municipal water supply wells). This survey revealed that approximately 95% of these wells had a capture zone (i.e., zone of influence) within a 2 mile radius.

GROUND WATER QUALITY STANDARDS

The promulgated Water Quality Standards include narrative and numeric standards.

NARRATIVE STANDARDS

The narrative standards consider all man-induced alterations of ground water. Since the Commission cannot, and will not, control the withdrawal and use of ground water, the narrative standards are designed to protect all potential uses of the waters. The narrative standards prohibit the introduction of non-natural chemicals where best available information indicates a potential threat to the public health, safety or welfare.

The Colorado Primary Drinking Water Regulations (CPDWR) do not include MCLs (maximum contaminent levels) for many chemicals such as dioxin, TCE, and EDB. There are often health advisories and other scientific studies indicating that a specific chemical is carcinogenic, mutagenic, toxic, or poses a danger to public health, safety, or welfare. The Commission will have the ability to make a specific determination of a limit for that constituent in ground water. This section allows the Commission to make such a determination in the absence of an MCL for the chemical. The toxic and hazardous pollutant lists developed pursuant to sections 301 (a)(1) and 311 (b)(2)(A) of the federal Clean Water Act and contaminants (pollutants) that have had an EPA Health Advisory developed for them will be used as a basis for determining what specific compounds will be included.

NUMERIC STANDARDS

The numeric standards are contained in Tables 1, 2, 3, and 4. These standards apply to classified ground water.

The majority of the numeric standards listed in Table 1 are the maximum contaminant levels (MCLs) for public drinking water supplies, as established by the National Primary Drinking Water Regulations. The remainder are derived from the Colorado Basic Surface Water Standards. These human health levels are set to protect the public from acute poisoning and from long-term “chronic” effects. The MCLs are also contained in the CPDWR. The limits for radioactive constituents; Cesium, Plutonium, Thorium and Tritium

are those which would limit human exposure to four (4) millirems/year. Table 1 will be expanded as MCLs for additional parameters are developed under the National Primary Drinking Water Regulations. The numeric standards listed in Table 1 are applicable to ground waters classified “Domestic Use-Quality”.

Table 2 contains additional numeric standards for “Domestic Use - Quality” ground waters. Much debate and discussion revolved around the need for these standards. These parameters are the National Secondary Drinking Water Standards and are instituted to maintain a ground water as a drinking water source requiring very little treatment. In the judgement of the USEPA Administrator, these limits are a requisite to protect the public welfare.

Contaminants (pollutants) contained in Table 2 are those which may adversely affect the aesthetic quality of a drinking water such as taste, odor, color, and appearance and which thereby may deter public acceptance of and confidence in that ground water source as a drinking water supply.

Numeric standards meant to protect a water source for agricultural uses are listed in Table 3. Table 3 numeric values were developed through Commission review of Water Quality Criteria in 1972, EPA/R/73/033 (March 1973). The value of the molybdenum was developed from information provided by AMAX and the Cottor Corporation. These values are set at levels to protect livestock and crops. All “Agricultural Use - Quality” ground waters must meet these standards when implemented by any agency.

Much public input and debate revolved around Table 4, “TDS Water Quality Standards.” Some parties wanted less or no degradation of ground water, while other parties felt that more was warrented. The division proposed this version which allows for limited degradation.

The TDS numeric standard is implemented on a sliding scale and is applicable to all classes of ground water, except “Domestic Use - Quality” and “Limited Use and Quality” ground waters. TDS Table 4 values are applicable to “Agricultural Use - Quality”, “Surface Water Quality Protection” and “Potentially Usable Quality” ground waters, because these three classes are not subject to Table 2 for sulfates and chlorides; a TDS limitation for these three classes assumes some level of anti-degradation.

By maintaining a TDS concentration within a range, an existing or potential use should not be impacted. The sliding scale allows for a twenty-five percent increase for all ground waters with a background TDS concentration greater than 500 mg/l. If the background concentration is less than 400 mg/l then the maximum allowable concentration of TDS is 500 mg/l. This value is the secondary drinking water standards and is instituted to maintain a high quality water. Total dissolved solids concentrations of less than 500 mg/l are not expected to impair any ground water use. The twenty-five percent allowable incremental increase for waters with a background between 500 and 10,000 mg/l would afford a greater degree of protection to ground water with lower TDS concentrations. Ground waters with TDS concentrations greater than 10,000 mg/l would not have a numeric limit.

The term “representative” contained within the definition for background level implies standard acceptable monitoring, sampling, and analytical procedures, which are available.

The criteria for determining background levels will be established by the Commission. It is important that the regulated entity work closely with the agency requiring the background level determination.

It is intended that the monitoring and sampling protocols shall be those procedures best capable for obtaining ground water samples which are representative of the water quality being monitored.

The following documents may provide useful guidance:

1. “Manual of Ground-Water Sampling Procedures”, Scalf, M.R., et al., 1981. National Water Well Association, Worthington, Ohio.

2. "Procedures for the Collection and Preservation of Ground Water and Surface Water Samples and for the Installation of Monitoring Wells", U.S. Dept. of Energy, January, 1981. GJ/TMC-08, UC-70A.

3. "Practical Guide for Ground-Water Sampling", Barcelona, M.J., et al., EPA/600/2-85/104 September, 1985.

The analytical method selected for a parameter should be that which can measure the lowest detection limit for the parameter, unless a standard is within the range of another approved method. Approved analytical methods include those contained in the "Standard Methods for the Examination of Water and Wastewater," 16th or most recent edition, or "Methods for Chemical Analysis of Water and Wastes," EPA, Office of Technology Transfer, or 40 CFR "Guidelines Establishing Test Procedures for the analysis of Pollutants under the Clean Water Act (CWA)."

The owner/operator reporting the results of the laboratory studies shall identify the detection limit and method used for the analysis of each parameter.

POINT OF COMPLIANCE

The Commission intends to allow for flexibility in locating the point or points of compliance within the specified area. After the point or points of compliance are determined, applicable ground water quality standards are to be met at these locations.

Mining activities are recognized to occur within ground water bodies and that water quality within the disturbed area will obviously change. The point(s) of compliance established outside the area anticipated to be disturbed may protect the water body while allowing the mining activity.

The Commission envisions that future and/or amended regulations will specify the design criteria and/or monitoring requirements necessary at the point or points of compliance. Down-gradient ground water monitoring locations may correspond to the point of compliance for the regulated activity.

IMPLEMENTATION

The Commission has considered several approaches to implementation of these regulations. The proposed rule initially included a provision for automatic applicability, with appeals to the Commission for reclassification. The parties raised strong objections to this proposal based on due process and statutory grounds. In its deliberations the Commission deleted this approach and proposed to the delegate classification and standard setting authority to other state agencies. The Attorney General's office indicated that the approach would constitute an unlawful delegation of the Commission's statutory duties. Next the Commission proposed to include a procedure for appeals to the Commission, but the delegation issue continued to be raised by the Attorney General's office and at least one party. The implementation provisions adopted in this rule are a response to objections raised by parties and the Attorney General.

The Commission assumes full responsibility for classification and standard setting at this time. Ample opportunity for comment has been provided at each juncture in the process, and the Commission has afforded the parties two additional four day comment periods.

In the absence of some delegation of responsibility to other agencies, the Commission anticipates a potential workload beyond its capabilities to absorb. The final rule establishes a list of factors to be considered in acting upon petitions for rulemaking hearings, in recognition of the time and resource limitations placed upon the Commission.

Reconsideration of classifications and standards by the Commission is permissible in the final rule. However, the Commission has determined that C.R.S. 25-8-207 was intended to apply only to surface waters and is not applicable to ground water.

A variance provision has been included in the final rule. The burden of proof is on the proponent of a variance to demonstrate that Table Values need not be adopted in order to protect classified uses. Variances can be granted at the time that standards are initially adopted or in a proceeding under Section 3.11.7(D).

When the Commission has adopted classifications and standards, such regulations should be applied by the Commission, the Division and other state agencies in carrying out their ground water protection responsibilities. The Commission has favored the delegation of responsibilities to other agencies, but has eliminated that approach based upon the objections of the Attorney General. However, the Commission hopes that other agencies with the authority to do so will follow the classification and standards system established by the regulations even in the absence of rulemaking by the Commission to establish classifications and standards for a specified area.

Ground water in a specified area shall not be deemed classified under C.R.S. 25-8-203, and standards shall not be deemed to be set under C.R.S. 25-8-204, in the absence of rulemaking by the Commission.

FISCAL IMPACT STATEMENT FOR THE BASIC STANDARDS FOR GROUND WATER

The Colorado Water Quality Control Commission promulgates this regulation entitled “The Basic Standards for Ground Water” under the authority to classify waters of the state and to establish water quality standards to support those classifications, Section(s) 25-8-202, 203, and 204 CRS.

The regulation establishes a system for classifying ground water and describing those classifications by use and quality. The standards, when applied to specific classes of ground water, become the baseline by which one can establish if water quality has been degraded or water use has been impaired or precluded. At this point there is no economic impact with respect to these regulations, except the cost associated with adopting the regulations. As control or other regulations are proposed which will implement the classification and standards system, the actual costs and benefits for each such proposal will be developed and considered. These regulations as originally proposed would have been automatically applicable to all sources of ground water contamination. This concept has been eliminated in the final rule.

This statement discusses potential economic impacts form future regulations that may be adopted to implement this regulation. All statements regarding values and costs are subject to change during the future adoption of specific control regulations.

COSTS

The fiscal impacts may occur at two different points in the regulatory system. If the regulations are implemented through source controls, then the entities responsible for the source (activity) will bear the cost. In socio-economic terms, this is the most equitable way to pay for the cost of prevention. The responsible entity may either pass the costs on to their consumers and have a relatively small percent increase in costs of service over a large user base, or absorb the costs without changing the price of their goods or services.

If the regulations are implemented by pathway elimination (i.e., alternate water supplies or point-of-use water treatment), then the question is who bears the costs? If the owner or operator of the source (activity) pays for pathway elimination, then the cost remains spread over the users of the product. If the pathway is eliminated and the cost is borne by the ground water users who are not responsible for the source, then the cost may be borne by a larger but less appropriate user base.

Finally, if neither the source nor the pathway are controlled and contaminated ground water is delivered to its ultimate user, then the individual water user carries the burden associated with increased health costs and risks.

Treatment of waste prior to discharge as a result of a control regulation is a viable alternative but the burden is upon the facility to provide the treatment. The elimination or reduction of the discharge includes design criteria such as pond linings, leak collection and/or detection. These costs can be significant but are limited to the life of the facility plus some limited post closure period. Eliminating or reducing the discharge is already required under several state statutes for some facilities such as certain solid waste disposal facilities.

Treatment of waste prior to discharge is an effective option for controlling contamination but is capital-intensive in terms of initial costs. This is a cost of production, manufacturing or operation and is considered a cost of doing business. The treatment of waste prior to discharge is already required for facilities that discharge to surface water.

Treatment of water at the point of use is the most costly option because it requires recapturing a much larger volume of contaminated water and redistribution of the water as well as treatment and maintenance. When this is related to private water supplies and maintenance, the cost rises because the treatment is not centralized.

One example of point-of-use treatment costs is nitrate removal system for the McFarland Mutual Water Company water supply in McFarland, California. The capital cost in 1983 was $900,000 for a one million gallon per day facility. Operating costs are twenty-four cents per 1,000 gallons.

In Colorado, provision of an alternate water supply could arguably be the most expensive option depending on the location of the contaminated resource. For example in the Denver area the cost to replace a water supply for South Adams County Water and Sanitation District (30,000 residents) is approximately $20.9 million for water from the Metro Water Development Authority and $34 million for water from the Burlington Ditch. This does not include the costs of treating the water. In rural areas, the replacement cost may not be as high as in the Denver area but alternate water supplies are not likely to be readily available.

Finally, the costs associated with cleanup of contaminated ground water tends to be the most expensive. Remedial cleanup is not always feasible, it is always costly. The costs associated with implementing these regulations as preventative measures are significantly less than the costs of implementing them as reactive or “cleanup” measures.

When used in the reactive sense, the costs of cleanup and contamination investigation have been described by Geraghty and Miller Ground Water Contamination, 1984, page 16. “Hydrogeologic investigations to define contamination problems can cost from $25,000 to $250,000. Litigation may lead to doubling of this price. The minimum costs of the ground water phase of a partial cleanup and containment project is $500,000.”

In Santa Clara, California, IBM has spent $20 million and Fairchild has spent $16 million to cleanup ground water contamination. California has had some nineteen sites put on the Superfund National Priorities List because the small companies which are responsible do not have the funds to pursue cleanup activities.

In Colorado, the costs estimated for the cleanup of the Rocky Mountain Arsenal are estimated in the billions of dollars. The time needed for such cleanup is estimated to be several decades. Indeed, there will be costs associated with these rules that are likely to be large. However, when compared to the benefits or elimination of risk to the public health, those costs are warranted.

In terms of monitoring requirements, the agencies that may have to consider these standards in their permitting actions already require specific monitoring and hydrogeologic analyses to be performed. Therefore, no new monitoring requirements or costs may be associated with these rules when implemented under existing regulatory controls unless frequency of sampling or the number of parameters is increased by the agency.

Monitoring requirements, when implemented under the Commission's future regulations, will be an additional cost to facilities which will be controlled by those regulations. The Colorado Mining Association has estimated that a new investigation designed to comply with monitoring requirements which may result from future control regulations, may cost $500,000 the first year and $68,000 for each additional year. Monitoring programs for other types of activities may be lesser or greater than these figures depending on the nature of the activity and the specific requirements of the future control regulations.

State agencies, including the Division, will incur costs to adopt the future classifications, standards and control regulations and to implement them. It is not now known the magnitude of such costs or whether they will be paid by the taxpayers of the state or by facility owners through cash funding mechanisms such as discharge permit fees.

BENEFITS

There are no specific benefits which can be attributed to this present Commission action since these regulations only set up a framework for additional future regulations and their implementation. Several potential benefits may be realized by such future action. The most obvious possible benefit would be the protection of human health. Prevention of ground water contamination which would otherwise result in long-term illness is a benefit. The prevention of the costs of remedial medical care for the sick, additional health insurance premiums and costs to business for long-term illnesses and the costs to society for caring for chronically ill patients, not to mention the reduction of human suffering, is a distinct benefit.

Possible environmental benefits are related to the preservation of a valuable resource in a water scarce state. In many areas of Colorado, ground water is the only source of water for agriculture. The prevention of contamination of ground water allows the agriculture use to continue through the irrigation of crops or watering of livestock. Such crops and livestock make up a significant segment of the Colorado economy, the protection of which is a benefit.

PARTIES TO THE PROCEEDINGS OF THE PUBLIC RULEMAKING HEARING FOR THE BASIC STANDARDS FOR GROUND WATER

1. CF&I Steel Corporation
2. The Colorado Water Congress
3. The Colorado Mining Association
4. Yuma County Ground Water Management Districts
5. Metropolitan Denver Sewage Disposal District
6. AMAX, Inc.
7. The City of Northglenn
8. The Colorado Association of Commerce & Industry
9. Committee on Oil Shale of the Rocky Mountain Oil and Gas Association
10. The City of Colorado Springs
11. The Adolph Coors Company
12. Cathedral Bluffs Shale Oil Company
13. The Special Districts Association
14. Colorado Petroleum Association
15. Gulf and Western, Inc.

41.13 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE(1989 REVISIONS)

The provisions of section 25-8-202(1)(b), (2) and (7); and 25-8-204; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

A. OVERVIEW

Since the Commission adopted The Basic Standards for Ground Water in 1987, no specific ground water quality classifications and standards have been adopted for any state ground waters. The purpose of the adoption of the statewide standards that are the subject of this action is to provide a statewide baseline of protection by establishing standards that will apply broadly to Colorado ground waters, for certain toxic organic pollutants and radioactive materials.

As a part of the same proceeding that led to the adoption of these ground water standards, the Commission has adopted similar statewide surface water standards for organic pollutants in section 3.1.11 of the Basic Standards and Methodologies for Surface Water, and deleted certain very general statewide ground water quality standards previously contained in that document. As explained more fully in the Statement of Basis and Purpose for those changes (section 3.1.22), the Commission has adopted an expanded set of numerical basic surface water standards for toxic organic pollutants in part due to requirements of the federal Clean Water Act. Although that Act does not contain any requirements for the adoption of ground water quality standards, the Commission believes that it is appropriate in this instance to provide consistent levels of protection for both surface and ground water resources. The principal difference between the two sets of standards is the lack of aquatic life standards for ground water, because ground water quality does not affect aquatic life unless it emerges at some point and becomes surface water (which is then subject to surface water standards).

Evidence has been submitted that on a site-specific basis some ground waters have become substantially contaminated with organic pollutants, e.g. as a result of past disposal practices. Although there is no information currently indicating that such contamination is widespread, the Commission believes that the best policy option is to adopt numerical standards now, to help assure that these pollutants do not become a more widespread problem.

The organic chemicals for which standards are being adopted generally are not naturally occurring water quality constituents. Therefore, the Commission has determined that a statewide approach to adoption of water quality standards for these substances is the most efficient and appropriate means of assuring human health and environmental protection in a timely manner. Where there may be naturally occurring levels of some specific pollutants for which standards are adopted, or where other site-specific factors warrant, the Commission has preserved the flexibility to adopt alternative, site-specific standards, as discussed further below.

In addition to the adoption of the new organic pollutant standards, the Commission also adopted new ground water quality standards for a limited list of radioactive materials. These standards are identical to those which have been and will continue in place for surface waters. The Commission rejected a proposal to adopt a new numerical uranium standard for ground water at this time, because the Commission believes that this issue warrants more specific analysis prior to such action. For example, the consistency with established surface water quality standards for uranium in several basins needs to be more fully considered.

Considering the desirability of having consistent levels of protection for surface and ground waters and the potentially serious adverse impacts from these pollutants, the Commission has determined that the record in this proceeding demonstrates the need for the adoption of these standards. Recently adopted legislation-Senate Bill 181 in the 1989 session-includes new provisions that apply when the Commission adopts “rules more stringent than corresponding enforceable federal requirements.” Section 25-8-202(8)(a), C.R.S. The Commission interprets these provisions to be inapplicable to this rulemaking, since there are no “corresponding enforceable federal requirements” that establish ambient ground water quality standards. Section 303 (c)(2)(B) of the 1987 amendments to the federal Clean Water Act includes a directive that, whenever states revise surface water quality standards, they adopt standards for certain toxic pollutants. However, no federal standards—no enforceable federal requirements—are established for these pollutants, and the directive that states act applies only to surface water, not ground water.

Moreover, even if this section did apply, the Commission finds that the standards adopted are based on sound scientific and technical evidence in the record. This basis is demonstrated in part by the testimony submitted by witnesses for the Division and for EDF, including the underlying analyses and studies

referenced therein. The Commission's evaluation of the available information, and its assessment of how this information should be reflected in the standards, is also addressed in the discussion of “Basis for Specific Standards” set forth below. Finally, these standards are necessary to protect the public health, beneficial uses of water, and the environment of the State-in part due to the fact that there are no corresponding enforceable federal requirements. As mentioned above, the Commission believes that the best policy to assure protection of these uses is to adopt uniform, preventive standards. Without such standards in place, waters that have not yet been affected by the discharge or presence of such toxic pollutants may be adversely affected in the future, and protection of their present and future uses would then not be assured. The approach adopted by the Commission attempts to assure protection of uses by initially applying the standards broadly, but at the same time assures economic reasonableness by providing flexibility to revise the standards on a site-specific basis and to take site-specific circumstances into account in determining the need to apply the standards in regulating individual entities. See, e.g., the discussion below regarding “Point of Compliance”.

Finally, in addition to the revisions discussed in more detail below, the Commission has made relatively minor changes to sections 3.11.2 and 3.11.7 for consistency with the major changes being adopted.

B. RELATION OF STANDARDS TO CLASSIFICATIONS

In contrast to the approach the Commission has taken for the new surface water organic pollutant standards, applicability of the new ground water standards is not tied to the presence of corresponding ground water use classifications. For the reasons discussed above, and because it is likely to take several years to adopt site-specific ground water classifications throughout the State, the Commission has decided as a matter of policy that these standards now being adopted should apply statewide on an immediate basis.

During the course of the proceeding, other alternatives were considered. For example, one option discussed was applying the standards to (1) all nontributary ground water, (2) all tributary ground water that has been classified “domestic use-quality”, (3) all tributary ground water located in aquifers that have been or are being used for domestic water supply purposes, and (4) all ground water that is tributary to streams or stream segments which are classified for domestic water supply. Alternatives such as this have the disadvantage of requiring potentially difficult factual determinations regarding precisely where the standards apply. While such issues could be resolved by the Division as they arise, this system would make it difficult for the public to know in advance where the standards apply.

The intent of such alternatives was to avoid unnecessarily stringent requirements that could result from applying the standards to ground water that does not warrant protection as an actual or potential drinking water supply. However, the Commission believes that this goal can be achieved by a simpler approach. Pursuant to recently adopted legislation (SB181), other state regulatory agencies with ground water quality protection responsibilities have the flexibility to determine appropriate points of compliance when implementing these standards. (See section 3.11.6(D) and the discussion under G., below.) Second, the Commission has included language in section 3.11.5(C)(5) to clarify that certain federal program regulatory determinations regarding ground water quality would not be superceded by the Commission's standards, where such programs dictate a contrary result. (See the discussion under F., below.) Finally, the Commission has preserved the option of establishing different site-specific standards to apply in place of the statewide standards, where determined appropriate following a rulemaking hearing before the Commission. (See section 3.11.5(D), and the discussion under D., below.)

The Commission believes that the combination of these provisions provides ample means of assuring that unnecessarily stringent regulation, based on the statewide standards, can be avoided.

C. BASIS FOR SPECIFIC STANDARDS

A wide range of approaches to setting standards for the organic pollutants were considered during the course of this proceeding. These ranged from setting “zero” standards for some pollutants (carcinogens),

to setting standards only for chemicals for which maximum contaminant levels (MCLs) have been adopted, to setting standards based on practical quantitation limits (PQLs).

The standards adopted have been established as interim rather than permanent standards principally because it is clear to the Commission that the development of appropriate numerical criteria to protect various beneficial uses from organic pollutant impacts is a rapidly evolving area that is still very much in flux. For example, there are currently significant differences among the various criteria, advisories, and maximum contaminant levels available for a number of specific pollutants. As new information becomes available and potential conflicts among the various numerical levels are resolved, it may be appropriate in specific instances in the future to adopt permanent standards either more or less stringent than the interim standards being established at this time. However, given the importance of controlling toxic pollutants in the environment, the Commission believes that it is necessary to move forward with the adoption of interim statewide standards at this time, and that the interim standards adopted are reasonable based on the best currently available information.

The organic pollutant standards have been divided into two categories—Table A for carcinogens and Table B for non-carcinogens. For non-carcinogens, the interim standards are based on MCLs, or lifetime exposure levels derived from the “reference dose” for constituents for which no MCLs have been adopted. Non-MCL standards generally are based on EPA health advisories or integrated risk in formation system (IRIS) data. The Commission has determined that this is the best information currently available as to the appropriate criteria for protection of human health for non-carcinogens.

For the Table A carcinogens, the interim standards are again based on MCLs for constituents for which these limits have been developed. For non-MCLs, standards based on the 1×10^{-6} risk level have been adopted. Recognizing that there is no scientifically “correct” risk level, the Commission has selected this level as a matter of policy, because it believes this is an appropriately conservative and protective level for human health risks.

To determine which specific pollutants to list on Table A, any particular compound was considered to be carcinogenic if it has been classified by EPA as either a Group A (known human carcinogen) or Group B (probable human carcinogen) compound. Compounds classified as Group C (possible human carcinogen), Group D (information inadequate to assess), or Group E (not anticipated to be a carcinogen), were treated as non-carcinogenic and listed on Table B. A few specific compounds classified by EPA as Group B/C were considered carcinogens and included in Table A.

D. SITE-SPECIFIC STANDARDS

Section 3.11.5(D) clarifies the Commission's ability to adopt site-specific standards to apply in lieu of the statewide standards where appropriate. Rather than attempt to anticipate all potential factual justifications for different site-specific standards, the Commission has determined that it is most appropriate simply to refer to the standard statutory and regulatory criteria for such determinations.

The Commission believes that because these standards are being adopted without taking site-specific factual circumstances into account, any revised site-specific standards based on such a site-specific analysis should not be considered a downgrading. Rather, this would simply be a determination that different numerical standards are adequate to protect the uses in question. The fact that downgrading criteria would not apply to such circumstances is a material assumption upon which the Commission relies in adopting these statewide standards.

E. USE OF DETECTION LEVELS

Section 3.11.5(C)(4) explains how detection levels are to be used in implementing the new standards, in view of the fact that in many instances the standards are lower (more stringent) than common detection levels. The Commission believes that it is appropriate to recognize the limits of current detection

technology by clarifying that specified detection levels will be used for purposes of establishing performance standards.

The specific detection levels to be used for these statewide standards are being specified in the regulation. Although this is not the Commission's normal practice, it has determined that this step is appropriate in this instance because the need to comply with very stringent standards for organic pollutants will be new to many regulated entities.

The Commission has decided to rely for now on detection levels based on practical quantitation limits (PQLs) associated with GC-MS laboratory analysis techniques, except where only a GC-based PQL exists. For those compounds which have an MCL as the standard, the corresponding detection method was adopted. The Commission has decided not to require detection to the generally more stringent GC-PQLs in all circumstances, in order to temper the economic impact of this new set of standards. Of course, as scientific knowledge and technology advance, this decision may be reconsidered in subsequent rulemaking hearings. In a few specific instances where national guidance is not available, PQLs have been established based on the Colorado Health Department Laboratory's best professional judgment.

F. RELATIONSHIP TO OTHER PROGRAMS

Concerns were raised during the hearing process regarding the relationship of these new statewide organic pollutant standards to environmental standards that might be established under federally-dictated environmental programs. The Commission does not intend to attempt to preempt such programs by the adoption of these standards. To address the programs where there appeared to be a potential for conflict, the Commission has added new subsection 3.11.5(C)(5), relating to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and Resource Conservation and Recovery Act (RCRA) Subtitle C and I programs. This section clarifies the Commission's intent that both a compliance level or performance standard, and a point of compliance that differ from those established in this regulation or in a site-specific hearing by the Commission can be utilized by the relevant agencies where authorized by those programs.

The Commission also notes that, in accordance with Senate Bill 181, for certain categories of activities these standards will be implemented initially by other state “implementing agencies.” Section 25-8-202(7), C.R.S. The Commission believes that this system should be efficient and effective. Moreover, if at any time it appears that the other agencies are not taking adequate steps to assure compliance with the standards, the Commission is authorized by SB181 to step back in and take appropriate action.

G. POINT OF COMPLIANCE

The Commission has added significant new provisions to section 3.11.6, regarding points of compliance. In subsection (A) the Commission has now noted the integral relationship between numerical standards and points of compliance. In subsection (B), the Commission has specified points of compliance to apply for the new statewide organic pollutant and radioactive materials standards, unless a different site-specific point of compliance is later adopted by the Commission, or applied by another agency pursuant to its independent authorities.

For situations where significant ground water quality contamination has not yet occurred, the Commission believes that the downgradient limit of the area above which potentially polluting activities are located—the edge of the disturbed area—is a reasonable and environmentally protective point of compliance. However, for situations where contamination exists as of the effective date of these regulatory amendments, the Commission recognizes that it may not always be feasible to clean-up the ground water to the levels established by these statewide standards back to the edge of the disturbed area. Therefore, the alternative potential points of compliance listed in section 3.11.6(B)(1) have been established for such situations. This approach is being adopted to help assure the administrative practicality of applying the new statewide standards, to reduce the administrative burden of potentially numerous site-specific

rulemaking hearings before the Commission, and the potential resulting delays in remediation of contaminated sites.

It was suggested during the course of the proceeding that subsection 3.11.6(B)(1) should make a further distinction between facilities at which control requirements have been established as of the effective date of these amendments, and facilities at which such requirements have not been established as of that date. The Commission has rejected this option for several reasons. First, significant factual and legal uncertainties could arise in determining which facilities are ones “at which control requirements have been established.” For example, have control requirements “been established” for a hazardous waste disposal facility operating without a permit?

Second, in order to achieve a preventive program, the Commission believes that activities and facilities that pollute ground water should be put on notice now that they may some day need to comply with these standards, even if they are not currently subject to specific regulatory requirements under an existing program. Section 3.11.6(B)(1) already allows an effective “grandfathering” of some pollution that has occurred prior to the effective date of these statewide standards. The Commission sees no reason to adopt a general grandfathering of future ground water pollution. If site-specific inequities would result from application of the statewide standards and points of compliance, that can be addressed in a site-specific hearing before the Commission (or, in some instances, by the implementing agency). Moreover, if new control regulations are proposed in the future, in a rulemaking proceeding to consider their adoption the Commission would consider whether application of the points of compliance established in this regulation would be appropriate in that new program. If such application would lead to unreasonable or inequitable results, the Commission could apply different provisions at the time, while still protecting the appropriate beneficial uses.

The Commission's overriding concern is that a point of compliance be established that is protective of human health and the environment. The Commission is adopting section 3.11.6(C) to provide further clarification of the approach that it intends to take to considering site-specific points of compliance. That section provides that when requested in a site-specific hearing, the Commission shall adopt a point of compliance closer to the existing source of contamination when the alternative points of compliance provided in section 3.11.6(B)(1) are not protective of human health and the environment. Conversely, section 3.11.6(C) also requires the Commission, when requested in a site-specific hearing, to establish a point of compliance further from the source of contamination than the alternatives provided in section 3.11.6(B) considering the enumerated factors, so long as the point of compliance remains protective of human health and the environment.

By establishing the alternative points of compliance in section 3.11.6(B)(1), for facilities with ground water contamination existing as of the effective date of these amendments, the Commission does not intend to supercede any more stringent ground water quality remediation requirements that may apply under other state or federal authorities. The Commission is attempting in section 3.11.6(B), as a matter of administrative necessity, to provide an initial baseline of protection, while avoiding potential unreasonably stringent results from the application of its statewide standards that are being adopted without taking site-specific conditions into account. Where a more stringent result is required or has been or is determined appropriate as a result of a site-specific analysis under another agency's program, such as RCRA or CERCLA, the Commission does not intend section 3.11.6(B)(1) to preempt that result. The alternative points of compliance established in section 3.11.6(B)(1) shall carry no presumptive weight in a site-specific standards hearing. In site-specific hearings, it is the Commission's intention to consistently apply the standards for establishing a point of compliance in similar circumstances at all remedial sites across the State.

Finally, the Commission has added a new subsection 3.11.6(D) to implement relevant portions of Senate Bill 181. In accordance with this Act, this subsection defers the initial authority to establish points of compliance to the appropriate “implementing agency.” SB181 contemplates that implementing agencies will establish points of compliance for activities under their jurisdiction, in accordance with criteria established through rulemaking after public hearing and consultation with the Commission and Division, so as to protect present and future beneficial uses of water. Correspondingly, the ultimate authority of the

Commission is retained to step back in and establish points of compliance if necessary to assure a consistent statewide water quality control program, in accordance with the specific provisions of SB181. The Commission intends to monitor the implementation of SB181 closely. In particular, the Commission intends to conduct an informal review of the implementation of these standards one year after their effective date. Hopefully, by that time other agencies will have had an opportunity to complete any required rulemaking and begin applying the standards where appropriate. If necessary, the Commission will at that time consider taking additional action of its own to assure that the standards are implemented in a timely and effective manner.

H. ECONOMIC REASONABLENESS

The new statewide standards for organic pollutants could have an adverse fiscal impact on any persons discharging such pollutants to state waters. It is impossible to quantify that impact at this time. Such impacts will depend to a large degree on the nature of any control regulations subsequently adopted by the Commission to implement these standards, as well as any potential future amendments to the discharge permit regulations to address discharges to ground water. The impacts will also depend on the requirements of other state agencies to implement or assure compliance with water quality standards adopted by the Commission. However, the Commission believes that in general the cost associated with compliance with the standards will be counter-balanced by the environmental benefits associated with protecting beneficial uses, although these benefits are also impossible to quantify at this time. Specifically with respect to future activities that may be subject to these standards, evidence was submitted indicating that preventing ground water contamination generally is less costly than after-the-fact clean-up or remediation.

The Commission has incorporated several elements into these amendments in an effort to make them as economically reasonable as possible, consistent with providing adequate protection of human health and the environment. Examples of these elements include:

1. Use of MCLs, which are set at levels that take technological feasibility into account, as standards for any pollutants for which these levels have been established;

2. Reliance on accepted detection levels as compliance thresholds where the actual standards are more stringent;

3. Establishment of more lenient points of compliance for situations with existing contamination;

4. Explicit deference to points of compliance established by certain state “implementing agencies;”

5. Provisions for adoption of site-specific standards and site-specific points of compliance to apply in lieu of the statewide provisions where appropriate; and

6. Explicit deference to certain federal regulatory programs which may apply different standards.

Each of these elements is discussed in more detail above, in earlier sections of this statement.

PARTIES TO THE PROCEEDINGS OF THE PUBLIC RULEMAKING HEARING FOR THE BASIC STANDARDS FOR GROUND WATER

1. Holme, Roberts & Owen
2. Vranesh & Raisch
3. Colorado Mining Association
4. City of Colorado Springs
5. North Front Range Regional Planning Agency
6. Homestake Mining Company
7. Rocky Mountain Oil & Gas Association

8. Amoco Production Company
9. Saunders, Snyder, Ross & Dickson
10. Welborn, Dufford, Brown & Tooley
11. Environmental Defense Fund

41.14 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1990 REVISIONS)

The provisions of sections 25-8-202(1)(a), (b), and (2); 25-8-203; and 25-8-204; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following Statement of Basis and Purpose.

A. POINT OF COMPLIANCE

The Commission has revised section 3.11.6 to eliminate the previous requirement that the Commission establish a point of compliance at the time of each ground water classification proceeding. The Commission determined that the former approach will often be inappropriate, where classifications are not being established to address a specific contamination source. At the time of a classification proceeding, the Commission may not be aware of all contamination sources within the specified area. In addition, the Commission has determined that establishment of points of compliance by the Division in the first instance is more consistent with the new framework established by Senate Bill 181, adopted in 1989. In this regulation the Commission is now establishing criteria to be taken into account by the Division in establishing such points of compliance. This structure is then parallel to that for other SB181 implementing agencies, who establish points of compliance in accordance with criteria adopted through rulemaking.

A definition of the term “point of compliance” has also been added by the regulatory amendments. The definition reflects the Commission's view that it generally will be more practical to determine compliance with the standards at a vertical surface downgradient from the regulated activity (as opposed to a point directly below the activity). However, the Commission retains authority to designate a point of compliance other than a vertical surface on a case-by-case basis when a site-specific point of compliance is adopted under section 3.11.6 (E).

IMPLEMENTING AGENCY COORDINATION

In response to SB181, the Commission has amended the Basic Standards for Ground Water to clarify that a point of compliance for activities that are regulated by implementing agencies identified in that statute is not a part of this regulation. Consistent with the spirit of SB181, these other implementing agencies will have the first opportunity to assure that adequate water quality protection is provided by the facilities in question. The Commission anticipates that Memoranda of Agreement entered into between the Water Quality Control Commission and Division and appropriate other agencies will provide a mechanism to assure that the other agencies' programs provide protection that is comparable to that provided by this regulation. Pursuant to SB181, the ultimate authority of the Commission is retained to apply additional regulation to such facilities if necessary to ensure a consistent statewide water quality control program. The Commission intends to monitor the implementation of SB181 closely to assure that an acceptable overall water quality control program is maintained.

A question was raised during the hearing as to whether Commission oversight pursuant to SB 181 of other agencies' activities would be only programmatic, or might also address individual, site-specific actions by such agencies. The Commission anticipates that its oversight generally will be programmatic. However, the Commission has authority to act with respect to individual situations, if it believes its intervention is necessary to assure compliance with the intent of the Water Quality Control Act. Of course, even if the Commission did choose to act in such circumstances, it would be limited to acting through the adoption of control regulations or permit regulations.

WATER QUALITY CONTROL DIVISION IMPLEMENTATION

Section 3.11.6 (D) creates authority for the Water Quality Control Division to establish points of compliance whenever it has authority to do so pursuant to discharge permit regulations or control regulations. The Commission has scheduled a rulemaking hearing later this year to consider revisions to the discharge permit regulations, 6.1.0 (5 CCR 1002-2) to address discharges to ground water. At this time there are no control regulations governing ground water impacts, and no specific regulations of this type have been scheduled for consideration by the Commission. However, the Commission believes that it is advisable to have the point of compliance process in place, so that it should not be necessary to revise this regulation when new control regulations are adopted or the permit regulations are revised.

The Commission intends that determinations of a point of compliance within classified areas, as well as for statewide standards, by the Division will be appealable. The exact process for such appeals would be set forth in amendments to the permit regulations or any new control regulation.

WHERE THE STANDARD IS APPLIED

After standards, the most important issue regarding ground water protection is the physical point at which the standard should be applied. At what point in the aquifer does contamination constitute noncompliance? Among the points considered were the site boundary, the limit of existing contamination, or some specified distance from the contamination source.

It was determined that the site boundary should set the outer limit for a point of compliance (except for surface water discharges, as discussed below) because it distinguished areas that a responsible party controls from areas where the general public may be affected. For the inner limit we chose the edge of the activity or contamination source boundary to minimize the area affected. These limits are consistent with previous Commission rulings on the statewide standards.

For existing activities contamination may have, to some extent, merged with the immediate surroundings, making the contamination source boundary difficult and expensive to define. Where the standards might be exceeded only in the immediate vicinity of a source, the cost of remediation to avoid the exceedence might be unjustified in relation to the benefits of remediation. Therefore, for existing activities the regulation allows the Division to establish the point of compliance at a specified distance from the contamination source, taking into account site-specific facts in accordance with criteria spelled out in the regulation. Application of the standards at the specific activity boundary might not serve the intended purpose of avoiding large expenditures for very little gain, and yet setting some large arbitrary distance would be insufficiently protective. For those facilities who have conducted prior investigations to discover and map the extent of existing contamination, the option exists to set the point of compliance at the leading edge of the plume.

For new activities, new opportunities for site selection and preparation become available. For new sites we propose to apply the standards at the specific activity boundary. In effect, this is as protective as applying them at the specific contamination source (e.g., the point at the bottom of an impoundment at which a leak occurs), while allowing some benefit from sorption and dilution in immediately adjacent ground, in case small leaks occur.

HOW THE STANDARD IS APPLIED

The Commission recognized the difficulty of complying with a concentration limit standard at a fixed point in space, when operating within the temporal and spatial variations inherent in ground water flow.

The intent of any permit or control regulation should be to permit sampling frequency and interpretation that adequately reflects groundwater quality variation over time. Owners and operators should have latitude in this regard provided that an acceptable minimum number of samples are taken from each well annually. At the discretion of the owner/operator a shorter sampling interval may be employed to

demonstrate that an exceedence of standards is due to temporal effects. This interval should be determined after evaluating the aquifer's effective porosity, hydraulic conductivity, and hydraulic gradient (which would govern rates of flow), and the fate and transport characteristics of the potential contaminants. This additional effort should help identify seasonal trends in the data and permit evaluation of the effects of seasonal variation or slugs of contamination if present in the samples. To better characterize spatial variability, an owner/operator may wish to install and sample from multiple background and compliance wells. If sufficient data is made available through these additional efforts, the owner/operator may employ statistical procedures such as moving averages and trend analysis to reduce seasonal and temporal effects. Utilization of site-specific characterizations to statistically evaluate an exceedence of standards requires detailed knowledge of the site. For owners/operators to use these methods they should be able to identify the uppermost aquifer, and aquifers hydraulically interconnected beneath the facility property, including groundwater flow direction and rate, and the basis for that identification.

In many situations it may benefit the owner/operator to install intermediate monitoring points. These monitoring points could be closer to the source or activity, or within the unsaturated zone. The monitoring points could function to alert the owner/operator to a potential contamination problem before it reaches the point of compliance.

“CONTAMINATION” DEFINITION

Because it is used several times in the point of compliance provisions, a definition of the term “contamination” has been added to the definitions section. This term is defined broadly, to provide a threshold determination of when non-naturally occurring pollution is present, and to help identify the appropriate locations for points of compliance. This definition does not determine who is responsible for cleaning up any specific contamination. It is not the Commission's intention by this broad definition to make individuals responsible for contamination caused by others. Nor is it the Commission's intention to adopt an antidegradation standard for ground water. The regulation does not state that all “contamination” must be avoided or cleaned up; rather, any adopted ground water standards remain the target for regulatory activities.

HYDROLOGICALLY DOWNGRADIENT LIMIT

Concern was expressed during the hearing regarding the use of the term “hydrologically downgradient limit.” This phrase is commonly used in the industry. Generally, it refers to the “downstream” edge of the ground water in question. For example, “the hydrologically downgradient limit of the area below the activity potentially impacting ground water quality” is located by a vertical plane at the immediate edge of the surface activity in question, on the side of the activity toward which the ground water is flowing.

SURFACE WATER DISCHARGES

The Commission has included in section 3.11.6 (D) language to address points of compliance for surface water discharges that may adversely impact ground water. Specifically, the Commission has added a cross-reference to the Discharge Permits System Regulations, where such points of compliance will be addressed. The Commission also added language to section 3.11.6 (D)(1)(b)(iii) and (D)(2)(b)(iii) to add the quality of water discharged to the factors to be considered by the Division in setting points of compliance.

B. OTHER REVISIONS

1. Table Corrections.

Other changes to the Basic Standards, first pointed out at the triennial review, involve corrections to table 1 and table A. In table 1 duplicative standards that are already established in the statewide standards for radioactive materials and organic pollutants have been deleted. In table A the detection level for the

pesticides chlordane, DDT, and dieldrin were incorrectly listed in the GC/MS column. The corrected detection level of 0.1 ug/l is now under the GC column heading. These pesticides are part of a chemical group known as chlorinated organics and therefore should be tested by the GC method only. Concern was expressed at the hearing as to whether a second column confirmation would be conducted to achieve these practical quantitation limits. Dr. Sexton of the Health Department Laboratory testified that they routinely use such confirmations in accordance with the EPA methods.

2. Molybdenum Standard.

The Commission has agreed in response to a proposal by AMAX, Inc. to delete the previous molybdenum standard from Table 3, Agricultural Standards. The Commission has taken this action because it does not believe that the information submitted in the hearing was adequate to support any specific numerical standard at this time. The Commission has not made a determination that molybdenum poses no risk to potential beneficial uses of ground water, If better information is submitted at a later date regarding an appropriate numerical protection level for molybdenum, the Commission will reconsider the potential need for a standard at that time.

PARTIES TO THE PROCEEDINGS OF THE PUBLIC RULEMAKING HEARING FOR THE BASIC STANDARDS FOR GROUND WATER

1. Holme, Roberts & Owen
2 Vranesh & Raisch
3. Colorado Mining Association
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5. North Front Range Regional Planning Agency
6. Homestake Mining Company
7. Rocky Mountain Oil & Gas Association
8. Amoco Production Company
9. Saunders, Snyder, Ross & Dickson
10. Welborn, Dufford, Brown & Tooley
11. Environmental Defense Fund

41.15 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1991 REVISIONS)

The provisions of section 25-8-202(1)(a),(b) and (2); 25-8-203; and 25-8-204; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

STATEWIDE NUMERICAL STANDARDS

1. Organic Chemicals.

In 1989, the Commission adopted certain interim organic pollutant standards, applicable to ground water statewide. Several revisions and additions to those interim standards are now being adopted. In general, the primary purpose of these changes is to provide a more thorough system to assure protection of Colorado's water resources with respect to potential adverse impacts from organic chemicals. One change adopted is to combine previous Tables A and B into a single, consolidated Table A. The Commission believes that this format will be easier to read, and helps to assure elimination of potential inconsistencies between the separate tables.

a. Risk-based Water Supply Standards.

When the Commission adopted interim organic chemical standards in 1989, the Commission adopted standards based on maximum contaminant levels (MCLs) for all pollutants for which MCLs had been

established under the Safe Drinking Water Act. The Commission has now reevaluated this policy and adopted health-based standards for these constituents instead of standards equal to the MCLs, whenever health-based criteria are available. Several considerations have led to this new approach.

The vast majority of the standards adopted in 1989 were already set equal to health-based criteria. MCLs generally are more lenient than health-based criteria, and have been developed taking into account laboratory detection limits and the economic ability of water suppliers to treat for removal of these constituents. The Commission already has attempted to temper the application of stringent health-based standards for non-MCLs organic pollutants by providing for the application of the practical quantitation limit (PQL) concept in determining compliance with the standards. Any dilution present prior to the point of compliance would further temper the application of these standards. Therefore, the Commission has determined that it is a more appropriate policy to base these water quality standards on health-based criteria, rather than MCLs. Revisions have been made to the standards, as now contained in the consolidated Table A.

b. Other Revisions.

Standards for a number of additional organic chemicals have been added to the Basic Standards for Organic Chemicals Table in the Basic Standards and Methodologies for Surface Water to help complete Colorado's compliance with section 303(c)(2)(B) of the federal Clean Water Act. The chemicals added are ones listed as priority toxic pollutants, and for which EPA has developed human health or aquatic life criteria under the Clean Water Act. The same additions have been made to the revised Table A in this regulation, for consistency between ground and surface water standards for organic chemicals.

The Commission decided not to include in the consolidated Table standards for total trihalomethanes or for polynuclear aromatic hydrocarbons (PAHs) as a class. The Commission believes that it is more practical to regulate individual chemicals in these groups. Some evidence was submitted indicating that not all PAHs should have the same standard. For now the Commission has adopted these standards based on the available EPA criteria, although if more specific evidence on this issue is brought to the Commission in the future, revisions can be considered.

Several minor clarifications have been adopted for Table A. A footnote has been added to the “standard” column to indicate that these are chronic water quality standards. The “detection levels” column has been relabeled “PQLs”, to clarify that the values indicated are practical quantitation limits. In addition, the PQLs for a few parameters were revised to be consistent with the current information from the Colorado Department of Health laboratory.

PARTIES TO THE RULEMAKING HEARING FOR BASIC STANDARDS & METHODOLOGIES FOR SURFACE AND GROUND WATER

1. Adams Rib Recreational Area
2. EG&G Rocky Flats
3. Northwest Colorado Council of Governments
4. The Grand County Water & Sanitation District #1, Fraser Sanitation District and Winter Park Water and Sanitation District
5. The Metro Wastewater Reclamation District
6. Amax, Inc.
7. Kodak Colorado Division
8. Paramount Communications Inc.
9. Schlage Lock Company
10. The Colorado Water Congress
11. Chevron Shale Oil Company
12. Adolph Coors Company
13. Remedial Programs Section, Hazardous Materials & Waste Management Division, Colorado Department of Health
14. Umetco Minerals Corporation

15. Martin Marietta Corporation
16. Shell Oil Company
17. Cotter Corporation
18. Union Oil Company of California
19. Supervisory Committee of the Littleton-Englewood Bi-City Wastewater Treatment Plant
20. Arapahoe County Water and Wastewater Authority
21. City of Colorado Springs Wastewater Department
22. Colorado Wastewater Utility Council
23. Colorado Mining Association
24. Getty Oil Exploration Company and Texaco
25. Colorado River Water Conservation District
26. Exxon Company, USA
27. St. Vrain and Left Hand Conservancy District
28. Division of Wildlife
29. North Front Range Water Quality Planning Association
30. City of Westminster
31. City of Colorado Springs Water Department
32. Res-ASARCO
33. Three Lakes Water & Sanitation District
34. City of Arvada
35. Northern Colorado Water Conservancy District and the Municipal Subdistrict, Northern Colorado Water Conservancy District
37. Environmental Defense Fund
38. Cherokee Water and Sanitation District, Security Sanitation District, and the Fountain Sanitation District

41.16 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1993 REVISIONS-DIMP STANDARD)

The provisions of Colorado Revised Statutes (C.R.S.) Sections 25-8-202(1)(b), (2), and 25-8-204 provide the specific statutory authority for adoption of the attached regulatory amendment regarding a statewide ground water standard for diisopropylmethylphosphonate. In support of the regulatory amendment and in accordance with 24-4-103(4) C.R.S., the following statement of basis and purpose is provided.

I. Overview

a. Diisopropylmethylphosphonate (DIMP)

The purpose of this hearing was to consider the adoption of statewide water quality standards for diisopropylmethylphosphonate (DIMP). DIMP is a liquid chemical, a by-product from the manufacture and detoxification of a nerve agent, Sarin or GB (isopropylmethanefluorophosphonate), produced by the U.S. Army (Army) at the Rocky Mountain Arsenal in the 1950s. This is an area on the Front Range of the Rocky Mountains, just north of Denver. The Army disposed of DIMP, along with other chemicals, primarily in surface impoundments at the Rocky Mountain Arsenal where it leached into the underlying soils and ground water. The Water Quality Control Commission has heard testimony indicating that DIMP contamination has been detected in the surface and ground water within and outside the boundaries of the Rocky Mountain Arsenal, although ground water contamination exists in the greatest concentrations and is the most prevalent.

The Commission has heard evidence demonstrating that a significant quantity of ground water in the vicinity of the Rocky Mountain Arsenal is contaminated with DIMP. DIMP has been detected in certain drinking water wells located up to 5 miles downgradient of the Rocky Mountain Arsenal. In addition, the evidence indicates that DIMP-contaminated ground water near the Rocky Mountain Arsenal discharges to certain irrigation ditches and affects First Creek, a tributary to the South Platte River. For approximately the last three years, the State has been providing bottled water for consumption and cooking to residents

and businesses whose wells were found to contain DIMP, although it is uncertain how long funds will be available to continue this program.

b. Scope of Evidence and Information

The Commission was presented with, and considered, a voluminous amount of evidence in this rulemaking. The majority of the evidence addressed the risk associated with exposure to DIMP and the toxicity of the chemical. The Commission heard approximately twenty-five hours of oral testimony from more than twenty witnesses for the Colorado Department of Health, the Army, the Shell Oil Company (Shell), the Arsenal Action Alliance, and the Environmental Protection Agency (EPA), as well as comments by members of the public and commentary by an expert advisory panel of toxicologists. The Commission received and considered literally thousands of pages of written testimony and exhibits from parties and the expert advisory panel. A Regulatory Analysis was prepared by Water Quality Control Division staff in response to a request by one of the parties. The Commission devoted a significantly greater amount of time in hearing testimony and considering written submissions, compared to the majority of water quality standard-setting proceedings it undertakes. Moreover, this hearing addressed the adoption of a water quality standard for a single contaminant, whereas most hearings address multiple pollutants and multiple segments.

Because of the importance of this proceeding, prior to the hearing the Commission took the unprecedented step of requesting that the parties and the Department of Health fund an independent expert advisory panel to provide testimony to the Commission on toxicology issues relating to DIMP. The expert advisory panel, which consisted of three toxicologists who were qualified to discuss risk assessment, assisted the Commission in objectively understanding the large volume of evidence regarding the toxicity of DIMP. The expert advisory panel provided a background educational briefing to the Commission, reviewed the written record, prepared a report for the Commission generally discussing the toxicity information and the different positions of the parties, attended the hearing and asked questions of witnesses, made an oral presentation to the Commission, and responded to questions from the Commission. The Commission found the explanation and clarification of the large amount of evidence by the expert advisory panel very helpful. In accordance with an agreement between the Department of Health, Shell and the Army, and upon advice by the Attorney General's Office, the panel did not advocate or offer a recommendation as to whether a water quality standard for DIMP should be adopted, or, if so, at what level.

Prior to these proceedings, there were no enforceable federal or state standards for DIMP. In 1989, the EPA's Office of Drinking Water issued a lifetime Health Advisory, which is not an enforceable standard, of 600 ug/l (micrograms per liter, also expressed as parts per billion) for DIMP. The EPA Health Advisory is based on a 1980 study of beagle dogs exposed to DIMP over a period of ninety days.[1]

The Department of Health initiated these water quality proceedings by requesting that the Commission adopt a statewide standard for DIMP of 8 ug/l, based on its evaluation of the relevant toxicology studies and selection of the 1979 Aulerich mink study[2] as the critical study upon which to base the water quality standard. In the Aulerich study, a significant number of female mink died over the course of their one year exposure to DIMP. Based on this and a more recent study with mink[3], the Department of Health is concerned about the public health threat associated with DIMP exposure, particularly long-term or lifetime exposure, and derived its proposed standard to protect against these possible effects. In deriving its proposed standard of 8 ug/l for DIMP, the Department of Health followed EPA risk assessment methodology published in EPA's Integrated Risk Information System (IRIS) guidance. The Department of Health presented witnesses and exhibits supporting its recommended standard for DIMP of 8 ug/l. The State's consultant, Dr. Edward Calabrese, recommended a more stringent standard of 0.36 ug/l based on the Aulerich study, but employed certain factors in deriving that recommendation which the Department of Health, based on its professional judgment and the IRIS guidance, chose not to incorporate in its derivation of the recommended standard.

The EPA provided a witness who explained the toxicological basis for that agency's DIMP Health Advisory, and also discussed other issues related to the toxicity of DIMP. The Army and Shell offered

witnesses and exhibits supporting the EPA Health Advisory of 600 ug/l on a site-specific basis, although one witness for Shell supported a standard of 500 ug/l later in the proceedings.

The Arsenal Action Alliance provided testimony and exhibits supporting its recommendation that a DIMP standard of 0 ug/l be adopted by the Commission. This position was based largely on that entity's general policy concerns regarding toxins and pollutants in the environment, although it referenced as support Dr. Calabrese's 1990 report regarding DIMP toxicity. The Commission also heard considerable testimony from the public regarding the significant health concerns raised by the presence of DIMP in domestic water supplies.

Accordingly, the toxicological testimony supporting the various recommended standards primarily involved three studies, the 1980 Hart dog study lasting ninety days, the 1992 Bucci study with mink lasting ninety days, and the 1979 Aulerich mink study lasting one year. As the expert advisory panel acknowledged, interpreting the toxicological data from these and the other relevant DIMP studies in the risk assessment context involves professional judgment, and there were differing opinions among the various experts on behalf of the parties regarding the results of these studies.

One question that arose near the conclusion of this process was whether a transcript of the Commission's deliberations regarding the issues raised in this rulemaking proceeding should be made a part of the hearing record. The Commission has decided not to include the deliberations transcript in the record, because it believes that to do so may result in confusion regarding the basis for the Commission's ultimate determination. During deliberations it is typical for many perspectives to be offered and many options advanced and “tested” by individual Commission members. However, it is ultimately only this Statement of Basis, Specific Statutory Authority, and Purpose that accurately reflects the final views of the full Commission. It is this document that sets forth the basis for the Commission's decision, not some or all of the individual comments made during the deliberative process.

c. Summary of Basis for Decision

Following consideration of the extensive information briefly summarized above, the Commission has decided to establish a statewide interim ground water quality standard for DIMP at 8.0 ug/l, with an accompanying practical quantitation limit (PQL) of 1.0 ug/l. The ultimate basis for this decision is a policy judgment regarding what level of DIMP is protective of public health and the beneficial uses of water, in the face of credible but differing scientific interpretation of the information regarding the toxicity of DIMP.

The Commission has experienced considerable frustration in coming to the realization that the extensive information and data presented in the record does not lead to the identification of one scientifically “correct” value for the toxicity of DIMP upon which all experts can agree. EPA, which issued a lifetime Health Advisory for DIMP, has indicated that it has “low confidence” in the standard it recommends. Based upon the information provided by the parties, the public, and the Department of Health staff, and the explanations and clarifications of this scientific evidence provided by the expert advisory panel, it is the Commission's judgment that it is ultimately faced with a range of scientifically supportable interpretations of the evidence regarding the toxicity of DIMP. The Commission acknowledges that each of these interpretations carries with it a degree of uncertainty. In the face of this uncertainty, the Commission must exercise its policy judgment. Even a decision to adopt no standard for DIMP would entail substantial uncertainty — uncertainty as to whether public health and the beneficial uses of water would be adequately protected until better information might become available in the future.

Fully cognizant of the existing scientific uncertainty, the Commission has determined that there is a need for the adoption of a statewide ground water quality standard for DIMP at the level of 8 ug/l, in view of the evidence submitted regarding the presence of DIMP in some waters of the State as described above and the evidence regarding the toxicological risk posed by DIMP (as discussed briefly above, and further discussed in section II of this Statement of Basis and Purpose). This standard is derived from the results of the 1979 Aulerich study. The Commission is concerned by the death of female mink observed at each dose level in that study, and cannot ignore these results. The Commission believes that the statewide

standard of 8 ug/l is necessary to protect public health and the beneficial uses of waters of the State at this time, and that the standard is based on sound scientific and technical evidence in the record.

The Army and Shell have stated their belief that the Commission's selection of an 8 ug/l standard is based upon a public policy choice that “was not supported by the weight of the scientific evidence.” This assertion is a misleading characterization of the basis for the Commission's action. The Commission finds that there is substantial and sufficient scientific and technical evidence in the record to support this standard. The fact that other standards could also be defended from a scientific and technical standpoint based upon the information submitted does not mean that there is no such basis for the standard selected.

This Statement of Basis, Specific Statutory Authority, and Purpose does set forth “an evaluation of the scientific or technological rationale justifying the rule,” as required by the State Administrative Procedure Act. §24-4-103(4)(c). Indeed, in view of the importance of and controversy surrounding this determination, the Commission has taken pains to assure that this evaluation is substantially more extensive than that typically provided for the adoption of water quality standards. However, the Commission rejects the interpretation of the Administrative Procedure Act and Water Quality Control Act requirements implicit in the position advocated by the Army and Shell, which would appear to lead to the conclusion that whenever there is scientific disagreement or any remaining level of uncertainty regarding the appropriate standard to be adopted, the Commission is required to adopt the least stringent scientifically defensible standard. The Commission does not believe that this interpretation is mandated by law, and in fact believes that it would be contrary to the Commission's mission as set forth in the Water Quality Control Act.

The Commission previously considered the adoption of water quality standards for DIMP in January, 1991. The Commission eventually decided not to adopt any standards for DIMP as a result of that proceeding, in part based upon the representations of the Army that new DIMP toxicity studies then being conducted and scheduled for completion in 1992 would provide additional information that might address some of the uncertainty surrounding the interpretations of the studies completed prior to that time. It had been the Commission's hope that a new mink study of at least one year's duration, including at least one reproductive cycle for female mink, would be completed to essentially reassess the results of the 1979 Aulerich mink study, which was the focus of substantial debate in 1991 and again in this 1993 rulemaking hearing. Unfortunately, the additional studies conducted were not of a design or duration to provide this reassessment. Moreover, based upon the information presented in these proceedings it now appears unlikely that a new study of this scope, design and duration is likely to be completed in the foreseeable future. Therefore, the Commission believes that further delay or inaction on its part would be inappropriate. Accordingly, the Commission believes it must exercise its judgment based upon the information available now as presented in the 1993 rulemaking hearing, and adopt a standard to protect against the potential adverse health effects associated with DIMP exposure and to help ensure that DIMP does not become a more widespread threat to human health and the waters of the State.

This decision does not mean that the Commission is not open to reconsidering appropriate water quality standards for DIMP should additional relevant information become available in the future. Consistent with the Commission's practice for statewide standards for other organic chemicals, the DIMP standard is being adopted as an interim statewide standard. This standard is fully effective and enforceable once promulgated. However, the “interim” label recognizes the potential for future modifications should additional relevant information become available. In this regard, the Commission's statement concerning the adoption of interim statewide organic pollutant standards in 1989 applies here:

> As new information becomes available and potential conflicts among the various numerical levels are resolved, it may be appropriate in specific instances in the future to adopt permanent standards either more or less stringent than the interim standards being established at this time. However, given the importance of controlling toxic pollutants in the environment, the Commission believes that it is necessary to move forward with the adoption of interim statewide standards at this time, and that the interim standards adopted are reasonable based on the best currently available information.

II. Selection of Numerical Level for Standard

a. Toxicological Basis

As briefly described above, the Water Quality Control Commission has heard and considered substantial testimony and scientific evidence regarding the toxicity of DIMP and the risk associated with DIMP exposure. The Commission believes that a statewide interim standard for DIMP of 8 ug/l is necessary and appropriate to protect the citizens of Colorado and the waters of the State, and is based on sound scientific evidence as presented by the Department of Health and the parties to the hearing. The Commission's determination follows EPA risk assessment methodology, as applied to the available information regarding DIMP toxicity. In summary form, the Commission's substantive basis for adopting the 8 ug/l statewide standard for DIMP in ground water is described below.

There are no studies of human exposure to DIMP that can be used in deriving a health-based drinking water standard. Of the most relevant animal studies regarding DIMP toxicity, the Commission has identified the 12 month mink study undertaken by Aulerich, as the critical animal study from which to derive a water quality standard. The Commission believes this is the critical study because none of the other species of animal used in other DIMP studies are proven to be of superior extrapolative relevance to humans; the 12 month mink study had the longest duration of all the animal studies; the 12 month study used a relatively large number of animals; and, the mink in the 12 month study proved to be the most sensitive of all the animals exposed to DIMP (exhibiting an increasing linear mortality relationship to their exposure to DIMP). This selection of the critical study comports with accepted risk assessment principles, including EPA's IRIS guidance.

The Commission recognizes the disagreement among scientific experts regarding the cause of death of mink in the 1979 Aulerich study and the issues surrounding background mortality for mink. However, the Commission agrees with the expert advisory panel's conclusion that the possibility that the mink deaths resulted from administration of DIMP could not be ruled out. The Aulerich 12 month mink study is the only study lasting one full year. Although experts debate over the significance of the results of the Aulerich study, the Commission recognizes that a dose-response relationship was exhibited during the study. This fact is troubling and cannot be ignored from a public health perspective, particularly because the end-point was mortality. No other studies to date have addressed female mink exposed before, during and through the reproductive cycle. The Commission also recognizes that adverse blood effects, among others, were observed in mink in the 90 day Bucci study, and that these effects were still increasing in severity when the study was completed at 90 days.

Given the Aulerich study's statistically significant mortality rate at the highest dose level, the statistically significant linear dose-response relationship across all doses, and the highly biologically significant endpoint, the Commission believes it is an appropriate scientific and policy decision to base the DIMP standard of 8 ug/l on the information available currently to the Commission regarding mortality in female mink. The Commission recognizes that there was a difference of opinion among experts in the hearing regarding the relevance of the linear regression (trend) analysis of mortality across the different dose levels to select a Lowest Observed Adverse Effect Level. One member of the expert advisory panel commented that such trend analysis could result in more false positive conclusions compared to other relevant statistical tests. Recognizing this concern as well as the advantages of trend analysis, the difference of opinion among experts, and that the end-point was mortality in female mink, the Commission has chosen to use this potentially more conservative approach as part of its analysis.

The Commission recognizes there was considerable debate in the testimony regarding whether to incorporate in the statistical analysis of the 1979 Aulerich DIMP study the female mink deaths observed in the control group of a parallel 1979 study with dicyclopentadiene (DCPD). The expert advisory panel discussed the results of the DCPD study and noted that, because of atypical circumstances, they “should be factored in the overall analysis” of the results of the Aulerich DIMP study. The Commission has considered this information, as well as countervailing evidence presented that it is unorthodox to use data from a different study to statistically evaluate the results of the primary study that is being considered, and that statistical comparison using the concurrent control group from the primary study is the norm. There

was evidence both supporting and challenging the notion that the two studies were sufficiently similar to allow their respective results to be commingled. There is considerable professional judgment involved in evaluating the available data in risk assessment, and the Commission is concerned by the direct linear increase in female mink mortality observed between the control group and the successive treatment groups in the 1979 Aulerich DIMP study. Considering the above, the Commission has decided to follow scientific convention and use only the data from the 1979 Aulerich DIMP study to evaluate the death of female mink in that study.

With the selection of the Aulerich study as the critical study, following accepted risk assessment guidance, the Commission derives the recommended standard as follows:

(1) The Lowest Observable Adverse Effect Level (LOAEL)[4] in the 12 month mink study was at the 11 mg/kg/day dose level (the lowest dose) because at this dose level the end-point of concern (female mink mortality) was both statistically and biologically significant.[5]

(2) In accordance with EPA methodology for risk assessment, the relevant Uncertainty Factors to be applied to the LOAEL of 11 mg/kg/day in the Aulerich study are: (i) interspecies variation, (10), (ii) intra-species variation (10), (iii) less than lifetime exposure (10), and (iv) conversion from LOAEL to NOAEL (10), for a total Uncertainty Factor of 10,000.

(3) The Commission recognizes that the LOAEL identified in the critical study was for death in female mink. This critical effect level, therefore, is actually a Frank Effect level.[6] Given that the endpoint was a Frank Effect Level and not a subtle, reversible toxic effect, and that the critical study has not been replicated to verify the results or better characterize the biological response in that study, it is appropriate to consider the application of a Modifying Factor[7]. The Commission chooses to follow the professional judgment of the Department of Health that in this instance the appropriate Modifying Factor is 1 because of the overall protection provided by the four Uncertainty Factors adopted by the Commission, although it appears that the evidence could also support a larger Modifying Factor. Therefore, the total Uncertainty Factor of 10,000 will not change based on the Modifying Factor.

(4) Deriving a safe human dose, commonly referred to as the Reference Dose (or RfD), the LOAEL is divided by the final total Uncertainty Factor of 10,000.

$$\frac{11 \text{ mg/kg/day}}{10{,}000} = 0.0011 \text{ mg/kg/day}$$

(5) The water quality standard is derived using standard EPA methodology - multiplying the Reference Dose by (i) the average adult body weight of 70 kg and (ii) the relative source contribution from water of 20% (0.2), and then dividing this figure by (iii) the average drinking water consumption of 2 liters/day.

$$\frac{0.0011 \text{ mg/kg/day} \times 70 \text{ kg} \times 0.2}{2 \text{ l/day}} = 0.0077 \text{ mg/l.}$$

0.0077 mg/l = 7.7 ug/l, which is rounded to <u>8 ug/l</u>.

Based on the information available and evidence presented during these rulemaking proceedings, the Commission believes the statewide groundwater standard for DIMP of 8 ug/l is necessary, scientifically justified and supported by the record. Also, as described above, the Commission has fully considered the relevant evidence regarding the risk associated with the pollutant, and the extent of such pollution to be tolerated as a goal, in deciding to adopt the standard for DIMP of 8 ug/l.

b. Technological Basis

Based on evidence presented to the Commission in these proceedings, the Commission believes it is technically and economically feasible and practical to treat water contaminated with DIMP with granular activated carbon to achieve a DIMP effluent concentration in water of 8 ug/l or less. There is evidence in the record that other treatment technologies might also be practical and technically and economically feasible to achieve the adopted standard.

The Commission recognizes that the Army and Shell are currently undertaking ground water remediation at and near the Rocky Mountain Arsenal employing granular activated carbon; that their existing ground water treatment systems are treating ground water for DIMP prior to discharge and are capable of achieving the adopted DIMP standard of 8 ug/l; that the existing ground water treatment systems may have to be reconfigured or costs associated with those systems may be increased; and that, if adopted as an applicable or relevant and appropriate requirement under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remediation process or applied as a standard pursuant to any other law, new or additional ground water treatment systems may be required of the Army and Shell in order to meet the adopted statewide ground water standard for DIMP. The Commission recognizes that costs may be associated with meeting the adopted standard if DIMP is discovered in ground water elsewhere in the State.[8] It is the hope of the Commission that public health and the waters of the State can be protected in a cost-effective manner when the standards it adopts are applied in any regulatory or remedial context. However, the Commission finds that in general the costs associated with compliance with the adopted DIMP standard, wherever compliance may be required, will be counter-balanced by the public health and water quality benefits achieved.

c. Consideration of Statutory Requirements

As described in part above, in promulgating the statewide ground and surface water quality standards for DIMP, the Commission has considered the factors enumerated in Section 25-8-204(4), C.R.S. The Commission has considered evidence regarding the extent of DIMP contamination and the risk associated with DIMP exposure. The Commission is aware that DIMP is a non-naturally occurring pollutant and it is also a “continuous” pollutant in the ground water (versus “intermittent” or “seasonal”) in the currently known affected area. The Commission has also considered the technical evidence regarding treatment, and has concluded that treatment techniques to achieve the statewide standard of 8 ug/l are available, practical, and technically and economically feasible. As discussed above, the Commission recognizes the potential economic impacts associated with the adopted standard for DIMP, but believes these potential impacts will be counter-balanced by the public health and water quality benefits achieved. No evidence was submitted indicating that treatment for DIMP would have a significant impact on water quantity. Based on all the evidence presented, as summarized above, the Commission believes that there is a strong need for a statewide standard for DIMP of 8 ug/l at this time to support the beneficial uses of State waters, including drinking water, and that the standard adopted is appropriate and scientifically supported by the record.

d. Senate Bill 181 Requirements

Colorado Senate Bill 181, adopted in the 1989 legislative session and codified in part in Section 25-8-202(8)(a), C.R.S., includes provisions that apply when the Commission adopts “rules more stringent than corresponding enforceable federal requirements.” In the 1989 revision to the Basic Standards for Ground Water 3.11.0 (5 CCR 1002-8), the Commission interpreted these provisions to be inapplicable to the rulemaking since there were no “corresponding enforceable federal requirements” that establish ambient ground water quality standards. Likewise, the provisions of C.R.S. Section 25-8-202(8)(a) are inapplicable to the proposed rulemaking on DIMP because, as stated above, there are no enforceable federal requirements for DIMP. Even if Section 25-8-202(8)(a) were applicable, the Commission finds that the standard adopted is based on sound scientific and technical evidence in the record.

III. <u>Decision to Adopt a Statewide Standard</u>

In establishing a statewide standard for DIMP the Commission has determined that DIMP should be controlled on a statewide basis, wherever it is found in the waters of the State, within or outside the Rocky

Mountain Arsenal. While the present known contaminated area is limited, the Commission recognizes that the ultimate clean-up and remediation actions for the Rocky Mountain Arsenal may not be finally determined, or may not be put in place, for many years. In establishing a statewide standard, the Commission also intends to ensure that future disposal and handling practices associated with the clean-up and remediation do not adversely affect surface or ground water resources anywhere in the State, and that new contamination problems associated with DIMP do not arise elsewhere in the future.

Much of the rationale for the Commission's 1989 adoption of statewide standards for organic chemicals applies with respect to DIMP (see, Section 3.11.10; revised in 1991, Section 3.11.12). The Commission believes that as a matter of policy all potential beneficial uses of water should be protected on a statewide basis from potential contamination from non-naturally occurring organic chemicals. This policy was reflected in the Commission's 1989 adoption of statewide standards for surface and ground water for approximately 55 organic chemicals. The current adoption of the DIMP standard is a consistent extension of this policy. As with the other organic chemicals, DIMP is a non-naturally occurring pollutant for which a statewide standard is appropriate. Unlike certain other potential pollutants, there is no need to take natural background levels for DIMP into account on a site-specific basis in adopting standards. DIMP is a “continuous” pollutant in the ground water at and near the Rocky Mountain Arsenal, with an estimated half-life of over 500 years, so the adoption of a statewide standard that applies at all times, and that protects future water supplies, is appropriate. As Water Quality Control Division staff testified, there are other statewide standards for chemicals that exist in limited areas of the State, such as chlorobenzene, for example.

The Commission also intends to set a statewide standard in order to protect any state waters that are not yet known to have DIMP contamination, if any are found to exist. The Commission intends that the standard should be applied uniformly wherever DIMP may be a concern in the State, currently or in the future, and that the standard is generally applicable and legally enforceable throughout the State pursuant to statute and associated regulations.

The parties to the hearing have expressed differing opinions regarding the Commission's intent on how its statewide water quality standards will be used as cleanup standards in other statutory programs. In a letter to the Commission, Shell appears to interpret Sections 3.11.5(C)(5)(a) (regarding statewide ground water standards) and 3.1.11(5) (regarding statewide surface water standards), 5 C.C.R. 1002-8, of the Commission's regulations to mean that the Commission “did not intend” for its standards to be applicable or relevant and appropriate requirements (ARARs) under CERCLA (i.e., cleanup standards) or to be enforced as cleanup standards under other statutes. Shell interprets those sections to mean that the Commission believes “it is in the discretion of other agencies” to apply or ignore the statewide standards as cleanup standards, and that the Commission intended to “specifically defer to the discretion of other agencies in setting cleanup levels at Superfund sites.” This is an inaccurate expression of the Commission's intent. Instead, the Commission intends for its standards to be used as cleanup requirements, including at CERCLA sites, except in the limited circumstances where “<u>a determination</u> is made that such a variation <u>is authorized</u> pursuant to the applicable provisions” of those federal statutes [§ 3.11.5(C)(5)(a); § 3.1.11(5)].

These cited sections were added to the Commission's regulations in 1989 as simple clarifying statements to address potential conflicts between the Commission's statewide standards and other remediation requirements under the federal programs. The Commission is simply stating that it does not attempt to preempt a federal law, such as CERCLA, by mandating the use of its specific water quality standards as cleanup standards in instances where the federal program is <u>authorized</u> to use a different standard, more or less stringent, and where such programs <u>dictate</u> that the different standard be applied. See e.g., § 3.11.10 (F). The Commission's regulations do not provide that any agency has open-ended discretion to choose to apply or disregard the Commission's standards as cleanup requirements. The Commission intends for its standards to be used as cleanup standards; the Commission understands that in certain federal programs, such as CERCLA, the federal agency can waive a state standard, but only if certain specific statutory requirements have been met. From the Commission's perspective, the standards cannot be waived based on the federal agency's mere discretion whether to use them or not.

IV. Selection of a Practical Quantitation Limit

The Commission has heard testimony from the Department of Health's Laboratory on its routine analytical capability and procedure for DIMP analysis, and has determined that the Practical Quantitation Limit (PQL) for DIMP should be set at 1.0 ug/l. The Commission credited the testimony that the Department of Health Laboratory has devised a reliable and effective methodology for analyzing DIMP. The Commission also considered the evidence that the Army has been reporting levels of DIMP above .392 ug/l since 1988, demonstrating that the Department of Health Laboratory's PQL could be reproduced by other laboratories. The basis for this PQL is consistent with that underlying PQLs for other statewide organic chemical standards. Because the adopted standard is higher than the PQL of 1.0 ug/l, this value should have little practical significance.

PARTIES TO THE RULEMAKING HEARING

1. Colorado Department of Health
2. United States Department of the Army
3. South Adams County Water and Sanitation District
4. Shell Oil Company
5. Arsenal Action Alliance

41.17 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1993 REVISIONS)

The provisions of section 25-8-202(1)(a), (b) and (2); 25-8-203; and 25-8-204; C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

ADDITIONAL ORGANIC CHEMICALS - TABLE A

In 1991, Table A, Ground Water Organic Chemical Standards, was updated to set health risk-based standards where MCLs had been established earlier. In this rulemaking, the same policy was followed for forty-five additional organic chemicals that have been promulgated by EPA in the National Primary Drinking Water Regulations as Maximum Contaminant Levels (MCLs), either in EPA's Phase II Rule (Fed. Reg. Jan. 30, 1991), or the Phase V Rule (Fed. Reg. July 17, 1992). Rather than establish the MCL as the standard, however, the Commission chose to continue with its policy to set a health risk-based standard at the 1:1,000,000 level using the same rationale as it did in 1991. That rationale is that MCLs are inappropriate as stream or ground water standards because they include economics and technical feasibility of removal in their development, whereas a standard is designed to fully protect the use of the water. Since dilution is present to temper the effect of applying the health-based standards to dischargers, along with the PQL, the net effect should not be overly burdensome on the regulated community. Where the necessary information in the integrated Risk Information System (IRIS) was not available to establish the health risk-based standard, the MCL was adopted as the standard. As more information becomes available over time, the Commission intends to convert all standards to the health risk-based level.

For benzene, the policy outlined above was not followed. At the informational hearing in February, 1993, the Commission heard considerable testimony concerning the implications that the health-based benzene standard of 1 ug/1 had been having on remedial activities associated with fuel contaminated areas. The MCL level of 5 ug/1 appears to provide sufficient health protection while recognizing the practical difficulties of removing benzene contamination to levels below that concentration.

The organic chemicals chlorophenol and phenol were moved from Table 1 (Human Health Standards) to Table 2 (Secondary Drinking Water Standards), and the proposed standards were set equal to the Ambient Water Quality Criteria for the chemicals. The reason for the change is that although the two

chemicals pose a significant health risk at much higher concentrations, taste and odor considerations are a concern at lower concentrations.

PQL's for the organic chemicals proposed in this rulemaking were provided by the Colorado Department of Health Laboratory, and were calculated by multiplying the Method Detection Limit ("MDL"), Estimated Detection Limit ("EDL"), or other detectable level as published by EPA by a factor of ten (10).

It was determined during this rulemaking hearing that PQL's in the Basic Standards for Ground Water, and also in the Basic Standards and Methodologies for Surface Water, will receive further consideration by the Commission and the Division in the next year.

ADDITIONS TO TABLE 1

Four metals standards were added to Table 1 of the Basic Standards for Ground Water. The basis for the addition was the federal Phase V Rule, published in the Federal Register on July 17, 1992. All additional standards were set at the MCL level. Cyanide, one of the Phase V MCLs, was not changed since Table 1 already contained a cyanide standard at a level more stringent than the MCL.

During the rulemaking hearing, the Metro Wastewater Reclamation District pointed out that there is no laboratory test for free cyanide, and that the acid dissociable should be used. Since this proposal was not part of the public notice and was raised so late in the process, it was determined that the Division would address the issue in a rulemaking proposal during the next year.

CHANGES TO 3.11.5 (C)(5)(c)

The change in wording made in the section referenced above was necessary to update the statutory reference for the Storage Tank program in the Hazardous Materials and Waste Management Division. This change will allow a consistent regulatory approach by the Storage Tank program to ground water contamination caused by either underground or above-ground tanks.

CHANGES TO 3.11.6(A)

The change to 3.11.6(A) has been made for purposes of clarifying that the Division has existing authority to consider ground water standards when setting limits for surface water discharges which impact ground water.

A party to the proceeding is in a position where it has alluvial wells in close proximity to a proposed surface water discharge to a frequently dry stream. This party has raised the issue that the sole biological standard of total coliform bacteria may be inadequate to protect public health from direct or indirect discharges to ground water, and that this is particularly the case in instances where a surface discharge impacts ground water.

PARTIES TO THE DECEMBER, 1993 RULEMAKING HEARING

1. Shell Oil Company
2. The City of Colorado Springs
3. Arapahoe County Water and Wastewater Authority
4. Storage Tank Technology, Inc.
5. Martin Marietta Corporation
6. The Coors Brewing Company

41.18 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1994 REVISIONS)

The provisions of section 25-8-202(1)(a), (b) and (2); 25-8-203; and 25-8-204; C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose of these amendments.

STATEMENT OF BASIS AND PURPOSE

During the December, 1993, hearing on the basic Standards for Ground Water, a number of parties and members of the public spoke and submitted evidence on the difficulties of implementing Practical Quantitation Limits (PQL's). It was determined at that time that the Division would consider the problem during this proceeding. A determination has been made that PQL's are more appropriately addressed within the Regulations for State Discharge Permit System, allowing more flexibility in applying the PQL's to regulated discharges. The PQL column in Table A has been removed, as have all footnotes to the Table A that pertained to PQL's. Note that the same modifications have been made to the Basic Standards and Methodologies for Surface Water (3.1.0).

Parties to this hearing also suggested that the Commission consider replacing the current bromodichloromethane, bromoform, chloroform, and dibromochloromethane standards with a total trihalomethanes (THMs) standard based on the current drinking water maximum contaminant level for total THMs, as was done in this hearing for surface water. The Commission has declined to do so, since one of the major factors applicable to the surface water situation—impact on dischargers—has not been demonstrated to apply with respect to ground water.

PARTIES TO THE JULY 11, 1994 HEARING

1. Sierra Club and Colorado Environmental Coalition
2. City of Colorado Springs
3. Conoco, Inc.
4. Shell Oil Co.
5. Metro Wastewater Reclamation District, the City of Fort Collins, the Silver Coalition, and the Cyprus Climax Metals Company
6. Coors Brewing Company
7. City of Pueblo
8. ASARCO, Inc.

41.19 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1996 REVISIONS)

The provisions of section 25-8-202(1)(a), (b) and (2); 25-8-203; and 25-8-204; C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

This hearing was held to consider changes recommended in the triennial review informational hearing for the ground water standards and classifications regulations “The Basic Standards for Ground Water” 3.11.0, and “The Classifications and Water Quality Standards for Ground Water” 3.12.0. With a few exceptions, the majority of the changes proposed were of a “housekeeping” nature aimed at improving the clarity, organization, and useability of both sets of regulations.

The Commission has moved the statewide interim narrative standard for ground water from 3.12.0 to 3.11.0. This was done to consolidate all statewide standards in the basic standards regulation. This action was warranted due to the Commission's action, in December, 1994 to apply the interim narrative standard to all ground waters of the state. Note that the Statements of Basis and Purpose for the original adoption of the interim narrative standard and for applying it statewide are located in 3.12.11 and 3.12.13.

Changes to the Table 1 values for asbestos, barium, chromium and selenium were adopted for both 3.11.0 and 3.12.0 to reflect the current domestic use values found in the Colorado Primary Drinking Water Regulations. This change was particularly important for selenium as background levels in many areas of the state exceed the previous table value of 0.01 mg/l. Six changes were made to Table A in order to make these values reflect maximum contaminant levels (MCLs) found in the Safe Drinking Water Act, or the 10^{-6} risk levels reported in EPA's IRIS System.

PARTIES TO THE RULEMAKING HEARING

1. Coors Brewing Company
2. CF&I Steel, L.P.
3. The United States Department of Energy
4. Cherry Creek Basin Water Quality Authority
5. City of Westminister
6. Kaiser-Hill Company, L.L.C.

41.20 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (1996 REVISIONS)

The provisions of section 25-8-202(1)(a), (b) and (2); 25-8-203; and 25-8-204; C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

1. Summary

In this rulemaking proceeding, the Commission adopted a revised basic standard for ground water for plutonium (Pu) and established an additional basic standard for ground water for americium (Am).

2. Background

The Commission previously adopted a basic standard for plutonium of 15 pCi/L and had no basic standard for americium. A basic standard was considered in this hearing for americium because it is closely associated with plutonium and these two radionuclides generally occur together. The current basic standard of 15 pCi/L plutonium was calculated using methodologies in the 1976 National Interim Primary Drinking Water Regulations and was consistent with a goal of keeping exposures below 4 millirems per year. The Basis and Purpose indicated that it was necessary and important to restrict levels because of the difficulty of removing this radionuclide by conventional treatment procedures and because the potential adverse effect on human health suggests that extreme caution be exercised in its release to State waters. Since plutonium is predominantly an alpha emitter, the basic standard was made consistent with the 15 pCi/L alpha standard. (A site-specific standard, based on ambient conditions, was set in 1990. Note that this hearing also addressed site-specific standards, which are further discussed in section 3.8.48 of this Statement of Basis and Purpose.)

3. Basis for Commission Decision

Since the previous basic standard was set, several changes have occurred: 1) a new methodology for assessing carcinogens has become the standard practice, 2) new data have resulted in periodic updates to the slope factors used in this methodology, and 3) a more refined Commission policy on appropriate levels of protection for carcinogens has been developed. This latter risk-based policy also parallels a national trend towards risk-based approach to environmental cleanup standards.

The 15 pCi/L dose-based approach was calculated using a “reference-man” and considered exposure during his working life. It was an approach designed to address questions related to occupational

exposure. It did not consider sex, age and organ-specific factors over a lifetime. In contrast, the new slope factor methodology, used in EPA's 1989 Risk Assessment Guidance for Superfund Sites, is more complete, more applicable to a general population and has become the standard practice for calculating risk.

The Commission adopted a basic standard of 0.15 pCi/L for plutonium and americium, calculated using a 1×10^{-6} risk level, based on residential use. This risk level is consistent with the Commission's policy for human health protection.

The Commission also considered a request by the Water Quality Control Division to annotate the new standards for plutonium and americium as total (unfiltered) water. The Commission heard disputed testimony on this issue and could not reach a consensus to require unfiltered samples in all circumstances. The Division will have discretion to consider appropriate sampling techniques in implementing the adopted standards.

PARTIES TO THE RULEMAKING

1. State of Colorado Division of Wildlife
2. U.S. Department of Energy
3. Kaiser-Hill Company, LLC
4. City of Broomfield
5. City of Westminster
6. U.S. EPA Region VIII
7. City of Thornton
8. City of Arvada
9. City of Northglenn

41.21 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JULY, 1997 RULEMAKING

The provisions of sections 25-8-202 and 25-8-401, C.R.S., provide the specific statutory authority for adoption of the attached regulatory amendments. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

The Commission has adopted a revised numbering system for this regulation, as a part of an overall renumbering of all Water Quality Control Commission rules and regulations. The goals of the renumbering are: (1) to achieve a more logical organization and numbering of the regulations, with a system that provides flexibility for future modifications, and (2) to make the Commission's internal numbering system and that of the Colorado Code of Regulations (CCR) consistent. The CCR references for the regulations will also be revised as a result of this hearing.

41.22 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JANUARY, 1999 RULEMAKING

The provisions of sections 25-8-202; 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

This revisions is to reconfirm the previous action taken by the Commission to include correct publication in the Colorado Code of Regulations Statement of Basis, Specific Statutory Authority and Purpose for the December, 1996 rulemaking hearing.

41.23 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY, AND PURPOSE (2001 REVISIONS)

The provisions of section 25-8-202(1)(a), (b) and (2); 25-8-203; and 25-8-204; C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

This hearing was held to consider changes recommended in the triennial informational hearing for the ground water standards and classifications regulation "The Basic Standards for Ground Water" 41. Significant changes were made to Table A "Ground Water Organic Chemical Standards" with the addition of new chemical standards and changes to existing standards. The changes are in keeping with the Commission's Policy 96-2 to coordinate surface and ground water standards. The changes and additions to Table A reflect the changes to the surface water Human Health Based Water Supply Standards adopted by the Commission in the Basic Standards and Methodologies for Surface Water, Regulation 31, triennial review hearing July 10, 2000.

Many of the surface water standards are based upon EPA-established drinking water standards, under the Safe Drinking Water Act (SDWA), or water quality criteria developed pursuant or section 304(a) of the federal Clean Water Act. Since these standards and criteria are modified from time to time, it is necessary to review the existing Colorado standards in comparison to the latest available information. As a result of this review, the Commission adopted revisions to the standards to conform with the latest available information as to protective levels for the various chemicals.

In adopting these standards for ground water, 39 new organic chemical standards were added to Table A, 25 existing standards were changed, and two chemicals were renamed. Two organic Chemicals were renamed in Table A: Dichloromethane CAS No. 75-09-2 is now Methylene chloride[C], and Di(2 ethylhexyl)phthalate[C] CAS No. 117-81-7 is now Ethylhexyl phthalate (BIS-2)[C].

The Commission has adopted amendments to section 41.5.B to provide for the establishment of alternative standards to the site-specific water quality standards for the Domestic Use - Quality classification. Prior to this amendment this alternative was not possible because section 41.5.B.3.a provided that the human health standards (Table 1) and the secondary drinking water standards (Table 2) apply to ground water classified Domestic Use - Quality. No alternative standards to the Table 1 and 2 standards were provided for in the original regulation. The Commission believes that the option of site-specific standards should be allowed taking into account the factors set forth in §25-8-204(4) C.R.S. The language adopted by the Commission is similar to the language included in section 41.5.D.2 that allows the Commission to adopt sitespecific standards for radioactive materials and organic pollutants.

Additional changes proposed to Regulation 41 were of a "housekeeping" nature to update the regulation and to correct typographical errors.

PARTIES TO THE RULEMAKING

1. Climax Molybdenum Company

41.24 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; SEPTEMBER 2004 RULEMAKING

The provisions of sections 25-8-202; 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

This hearing was held to consider changes recommended in an Informational Hearing for Regulation 41, The Basic Standards for Ground Water. The majority of the changes involved modifications to the organic chemical standards in Table A, as well as the addition of new standards for twenty-one carcinogenic organic chemicals. During this hearing the Commission also considered the organic chemical standards contained in Regulation 31, The Basic Standards and Methodologies for Surface Water. Other changes, for Regulation 41, included renaming Tables 1 and 2 to parallel the nomenclature used in Policy 96-2, the Commission's policy on human-health based water quality criteria. Additionally, several footnotes for Tables 1 and 2 were updated to clarify and identify the source of the associated numeric standards. References to Practical Quantitation Limits (PQL) were modified to reflect the Commission's decision to remove the determination of appropriate PQLs from the Rulemaking process. The Commission understands that the Water Quality Control Division is developing a PQL guidance document, which will contain those PQLs deemed acceptable to the Division. In addition, the Water Quality Control Division, or applicable implementing agency, may establish site-specific or discharge-specific PQLs. Finally, additional clarification was added to the table of Radioactive Standards to reflect the Commission's decision to allow discretion in considering appropriate sampling techniques in implementing these standards.

In November 2000, EPA disapproved surface water standards for several Group C organic chemicals because the proposed standards were not based on carcinogenic risk. Group C carcinogens are typically classified, based on limited evidence, as possible human carcinogens. Historically, due to the lack of substantive carcinogenic evidence, the Commission has not established carcinogenic-based standards for Group C chemicals, but rather adopted standards based on toxicity.

Based on published human-health risk data there are three classes of Group C compounds, which include:

Those compounds with published toxicity (RfD) values,
Those compounds with published cancer slope factors (q1*), and
Those compounds with published RfD and q1* values.

Previously, the Commission has promulgated standards for the Group C compounds in the first and third class based on toxicity and for the second class based on carcinogenicity. However, this treatment of the class 3 Group C compounds resulted in EPA disapproving the standards.

In order to resolve this issue with EPA, during this hearing, the Commission adopted a standard for these Group C compounds based on toxicity, but with an additional margin of safety to account for any unknown carcinogenic effects. Using this method the standards for Group C compounds, with both RfD and q1* values, are based on toxicological data, and then adjusted downward using an uncertainty factor of 10. The Commission believes that this methodology is consistent with SDWA practices and will be protective of human health.

The Commission also decided to add numeric standards for twenty-one additional organic chemicals that are classified as either Group A, known human carcinogens, or Group B, probable human carcinogens.

One of the new standards that was the subject of extensive written and oral testimony in this hearing is a standard for 1,4-dioxane. Based upon the current status of the scientific evidence as disclosed at the hearing, with specific reference to the number for 1,4-dioxane found in EPA's IRIS database, the Commission adopted a standard of 6.1 ug/l to apply for a period of five years, with a standard of 3.2 µg/l becoming effective at the end of the five-year period. The Commission is aware of the fact that EPA is re-examining its criteria for 1,4-dioxane. However, that effort likely will take a number of years and the result is uncertain, and there is a current need to address this chemical in the water quality standards context. Because 6.1 ug/l is the value typically used to date for 1,4-dioxane remedial activities in Colorado, the adoption of this value as a water quality standard will provide a basic level of protection of human health while essentially preserving the status quo regarding clean-up requirements for the next five years. This

standard provides protection within the same order of magnitude as the 3.2 ug/l standard that results from application of the Commission's generally accepted methodology for establishing health-based standards. The Commission sees no reason in this matter to deviate from its policy regarding the order of magnitude of risk used for the protection of human health.

If no further action is taken by the Commission, the 3.2 ug/l standard will go into effect after five years. If EPA's pending review of 1,4-dioxane results in a revision of the current IRIS value, the Commission can consider a corresponding revision of its water quality standards at that time.

The Commission notes that the adopted standards are consistent with the Department of Public Health and Environment's policy on the use of IRIS in setting standards. The Commission understands that remediation action levels applied by implementing agencies at currently contaminated sites may be set at a different, higher number based on a site-specific risk analysis as referenced in the CDPHE policy. The Commission also notes that it may adopt site-specific standards for 1,4-dioxane if warranted by a site-specific risk assessment. The Commission has adopted numerous site-specific standards for other chemicals where it was determined that such standards appropriately account for site-specific circumstances.

Further, to clarify the use of this standard in a regulatory context, the Commission requests that the Division promptly develop a practical quantitation limit (PQL) for 1,4-dioxane. Consistent with other provisions of this regulation, the PQL will be used as the compliance threshold for implementation of these standards. The Commission notes that it may be appropriate to establish a site-specific PQL for individual discharges, if warranted by the unique characteristics of a particular discharge.

In adopting standards for 1,4-dioxane, the Commission has considered the factors listed in section 25-8-204, C.R.S., as follows:

(a) <u>The need for standards which regulate specified pollutants</u>

1,4-dioxane is a Group B2, probable human carcinogen and has been found as a ground water contaminant in the State of Colorado. In addition, following treatment ground water contaminated with 1,4-dioxane is discharged to Colorado surface waters.

(b) <u>Such information as may be available to the commission as to the degree to which any particular type of pollutant is subject to treatment; the availability, practicality, and technical and economic feasibility of treatment techniques; the impact of treatment requirements upon water quantity; and the extent to which the discharge to be controlled is significant</u>

1,4-dioxane is most commonly treated with a combination of advanced oxidation processes (AOP) in combination with ultraviolet light (UV). This remediation technology, though relatively new, is rapidly becoming a more common technique. The AOP/UV treatment techniques will have minimal impact on water quantity. Evidence was submitted indicating that 1,4-dioxane treatment costs could be substantial in some circumstances, although there was conflicting evidence regarding treatment costs. Because the standard that will be in effect for the next five years is set at the level already most commonly used as a 1,4-dioxane remediation goal, the adopted standard will not have a major impact on treatment costs during this period. The Commission intends that discharge permits issued while the 6.1 ug/l standard is in effect will include effluent limits based on that standard until the expiration of the existing permit. Renewal permits will be subject to the standard in effect at the time of renewal. Moreover, to the extent that the adopted standards do result in increased treatment costs, the Commission believes that such costs must be weighed against the benefits of the protection of public health, including the preventative benefits of reducing the likelihood of future exposure to 1,4-dioxane.

As to the extent to which this pollutant is significant, since 1,4-dioxane is primarily used as a solvent stabilizer, it will most likely be found in areas with known chlorinate solvent contamination. Chlorinated

solvents have been in use since the 1960s, with more widespread use occurring in the late 1970s and early 1980s due to the increasing production of electronic circuits.

(c) The continuous, intermittent, or seasonal nature of the pollutant to be controlled

1,4-dioxane is characterized by a high solubility (infinitely soluble/miscible), moderate vapor pressure, and low Henry's Law Constant, all of which indicate that this chemical will be persistent within the aquatic environment. Additionally, the available data indicate that 1,4-dioxane will not readily degrade in the environment.

(d) The existing extent of pollution or the maximum extent of pollution to be tolerated as a goal

The Hazardous Materials and Waste Management Division reports that 1,4-dioxane has been found at 9 sites and is suspected at 19 others. The standards adopted by the Commission establish the maximum extent of 1,4-dioxane to be tolerated as a human health goal, for the reasons set forth in this Statement of Basis and Purpose.

(e) Whether the pollutant arises from natural sources

1,4-dioxane contamination does not arise from natural sources.

(f) Beneficial uses of water

The 1,4-dioxane standards are adopted to protect domestic water supply uses.

(g) Such information as may be available to the Commission regarding the risk associated with the pollutants including its persistence, degradability, the usual or potential presence of the affected organisms in any waters, the importance of the affected organisms, and the nature and extent of the effect of the pollutant on such organisms

1,4-dioxane is a highly persistent contaminant. Very little degradation is observed in the ambient environment. The standards are being adopted to protect human health, so humans are the affected "organisms". 1,4-Dioxane is classified by EPA as a probable human carcinogen (Group B2). Conflicting evidence was submitted regarding the level at which 1,4-dioxane poses a human health risk. Some parties argued that a different toxicity model than that used to develop the current IRIS value for 1,4-dioxane should be used to characterize its toxicity. Some parties also argued that a 1,4-dioxane standard should be established based on a PQL for this chemical, but the Commission believes that the standard should be health-based. The Commission acknowledges that there are conflicting scientific interpretations of the available information and that further review and analysis of the toxicity of 1,4-dioxane is warranted. However, the outcome of that further review is uncertain and the Commission does not believe that there is sufficient evidence to invalidate the current EPA IRIS value at this time. The Commission believes that the record supports the scientific and technical validity of the standards that it is adopting. Moreover, in the face of conflicting scientific information, as a matter of policy the Commission has decided to err in the direction of protection of public health in approving the 6.1 ug/l and 3.2 ug/l standards for 1,4-dioxane.

Since the 1989 hearing, there has been debate about whether standards for parameters with MCLs should be based on the MCLs or purely health-based numbers. The arguments for MCLs focused on whether it is reasonable to require ground water remediation to a level below that required for drinking water. The arguments for health-based standards focused on maximizing human-health protection, putting the clean-up burden on pollution sources, and protection of ground water as a resource.

In this hearing, the Commission adopted a hybrid MCLG/MCL proposal that provides much of the benefits advocated for each of the above options. This hybrid approach allows for existing ground water contamination to be addressed at levels that are deemed safe for drinking water sources, but allow for the

protection of ground water as a resource by implementing a more protective human-health health based standard for future contamination. The Commission decided that implementation of this range of standards should be based on the date of the discharge that subsequently caused contamination of the ground water. In some cases, especially where the ground water contamination may not be discovered immediately, the contamination will have subsequently migrated. In these instances, it is the Commission's intent that the original date of the release that caused the contamination, not the date of the identification or subsequent extent of any migration of that contamination, shall be used to determine the appropriate standard for the resulting contaminant plume.

Additionally, the hybrid MCLG/MCL proposal was concurrently considered for Regulation 31, The Basic Standards and Methodologies for Surface Water, and the adoption of this rule for ground water provides a consistent approach to addressing water quality for all waters of the State.

For existing aquifer storage and recovery facilities an issue, which was presented to the Commission regarding the MCLG/MCL proposal, was the potential impact this rule could have on existing aquifer storage and recovery, or artificial recharge projects. Cognizant of both the drought and the corresponding potential future implementation of the various forms of anthropogenic recharge, the Commission decided adopt a total trihalomethanes (TTHM) standard. In order to assure that the ground water quality standards do not limit continued aquifer storage and recovery at these facilities using potable finished water, the Commission adopted a standard for TTHM. However, the Commission also elected to leave the existing standards for bromodichloromethane, bromoform, chloroform and dibromochloromethane in place in order to address ground water contamination due to other possible sources of these chemicals (e.g. from spills or industrial activity).

The applicability of Footnote 7 (allowing compliance with TTHMs rather than the separate standards for bromodichloromethane, bromoform, chloroform, and dibromochloromethane) to other sources of water and aquifers requires further evaluation. The Commission requests that the Division coordinate with stakeholders using and developing aquifer storage and recovery projects regarding these organic standards and their statewide applicability and provide a status report regarding whether modifications to the statewide organic standards for aquifer storage projects will likely be proposed.

The Commission is not aware of other instances where the ground water quality standards are likely to limit the ability to undertake such ground water recharge projects. If such circumstances should arise in the future the Commission can revisit other aspects of this regulation at that time. Alternatively, proponents of such projects could request site-specific ground water quality classifications and standards.

Tables 1 and 2 were renamed and revised to be more consistent with the description of the various standards in both Regulation 31 and Policy 96-2. Several footnotes were added or modified to further clarify the existing numeric standards.

A footnote was added to the radioactive standards table to reflect the Commission's decision in 1996 (41.20) to allow the Division latitude in requiring total or dissolved samples. In the 1996 hearing the Commission decided to allow the Division discretion to consider appropriate sampling techniques in implementing the radionuclide standards. Since that time there has been considerable interest in additional clarification of the implementation of these standards, and therefore the Commission elected to adopt additional footnotes clarifying the radioactive standards.

PARTIES TO THE RULEMAKING HEARING

1. Schlage Lock Company
2. Teck Cominco Limited
3. Raytheon Aircraft Company
4. City and County of Denver
5. Waste Management of Colorado
6. Lockheed Martin Space Systems Company
7. Barrick Gold Corporation

8. Shell Oil Company
9. Colorado Wastewater Utility Council
10. The City of Boulder
11. Emerson Electric Company
12. Colorado Association of Commerce and Industry
13. Metro Wastewater Reclamation District
14. Dover Industries, Inc.
15. Colorado Mining Association
16. The Board of County Commissioners of El Paso County
17. The JRW Family Limited Partnership
18. The South Adams County Water and Sanitation District
19. Colorado Department of Transportation
20. U.S. Environmental Protection Agency
21. Stephen A. Bain
22. U.S. Department of Energy, Rocky Flats Project Office
23. John D. Fognani & Suzanna K. Moran
24. Alliant Techsystems Inc.

41.25 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; DECEMBER 10, 2007 RULEMAKING; EFFECTIVE MAY 31, 2008

The provisions of sections 25-8-202(1)(b); 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

1. Statewide Standards - Interim Organic Pollutant Standards

In this rulemaking, the Commission adopted revised and new organic chemical standards in section 41.5(C)(3). In an effort to keep ground water and surface water organic chemical standards consistent, the changes to section 41.5(C)(3) were considered during the same hearing that addressed changes to the statewide surface water organic chemical standards in Regulation No. 31 (Basic Standards and Methodologies for Surface Water).

In adopting these new and revised organic chemical standards, the Commission continued to rely on its past policy decisions and precedence documented in Commission Policy 96-2. Additionally, as per Departmental policy the Commission has relied on the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as its first tier source of toxicological data. Review of the IRIS data that had been updated since the last revisions to 41.5(C)(3) indicated that the water quality standards for two organic chemicals, toluene and 1,2-dibromoethane, needed to be revised.

At the last hearing addressing section 41.5(C)(3), in September 2004, during which the Commission adopted water quality standards for several carcinogenic compounds, EPA had requested that a future rulemaking consider water quality standards for non-carcinogenic compounds. For this hearing the Commission reviewed several non-carcinogenic compounds that lacked water quality standards. This review identified four pesticides that the Commission elected to adopt water quality standards for: acetochlor, dicamba, metribuzin, and prometon. The Commission also corrected several typographical errors and added common synonyms for some of the organic chemicals.

2. Table Value Criteria – Tables 1 through 4

The Commission elected to adopt EPA's maximum contaminant level (MCL) for arsenic and uranium as Domestic Water Supply – Human Health Standards (Table 1). EPA promulgated a MCL of 30 µg/l for uranium in December of 2003, and a MCL of 10 µg/l for arsenic in January of 2006. The Commission has previously adopted these MCLs as surface water-water supply standards, and in an effort to keep the surface and ground water standards consistent, now adopts them as ground water standards.

The Commission received testimony regarding the association of molybdenum as a ground water contaminant in several uranium and vanadium processing and mining sites throughout the Colorado. During the 1990 hearing (q.v. section 41.14), the Commission had elected to delete the molybdenum standard until additional scientific data was available. In August of 1993, IRIS published additional findings and finalized an RfD for molybdenum. During this hearing the Commission elected to adopt a Domestic Water Supply – Human Health Standards (Table 1) for molybdenum based on this updated toxicological data, as well as testimony regarding both existing and planned uranium and vanadium mining and milling activities throughout the State.

The Water Quality Control Division submitted testimony regarding its efforts to update and issue new general ground water discharge permits, and during that process requested additional clarification regarding the existing fecal coliform standard. The Commission updated the fecal coliform standard to clarify both the averaging period and the allowable maximum over that same averaging period. In determining the appropriate maximum and averaging period the Commission relied on EPA's water reuse guidance (EPA/625/R-04/108) for unrestricted urban reuse.

During the Issues Formulation and Informational Hearing the Commission received testimony regarding the Agricultural Standards (Table 3) and the implementation of the manganese standard. The original agricultural manganese standard was derived from EPA's 1972 Water Quality Criteria ("Blue Book"), and addressed crop toxicity in acidic soils. In order to remain consistent with the 1972 criteria, as well as with Regulation No. 31, the Commission elected to add a footnote to specify that the agricultural manganese standard is only applicable in those areas where acidic soils exist.

3. Other Changes to the Regulation

During the Issues Formulation and Informational Hearing an issue was raised regarding activities that increase naturally occurring contamination, with the intent at that time being that revisions to section 41.5(A), the narrative standards, would address this issue. Additional investigation into the issue discovered that the narrative standards, as currently adopted in Regulation No. 41, are only implemented during a ground water classification hearing. The Commission believes that this poses two problems. First, as written, the narrative standards did not apply to all State waters which conflicts with the intention of the Colorado Water Quality Control Act (CWQCA). Second, the narrative standards have not been specifically adopted for all of the current ground water classifications.

One purpose of narrative standards is to provide general qualitative guidance for situations that lack quantifiable, or scientifically predicted, outcomes. Narrative standards define broad guidelines that are intended to meet general water quality goals. For these reasons, narrative standards are applicable when numeric criteria cannot be established, or applied, to a specific discharge or release. Additionally, narrative standards are critical for addressing emergency circumstances when the dynamics of the situation prevent timely scientific review or the normal Commission procedure.

For these reasons the Commission believes that applying the narrative standards to all ground water is appropriate and effectively solves the issues before them. By making the narrative standards statewide standards the Commission fulfills the intent of the CWQCA, implements the

narrative standards for all existing ground water classifications, and addresses the issue of anthropogenic increases to naturally occurring ground water contamination.

The Commission revised the paragraph regarding "implementing agencies" to recognize the recent reorganization of the Division of Minerals and Geology into the Division of Reclamation, Mining, and Safety. The Commission also changed the reference to the agency responsible for the Resource Conservation and Recovery Act to recognize that both the Hazardous Materials and Waste Management Division and the Department of Labor and Employment implement different aspects of this statute.

In the 2004 hearing the Commission adopted footnote 7which included a total trihalomethane (TTHM) standard applicable to existing aquifer storage and recovery (ASR) facilities that use potable finished water. The Commission's intention in doing so was to assure that the ground water organic chemical standards did not limit continued ASR at existing facilities. ASR has been identified by the Colorado General Assembly and the Colorado Water Conservation Board as a potential way to maximize use of aquifers through conjunctive use of surface and ground water resources. ASR has also been identified by the South Platte River Task Force as a potential tool to address water issues in the South Platte River Basin.

In order to assure that the ground water quality standards do not limit future use of ASR, the Commission adopted changes to footnote 7 deleting the reference to facilities that existed as of September 14, 2004, thereby applying the TTHM standard to all ASR facilities using finished potable water that meets all applicable federal and state drinking water requirements. In addition, the Commission adopted a new provision that applies the maximum containment level (MCL) as the standard for ground water that must be met by ASR facilities using finished potable water.

PARTIES TO THE RULEMAKING

1. Centennial Water and Sanitation District, Town of Castle Rock, Castle Pines Metropolitan District, Consolidated Mutual Water Company, Rangeview Metropolitan District
2. Metro Wastewater Reclamation District
3. Colorado Wastewater Utility Council
4. City of Boulder
5. City of Colorado Springs and Colorado Springs Utilities
6. City and County of Denver Department of Environmental Health
7. Climax Molybdenum Company
8. Information Network for Responsible Mining (INFORM), High Country Citizens' Alliance (HCCA), and Coloradoans Against Resource Destruction (CARD)
9. United States Environmental Protection Agency, Region 8
10. U.S. Department of Energy (DOE) Office of Legacy Management
11. Upper Black Squirrel Creek Ground Water Management District

41.26 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; OCTOBER 13, 2009 RULEMAKING; EFFECTIVE NOVEMBER 30, 2009

The provisions of sections 25-8-202(1)(b); 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

During its September 2004 rulemaking, the Commission adopted two standards for 1,4 dioxane -- 6.1 ug/L to be effective through March 21, 2010; and 3.2 ug/L to become effective on March 22, 2010. The dual standard was adopted, in part, due to the uncertainty about the risks posed by 1,4 dioxane and the fact that EPA was in the process of updating the Integrated Risk Information System ("IRIS") database for

that compound. At that time, the Commission adopted the 6.1 µg/L value (which had been typically used for remedial activities in Colorado) as a temporary standard in order to maintain the status quo for a period of five years to give EPA time to complete its IRIS update. The Commission determined that if EPA's pending review resulted in a change in the IRIS value, the Commission could consider a corresponding revision of its standards. As of this date, EPA has not completed the IRIS review.

In May 2009, EPA released an updated draft toxicological review on 1,4 dioxane for external peer review. According to the current schedule, final completion of the IRIS update should occur before the end of 2011.

41.27 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; AUGUST 13, 2012 RULEMAKING; FINAL ACTION SEPTEMBER 11, 2012; EFFECTIVE JANUARY 31, 2013

The provisions of sections 25-8-202(1)(b); 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

1. Statewide Standards - Interim Organic Pollutant Standards

In this rulemaking, the Commission adopted revised and new organic chemical standards in section 41.5(C)(3). In an effort to keep ground water and surface water organic chemical standards consistent, the changes to section 41.5(C)(3) were considered during the same hearing that addressed changes to the statewide surface water organic chemical standards in Regulation No. 31 (Basic Standards and Methodologies for Surface Water).

In adopting these new and revised organic chemical standards, the Commission continued to rely on its past policy decisions and precedence documented in Commission Policy 96-2. Additionally, as per Departmental policy, the Commission has relied on the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as its first tier source of toxicological data. Review of the IRIS data that had been updated since the last revisions to 41.5(C)(3) indicated that the water quality standards for acrylamide, carbon tetrachloride, 1,2-cis dichloroethylene,1,2-trans dichloroethylene, 1,4-dioxane, hexachloroethane, nitrobenzene, pentachlorophenol, tetrachloroethylene (PCE), and 1,1,1-trichloroethane, needed to be revised. This review also identified new compounds in the IRIS data that the Commission elected to adopt as water quality standards, these were: acetone, bromobenzene, chlordecone, 1,2-dibromoethane, dichloromethane, ethylene glycol monobutyl ether (EGBE) (2-Butoxyethanol), 2-hexanone, perchlorate, trichloroacetic acid, 1,2,3-trichloropropane.

The compounds acylamide, dichloromethane, and 1,2,3-trichloropropane are mutagenic compounds, and the resulting standards were calculated following EPA guidance on calculating drinking water supply standards for mutagenic compounds. Footnote 8 was added to indicate that these compounds were calculated using age dependent factors.

The EPA IRIS updates also included instances where the updated human health criteria is less stringent than the maximum contaminant level (MCL) promulgated under the federal Safe Drinking Water Act. In these instances, the Commission adopted two values shown as a range, with the updated human health criteria being the first number in the range and the federal MCL being the second number in the range. In such cases, the implementing agency must establish the protection level that is determined by the agency to be consistent with the current and future uses of the ground water. The compounds that have a range with the human health criteria being higher than the MCL are 1,2-trans dichloroethylene, tetrachloroethylene (PCE), and 1,1,1 trichloroethane (1,1,1-TCA). Footnote 6 to Table A was amended to clarify the standards implementation intent of the Commission when a human health based standard is a higher numeric value than the maximum contaminant level in a range between the human health based standard and the maximum contaminant level.

The Commission also corrected several typographical errors and added common synonyms for some of the organic chemicals.

The Commission heard testimony from several parties asserting that the revised standard adopted for 1,4 dioxane may not be attainable with economical treatment technologies and in some instances may be difficult to measure using current laboratory analytical techniques. Such technical and economic issues are often addressed by EPA in establishing a Maximum Contaminant Level (MCL) under the Safe Drinking Water Act, and the Commission has in the past established a range for a particular chemical, with the health-based standard being the minimum and the MCL the maximum, since EPA has determined that MCLs represent an acceptable level to provide in public drinking water. However, no MCL has been developed for 1,4 dioxane. The Commission therefore did not adopt a range and instead set the statewide standard for 1,4 dioxane at a level to protect human health, based on the currently available scientific information and applying the Commission's established risk-based policy approach. The Commission believes that the concerns raised are better addressed with respect to site-specific implementation issues and notes that there may be a need for site-specific standards for 1,4-dioxane and other regulated organic chemicals to address site-specific economic and/or technical treatment capabilities. The Division concurred with the parties' testimony regarding these concerns and expressed willingness to work with parties who propose site-specific solutions to the Commission.

2. Table Value Criteria – Tables 1 through 4

The Commission revised the Table 1 standard for molybdenum from 35 ug/l to 210 ug/l in an effort to keep the surface and ground water standards consistent. The Division presented evidence during the hearing that the total recoverable form of molybdenum can be translated to the dissolved form in a 1:1 ratio.

The Commission revised Table 1 standard for uranium to be a hyphenated value. The Commission retained the 30 µg/L value, the maximum contaminant level (MCL) from EPA's 2000 radionuclides rule under the Safe Drinking Water Act, and added a value of 16.8 µg/L. The 16.8 µg/L value is derived from use of the reference dose and relative source contribution from the 2000 radionuclides rule in Equation 1-1 of Policy 96-2. This equation and the resulting value are based purely upon the protection of human-health and do not take treatment or economic considerations into account as does the MCL. Footnote 2 to Tables 1- 4 will be applied to the revised uranium value.

PARTIES TO THE RULEMAKING

1. Climax Molybdenum Company
2. Metro Wastewater Reclamation District
3. Lowry Environmental Protection/Cleanup Trust Fund
4. South Adams County Water and Sanitation District
5. Brown Group Retail, Inc.
6. International Risk Group, LLC
7. Environmental Protection Agency
8. City of Boulder

41.28 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; APRIL 11, 2016 RULEMAKING; FINAL ACTION MAY 9, 2016; EFFECTIVE DATE JUNE 30, 2016

The provisions of sections 25-8-202(1)(b); 25-8-204; 25-8-402, C.R.S., provide the specific statutory authority for adoption. The Commission also adopted, in compliance with section 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE:

1. Statewide Standards - Interim Organic Pollutant Standards

The Commission adopted revised and new organic chemical standards in section 41.5(C)(3). In an effort to keep ground water and surface water organic chemical standards consistent, the changes to section 41.5(C)(3) were considered during the same hearing that addressed changes to the statewide surface water organic chemical standards in Regulation No. 31 (Basic Standards and Methodologies for Surface Water).

In adopting these new and revised organic chemical standards, the Commission continued to rely on its past policy decisions and precedence documented in Commission Policy 96-2. Additionally, as per Departmental policy, the Commission has relied on the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as its first tier source of toxicological data. Review of the IRIS data that had been updated since the last revisions to 41.5(C)(3) indicated that the water quality standard for tetrachloroethylene (TCE), needed to be revised. EPA expressed concerns regarding the proposed hybrid standard approach for TCE. In light of the impact that a decision on the hybrid standard for TCE may have on other hybrid standards adopted by the WQCC, and because the human health risk of maintaining the current standard of 5 mg/L is not an order of magnitude above the risk for a standard of .76 mg/L, the Commission decided to not modify the TCE standard at this hearing. The Commission expects the broader issue of hybrid standards will be discussed with EPA and the stakeholders, and that the issue may be revisited at a future hearing. The IRIS review also identified new compounds in the IRIS data that the Commission elected to adopt as water quality standards, these were: biphenyl, methanol, and tetrahydrofuran.

2. Table A, Footnote 6

The Commission amended Footnote 6 to Table A in section 41.5(C)(3) to clarify the standards implementation intent of the Commission when a human health based standard is a higher numeric value than the maximum contaminant level in a range between the human health based standard and the maximum contaminant level.

The Commission deleted implementation language for organic chemicals that was deemed no longer necessary.

The Commission added to the footnote an explanation of its intent with how an implementing agency can establish a protection level when there is site-specific information that demonstrates that there is no current or reasonably anticipated future uses of groundwater.

3. Practical Quantification Limitations (PQLs)

The Commission heard testimony that it is no longer necessary for the Division to approve the Practical Quantification Limitations (PQLs) used by the groundwater standards implementing agencies. The groundwater implementing agencies have their own PQLs or PQL equivalents established under their own authorities. Therefore, section 41.5(C)(4) was amended to remove the requirement of the WQCD approving PQL's for the groundwater standards implementing agency.

PARTIES TO THE RULEMAKING

1. Environmental Protection Agency