NOTICE

All drawings located at the end of the document.

PREDECISIONAL DRAFT

DOE – EG&G MEETING

REQUEST FOR DOE CONCURRENCE ON CHEMICAL-SPECIFIC ARAR/TBC POLICY

October 7, 1991

REVIEWED FOR CLASSIFICATION/UCNI
By F. J. Curran
Date 10-24-91

EG&G ROCKY FLATS

91-0125

A-SW-000463

APPLICATION OF CHEMICAL–SPECIFIC ARARs VERSUS TBCs FOR FEDERAL AND COLORADO WQCC STANDARDS

SUMMARY OF CHEMICAL–SPECIFIC ARARs VERSUS TBCs FOR FEDERAL STANDARDS

FEDERAL STANDARDS

- SURFACE WATER
  - SDWA MCLs for Segment 4 – ARAR
  - SDWA MCLs for Segment 5 – TBC
  - SDWA MCLGs – TBC
  - CWA Ambient Water Quality Criteria – TBC
- GROUND WATER
  - SDWA MCLs – TBC
  - SDWA MCLGs – TBC
  - RCRA CFR Part 264 Subpart F concentration limits – ARAR
  - CWA Ambient Water Quality Criteria – TBC

RATIONALE FOR ARAR/TBC DETERMINATION OF FEDERAL STANDARDS

FEDERAL STANDARDS FOR SURFACE WATER IN SEGMENT 4

SDWA MCLs – ARAR

MCLs define the maximum permissible level of contaminants in water delivered to the free flowing outlet of the ultimate user of a public water system, per 40 CFR 141.2. As such, MCLs are clearly not applicable to RFP surface waters. However, since RFP Segment 4 surface waters have been classified by the CWQCC as a source of drinking water (consistent with the Big Dry Creek Basin-wide classification), MCLs have been determined to be relevant and appropriate and have accordingly been applied as ARAR.

FEDERAL STANDARDS FOR SURFACE WATER IN SEGMENT 5

SDWA MCLs – TBC

MCLs define the maximum permissible level of contaminants in water delivered to the free flowing outlet of the ultimate user of a public water system, per 40 CFR 141.2. As such, MCLs are clearly not applicable to RFP surface waters. Also, since the Segment 5 classification as *drinking water supply* has been applied as a goal by the CWQCC, MCLs are accordingly applied as TBC.

FEDERAL STANDARDS FOR SURFACE WATER

SDWA MCLGs - TBC

MCLGs are nonenforceable health goals at which no adverse health affects are known or anticipated, per 40 CFR 141.2. MCLGs currently in effect are either zero or equivalent to the MCL. Such goals cannot be ARAR. However, CERCLA §121(d) requires that MCLGs be attained for onsite remedial actions, where relevant and appropriate. Furthermore, 40 CFR 300.430(e) requires consideration of nonzero MCLGs in the development of preliminary remediation goals and ultimately in the establishment of remedial action objectives. While not ARAR, nonzero MCLGs must be attained, where relevant and appropriate.

FEDERAL STANDARDS FOR SURFACE WATER

CWA Ambient Water Quality Criteria - TBC

AWQCs are nonenforceable guidance developed under CWA §304 to be used by states in establishing surface water protection standards. Such guidance criteria cannot be ARAR. Attainment of AWQCs is required by CERCLA §121(d) and 40 CFR 300.430(e) as was discussed for MCLGs. The NCP preamble (55 FR 8755) states that AWQCs may be determined not to be relevant and appropriate where more appropriate state standards exist. Colorado has established surface water protection standards for RFP which, while not currently ARAR, will likely be found to be more appropriate than AWQCs when remediation goals are determined. While not ARARs, AWQCs must be considered and are applied as TBCs for RFP surface waters.

FEDERAL STANDARDS FOR GROUND WATER

SDWA MCLs - TBC

As discussed for surface water, MCLs apply to public drinking water systems and are considered relevant and appropriate for potential drinking water sources under the Safe Drinking Water Act. Since RFP alluvial ground water does not support the technical requirements of a potential viable drinking water supply due to the minute volume of water in this aquifer, MCLs are applied as TBC. Also, the State has classified the upper aquifer at RFP as domestic water supply, but this is the only location within the State with such a classification. Therefore, it is not certain that the classification meets the "applicability" requirements under 40 CFR 300.400(g)(4).

FEDERAL STANDARDS FOR GROUND WATER

SDWA MCLGs - TBC

MCLGs are nonenforceable health goals at which no adverse health affects are known or anticipated, per 40 CFR 141.2. MCLGs currently in effect are either zero or equivalent to the MCL. Such goals cannot be ARAR. However, CERCLA §121(d) requires that such goals be attained for onsite remedial actions, where relevant and appropriate. Furthermore, 40 CFR 300.430(e) requires consideration of nonzero MCLGs in the development of preliminary remediation goals and ultimately in the establishment of remedial action objectives. While not ARAR, nonzero MCLGs must be attained, where relevant and appropriate.

FEDERAL STANDARDS FOR GROUND WATER

RCRA 40 CFR Part 264 Subpart F Concentration Limits – ARAR

RCRA ground water requirements apply to hazardous constituents in the ground water underlying a waste management area at the point of compliance from a regulated unit. While most areas of RFP do not contain regulated units, they often do contain IHSSs (SWMUs). Accordingly, RCRA 40 CFR Part 264 Subpart F requirements, which require attainment of MCLs or background, or alternate concentration limits (ACLs), are relevant and appropriate and are applied as ARAR. However, until a risk assessment is conducted to determine if background concentrations are the appropriate ACLs, background (detection limits) are applied as TBC.

FEDERAL STANDARDS FOR GROUND WATER

CWA Ambient WaterQualityCriteria – TBC

As discussed for surface water, AWQCs cannot be ARAR, however, they must be considered in the development of preliminary remediation goals (where such criteria are found to be relevant and appropriate). Relative to RFP ground water, fish and water ingestion AWQCs maybe considered relevant and appropriate and are applied as TBC. As with RFP surface waters, however, Colorado has identified both site-specific and state-wide ground water protection standards. These state standards are either nonenforceable or not of general applicability. However, it is probable that AWQCs will be found to be less appropriate than the Colorado standards when preliminary and final remediation goals are established.

SUMMARY OF CHEMICAL - SPECIFIC COLORADO WATER QUALITY CONTROL COMMISSION STANDARDS

- SURFACE WATER
  - Statewide Standards – ARAR
  - Basin–Specific Standards – ARAR
  - Site–Specific Standards – TBC

- GROUND WATER
  - Statewide Standards – TBC
  - Basin–Specific Standards – TBC
  - Site–Specific Standards – TBC

RATIONALE FOR ARAR/TBC DETERMINATION OF COLORADO WQCC STANDARDS

STATE STANDARDS FOR SURFACE WATER

State-wide Standards – ARAR

The statewide surface water standards at Section 3.1.11(2) and at Tables A, B, and C (5 CCR 1002-8) (the use-designations triggering these tables are generally applicable and enforceable, although maybe they should be under 'site-specific') are ARAR since they are applied statewide and are enforceable through the NPDES permitting process.

Basin-Specific Standards-ARAR

Basin-Specific standards are ARAR since these standards are applied to facilities other than RFP and would be enforceable under the NPDES permitting process.

STATE STANDARDS FOR SURFACE WATER

Site–Specific Standards (Inorganics) – TBC

These site–specific standards for metals and inorganics for Segment 4 of the Big Dry Creek Basin are applied consistently with such applications to other stream segments around the state and are enforceable through the NPDES permitting process. However, since these are site–specific standards, it is the opinion of EG&G that these standards should be applied as TBC.

The Segment 5 standards have been assigned as goals by the CWQCC and accordingly are TBCs.

STATE STANDARDS FOR SURFACE WATER

Site–Specific Standards (Additional Organics) – TBC

These standards are only applied at RFP and are therefore not of general applicability and can only be TBC.

Site–Specific Standards (Radionuclides) – TBC

These standards have only been applied at RFP and are therefore not of general applicability and can only be TBC.

STATE STANDARDS FOR GROUND WATER

State-wide Standards – TBC

These standards are not independently enforceable. While they may be enforced through other state environmental regulatory programs (reportedly under RCRA Corrective Action Authority according to David Shelton of CDH) it is unclear whether this satisfies the NCP criteria for "promulgated." Accordingly, they are TBC.

STATE STANDARDS FOR GROUND WATER

Basin–Specific Standards – TBC

CWQCC has proposed basin–specific standards. Since these standards are not yet promulgated, they are TBC. (Note that the CWQCC has specifically stated in the proposed regulations that these standards are not to be applied to remedial actions.)

Site–Specific Standards – TBC

These standards may be enforceable in July 1992 through the State Discharge Permit System regulations (6.1.0). Currently, site–specific classification of ground water has only been applied at RFP, the standards are not of general applicability and are applied as TBC.

TABLE 1
POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)
GROUNDWATER QUALITY STANDARDS (ug/l)

				FEDERAL STANDARDS					STATE STANDARDS (TBCs)							
									CDH/CWQCC Groundwater Quality Standards (d)							
									Statewide	Site-Specific (g)						
Parameter	Type (5)	PQL MDL	Method (6)	SDWA Maximum Contaminant Level TBCs (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	RCRA Subpart F Concentration Limit (40CFR264.94) (c)	Tables A & B (d)	Table 1 Human Health	Table 2 Secondary Drinking	Table 3 Agriculture	Table 4 TDS	Table 5 Chronic	Table 6 Radionuclides Woman Creek	Table 6 Radionuclides Walnut Creek
1,1-Dichloroethane	V	5	CV											0.6		
1,1-Dichloroethene	V	5	CV	7		7			7							
1,2-Dichloroethane	V	5	CV	5		0			5							
1,2-Dichloroethene (cis)	V		a		70		70		70							
1,2-Dichloroethene (total)	V	5	CV													
1,2-Dichloroethene (trans)	V		a		100		100		70							
1,2-Dichloropropane	V	5	CV		5		0		0.56 (7)							
1,3-Dichloropropene (cis)	V	5	CV													
1,3-Dichloropropene (trans)	V	5	CV													
2-Butanone	V	10	CV													
2-Hexanone	V	10	CV													
4-Methyl-2-pentanone	V	10	CV													
Acetone	V	10	CV													
Acrylonitrile	V		c											0.058		
Benzene	V	5	CV	5		0			5							
Bromodichloromethane	V	5	CV													
Bromoform	V	5	CV													
Bromomethane	V	10	CV													
Carbon Disulfide	V	5	CV													
Carbon Tetrachloride	V	5	CV	5		0			5							
Chlorinated Benzenes	V	10	CV/CS													
Chlorobenzene	V	5	CV/CS		100		100		300							
Chloroethane	V	10	CV													
Chloroform	V	5	CV	Tot THM <100**					Tot THM <100**					0.19		
Chloromethane	V	10	CV													
Dibromochloromethane	V	5	CV													

TABLE 1

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)
GROUNDWATER QUALITY STANDARDS (ug/l)

				FEDERAL STANDARDS					STATE STANDARDS (TBCs)							
									CDH/CWQCC Groundwater Quality Standards (d)							
									Statewide	Site-Specific (g)						
Parameter	Type (5)	PQL MDL	Method (6)	SDWA Maximum Contaminant Level TBCs (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	RCRA Subpart F Concentration Limit (40CFR264.94) (c)	Tables A & B (d)	Table 1 Human Health	Table 2 Secondary Drinking	Table 3 Agriculture	Table 4 TDS	Table 5 Chronic	Table 6 Radionuclides Woman Creek	Table 6 Radionuclides Walnut Creek
Dichloroethenes	V															
Ethyl Benzene	V	5	CV		700		700		680							
Ethylene Dibromide	V		d		0.05		0		0.0004							
Ethylene Oxide	V															
Halomethanes	V			100					100					0.19		
Methylene Chloride	V	5	CV													
Pyrene	V	10	CS													
Styrene	V	5	CV		100		100									
Tetrachloroethanes	V	5	CV													
Tetrachloroethene	V	5	CV		5		0		10					0.8		
Toluene	V	5	CV		1,000		1,000		2,420							
Trichloroethanes	V	5	CV													
Trichloroethene	V	5	CV	5		0			5							
Vinyl Acetate	V	10	CV													
Xylenes (total)	V	5	CV		10,000		10,000									

TABLE 1

POTENTIAL CHEMICAL–SPECIFIC ARARs/TBCs (October 1, 1991)

GROUNDWATER QUALITY STANDARDS (ug/l)

				FEDERAL STANDARDS					STATE STANDARDS (TBCs)							
									CDH/CWQCC Groundwater Quality Standards (d)							
									Statewide	Site–Specific (g)					Table 6	
Parameter	Type (5)	PQL MDL	Method (6)	SDWA Maximum Contaminant Level TBCs (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	RCRA Subpart F Concentration Limit (40CFR264.94) (c)	Tables A & B (d)	Table 1 Human Health	Table 2 Secondary Drinking	Table 3 Agriculture	Table 4 TDS	Table 5 Chronic	Radionuclides Woman Creek	Radionuclides Walnut Creek

EXPLANATION OF TABLE

* = secondary maximum contaminant level; TBCs

** = total trihalomethanes: chloroform, bromoform, bromodichloromethane, dibromochloromethane

CDH = Colorado Department of Health
CLP = Contract Laboratory Program
EPA = Environmental Protection Agency
pCi/l = picocuries per liter
PCB = polychlorinated biphenyl
PQL = Practical Quantitation Limit
RCRA = Resource Conservation and Recovery Act
SDWA = Safe Drinking Water Act
TAL = Target Analyte List
THM = Total Trihalomethanes
TIC = Tentatively Identified Compound
MDL = Minimum Detection Limit for radionuclides (pCi/l)
ug/l = micrograms per liter
VOA = Volatile Organic Analysis
WQCC = Water Quality Control Commission

(1) TDS standard – see Table 4 in (d); standard is 400 mg/l or 1.25 times the background level, whichever is least restrictive
(2) radionuclide standards – see sec. 3.11.5(c)2 in (d)
(3) If both strontium–90 and tritium are present, the sum of their annual dose equivalents to bone marrow shall not exceed 4 mrem/yr.
(4) MDL for Radium 226 is 0.5; MDL for radium 228 is 1
(5) type abbreviations are: A=anion; B=bacteria; C=cation; D=dioxin; E=element; FP=field parameter; I=indicator; M=metal; P=pesticide; PP=pesticide/PCB; R=radionuclide; SV=semi–volatile; V=volatile
(6) method abbreviations are: CT=CLP–TAL; NC=non–CLP; CV=CLP–VOA; CS=CLP–SEMI; EP=EPA–PEST; CP=CLP–PEST; E=EPA; a = detected as total in CV; b = detected as TICs in CS; c = detected as TIC in CV;
d = not routinely monitored; e = monitored in discharge ponds; f = mixture–individual isomers detected.

TABLE 1

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

GROUNDWATER QUALITY STANDARDS (ug/l)

				FEDERAL STANDARDS					STATE STANDARDS (TBCs)							
									CDH/CWQCC Groundwater Quality Standards (d)							
									Statewide	Site-Specific (g)						
				SDWA Maximum Contaminant Level	SDWA Maximum Contaminant Level	SDWA Maximum Contaminant Level	SDWA Maximum Contaminant Level	RCRA Subpart F Concentration	Tables	Table 1	Table 2	Table 3	Table 4	Table 5	Table 6	
									A & B	Human	Secondary	Agriculture	TDS	Chronic	Radionuclides	
Parameter	Type (5)	PQL MDL	Method (6)	TBCs (a)	TBCs (b)	Goals TBCs (a)	Goals TBCs (b)	Limit (40CFR264.94) (c)	(d)	Health	Drinking				Woman Creek	Walnut Creek

(7) Standard is below (more stringent than) PQL, therefore PQL is standard.

(8) Value for gross alpha excludes uranium.

(a) EPA National Primary and Secondary Drinking Water Regulations, 40 CFR 141 and 40 CFR 143 (as of 5/1990)

(b) EPA National Primary and Secondary Drinking Water Regulations, 40 CFR Parts 141, 142, 143, Final Rule, Effective July 30, 1992 (56 FR 3526; 1/30/1991)

(c) NCP, 40 CFR 300; NCP Preamble 55 FR 8764; CERCLA Compliance with Other Laws Manual, EPA/540/G-89/006, August 1988

(d) CDH/Water Quality Control Commission, The Basic Standards for Ground Water, 3.11.0 (5 CCR 1002-8) 1/5/1987 amended 9/11/1990

(e) EPA National Primary and Secondary Drinking Water Regulations, 40 CFR Parts 141, 142, 143, Final Rule, Effective January 1, 1993 (56 FR 30266; 7/1/1991)

(f) EPA Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper, 40 CFR 141 and 142 (56 FR 26460; 6/7/91) effective 11/6/91.

(g) CDH/Water Quality Control Commission, Classifications and Water Quality Standards for Ground Water, 3.12.0 (3/5/1991).

TABLE 2

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c)		CWA AWQC for Protection of Human Health TBCs (c)	
								Acute Value	Chronic Value	Water and Fish Ingestion	Fish Consumption Only
Bicarbonate	A	10	E310.1								
Carbonate	A	10	E310.1								
Chloride	A	5	E325	250,000*				860,000(e)	230,000(e)		
Chlorine	A	1000	E4500					19	11		
Flouride	A	5	E340	4,000; 2,000*		4,000					4,000
N as Nitrate	A	5	E353.1	10,000			10,000			10,000	
N as Nitrate+Nitrite	A	5	E353.1		10,000		10,000				
N as Nitrite	A	5	E354.1		1,000		1,000				
Sulfate	A	5	E375.4	250,000*							
Sulfide	A										
Coliform (Fecal)	B	1	SM9221C	1/100 ml							
Ammonia as N	C	5	E350					Criteria are pH	and temperature	dependent - see	criteria document
Dioxin	D		d					0.01	0.00001	0.000000013	0.000000014
Sulfur	E	100,000	E600								
Dissolved Oxygen	FP	0.5	SM4500					5,000			
pH	FP	0.1	E150.1	6.5-8.5 *					6.5-9		
Specific Conductance	FP	1	E120.1								
Temperature	FP							SS	SS		
Boron	I	5	E6010								
Total Dissolved Solids	I	10	E160.1	500,000*				SS	SS	250,000	
Aluminum	M	200	CT		50 to 200*			750	87		
Antimony	M	60	CT					9,000	1,600	146	45,000
Arsenic	M	10	CT	50						.0022	.0175
Arsenic III	M							360	190		
Arsenic V	M							850	48		
Barium	M	200	CT	1,000	2,000 (f)		2,000 (f)			1,000	
Beryllium	M	5	CT					130	5.3	.0068**	.117**

TABLE 2

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c)		CWA AWQC for Protection of Human Health TBCs (c)	
								Acute Value	Chronic Value	Water and Fish Ingestion	Fish Consumption Only
Cadmium	M	5	CT	10	5		5	3.9 (3)	1.1 (3)	10	
Calcium	M	5,000	CT								
Cesium	M	1,000	NC								
Chromium	M	10	CT	50	100		100				
Chromium III	M	5	SW8467196					1,700	210	170,000	3,433,000
Chromium VI	M	10	E218.5					16	11	50	
Cobalt	M	50	CT								
Copper	M	25	CT	1,000*			1,300 (f)	18 (3)	12 (3)		
Cyanide	M	10	CT					22	5.2	200	
Iron	M	100	CT	300 *					1,000	300	
Lead	M	5	CT	50			0 (g)	82 (3)	3.2 (3)	50	
Lithium	M	100	NC								
Magnesium	M	5000	CT								
Manganese	M	15	CT	50 *						50	100
Mercury	M	0.2	CT	2	2		2	2.4	0.012	0.144	0.146
Molybdenum	M	200	NC								
Nickel	M	40	CT					1,400 (3)	160 (3)	13.4	100
Potassium	M	5000	CT								
Selenium	M	5	CT	10	50		50	20 (d)	5 (d)	10	
Silver	M	10	CT	50	100 *			4.1 (3)	0.12	50	
Sodium	M	5000	CT								
Strontium	M	200	NC								
Thallium	M	10	CT					1,400 (1)	40 (1)	13	48
Tin	M	200	NC								
Titanium	M	10	E6010								
Tungsten	M	10	E6010								
Vanadium	M	50	CT								
Zinc	M	20	CT	5,000 *				120 (3)	110 (3)		

TABLE 2

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c)		CWA AWQC for Protection of Human Health TBCs (c)	
								Acute Value	Chronic Value	Water and Fish Ingestion	Fish Consumption Only
2,4,5-TP Silvex	P		d	10	50		50				
2,4-Dichlorophenoxyacetic Acid (2,4-D)	P		d	100	70		70				
Aldicarb	P				3 (f)		1 (f)				
Aldrin	P	0.05	CP					3.0		0.000074	0.000079
Bromacil	P										
Carbofuran	P		d		40		40				
Chloranil											
Chlordane (Alpha)	P	0.5	CP		2		0	2.4	0.0043	0.00046	0.00048
Chlordane (Gamma)	P	0.5	CP		2		0	2.4	0.0043	0.00046	0.00048
Chlorpyrifos	P		E619					0.063	0.041		
DDT	P	0.1	CP					1.1	0.0011	0.000024	0.000024
DDT metabolite (DDD)	P	0.1	CP					0.06			
DDT metabolite (DDE)	P	0.1	CP					1,050			
Demeton	P								0.1		
Diazinon	P										
Dieldrin	P	0.1	CP					2.5	0.0019	0.00007	0.000076
Endosulfan I	P	0.05	CP					0.22	0.056	74	159
Endosulfan II	P	0.1	CP								
Endosulfan Sulfate	P	0.1	CP								
Endrin	P	0.1	CP	0.2				0.18	0.0023	1	
Endrin Ketone	P	0.1	CP								
Guthion	P								0.01		
Heptachlor	P	0.05	CP		0.4		0	0.52	0.0038	0.00028	0.00029
Heptachlor Epoxide	P	0.05	CP		0.2		0				
Hexachlorocyclohexane, Alpha	P	0.05	CP							0.0092	0.031
Hexachlorocyclohexane, Beta	P	0.05	CP							0.0163	0.0547
Hexachlorocyclohexane, Delta	P	0.05	CP								
Hexachlorocyclohexane, Technical	P		f							0.0123	0.0414
Hexachlorocyclohexane, (Lindane) Gama	P	0.05	CP	4	0.2		0.2	2.0	0.08		

TABLE 2

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c)		CWA AWQC for Protection of Human Health TBCs (c)	
								Acute Value	Chronic Value	Water and Fish Ingestion	Fish Consumption Only
Malathion	P								0.01		
Methoxychlor	P	0.5	CP	100	40		40		0.03	100	
Mirex	P								0.001		
Parathion	P							0.065	0.013		
PCBs	P	0.5	CP		0.5		0	2.0	0.014	0.000079**	0.000079**
Simazine	P		e								
Toxaphene	P	1	CP		3		0	0.73	0.0002	0.00071**	0.00073**
Vaponite 2	P										
Aroclor 1016	PP	0.5	CP								
Aroclor 1221	PP	0.5	CP								
Aroclor 1232	PP	0.5	CP								
Aroclor 1242	PP	0.5	CP								
Aroclor 1248	PP	0.5	CP								
Aroclor 1254	PP	1	CP								
Aroclor 1260	PP	1	CP								
Atrazine	PP		e		3		3				
.											
Americium (pCi/l)	R										
Americium 241 (pCi/l)	R	0.01									
Cesium 134 (pCi/l)	R	1									
Cesium 137 (pCi/l)	R	1									
Gross Alpha (pCI/l)	R	2		15 (10)							15
Gross Beta (pCi/l)	R	4		50 (4 mrem/yr)							
Plutonium (pCi/l)	R										
Plutonium 238+239+240 (pCi/l)	R	0.01									
Radium 226+228 (pCi/l)	R	0.5/0.1 (9)		5							5
Strontium 89+90 (pCi/l)	R	1									
Strontium 90 (pCi/l)	R			8 (6)							8
Thorium 230+232 (pCi/l)	R										

TABLE 2

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c) Acute Value	CWA AWQC for Protection of Aquatic Life TBCs (c) Chronic Value	CWA AWQC for Protection of Human Health TBCs (c) Water and Fish Ingestion	CWA AWQC for Protection of Human Health TBCs (c) Fish Consumption Only
Tritium (pCi/l)	R			20,000 (6)							
Uranium 233+234 (pCi/l)	R										
Uranium 235 (pCi/l)	R	0.6									
Uranium 238 (pCi/l)	R	0.6									
Uranium (total) (pCi/l)	R										
1,2,4,5-Tetrachlorobenzene	SV		b							38	48
1,2,4-Trichlorobenzene	SV	10	CS								
1,2-Dichlorobenzene (Ortho)	SV	10	CS		600		600				
1,2-Diphenylhydrazine	SV		b					270 (1)			
1,3-Dichlorobenzene (Meta)	SV	10	CS								
1,4-Dichlorobenzene (Para)	SV	10	CS	75		75					
2,4,5-Trichlorophenol	SV	50	CS							2,800	
2,4,6-Trichlorophenol	SV	10	CS						970 (1)	1.2 **	3.6 **
2,4-Dichlorophenol	SV	10	CS					2,020 (1)	365 (1)	3,090	
2,4-Dimethylphenol	SV	10	CS					2,120 (1)			
2,4-Dinitrophenol	SV	50	CS								
2,4-Dinitrotoluene	SV	10	CS							0.11 **	9.1 **
2-Chloronaphthalene	SV	10	CS								
2-Chlorophenol	SV	10	CS					4,360 (1)	2,000 (1)		
2-Methylnaphthalene	SV	10	CS								
2-Methylphenol	SV	10	CS								
2-Nitroaniline	SV	50	CS								
2-Nitrophenol	SV	10	CS								
3,3-Dichlorobenzidine	SV	20	CS							0.01	0.02
3-Nitroaniline	SV	50	CS								
4,6-Dinitro-2-methylphenol	SV	50	CS								
4-Bromophenyl Phenylether	SV	10	CS								
4-Chloroaniline	SV	10	CS								

TABLE 2

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c)		CWA AWQC for Protection of Human Health TBCs (c)	
								Acute Value	Chronic Value	Water and Fish Ingestion	Fish Consumption Only
4-Chlorophenyl Phenyl Ether	SV	10	CS								
4-Chloro-3-methylphenol	SV	10	CS					30 (1)			
4-Methylphenol	SV	10	CS								
4-Nitroaniline	SV	50	CS								
4-Nitrophenol	SV	50	CS					230 (1)	150 (1)		
Acenaphthene	SV	10	CS					1,700 (1)	520 (1)		
Anthracene	SV	10	CS								
Benzidine	SV		d					2,500		0.00012	0.00053
Benzoic Acid	SV	50	CS								
Benzo(a)anthracene	SV	10	CS								
Benzo(a)pyrene	SV	10	CS								
Benzo(b)fluoranthene	SV	10	CS								
Benzo(g,h,i)perylene	SV	10	CS								
Benzo(k)fluoranthene	SV	10	CS								
Benzyl Alcohol	SV	10	CS								
bis(2-Chloroethoxy)methane	SV	10	CS								
bis(2-Chloroethyl)ether	SV	10	CS							0.03**	1.36 **
bis(2-Chloroisopropyl)ether	SV	10	CS							34.7	4,360
bis(2-Ethylhexyl)phthalate	SV	10	CS							15,000	50,000
Butadiene	SV										
Butylbenzylphthalate	SV	10	CS								
Chlorinated Ethers	SV										
Chlorinated Napthalenes	SV							1,600 (1)			
Chloroalkylethers	SV	10	CS					238,000 (1)			
Chlorophenol	SV										
Chrysene	SV	10	CS								
Dibenzofuran	SV	10	CS								
Dibenz(a,h)anthracene	SV	10	CS								
Dichlorobenzenes	SV							1,120 (1)	763 (1)	400	2,600

TABLE 2
POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)
FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c) Acute Value	CWA AWQC for Protection of Aquatic Life TBCs (c) Chronic Value	CWA AWQC for Protection of Human Health TBCs (c) Water and Fish Ingestion	CWA AWQC for Protection of Human Health TBCs (c) Fish Consumption Only
Pentachlorobenzene	SV		b							74	85
Pentachlorophenol	SV	50	CS		1 (f)		0 (f)	20 (4)	13 (4)	1,010	
Phenanthrene	SV	10	CS								
Phenol	SV	10	CS					10,200 (1)	2,560 (1)	3,500	
Phthalate Esters	SV		e					940 (1)	3 (1)		
Polynuclear Aromatic Hydrocarbons	SV		b							0.0028**	0.0311**
Vinyl Chloride	SV	10	CV	2		0				2 **	525 **
1,1,1-Trichloroethane	V	5	CV	200		200				18,400	1,030,000
1,1,2,2-Tetrachloroethane	V	5	CV						2,400	0.17**	10.7 **
1,1,2-Trichloroethane	V	5	CV						9,400	0.6**	41.8 **
1,1-Dichloroethane	V	5	CV								
1,1-Dichloroethene	V	5	CV	7		7					
1,2-Dichloroethane	V	5	CV	5		0		118,000	20,000	0.94**	243 **
1,2-Dichloroethene (cis)	V		a		70		70				
1,2-Dichloroethene (total)	V	5	CV								
1,2-Dichloroethene (trans)	V		a		100		100				
1,2-Dichloropropane	V	5	CV		5		0	23,000	5,700		
1,3-Dichloropropene (cis)	V	5	CV					6,060	244 (1)	87	14,100
1,3-Dichloropropene (trans)	V	5	CV					6,060	244 (1)	87	14,100
2-Butanone	V	10	CV								
2-Hexanone	V	10	CV								
4-Methyl-2-pentanone	V	10	CV								
Acetone	V	10	CV								
Acrylonitrile	V		c					7,500	2,600	0.058	0.65
Benzene	V	5	CV	5		0		5,300		0.66**	40 **
Bromodichloromethane	V	5	CV								
Bromoform	V	5	CV								
Bromomethane	V	10	CV								

TABLE 2

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c)		CWA AWQC for Protection of Human Health TBCs (c)	
								Acute Value	Chronic Value	Water and Fish Ingestion	Fish Consumption Only
Dichlorobenzidine	SV	20	CS							0.01	0.02
Diethylphthalate	SV	10	CS							350,000	1,800,000
Dimethylphthalate	SV	10	CS							313,000	2,900,000
Dinitrotoluene	SV	10	CS					330 (1)	230 (1)	70	14,300
Di-n-butylphthalate	SV	10	CS								
Di-n-octylphthalate	SV	10	CS								
Ethylene Glycol	SV		d								
Fluoranthene	SV	10	CS					3,980 (1)		42	54
Fluorene	SV	10	CS								
Formaldehyde	SV										
Haloethers	SV							380 (1)	122 (1)		
Hexachlorobenzene	SV	10	CS							0.00072**	0.00074**
Hexachlorobutadiene	SV	10	CS					90 (1)	9.3 (1)	0.45**	50 **
Hexachlorocyclopentadiene	SV	10	CS					7 (1)	5.2 (1)	206	
Hexachloroethane	SV	10	CS					980 (1)	540 (1)	1.9	8.74
Hydrazine	SV										
Indeno(1,2,3-cd)pyrene	SV	10	CS								
Isophorone	SV	10	CS					117,000 (1)		5,200	520,000
Naphthalene	SV	10	CS					2,300 (1)	620 (1)		
Nitrobenzene	SV	10	CS					27,000 (1)		19,800	
Nitrophenols	SV							230 (1)	150 (1)		
Nitrosamines	SV							5,850 (1)			
Nitrosodibutylamine	SV		b							0.0064	0.587
Nitrosodiethylamine	SV		b							0.0008	1.24
Nitrosodimethylamine	SV		b							0.0014	16
Nitrosopyrrolidine	SV		b							0.016	91.9
N-Nitrosodiphenylamine	SV	10	b							4.9 **	16.1 **
N-Nitroso-di-n-dipropylamine	SV	10	b								
Pentachlorinated Ethanes	SV		b					7,240 (1)	1,100 (1)		

TABLE 2
POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)
FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c) Acute Value	CWA AWQC for Protection of Aquatic Life TBCs (c) Chronic Value	CWA AWQC for Protection of Human Health TBCs (c) Water and Fish Ingestion	CWA AWQC for Protection of Human Health TBCs (c) Fish Consumption Only
Carbon Disulfide	V	5	CV								
Carbon Tetrachloride	V	5	CV	5		0		35,200 (1)		0.4**	6.94 **
Chlorinated Benzenes	V	10	CV/CS					250 (1)	50 (1)		
Chlorobenzene	V	5	CV/CS		100		100				
Chloroethane	V	10	CV								
Chloroform	V	5	CV	Tot THM<100 (2)				28,900 (1)	1,240 (4)	0.19 **	15.7 **
Chloromethane	V	10	CV								
Dibromochloromethane	V	5	CV								
Dichloroethenes	V							11,600 (1)		0.033**	1.85 **
Ethyl Benzene	V	5	CV		700		700	32,000 (1)		1,400	3,280
Ethylene Dibromide	V		d		0.05		0				
Ethylene Oxide	V										
Halomethanes	V			100				11,000 (1)		0.19**	15.7 **
Methylene Chloride	V	5	CV								
Pyrene	V	10	CS								
Styrene	V	5	CV		100		100				
Tetrachloroethanes	V	5	CV					9,320 (1)			
Tetrachloroethene	V	5	CV		5		0	5,280 (1)	840 (1)	0.80**	8.85 **
Toluene	V	5	CV		1,000		1,000	17,500 (1)		14,300	424,000
Trichloroethanes	V	5	CV					18,000 (1)			
Trichloroethene	V	5	CV	5		0		45,000 (1)	21,900 (1)	2.7 **	80.7 **
Vinyl Acetate	V	10	CV								
Xylenes (total)	V	5	CV		10,000		10,000				

EXPLANATION OF TABLE

* = secondary maximum contaminant level, TBCs
** = Human health criteria for carcinogens reported for three risk levels. Value presented is the 10-5 risk level.

AWQC = Ambient Water Quality Criteria

TABLE 2

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c) Acute Value	CWA AWQC for Protection of Aquatic Life TBCs (c) Chronic Value	CWA AWQC for Protection of Human Health TBCs (c) Water and Fish Ingestion	CWA AWQC for Protection of Human Health TBCs (c) Fish Consumption Only

CLP = Contract Laboratory Program
CWA = Clean Water Act
EPA = Environmental Protection Agency
pCi/l = picocuries per liter
PCB = polychlorinated biphenyl
PQL = Practical Quantitation Level
SDWA = Safe Drinking Water Act
SS = Species Specific
TAL = Target Analyte List
THM = Total Trihalomethanes
TIC = Tentatively Identified Compound
MDL = Minimum Detection Limit for radionuclides (pCi/l)
ug/l = micrograms per liter
VOA = Volatile Organic Analysis

(1) criteria not developed; value presented is lowest observed effects level (LOEL)
(2) total trihalomethanes: chloroform, bromoform, bromodichloromethane, dibromochloromethane
(3) hardness dependent criteria
(4) pH dependent criteria (7.8 pH used)
(5) standard is not adequately protective when chloride is associated with potassium, calcium, or magnesium, rather than sodium.
(6) if both strontium-90 and tritium are present, the sum of their annual dose equivalents to bone marrow shall not exceed 4 mrem/yr.
(7) type abbreviations are: A=anion; B=bacteria; C=cation; D=dioxin; FP=field parameter; I=indicator; M=metal; P=Pesticide; PP=Pesticide/PCB; R=radionuclide; SV=semi-volatile; V=volatile
(8) method abbreviations are: CT=CLP-TAL; NC=non-CLP; CV=CLP-VOA; CS=CLP-SEMI; EP=EPA-PEST; CP=CLP-PEST; E=EPA; a = detected as total in CV; b = detected as TIC in CS; c = detected as TIC in CV; d = not routinely monitored; e = monitored in discharge ponds; f = mixture-individual isomers detected.
(9) MDL for radium 226 is 0.5; MDL for radium 228 is 1.0
(10) Value for gross alpha excludes uranium

(a) EPA National Primary and Secondary Drinking Water Regulations, 40 CFR 141 and 40 CFR 143 (as of May 1990). Segment 4 MCLs are ARAR; Segment 5 MCLs are TBC; all MCLGs are TBC.
(b) EPA National Primary and Secondary Drinking Water Regulations, 40 CFR Parts 141, 142 and 143, Final Rule (56 FR 3526; 1/30/91) effective July 30, 1992.

TABLE 2

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

FEDERAL SURFACE WATER QUALITY STANDARDS (ug/l)

Parameter	Type (7)	PQL MDL	Method (8)	SDWA Maximum Contaminant Level (a)	SDWA Maximum Contaminant Level TBCs (b)	SDWA Maximum Contaminant Level Goals TBCs (a)	SDWA Maximum Contaminant Level Goals TBCs (b)	CWA AWQC for Protection of Aquatic Life TBCs (c) Acute Value	CWA AWQC for Protection of Aquatic Life TBCs (c) Chronic Value	CWA AWQC for Protection of Human Health TBCs (c) Water and Fish Ingestion	CWA AWQC for Protection of Human Health TBCs (c) Fish Consumption Only

(c) EPA, Quality Criteria for Protection of Aquatic Life, 1986

(d) EPA, National Ambient Water Quality Criteria for Selenium - 1987

(e) EPA, National Ambient Water Quality Criteria for Chloride - 1988

(f) EPA National Primary and Secondary Drinking Water Regulations, 40 CFR Parts 141, 142, and 143, Final Rule (56 FR 30266; 7/1/1991) effective 1/1/1993.

(g) EPA Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper, 40 CFR 141 and 142 (56 FR 26460; 6/7/1991) effective 11/6/1991.

TABLE 3

POTENTIAL CHEMICAL–SPECIFIC ARARs/TBCs (October 1, 1991)

STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)							Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B	Table C		Tables I,II,III (1)						Tables	Table C	Table D	Stream Segment Table		Table 2	
					Aquatic Life		Aquatic Life				Organics (12)		A,B	Fish &	Radio-	(8)		Radionuclides	
Parameter	Type (10)	PQL MDL	Method (11)	Carcinogens/ Noncarcin- ogens (2)	Acute Value	Chronic Value	Acute Value (2)	Chronic Value (2)	Agricul- tural Standard (3)	Domestic Water Supply (6)	Aquatic Life	Water Supply	(2)	Water Ingestion	nuclide	Acute Value	Chronic Value	Woman Creek	Walnut Creek
Bicarbonate	A	10	E310.1																
Carbonate	A	10	E310.1																
Chloride	A	5	E325							250,000						3	3		
Chlorine	A	1000	E4500		3	3										3	3		
Fluoride	A	5	E340							2,000									
N as Nitrate	A	5	E353.1						100,000	10,000						10,000	10,000		
N as Nitrate+Nitrite	A	5	E353.1						100,000	10,000									
N as Nitrite	A	5	E354.1				SS	SS	10,000	1,000						1,000	1,000		
Sulfate	A	5	E375.4							250,000						250,000	250,000		
Sulfide	A							2		50									
Coliform (Fecal)	B	1	SM9221C							2000/100 ml									
Ammonia as N	C	5	E350				620	60		5,000						620	60		
Dioxin	D		d	0.00000022 (13)	0.01	0.00001							0.00000022 (13)	0.000000013			0.000000013		
Sulfur	E	100,000	E600													2.0	2.0		
Dissolved Oxygen	FP	0.5	SM4500				5,000	5,000	3,000	3,000						5,000	5,000		
pH	FP	0.1	E150.1				6.5–9.0	6.5–9.0		5.0–9.0						6.5–9	6.5–9		
Specific Conductance	FP	1	E120.1																
Temperature	FP						30 degrees	30 degrees											
Boron	I	5	E6010						750							750	750		
Total Dissolved Solids	I	10	E160.1																
Aluminum	M	200	CT				950	150											
Antimony	M	60	CT																
Arsenic	M	10	CT				360	150	100	50						50			
Arsenic III	M																		
Arsenic V	M																		
Barium	M	200	CT							1,000									

TABLE 3

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)							Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B	Table C		Tables I,II,III (1)												
				Carcinogens/	Aquatic Life		Aquatic Life				Organics		Tables	Table C	Table D	Stream Segment Table		Table 2	
				Noncarcin-							(12)		A,B	Fish &	Radio-	(8)		Radionuclides	
Parameter	Type (10)	PQL MDL	Method (11)	ogens (2)	Acute Value	Chronic Value	Acute Value (2)	Chronic Value (2)	Agricul- tural Standard (3)	Domestic Water Supply (6)	Aquatic Life	Water Supply	(2)	Water Ingestion	nuclide	Acute Value	Chronic Value	Womnn Creek	Walnut Creek
Beryllium	M	5	CT						100										
Cadmium	M	5	CT				TVS	TVS	10	10						TVS	TVS		
Calcium	M	5,000	CT																
Cesium	M	1,000	NC																
Chromium	M	10	CT																
Chromium III	M	5	SW8467196				TVS	TVS	100	50						50			
Chromium VI	M	10	E218.5				16	11	100	50						TVS	TVS		
Cobalt	M	50	CT																
Copper	M	25	CT				TVS	TVS	200							TVS	TVS		
Cyanide	M	10	CT				5	5	200	1,000						5	5		
Iron	M	100	CT					1,000		300 (dis)							300 (5)		
Lead	M	5	CT				TVS	TVS	100	50						TVS	TVS		
Lithium	M	100	NC																
Magnesium	M	5000	CT																
Manganese	M	15	CT					1,000	200	50 (dis)							50 (5)		
Mercury	M	0.2	CT				2.4	0.1		2.0							0.01		
Molybdenum	M	200	NC																
Nickel	M	40	CT				TVS	TVS	200							TVS	TVS		
Potassium	M	5000	CT																
Selenium	M	5	CT				135	17	20	10						10			
Silver	M	10	CT				TVS	TVS		50						TVS	TVS		
Sodium	M	5000	CT																
Strontium	M	200	NC																
Thallium	M	10	CT					15											
Tin	M	200	NC																
Titanium	M	10	E6010																
Tungsten	M	10	E6010																
Vanadium	M	50	CT																
Zinc	M	20	CT				TVS	TVS	2,000	5,000						TVS	TVS		

TABLE 3

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)							Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B	Table C Aquatic Life		Tables I,II,III (1) Aquatic Life				Organics (12)		Tables A,B	Table C Fish &	Table D	Stream Segment Table (8)		Table 2 Radionuclides	
Parameter	Type (10)	PQL MDL	Method (11)	Carcinogens/ Noncarcin-ogens (2)	Acute Value	Chronic Value	Acute Value (2)	Chronic Value (2)	Agricul-tural Standard (3)	Domestic Water Supply (6)	Aquatic Life	Water Supply	(2)	Water Ingestion	Radio-nuclide	Acute Value	Chronic Value	Woman Creek	Walnut Creek
2,4,5-TP Silvex	P		d	10								10	10						
2,4-D	P		d	100								100	100						
Aldicarb	P			10									10						
Aldrin	P	0.05	CP	0.002 (13)	3						0.003		0.002 (13)	0.000074			0.000074		
Bromacil	P																		
Carbofuran	P		d	36									36						
Chloranil	P		E619																
Chlordane (Alpha)	P	0.5	CP	0.03 (13)	2.4	0.0043							0.03 (13)	0.00046			0.00046		
Chlordane (Gamma)	P	0.5	CP	0.03 (13)	2.4	0.0043							0.03 (13)	0.00046			0.00046		
Chlorpyrifos	P				0.083	0.041													
DDT	P	0.1	CP	0.1 (13)	1.1	0.001					0.001		0.1 (13)	0.000024			0.000024		
DDT Metabolite (DDD)	P	0.1	CP		0.6						0.001								
DDT Metabolite (DDE)	P	0.1	CP		1,050						0.001								
Demeton	P					0.1					0.1								
Diazinon	P																		
Dieldrin	P	0.1	CP	0.002 (13)	2.5	0.0019					0.003		0.002 (13)	0.000071			0.000071		
Endosulfan I	P	0.05	CP		0.22	0.056					0.003								
Endosulfan II	P	0.1	CP																
Endosulfan Sulfate	P	0.1	CP																
Endrin	P	0.1	CP	0.2	0.18	0.0023					0.004		0.2						
Endrin Ketone	P	0.1	CP																
Guthion	P					0.01					0.01								
Heptachlor	P	0.05	CP	0.008 (13)	0.52	0.0038					0.001	0.2	0.008 (13)	0.00028			0.00028		
Heptachlor Epoxide	P	0.05	CP	0.004 (13)									0.004 (13)						
Hexachlorocyclohexane, Alpha	P	0.05	CP											0.0092			0.0092		
Hexachlorocyclohexane, Beta	P	0.05	CP											0.0163			0.0163		
Hexachlorocyclohexane, Delta	P	0.05	CP																
Hexachlorocyclohexane, Tech.	P		f											0.0123			0.0123		

TABLE 3

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)							Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B	Table C		Tables I,II,III (1)												
					Aquatic Life		Aquatic Life				Organics (12)		Tables	Table C	Table D	Stream Segment Table (8)		Table 2 Radionuclides	
Parameter	Type (10)	PQL MDL	Method (11)	Carcinogens/ Noncarcin-ogens (2)	Acute Value	Chronic Value	Acute Value (2)	Chronic Value (2)	Agricul-tural Standard (3)	Domestic Water Supply (6)	Aquatic Life	Water Supply	A,B (2)	Fish & Water Ingestion	Radio-nuclide	Acute Value	Chronic Value	Woman Creek	Walnut Creek
Hexachlorocyclohexane, Lindane	P	0.05	CP	4	2.0	0.08					0.01	4.0	4	0.0186			0.0186		
Malathion	P					0.1					0.1								
Methoxychlor	P	0.5	CP	100		0.03					0.03	100	100						
Mirex	P					620					0.001								
Parathion	P					0.013					0.04								
PCBs	P	0.5	CP	0.005 (13)	2.0	0.014					0.001		0.005 (13)	0.000079			0.000079		
Simazine	P		e											4			4		
Toxaphene	P	1	CP	5	0.73	0.0002					0.005	5.0	5						
Vaponite 2	P																		
Aroclor 1016	PP	0.5	CP																
Aroclor 1221	PP	0.5	CP																
Aroclor 1232	PP	0.5	CP																
Aroclor 1242	PP	0.5	CP																
Aroclor 1248	PP	0.5	CP																
Aroclor 1254	PP	1	CP																
Aroclor 1260	PP	1	CP																
Atrazine	PP		e											3			3		
Americium (pCi/l)	R																	0.05	0.05
Americium 241 (pCi/l)	R	0.01													30				
Cesium 134 (pCi/l)	R	1		80 (6)									80		80			80	80
Cesium 137 (pCi/l)	R	1																	
Gross Alpha (pCi/l)	R	2																7	11
Gross Beta (pCi/l)	R	4																5	19
Plutonium (pCi/l)	R																	0.05	0.05
Plutonium 238+239+240 (pCi/l)	R	0.01		15 (6)											15				
Radium 226+228 (pCi/l)	R	0.5/1.0 (14)		5 (6)											5				
Strontium 89+90 (pCi/l)	R	1																	
Strontium 90 (pCi/l)	R			8 (6)											8			8	8

TABLE 3

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)							Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B Carcinogens/ Noncarcin-	Table C Aquatic Life		Tables I,II,III (1) Aquatic Life				Organics (12)		Tables A,B	Table C Fish &	Table D Radio-	Stream Segment Table (8)		Table 2 Radionuclides	
Parameter	Type (10)	PQL MDL	Method (11)	ogens (2)	Acute Value	Chronic Value	Acute Value (2)	Chronic Value (2)	Agricul- tural Standard (3)	Domestic Water Supply (6)	Aquatic Life	Water Supply	(2)	Water Ingestion	nuclide	Acute Value	Chronic Value	Woman Creek	Walnut Creek
Thorium 230+232 (pCi/l)	R			60 (6)											60				
Tritium (pCi/l)	R			20,000 (6)											20,000			500	500
Uranium 233+234 (pCi/l)	R																		
Uranium 235 (pCi/l)	R	0.6																	
Uranium 238 (pCi/l)	R	0.6																	
Uranium (Total) (pCi/l)	R						TVS	TVS							40			5	10
1,2,4,5-Tetrachlorobenzene	SV		b	2 (13)									2						
1,2,4-Trichlorobenzene	SV	10	CS																
1,2-Dichlorobenzene (Ortho)	SV	10	CS	620									620						
1,2-Diphenylhydrazine	SV		b	0.05 (13)									0.05 (13)						
1,3-Dichlorobenzene (Meta)	SV	10	CS	620									620						
1,4-Dichlorobenzene (Para)	SV	10	CS	75									75						
2,4,5-Trichlorophenol	SV	50	CS	700									700						
2,4,6-Trichlorophenol	SV	10	CS	2.0 (13)		970							2.0 (13)	1.2			1.2		
2,4-Dichlorophenol	SV	10	CS	21	2,020	365							21						
2,4-Dimethylphenol	SV	10	CS		2,120														
2,4-Dinitrophenol	SV	50	CS																
2,4-Dinitrotoluene	SV	10	CS																
2-Chloronaphthalene	SV	10	CS																
2-Chlorophenol	SV	10	CS		4,380	2,000													
2-Methylnaphthalene	SV	10	CS																
2-Methylphenol	SV	10	CS																
2-Nitroaniline	SV	50	CS																
2-Nitrophenol	SV	10	CS																
3,3-Dichlorobenzidine	SV	20	CS											0.01			0.01		
3-Nitroaniline	SV	50	CS																
4,6-Dinitro-2-methylphenol	SV	50	CS																
4-Bromophenyl Phenylether	SV	10	CS																

TABLE 3

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)							Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B	Table C		Tables I,II,III (1)				Organics (12)		Tables A,B	Table C	Table D	Stream Segment Table		Table 2	
				Carcinogens/	Aquatic Life		Aquatic Life						(2)	Fish &	Radio-	(8)		Radionuclides	
				Noncarcin-	Acute	Chronic	Acute	Chronic	Agricul-	Domestic				Water	nuclide				
				ogens (2)	Value	Value	Value	Value	tural	Water	Aquatic	Water		Ingestion		Acute	Chronic	Woman	Walnut
Parameter	Type (10)	PQL MDL	Method (11)				(2)	(2)	Standard (3)	Supply (6)	Life	Supply				Value	Value	Creek	Creek
4-Chloroaniline	SV	10	CS																
4-Chlorophenyl Phenyl Ether	SV	10	CS																
4-Chloro-3-methylphenol	SV	10	CS		30														
4-Methylphenol	SV	10	CS																
4-Nitroaniline	SV	50	CS																
4-Nitrophenol	SV	50	CS																
Acenaphthene	SV	10	CS		1,700	520													
Anthracene	SV	10	CS																
Benzidine	SV		d	0.0002 (13)	2,500						0.1	0.01	0.0002 (13)	0.00012			0.00012		
Benzoic Acid	SV	50	CS																
Benzo(a)anthracene	SV	10	CS																
Benzo(a)pyrene	SV	10	CS																
Benzo(b)fluoranthene	SV	10	CS																
Benzo(g,h,i)perylene	SV	10	CS																
Benzo(k)fluoranthene	SV	10	CS																
Benzyl Alcohol	SV	10	CS																
bis(2-Chloroethoxy)methane	SV	10	CS																
bis(2-Chloroethyl)ether	SV	10	CS	0.03 (13)									0.03 (13)	0.0000037			0.0000037		
bis(2-Chloroisopropyl)ether	SV	10	CS																
bis(2-Ethylhexyl)phthalate	SV	10	CS																
Butadiene	SV																		
Butyl Benzylphthalate	SV	10	CS																
Chlorinated Ethers	SV																		
Chlorinated Napthalenes	SV																		
Chloroalkylethers	SV	10	CS																
Chlorophenol	SV										1.0	1.0							
Chrysene	SV	10	CS																
Dibenzofuran	SV	10	CS																
Dibenz(a,h)anthracene	SV	10	CS																

TABLE 3
POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)
STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)							Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B	Table C		Tables I,II,III (1)												
				Carcinogens/	Aquatic Life		Aquatic Life				Organics		Tables	Table C	Table D	Stream Segment Table		Table 2	
				Noncarcin-	Acute	Chronic	Acute	Chronic	Agricul-	Domestic	(12)		A,B	Fish &	Radio-	(8)		Radionuclides	
	Type	PQL	Method	ogens (2)	Value	Value	Value	Value	tural	Water	Aquatic	Water	(2)	Water	nuclide	Acute	Chronic	Woman	Walnut
Parameter	(10)	MDL	(11)				(2)	(2)	Standard (3)	Supply (6)	Life	Supply		Ingestion		Value	Value	Creek	Creek
Dichlorobenzenes	SV																		
Dichlorobenzidine	SV	20	CS											0.01			0.01		
Diethylphthalate	SV	10	CS																
Dimethylphthalate	SV	10	CS																
Dinitrotoluene	SV	10	CS		330	230													
Di-n-butylphthalate	SV	10	CS																
Di-n-octylphthalate	SV	10	CS																
Ethylene Glycol	SV		d																
Fluoranthene	SV	10	CS		3,980														
Fluorene	SV	10	CS																
Formaldehyde	SV																		
Haloethers	SV																		
Hexachlorobenzene	SV	10	CS	0.02 (13)									0.02 (13)	0.00072			0.00072		
Hexachlorobutadiene	SV	10	CS	14	90	9.3							14	0.45			0.45		
Hexachlorocyclopentadiene	SV	10	CS	49	7	5.2							49						
Hexachloroethane	SV	10	CS		980	540								1.9			1.9		
Hydrazine	SV																		
Indeno(1,2,3-cd)pyrene	SV	10	CS																
Isophorone	SV	10	CS	1,050	117,000								1,050						
Naphthalene	SV	10	CS		2,300	620													
Nitrobenzene	SV	10	CS	3.5 (13)	27,000								3.5 (13)						
Nitrophenols	SV																		
Nitrosamines	SV																		
Nitrosodibutylamine	SV		b											0.0064			0.0064		
Nitrosodiethylamine	SV		b											0.0008			0.0008		
Nitrosodimethylamine	SV		b											0.0014			0.0014		
Nitrosopyrrolidine	SV		b											0.016			0.016		
N-Nitrosodiphenylamine	SV	10	CSb											4.9			4.9		
N-Nitroso-di-n-dipropylamine	SV	10	CSb																

TABLE 3

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)							Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B	Table C Aquatic Life		Tables I,II,III (1) Aquatic Life				Organics (12)		Tables A,B	Table C Fish &	Table D	Stream Segment Table (8)		Table 2 Radionuclides	
Parameter	Type (10)	PQL MDL	Method (11)	Carcinogens/ Noncarcin-ogens (2)	Acute Value	Chronic Value	Acute Value (2)	Chronic Value (2)	Agricul-tural Standard (3)	Domestic Water Supply (6)	Aquatic Life	Water Supply	(2)	Water Ingestion	Radio-nuclide	Acute Value	Chronic Value	Woman Creek	Walnut Creek
Pentachlorinated Ethanes	SV		b																
Pentachlorobenzene	SV		b	6 (13)									6 (13)						
Pentachlorophenol	SV	50	CS	200	9	5.7							200						
Phenanthrene	SV	10	CS																
Phenol	SV	10	CS		10,200	2,560					500	1.0							
Phthalate Esters	SV		e																
Polynuclear Aromatic Hydrocarbons	SV		b											0.0028			0.0028		
Vinyl Chloride	SV	10	CV	2									2						
1,1,1-Trichloroethane	V	5	CV	200									200						
1,1,2,2-Tetrachloroethane	V	5	CV			2,400								0.17			0.17		
1,1,2-Trichloroethane	V	5	CV	28		9,400							28	0.60			0.60		
1,1-Dichloroethane	V	5	CV																
1,1-Dichloroethene	V	5	CV	7									7						
1,2-Dichloroethane	V	5	CV	5	118,000	20,000							5						
1,2-Dichloroethene (cis)	V		a	70									70						
1,2-Dichloroethene (total)	V	5	CV																
1,2-Dichloroethene (trans)	V		a	70									70						
1,2-Dichloropropane	V	5	CV	0.56 (13)	23,000	5,700							0.56 (13)						
1,3-Dichloropropene (cis)	V	5	CV		6,060	244													
1,3-Dichloropropene (trans)	V	5	CV		6,060	244													
2-Butanone	V	10	CV																
2-Hexanone	V	10	CV																
4-Methyl-2-pentanone	V	10	CV																
Acetone	V	10	CV																
Acrylonitrile	V		c		7,550	2,600								0.058			0.058		
Benzene	V	5	CV	5	5,300								5						
Bromodichloromethane	V	5	CV																
Bromoform	V	5	CV																

TABLE 3
POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)
STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)							Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B	Table C		Tables I,II,III (1)												
				Carcinogens/	Aquatic Life		Aquatic Life				Organics		Tables	Table C	Table D	Stream Segment Table		Table 2	
				Noncarcin-	Acute	Chronic	Acute	Chronic	Agricul-	Domestic	(12)		A,B	Fish &	Radio-	(8)		Radionuclides	
Parameter	Type (10)	PQL MDL	Method (11)	ogens (2)	Value	Value	Value (2)	Value (2)	tural Standard (3)	Water Supply (6)	Aquatic Life	Water Supply	(2)	Water Ingestion	nuclide	Acute Value	Chronic Value	Woman Creek	Walnut Creek

EXPLANATION OF TABLE

CLP = Contract Laboratory Program
CDH = Colorado Department of Health
dis = dissolved
EPA = Environmental Protection Agency
pCi/l = picocuries per liter
PCB = polychlorinated biphenyl
PQL = Practical Quantitation Level
SS = species specific
TAL = Target Analyte List
THM = Total Trihalomethanes
TIC = Tentatively Identified Compound
TVS = Table Value Standard (hardness dependent), see Table III in (a)
MDL = Minimum Detection Limit for radionuclides (pCi/l)
ug/l = micrograms per liter
VOA = Volatile Organic Analysis
WQCC = Water Quality Control Commission

(1) Table I = physical and biological parameters
Table II = inorganic parameters
Table III = metal parameters
Values in Tables I, II, and III for recreational uses, cold water biota and domestic water supply are not included.

(2) In the absence of specific, numeric standards for non-naturally occurring organics, the narrative standard is interpreted as zero with enforcement based on practical quantification levels (PQLs) as defined by CDH/WQCC or EPA

(3) All are 30-day standards except for nitrate+nitrite

(4) Total trihalomethanes: chloroform, bromoform, bromodichloromethane, dibromochloromethane

(5) Lowest value given: dissolved or total recoverable

TABLE 3

POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)

STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)							Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B	Table C Aquatic Life		Tables I,II,III (1) Aquatic Life				Organics (12)		Tables A,B	Table C	Table D	Stream Segment Table (8)		Table 2 Radionuclides	
Parameter	Type (10)	PQL MDL	Method (11)	Carcinogens/ Noncarcin-ogens (2)	Acute Value	Chronic Value	Acute Value (2)	Chronic Value (2)	Agricul-tural Standard (3)	Domestic Water Supply (6)	Aquatic Life	Water Supply	(2)	Fish & Water Ingestion	Radio-nuclide	Acute Value	Chronic Value	Woman Creek	Walnut Creek
Bromomethane	V	10	CV																
Carbon Disulfide	V	5	CV																
Carbon Tetrachloride	V	5	CV	5	35,200								5						
Chlorinated Benzenes	V	10	CV/CS																
Chlorobenzene	V	5	CV/CVS	300									300						
Chloroethane	V	10	CV																
Chloroform	V	5	CV	Tot THM <100 (4)	28,900	1,240							Tot THM <100 (4)	0.19			0.19		
Chloromethane	V	10	CV																
Dibromochloromethane	V	5	CV																
Dichloroethenes	V																		
Ethyl Benzene	V	5	CV	680	32,000								680						
Ethylene Dibromide	V		d																
Ethylene Oxide	V																		
Halomethanes	V			100									100	0.19			0.19		
Methylene Chloride	V	5	CV																
Pyrene	V	10	CS																
Styrene	V	5	CV																
Tetrachloroethanes	V	5	CV											0.8			0.8		
Tetrachloroethene	V	5	CV	10	5,280	840							10						
Toluene	V	5	CV	2,420	17,500								2,420						
Trichloroethanes -	V	5	CV																
Trichloroethene	V	5	CV	5	45,000	21,900							5						
Vinyl Acetate	V	10	CV																
Xylenes (Total)	V	5	CV																

TABLE 3
POTENTIAL CHEMICAL-SPECIFIC ARARs/TBCs (October 1, 1991)
STATE (CDH/CWQCC) SURFACE WATER QUALITY STANDARDS (ug/l)

				Statewide Standards (a)								Basin Standards (b)		Segment 4 & 5 Stream Classification and Water Quality Standards (b)(7)						
				Tables A,B	Table C		Tables I,II,III (1)													
					Aquatic Life		Aquatic Life													
Parameter	Type (10)	PQL MDL	Method (11)	Carcinogens/ Noncarcin-ogens (2)	Acute Value	Chronic Value	Acute Value (2)	Chronic Value (2)	Agricul-tural Standard (3)	Domestic Water Supply (6)		Organics (12)		Tables A,B (2)	Table C Fish & Water Ingestion	Table D Radio-nuclide	Stream Segment Table (8)		Table 2 Radionuclides	
												Aquatic Life	Water Supply				Acute Value	Chronic Value	Woman Creek	Walnut Creek

(6) Ammonia, sulfide, chloride, sulfate, copper, iron, manganese, and zinc are 30-day standards, all others are 1-day standards

(7) Segment 5 standards are goals

(8) Includes Table 1: Additional Organic Chemical Standards (chronic only)

(9) See section 3.1.11 (f)(2) in (a)

(10) type abbreviations are: A=anion; B=bacteria; C=cation; D=dioxin; FP=field parameter; I=indicator; M=metal; P= pesticide; PP=pesticide/PCB; R=radionuclide; SV=semi-volatile; V=volatile

(11) method abbreviations are: CT=CLP-TAL; NC=non-CLP; CV=CLP-VOA; CS=CLP-SEMI; EP=EPA-PEST; CP=CLP-PEST; E=EPA; a = detected as total in CV; b = detected as TICs in CS; c = detected as TIC in CV; d = not routinely monitored; e = monitored in discharge ponds; f = mixture-individual isomers detected.

(12) See Section 3.8.5 (2)(a) in (b)

(13) Standard is below (more stringent than) PQL, therefore PQL is standard.

(14) MDL for Radium 226 is 0.5; MDL for Radium 228 is 1.0

(a) CDH/WQCC, Colorado Water Quality Standards 3.1.0 (5 CCR 1002-8) 1/15/1974; amended 9/30/1989 (ARAR) (Envrionmental Reporter 726:1001-1020:6/1990)

(b) CDH/WQCC, Classifications and Numeric Standards for S. Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin 3.8.0 (5 CCR 1002-8) 4/6/1981; amended 2/15/1990. Basin-wide standards are ARAR; Site-specific standards are TBC.