Table 20 – Revised ~~June 2010~~[Date of EPA Approval]

WATER QUALITY CRITERIA SUMMARY
(Applicable to all Basins)[1]

The concentration for each compound listed in this chart is a criteria or guidance value* not to be exceeded in waters of the state for the protection of aquatic life and human health. Specific descriptions of each compound and an explanation of values are included in Quality Criteria for Water (1986). Selecting values for regulatory purposes will depend on the most sensitive beneficial use to be protected, and what level of protection is necessary for aquatic life and human health.

This June 2010 table includes revisions DEQ adopted in 2004 and EPA approved June 1, 2010. This table therefore shows the effective criteria under state and federal law.

Compound Name (or Class)	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
ACENAPTHENE	Y	N	*1,700	*520	*970	*710			
ACROLEIN	Y	N	*68	*21	*55		320ug	780ug	
ACRYLONITRILE	Y	Y	*7,550	*2,600			0.058ug**	0.65ug**	
ALDRIN	Y	Y	3.0		1.3		0.074ng**	0.079ng**	
ALKALINITY	N	N		20,000					
AMMONIA	N	N	CRITERIA ARE pH AND TEMPERATURE DEPENDENT — SEE DOCUMENT USEPA JANUARY 1985 (Fresh Water) CRITERIA ARE pH AND TEMPERATURE DEPENDENT — SEE DOCUMENT USEPA APRIL 1989 (Marine Water)						
ANTIMONY	Y	N	*9,000	*1,600			146ug	45,000ug	
ARSENIC	Y	Y					2.2ng**	17.5ng**	0.05mg
ARSENIC (PENT)	Y	Y	*850	*48	*2,319	*13			
ARSENIC (TRI)	Y	Y	360	190	69	36			
ASBESTOS	Y	Y					7.0E+06 fibers/L		
BARIUM	N	N					1mg		1.0mg
BENZENE	Y	Y	*5,300		*5,100	*700	0.66ug**	40 ug**	
BENZIDINE	Y	Y	*2,500				0.12ng	0.53ng**	
BERYLLIUM	Y	Y	*130	*5.3					
BHC	Y	N	*100		*0.34				
CADMIUM	Y	N	3.9+	1.1+	43	9.3			0.010mg
CARBON TETRACHLORIDE	Y	Y	*35,200	*50,000	0.4ug**	6.94ug**			
CHLORDANE	Y	Y	2.4	0.0043	0.09	0.004	0.46ng**	0.48ng**	
CHLORIDE	N	N	860 mg/L	230 mg/L					
CHLORINATED BENZENES	Y	Y	*250	*50	*160	*129	488 ug		
CHLORINATED NAPHTHALENES	Y	N	*1,600		*7.5				
CHLORINE	N	N	19	11	13	7.5			
CHLOROALKYL ETHERS	Y	N	*238,000						
CHLOROETHYL ETHER (BIS-2)	Y	Y					0.03 ug	1.36 ug**	
CHLOROFORM	Y	Y	*28,900	*1,240			0.19ug**	15.7ug**	
CHLOROISOPROPYL ETHER (BIS-2)	Y	N					34.7ug	4.36mg	

WATER QUALITY CRITERIA SUMMARY (Continued)

Table 20 – Revised ~~June 2010~~[Date of EPA Approval]

Compound Name (or Class)	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
CHLOROMETHYL ETHER (BIS)	N	Y					0.00000376ng**	0.00184ug**	
CHLOROPHENOL 2	Y	N	*4,380	*2,000					
CHLOROPHENOL 4	N	N			*29,700				
CHLOROPHENOXY HERBICIDES (2,4,5,-TP)	N	N					10ug		
CHLOROPHENOXY HERBICIDES (2,4-D)	N	N					100ug		
CHLORPYRIFOS	N	N	0.083	0.041	0.011	0.0056			
CHLORO-4 METHYL-3 PHENOL	N	N	*30						
CHROMIUM (HEX)	Y	N	16	11	1,100	50			0.05mg
CHROMIUM (TRI)	N	N	1,700.+	210.+	*10,300				0.05mg
COPPER	Y	N	18.+	12.+	2.9	2.9	1300 H		
CYANIDE	Y	N	22	5.2	1	1	200ug		
DDT	Y	Y	1.1	0.001	0.13	0.001	0.024ng**	0.024ng**	
(DDE) DDT METABOLITE	Y	Y	*1,050		*14				
(TDE) DDT METABOLITE	Y	Y	*0.06		*3.6				
DEMETON	Y	N		0.1		0.1			
DIBUTYLPHTHALATE	Y	N					35mg	154mg	
DICHLOROBENZENES	Y	N	*1,120	*763	*1,970		400ug	2.6mg	
DICHLOROBENZIDINE	Y	Y					0.01ug**	0.020ug**	
DICHLOROETHANE 1,2	Y	Y	*118,000	*20,000	*113,000		0.94ug**	243ug**	
DICHLOROETHYLENES	Y	Y	*11,600		*224.000		0.033ug**	1.85ug**	
DICHLOROPHENOL 2,4	N	N	*2,020	*365			3.09mg		
DICHLOROPROPANE	Y	N	*23,000	*5,700	*10,300	*3,040			
DICHLOROPROPENE	Y	N	*6,060	*244	*790		87ug	14.1mg	
DIELDRIN	Y	Y	2.5	0.0019	0.71	0.0019	0.071ng**	0.076ng**	
DIETHYLPHTHALATE	Y	N					350mg	1.8g	
DIMETHYL PHENOL 2,4	Y	N	*2,120						
DIMETHYL PHTHALATE	Y	N					313mg	2.9g	
DINITROTOLUENE 2,4	N	Y					0.11ug**	9.1ug**	
DINITROTOLUENE	Y	N					70ug	14.3mg	
DINITROTOLUENE	N	Y	*330	*230	*590	*370			
DINITRO-O-CRESOL 2,4	Y	N					13.4g	765ug	
DIOXIN (2,3,7,8-TCDD)	Y	Y	*0.01	*38pg/L			0.000013ng**	0.000014ng**	
DIPHENYLHYDRAZINE	Y	N					42ng**	0.56ug**	

Table 20 – Revised ~~June 2010~~[Date of EPA Approval]

WATER QUALITY CRITERIA SUMMARY (Continued)

	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
DIPHENYLHYDRAZINE 1,2	Y	N	*270						
DI-2-ETHYLHEXYL PHTHALATE	Y	N					15mg	50mg	
ENDOSULFAN	Y	N	0.22	0.056	0.034	0.0087	74ug	159ug	
ENDRIN	Y	N	0.18	0.0023	0.037	0.0023	1ug		0.0002mg
ETHYLBENZENE	Y	N	*32,000		*430		1.4mg	3.28mg	
FLUORANTHENE	Y	N	*3,980		*40	*16	42ug	54ug	
GUTHION	N	N		0.01		0.01			
HALOETHERS	Y	N	*360	*122					
HALOMETHANES	Y	Y	*11,000		*12,000	*6,400	0.19ug**	15.7ug**	
HEPTACHLOR	Y	Y	0.52	0.0038	0.053	0.0036	0.28ng**	0.29ng**	
HEXACHLOROETHANE	N	Y	*980	*540	*940		1.9ug	8.74ug	
HEXACHLOROBENZENE	Y	N					0.72ng**	0.74ng**	
HEXACHLOROBUTADIENE	Y	Y	*90	*9.3	*32		0.45ug**	50ug**	
HEXACHLOROCYCLOHEXANE (LINDANE)	Y	Y	2.0	0.08	0.16				0.004mg
HEXACHLOROCYCLOHEXANE-ALPHA	Y	Y					9.2ng**	31ng**	
HEXACHLOROCYCLOHEXANE-BETA	Y	Y					16.3ng**	54.7ng**	
HEXACHLOROCYCLOHEXANE-GAMA	Y	Y					18.6ng**	62.5ng**	
HEXACHLOROCYCLOHEXANE-TECHNICAL	Y	Y					12.3ng** J	41.4ng** J	
HEXACHLOROCYCLOPENTADIENE	Y	N	*7	*5.2	*7		206ug		
IRON	N	N		1,000			~~0.3mg K~~		
ISOPHORONE	Y	N	*117,000		*12,900		5.2mg	520mg	
LEAD	Y	N	82.+	3.2+	140	5.6			0.05mg
MALATHION	N	N		0.1		0.1			
MANGANESE	N	N					~~50ug K~~	~~100ug~~ 100µg[1]	
MERCURY	Y	N	2.4	0.012	2.1	0.025			0.002mg
METHOXYCHLOR	N	N		0.03		0.03	100ug J		0.1mg
MIREX	N	N		0.001		0.001			
MONOCHLOROBENZENE	Y	N					488ug		
NAPHTHALENE	Y	N	*2,300	*620	*2,350				
NICKEL	Y	N	1,400.+	160+	75	8.3	13.4ug	100ug	
NITRATES	N	N					10mg J		10mg
NITROBENZENE	Y	N	*27,000		*6,680		19.8mg		
NITROPHENOLS	Y	N	*230	*150	*4,850				

[1] The "fish consumption only" criterion for manganese applies only to ~~marine waters~~ saltwater and is for total manganese. This EPA recommended criterion predates the 1980 human health methodology and does not utilize the fish ingestion BCF calculation method or a fish consumption rate.

Table 20 – Revised ~~June 2010~~[Date of EPA Approval]

WATER QUALITY CRITERIA SUMMARY (Continued)

Compound Name (or Class)	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
NITROSAMINES	Y	Y	*5,850		*3,300,000		0.8ng** J	1,240ng** J	
NITROSODIBUTYLAMINE N	Y	Y					6.4ng**	587ng**	
NITROSODIETHYLAMINE N	Y	Y					0.8ng** J	1,240ng** J	
NITROSODIMETHYLAMINE N	Y	Y					1.4ng**	16,000ng**	
NITROSODIPHENYLAMINE N	Y	Y					4,900ng**	16,100ng**	
NITROSOPYRROLIDINE N	Y	Y					16ng**	91,900ng**	
PARATHION	N	N	0.065	0.013					
PCB's	Y	Y	2.0	0.014	10	0.03	0.079ng**	0.079ng**	
PENTACHLORINATED ETHANES	N	N	*7,240	*1,100	*390	*281			
PENTACHLOROBENZENE	N	N					74ug	85ug	
PENTACHLOROPHENOL	Y	N	***20	***13	13	*7.9	1.01mg		
PHENOL	Y	N	*10,200	*2,560	*5,800		3.5mg		
PHOSPHORUS ELEMENTAL	N	N				0.1			
PHTHALATE ESTERS	Y	N	*940	*3	*2,944	*3.4			
POLYNUCLEAR AROMATIC HYDROCARBONS	Y	Y			*300		2.8ng**	31.1ng**	
SELENIUM	Y	N	260	35	410	54	10ug		0.01mg
SILVER	Y	N	4.1+	0.12	2.3				0.05mg
SULFIDE HYDROGEN SULFIDE	N	N		2		2			
TETRACHLORINATED ETHANES	Y	N	*9,320						
TETRACHLOROBENZENE 1,2,4,5	Y	N					38ug	48ug	
TETRACHLOROETHANE 1,1,2,2	Y	Y		*2,400	*9,020		0.17ug**	10.7ug**	
TETRACHLOROETHANES	Y	N	*9,320						
TETRACHLOROETHYLENE	Y	Y	*5,280	*840	*10,200	*450	0.8ug**	8.85ug**	
TETRACHLOROPHENOL 2,3,5,6	Y	N				*440			
THALLIUM	Y	N	*1,400	*40	*2,130		13ug	48ug	
TOLUENE	Y	N	*17,500		*6,300	*5,000	14.3mg	424mg	
TOXAPHENE	Y	Y	0.73	0.0002	0.21	0.0002	0.71ng**	0.73ng**	0.005mg
TRICHLORINATED ETHANES	Y	Y	*18,000						
TRICHLOROETHANE 1,1,1	Y	N			*31,2000				
TRICHLOROETHANE 1,1,2	Y	Y		*9,400			0.6ug**	41.8ug**	
TRICHLOROETHYLENE	Y	Y	*45,000	*21,900	*2,000		2.7ug**	80.7ug**	
TRICHLOROPHENOL 2,4,5	N	N					2,600ug		
TRICHLOROPHENOL 2,4,6	Y	Y		*970			1.2ug**	3.6ug**	

Table 20 – Revised ~~June 2010~~[Date of EPA Approval]

WATER QUALITY CRITERIA SUMMARY (Continued)

Compound Name (or Class)	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
VINYL CHLORIDE	Y	Y					2ug**	525ug**	
ZINC	Y	N	120+	110+	95	86			

Footnotes:
H This value is based on a Drinking Water regulation.
J No bioconcentration factor was available; therefore, this value is based on that published in the 1986 EPA Gold Book.
~~K Human health criterion is for "dissolved" concentration based on the 1976 EPA Red Book conclusion that adverse effects from exposure at this level are aesthetic rather than toxic.~~

MEANING OF SYMBOLS:

g	=	grams	M.C.L	=	Maximum Contaminant Level
mg	=	milligrams	+	=	Hardness Dependent Criteria (100 mg/L used).
ug	=	micrograms	*	=	Insufficient data to develop criteria; value presented is the L.O.E.L – Lower Observed Effect Level.
ng	=	nanograms	**	=	Human health criteria for carcinogens reported for three risk levels. Value presented is the 10-6 risk level, which means the probability of one concern case per million people at the stated concentration.
pg	=	picograms	***	=	pH Dependent Criteria (7.8 pH used).
f	=	fibers			
Y	=	Yes			
N	=	No			

1 = Values in Table 20 are applicable to all basins as follows:.

Basin	Rule	Basin	Rule
North Coast	340-041-205(p)	Umatilla	340-041-645(p)
Mid Coast	340-041-245(p)	Walla Walla	340-041-685(p)
Umpqua	340-041-285(p)	Grande Ronde	340-041-725(p)
South Coast	340-041-325(p)	Powder	340-041-765(p)
Rogue	340-041-365(p)	Malheur River	340-041-805(p)
Willamette	340-041-445(p)	Owyhee	340-041-845(p)
Sandy	340-041-485(p)	Malheur Lake	340-041-885(p)
Hood	340-041-525(p)	Goose & Summer Lakes	340-041-925(p)
Deschutes	340-041-565(p)	Klamath	340-041-965(p)
John Day	340-041-605(p)		

Water and Fish Ingestion: Values represent the maximum ambient water concentration for consumption of both contaminated water and fish or other aquatic organisms.
Fish Ingestion: Values represent the maximum ambient water concentrations for consumption of fish or other aquatic organisms

Summary of Public Comment and Agency Response

Title of Rulemaking: Amending Oregon's Water Quality Standards: Revising Human Health Criteria for Arsenic, Iron and Manganese (OAR 340-041-0033 and Table 20)

Prepared by: Debra Sturdevant
Date: Nov. 3, 2010

Comment period

The public comment period opened Aug. 25, 2010, and closed 5 p.m. on Sept. 30, 2010. DEQ held public hearings Sept. 21, 2010, 5 p.m., at the DEQ headquarters office, 811 SW 6th Ave. in Portland; and Sept. 23, 7 p.m. at St. Anthony's Hospital in Pendleton. One person attended the Portland hearing, no one testified. Five people attended the Pendleton hearing, one person testified. Seventeen people submitted written comment. Attachment C contains the Hearing Officer reports.

Organization of comments and responses

Summaries of individual comments and DEQ's responses are provided below. Comments are summarized in categories. The persons who provided each comment are referenced by number. A list of commenters and their reference numbers follows the summary of comments and responses.

Comments and responses are organized in the following categories: general comments and comments applicable to all the proposed criteria and comments on the proposed criteria for iron and manganese. A response to comments received on the arsenic criteria is not included in this document for the reasons stated in the following paragraph.

DEQ will delay arsenic standard revisions

Due to the substantive nature of the comment received on the arsenic criteria, DEQ is not recommending adoption of the arsenic revisions at the December 2010 EQC meeting. DEQ needs additional time to consider and respond to the comments received. If DEQ makes significant changes to the proposed arsenic criteria or arsenic reduction policy, the public will have another opportunity to comment on the revised rules before DEQ recommends rule revisions for EQC action.

Summary of comments and agency responses: General or applicable to all proposed criteria	
Comment 1	Oppose changing criteria for water to be less stringent and allow higher levels of pollution in our water. As a society, we are polluting ourselves for profit and greed. These pollutants accumulate over time. The quality and safety of Oregon's public drinking water should be of the highest priority for DEQ. DEQ's responsibility is the health and safety of the public, not to benefit

	industry or ease guidelines for dischargers. DEQ should require pristine water quality. (3) (4) (8)
Response	DEQ has evaluated the proposed criteria and the relevant health effects information. The proposed criteria revisions for iron and manganese are recommended because the current levels of these pollutants do not pose a human health threat and because these metals have geologic origins and occur naturally in Oregon waters. Where naturally occurring levels are higher than the current criteria, there is no way to reduce those levels and they do not present new or human caused risk. DEQ concludes that the proposed criteria revisions will continue to appropriately protect human health. Implementation of the proposed revisions to the criteria will result in the resources of the state and industry being targeted towards efforts that achieve truly needed and beneficial environmental results.
Comment 2	Support DEQ's proposed changes to the water quality standards for arsenic, iron and manganese, noting: • The rule implements the October 2008 EQC charge to find innovative solutions to the complex problems posed by toxins in Oregon waters; to develop standards that are environmentally meaningful and cost-effective to implement. • The changes are appropriate given the natural sources and background levels. (7) (11) (16)
Response	DEQ also concludes that the proposed revisions are responsive to the EQC directive and are appropriate given the natural levels of these three metals in Oregon waters.
Comment 3	The monitoring and pollutant minimization plans associated with the rule will have positive effects. (11)
Response	This comment refers to the proposed revisions addressing arsenic. DEQ is not including final rules for arsenic in this package, and will address this comment in any future rule action related to arsenic.
Comment 4	NWPPA is committed to continuing work on viable implementation measures for the additional criteria revisions still under consideration. NWPPA's support for future rulemaking packages will depend on the viability, feasibility and cost effectiveness of NPDES permit implementation measures. (11)
Response	DEQ acknowledges that criteria implementation issues are critical to the Northwest Pulp and Paper Association.
Comment 5	The OWQSG appreciated the substantial amount of time and creative thinking DEQ and the workgroup members develop to the development of the proposed rule. The fact that there was consensus support from a very diverse group of stakeholders is testimony to the Department's perseverance and the

	willingness of workgroup members to work together to achieve a result that is in everyone's interest. (16)
Response	DEQ was pleased with the assistance of the stakeholder workgroup in developing the proposed rules and we believe it was a better proposal for having had that involvement.
Comment 6	Due to EPA approval of iron and manganese footnote K in June, 2010, DEQ should revise Table 20 and 33B to prevent confusion. (16)
Response	Through this rulemaking DEQ is recommending revisions to Table 20. Those revisions will not be effective until they are approved by EPA. DEQ will clarify for the public on its website that due to EPA's disapproval of the human health criteria in Tables 33A and 33B, those criteria are no longer effective. The public should refer to the most recent version of Table 20 available on DEQ's website for the currently effective human health criteria. At this time, the effective Table 20 is dated June 2010.

Summary of comments and agency responses: Proposed iron and manganese criteria	
Comment 7	DEQ should re-consider allowing iron in water to be increased. This may have catastrophic results for patients with hereditary hemochromatosis, a genetic disorder which causes the body to absorb too much iron. Water levels in Medford are currently satisfactory for hemochromatosis dietary requirements. Commenter has background training in water purification. Urge DEQ to consult with a local hematologist and the CDC about the potential hazards of raising iron levels in the water supply before making the proposed changes. (2)
Response	DEQ does not expect that the proposed change will lead to increases in the iron levels of drinking water supplies. The water quality criteria that DEQ are revising do not apply directly to the water supply that is delivered to people's homes. Water supplies are regulated under the Safe Drinking Water Act. Clean Water Act water quality standards apply to ambient surface waters. Where surface waters are used as for public domestic water supply, they will receive some treatment prior to delivery to homes.
Comment 8	Commenters are extremely frustrated and concerned about the lack of quality water and potential health hazard that manganese is posing. The commenter has a house in Marion County near Salem and has had plumbing problems for many years related to manganese in the water supply. It has reduced water pressure and when the filter is changed once per month it is black with manganese residue. It is a fire safety hazard and potential health hazard. The water company has changed hands many times, is difficult to reach and is reluctant to discuss water quality. The commenter would like information

	regarding the standards DEQ has for water quality with regard to manganese. (10)
Response	While DEQ acknowledges the commenter's concern, neither the current nor proposed criteria for manganese would address the situation described by the commenter. It is unclear from the comments what the source of the manganese in the plumbing is.
Comment 9	NWPPA supports the proposed withdrawal of the iron criteria, which is not based on human health, and the manganese criteria for freshwater. (11)
Response	DEQ acknowledges the commenter's support.
Comment 10	Department of Human Services Public Health Division staff support the elimination of the human health criteria for iron and manganese in fresh waters. (14)
Response	DEQ acknowledges the commenter's support.

List of commenters and reference numbers				
Ref #	**Name**	**Organization**	**Address**	**Comment date**
1	Shelia Herrera	None stated	1338 Woodland Drive, Bloomfield, New Mexico 87413	Aug. 25, 2010
2	Keith Nelson	Iron Overload Support Forums Online	keith@ironoverloadsupport.com	Sept.7, 2010
3	Cary Weigand	None stated	Troyweigand@aol.com	Sept. 11, 2010
4	Christina Shetterly	None stated	2844 Yvonne Road, Medford, OR 97504	Sept.13, 2010
5	Shirley VanLeuven	Evergreen Meadows Water Improvement District	Prospect, Oregon sdayvl@hughes.net	Sept. 15, 2010
6	Paul Neussl	Evergreen Meadows Water Improvement District	paulneussl@live.com	Sept. 22, 2010
7	William H. Burke, Chairman, Tribal Water Commission	Confederated Tribes of the Umatilla Indian Reservation	46411 Timine Way, Pendleton, OR 97801	Sept. 21, 2010
8	Susan Hansen	None stated	Ashland, OR she@opendoor.com	Sept. 26, 2010
9	Cheryl Moore	None stated	cmoore@mendoco.com	Sept. 27, 2010

List of commenters and reference numbers				
Ref #	**Name**	**Organization**	**Address**	**Comment date**
10	Ray Suek & Geri Johnson	None stated	25570 Valley View Lane, Sheridan, Oregon 97378 gerijohnson@live.com	Sept. 28, 2010
11	Llewellyn Matthews, Executive Director	Northwest Pulp & Paper	7900 S.E. 28th Street, Suite 304, Mercer Island, WA 98040	Sept. 30, 2010
12	Nina Bell	Northwest Environmental Advocates	PO Box 12187 Portland, OR 97212	Sept. 30, 2010
13	Cari Hinesly	Evergreen Meadows Water Improvement District	Prospect, OR hineslyc@huges.net	Sept. 29, 2010
14	Barbara Stifel and Ken Kauffman	Dept. of Human Services Public Health Division	800 NE Oregon St., Portland, OR 97232-2162	Sept. 27, 2010
15	Mark Willrett, P.E., Director of Public Works	City of Klamath Falls	PO Box 237, Klamath Falls, OR 97601	Sept. 29, 2010
16	Michael Campbell, Stoel Rives, LLP	Oregon Water Quality Standards Group (industrial facilities that hold NPDES permits)	900 SW Fifth Ave, Suite 2600, Portland, OR 97204	Sept. 30, 2010
17	Janet Gillaspie, Executive Director	Oregon Association of Clean Water Agencies	537 SE Ash St., Suite 12, Portland, OR 97214	Sept. 30, 2010

State of Oregon
Department of Environmental Quality **Memorandum**

Presiding Officer's Report

Date: Oct. 5, 2010

To: Environmental Quality Commission

From: Andrea Matzke

Subject: Presiding Officer's Report for Rulemaking Hearing

Title of proposal: Amendments to Water Quality Standards: Arsenic, Iron, and Manganese
Hearing date and time: Sept. 21, 2010; 5-7 p.m.
Hearing location: DEQ headquarters, 811 SW 6th Ave., Portland, room EQC-A (10th floor)

DEQ convened the rulemaking hearing on the proposal referenced above at 5 p.m. and closed it at 7 p.m. One member of the public attended, but no one submitted testimony, either oral or written, at this hearing.

State of Oregon
Department of Environmental Quality **Memorandum**

Presiding Officer's Report

Date: Sept. 28, 2010

To: Debra Sturdevant, DEQ headquarters, Portland, OR

From: Don Butcher, DEQ, Eastern Region, Pendleton, OR

Subject: Presiding Officer's Report for Proposed Amendments to the Water Quality Standard Criteria for Iron, Manganese and Arsenic

Hearing date and time: Sept. 28, 2010; 7 p.m.
Hearing location: Blues Room, Saint Anthony's Hospital, Pendleton, OR

On Sept. 23, 2010, I acted as Presiding Officer at the public hearing for the subject proposed amendments. Prior to receiving comments, I briefly explained the procedures to be followed during the hearing. The audience was informed that the purpose of the hearing was to gather comments pertaining to the proposed amendments. The audience was also informed that written comments would be accepted until 5 p.m., Sept. 30, 2010.

As an introduction to the hearing, Debra Sturdevant gave a presentation describing the proposed amendments and their informational basis. Members of the audience asked questions and technical and policy issues were discussed. Interest was expressed with regard to natural background levels of arsenic, criteria implementation planning and timelines.

The public hearing on the above titled proposal was convened at 7:05 p.m. People were asked to sign registration forms if they wished to present comments, and were advised that the hearing was being recorded. Seven people attended, including two DEQ staff. The hearing was closed at approximately 8:00 p.m. after one person gave testimony.

The comments of the individual who provided testimony are here summarized as appreciation for DEQ's efforts in developing the proposed amendments, including appropriate involvement of stakeholders. DEQ’s responses to all comments received during the comment period will be included in a staff report.

Oregon Department of Environmental Quality
COMMENT REGISTRATION FORM

DEQ

NAME: Kathryn VanNatta

REPRESENTING: Northwest Pulp and Paper Assn.

ADDRESS: 2191 SE Oak Crest DR

CITY: Hillsboro **STATE:** OR **ZIP CODE:** 97123

I request approximately 3 **minutes to address the subject of**

As, Mg, ~~Fe~~ WQS Rulemaking

☑ **Check here if you wish to be added to the mailing list about this subject. Be sure your complete mailing address is listed above.**

DEQ\WQ\PPPD\WC15\WC15620.doc (4/00)

Water Quality Standards

Oregon Department of Environmental Quality
Public Hearing Attendance Form

For: Public Hearing Date: Sept. 23, 2010

	Name	Representing	Mailing Address
46.	Robin Harris	CTUIR	robinharris@ctuir.org
47.	Mary Lou Soscia	EPA	
48.	Anthony Barber	EPA	barber.anthony@epa.gov
49.	Kathryn Vanlutto	NWPPA	
50.	Rick George	CTUIR	
51.			
52.			
53.			
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60.			

DEQ\WQ\PPPD\WC15\WC15619 (4/00)

Issue Paper

State of Oregon
Department of
Environmental
Quality

Water Quality Standards Review and Recommendations: Iron and Manganese

This report prepared by:

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November 16, 2010

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Table of Contents

Executive Summary

The Department of Environmental Quality (DEQ) proposes to revise Oregon's human health water quality criteria for iron and manganese as shown in Table 1 below. The proposed criteria, the scientific basis and rationale for the revisions and the process DEQ used to review these criteria are discussed in this issue paper.

Table 1. Proposed Human Health Water Quality Criteria for Iron and Manganese (µg/l)

Pollutant	Water and Fish Ingestion		Fish Consumption Only	
	Current Criteria	Proposed Criteria	Current Criteria	Proposed Criteria
Iron	300	None	None	None
Manganese	50	None	100	100 Saltwater only

Notes:
1) Current criteria are from Table 20 (OAR 340-041-0033).
2) The aquatic life criterion for iron is 1000µg/l. There are no aquatic life criteria for arsenic or manganese.
3) The fish consumption only criteria are for the total recoverable metal concentrations.

Iron

DEQ reviewed the iron criterion for human health because iron is a naturally occurring earth metal that sometimes exceeds the current criterion due to natural background levels, and because the criterion is not based on levels needed to protect human health. Oregon's current "human health" criterion for iron is 300 µg/L (0.3 mg/L). This was EPA's national recommended criterion at the time it was adopted. However, EPA does not consider iron a priority pollutant and did not recommend a criterion for fish consumption. EPA based their recommended criterion on taste and laundry staining effects, not on human health effects.

DEQ proposes to withdraw Oregon's human health criterion for iron for the following reasons:

- The current criterion of 300 µg/L is not based on human health effects.
- Iron criteria for the protection of human health are not necessary. The amount of iron that people can ingest without adverse effects are higher than those found in Oregon surface waters and much higher than the aquatic life criterion of 1000 µg/L.
- DEQ does not expect that discharges of iron in Oregon will impact beneficial uses, including the ability to drink water or consume fish.
- Oregon has a narrative criterion and EPA has a secondary MCL that allow DEQ or water suppliers to protect against objectionable taste and odor from iron in the water if a community finds there is a need to do that.

These revisions would not affect the current freshwater aquatic life criterion for iron, which is a chronic criterion of 1000 µg/L (1.0 mg/L). Aquatic life is a designated beneficial use in all surface waters of Oregon and therefore the aquatic life criterion for iron applies to all waters.

Manganese

DEQ reviewed the manganese criteria for human health because manganese is a naturally occurring earth metal in Oregon and because the "water and fish ingestion" criterion is based on taste and laundry staining effects, not on levels necessary to protect human health.

DEQ proposes to withdraw the manganese criterion for water and fish ingestion for the following reasons:

- The criterion is not based on human health effects. EPA has not recommended a water and fish ingestion criterion for the protection of human health, nor have they recommended an MCL to protect against human health effects of manganese in drinking water. Manganese levels in Oregon surface waters are far below average daily human intake levels, which are primarily taken in through food.
- There is no reason to conclude that discharges of manganese will impact beneficial uses of Oregon's fresh waters.
- Oregon does not need a numeric manganese criterion to protect water supply based on aesthetic and organoleptic effects. The Safe Drinking Water Information System database shows only one surface water supplier with detectable levels manganese in their finish water, and the concentration was 0.8 µg/l, far below the levels where aesthetic or taste effects are objectionable (30 – 150 µg/l). DEQ has a narrative criterion for the protection of taste, odor and aesthetic affects should limits be required to protect a surface water domestic water supply source from particularly high levels of manganese from anthropogenic sources. Finally, EPA has a secondary MCL of 50µg/l in place under the Safe Drinking Water Act to provide guidance to water suppliers who would like to prevent these non-health based effects.

In addition, DEQ proposes to withdraw the "fish consumption only" manganese criterion (100 µg/l) as it applies to freshwaters but will leave this criterion in place for saltwater. EPA recommended the 100µg/l criterion in 1976, prior to the fish ingestion/bioconcentration factor derivation method, which was published in 1980. The EPA criterion was not based on a calculation method, but rather was recommended due to concerns about possible high bioconcentration rates among marine mollusks. Data collected since that time show that bioconcentration factors for manganese in freshwater species are low (i.e., manganese does not accumulate in freshwater aquatic species in appreciable amounts). Consequently, a freshwater fish consumption criterion for manganese is not needed.

Arsenic

DEQ reviewed the human health criteria for arsenic, another naturally occurring earth metal, and proposed revisions to the criteria and adoption of an arsenic reduction policy for public comment. Following the public comment period, DEQ decided to take additional time to consider and respond to the comments received. DEQ anticipates recommending revisions to the arsenic criteria to the EQC in the spring of 2011.

Chapter 1 Introduction and Background

The Oregon Department of Environmental Quality (DEQ) reviewed the science behind the human health water quality criteria for some of the naturally occurring earth metals in response to concerns expressed to the Oregon Environmental Quality Commission (EQC) at their meeting in October 2008. Arsenic, iron and manganese are the three metals that DEQ selected to review in more detail. These three earth metals are naturally occurring and are found in Oregon waters at natural background levels greater than the current human health criteria. There are water bodies listed as impaired for all three metals on the 2004/06 303(d) list as in need of TMDLs. In addition, stakeholders point out that the arsenic criteria under the Clean Water Act are much more stringent than the maximum contaminant level for drinking water established under the Safe Drinking Water Act.

At its October 2008 meeting, the EQC directed DEQ to revise Oregon's human health criteria for toxic pollutants based on the recommended increased fish consumption rate of 175 grams per day; the Department is conducting that rulemaking process separately. DEQ moved forward with proposed rules for public comment for these three criteria in advance of the full human health criteria rulemaking for several reasons. First, the timeframe for the larger package targets EQC adoption in mid-2011 and the revised criteria will not likely be effective until late 2011 at the earliest, possibly not until mid-2012 or later. Second, the scientific review and early stakeholder review of these revisions are complete and the proposal was ready for public comment. Third, the changes are significant for several NPDES permits that will be renewed over the next year to 18 months. And lastly, 107 stream segments, which account for 43% of the total stream segments currently listed for toxic pollutants, are listed for arsenic, iron or manganese. If the proposed revisions are adopted by the EQC in late 2010 or early 2011, they should be effective for use in the 2012 water quality assessment. This will help DEQ to target its resources and those of dischargers to address more important environmental improvements.

DEQ worked with a stakeholder workgroup (membership shown below) to develop the proposed criteria revisions and an accompanying arsenic reduction policy. The workgroup supported the proposal. DEQ took public comment on the proposed rules from August 25 to September 30, 2010 and held two public hearings. Following the comment period, DEQ decided to recommend EQC adoption of the iron and manganese criteria revisions in December, 2010. DEQ will take additional time to consider the comment received on the arsenic proposal and anticipates recommending arsenic criteria revisions to the commission in the spring of 2011. For more information on the hearings and the public comment received, see the "Summary of Public Comment and Agency Response" attached to the EQC Staff Report on the proposed amendments to Oregon's iron and manganese water quality criteria for human health.

Table 2. Toxics Standards Rulemaking Workgroup Members (RWG)

Organization	Representative
CTUIR	Ryan Sudbury/Rick George
EPA	Jannine Jennings
ACWA	Dave Kliewer
League of Oregon Cities	Peter Ruffier
Northwest Pulp and Paper	Kathryn Van Natta
Industrial Dischargers	Michael Campbell
Associated Oregon Industries	Rich Garber or alternate Myron Burr
Northwest Environmental Advocates	Nina Bell
Oregon Environmental Council	Andrew Hawley
Columbia Riverkeeper	Lauren Goldberg

Chapter 2. Iron Human Health Criteria Review and Recommendations

As part of the review of Oregon's human health toxics criteria, DEQ re-evaluated the human health criterion for iron. DEQ reviewed this criterion because iron is a naturally occurring earth metal that sometimes exceeds the criterion and because the current criterion is not based on levels needed to protect human health.

Oregon's Current Iron Criteria

Oregon's current water quality criteria for iron include a "water and fish ingestion" criterion of 300 µg/l (0.3 mg/l) for human health and a chronic criterion of 1000 µg/l (1.0 mg/l) for freshwater aquatic life. These were EPA's national recommended criteria in the late 1980's when DEQ adopted these values.

Federal Requirements and Recommendations

Iron is a "non-priority" pollutant under the CWA. Federal regulations for non-priority pollutants (40 CFR § 131.11) require that states adopt criteria based on a sound scientific rationale that covers sufficient parameters to protect designated uses. Both numeric and narrative criteria may be applied to meet these requirements (EPA, 1994).

EPA's 1976 and 1986 *Quality Criteria for Water* (referred to as the "Red Book" and "Gold Book," respectively) established 300 µg/l as the recommended water quality criterion for iron for protection of domestic water supplies (EPA, 1976; EPA, 1986). According to the Red Book, "the iron criterion in water is to prevent objectionable tastes or laundry staining (0.3 mg/l) [and] constitutes only a small fraction of the iron normally consumed and is of aesthetic rather than toxicological significance" (text in brackets added). EPA previously recommended in *Water Quality Criteria 1972* (EPA, 1973) that 0.3 mg/l soluble iron not be exceeded in public water supply sources.

EPA's human health iron criterion under the Clean Water Act is the same as the secondary maximum contaminant level (MCL) established in EPA's National Secondary Drinking Water Regulations under the Safe Drinking Water Act. Secondary MCLs are established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. The contaminants are not considered to present a risk to human health at the secondary MCL level (EPA, 1992b).

Effects of Iron related to Public Water Supply

Taste. There is a range of sensitivities to the taste of iron in drinking water that can vary based on the form of iron. A 1960 study referenced by EPA's "Red Book" (1976) indicated that the taste of iron may be detected readily at levels of 1800 µg/l in spring water and 3400 µg/l in distilled water.

Health. The "Red Book" also noted that the daily nutritional requirement for iron is 1000 to 2000 µg/l, but that much larger amounts of iron must be ingested due to poor absorption. Tolerable upper intake levels used for a recent revision to West Virginia's criterion were 45,000 µg/l for adults and 40,000 µg/l for children.

Recent Actions in other States

As part of this review, DEQ considered information summarized here about iron criteria revisions that have been conducted in other states.

West Virginia: In 2003, the State of West Virginia adopted an iron criterion of 1500 µg/l for the protection of both aquatic life and human health uses. Support for EPA approval included the following:

- EPA Region 3 had previously approved a 1500 µg/l iron criterion for Pennsylvania, citing scientific studies that demonstrate that an aquatic life criterion of 1500 µg/l for total iron is sufficiently protective of both instream and withdrawal uses of Pennsylvania's waters.
- EPA Region 8 has approved site-specific iron criteria greater than 1000 µg/l based on scientific site-specific studies in Colorado.
- EPA's national recommended water quality criterion for iron of 300 µg/l is based on national secondary drinking water standards, which are established only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor.
- Tolerable Upper Intake Levels (UL) of iron for adults is 45 mg (45,000 µg) per day and for children is 40 mg (40,000 µg) per day. Maximum average intake from food and supplements is about 18 mg (18,000 µg) per day.
- Human health iron toxicity studies indicate that 1500 µg/l is protective of the majority of the population.

Missouri: In 2006, the State of Missouri removed its drinking water criterion of 300 µg/l for iron. Support for EPA approval included the following:

- EPA's recommended criterion for iron of 300 µg/l is based on aesthetic (e.g., laundry staining) and organoleptic (i.e. taste) effects and as such, was not developed to protect against toxicological effects.
- EPA reviewed data provided by the Missouri Department of Natural Resources regarding the State's 2002 and draft 2004 lists of impaired waters. Based upon this information, EPA did not have reason to expect levels of iron to be present that would interfere with the protection of waters designated for Drinking Water Supply.
- The manner in which Missouri assigns designated uses to the state's waters results in any water designated for Drinking Water Supply to also be designated for Warm Water Aquatic Life and Human Health-Fish Consumption. Given this method, the chronic aquatic life criterion for iron of 1000 µg/l, expressed as dissolved iron, is effective for all waters designated as Drinking Water Supplies.

- EPA also reviewed available information regarding potential human health effects from iron and analyzed this information, in combination with water quality monitoring data from waters in Missouri designated as Drinking Water Supply, in order to estimate potential exposure to iron. The results of this analysis led EPA to determine that the absence of an iron criterion for drinking water would not result in significant increased exposure to iron, and that a separate criterion for iron is not necessary to protect Missouri's Drinking Water Supply Use.

DEQ Proposed Revision

DEQ proposes to withdraw Oregon's human health criterion for iron for the following reasons:

- The current criterion of 300 µg/l is not based on human health effects.
- Iron criteria for the protection of human health are not necessary. The levels of iron that may be consumed without adverse health effects are much higher than the levels found in Oregon surface waters and much higher than the aquatic life criterion of 1000 µg/l.
- DEQ does not expect that discharges of iron in Oregon will impact beneficial uses, including the ability to drink water or consume fish.
- Oregon has a narrative criterion that allows us to protect against objectionable taste and odor if there is a need to do so.

Table 3 below shows iron data for the Willamette River at the St. John's Bridge, just below the city of Portland. These values are well below levels that are unsafe for human consumption.

The proposed revision would not affect the current freshwater aquatic life criterion for iron, which is a chronic criterion of 1000 µg/L (1.0 mg/L). Aquatic life is a designated beneficial use in all surface waters of Oregon and therefore the aquatic life criterion for iron applies to all waters.

DEQ's Toxics Standards Review Rulemaking Workgroup, a group of stakeholders providing input to DEQ on this rulemaking, supports the proposed criteria changes for iron.

Table 3. Water column iron data for the Willamette River below Portland (at St. Johns RR bridge) from Portland Bureau of Environmental Services, from 3/04 to 12/07

Dissolved Iron, µg/l

Result	Method	MDL
25.9	EPA 200.8	10.0
18.1	EPA 200.8	10.0
44.8	EPA 200.8	10.0
39.8	EPA 200.8	10.0
33.6	EPA 200.8	10.0
43.7	EPA 200.8	10.0
47	EPA 200.8	10.0
32.6	EPA 200.8	10.0
25.3	EPA 200.8	10.0
63.7	EPA 200.8	10.0
188	EPA 200.8	10.0
34.6	EPA 200.8	10.0
25.3	EPA 200.8	10.0

Total Iron, µg/l

Result	Method	MDL
225	EPA 200.8	10.0
243	EPA 200.8	10.0
375	EPA 200.8	10.0
288	EPA 200.8	10.0
422	EPA 200.8	10.0
734	EPA 200.8	10.0
1060	EPA 200.8	10.0
221	EPA 200.8	10.0
269	EPA 200.8	10.0
3890	EPA 200.8	10.0
1310	EPA 200.8	10.0
203	EPA 200.8	10.0
244	EPA 200.8	10.0

Chapter 3. Manganese Human Health Criteria Review and Recommendations

As part of the review of Oregon's human health toxics criteria, DEQ reevaluated the human health criteria for manganese. DEQ reviewed these criteria because manganese is a naturally occurring earth metal in Oregon that sometimes exceeds the "water and fish ingestion" criterion and because that criterion for "water and fish ingestion" is not based on levels needed to protect human health.

Background Information

According to the World Health Organization (1999), manganese (Mn) is a naturally occurring element that is found in rock, soil, water and food. All humans are exposed to manganese, and it is a normal component of the human body. Food is usually the most important route of exposure for humans. (See the Appendix B for more information from the WHO document.)

Studies of manganese concentrations in soils found that they generally range from 200 to 1000 µg/g in volcanically derived soils (Alloway, 1990 in DEQ, 2008). Natural background manganese concentrations in Washington State soils average between 700 and 1500 µg/g (Juan, 1994 in DEQ, 2008). Sampling by DEQ and USGS in the Molalla-Pudding subbasin of Oregon showed dissolved manganese concentrations in groundwater ranged from < 1 µg/l to 740 µg/l (DEQ, 2008).

Figure 1 shows surface water data for dissolved manganese from DEQ's LASAR database. Out of over 7000 samples, less than a handful exceed 1000 µg/l and only a small portion exceed 200 µg/l dissolved manganese. DEQ's 303(d) list includes 26 water bodies as exceeding the current "water and fish ingestion" criterion of 50µg/l (Table 7). Figure 2 shows seasonal dissolved manganese data from Beaverton Creek, Oregon. Manganese concentrations increased through the spring and summer, peaking in late summer/early fall and dropping for late fall and winter. This suggests that concentrations are higher relative to low base flows, which typically include a larger portion of groundwater inflow, and reduced relative to surface water runoff that occurs in response to rainfall events.

Oregon's Current Human Health Criteria for Manganese

Oregon's currently effective CWA criteria for manganese, which apply to both fresh and marine waters, are:

- 50 µg/l dissolved manganese for "human health, water and fish ingestion," and
- 100 µg/l total manganese for "human health, fish consumption only. "

These were EPA's nationally recommended criteria at the time they were adopted.

Federal Criteria Requirements and Recommendations

Manganese is considered a "non-priority" pollutant by EPA. 40 CFR § 131.11 describes the federal criteria requirements applicable to non-priority pollutants. Under these requirements, states must adopt criteria based on sound scientific rationale that cover sufficient parameters to protect designated uses. Both numeric and narrative criteria may be applied to meet these requirements (EPA, 1994).

Protection of domestic water supply. EPA's 1976 and 1986 *Quality Criteria for Water* (referred to as the "Red Book" and "Gold Book," respectively) established 50 µg/l as the recommended water quality criterion for manganese for protection of domestic water supplies. This criterion was established to protect against objectionable tastes and laundry staining. The Red Book provides that, "a criterion for domestic water supplies of 50 µg/l [for manganese] should minimize the objectionable qualities" (text in brackets added). EPA's recommendation for manganese in Water Quality Criteria 1972 (EPA, 1973) specified that 0.05 mg/l (50 µ/l) soluble manganese not be exceeded in public water sources based on user preference. One study found that consumer complaints about brownish staining of laundry and objectionable tastes in beverages arise when manganese exceeds 150 µg/l (Griffin, 1960 in EPA Red Book). The Red Book also notes that manganese concentrations of 10 to 20 µg/l are acceptable to most consumers.

The manganese criterion of 50 µg/l for protection of domestic water supply uses that EPA recommends under the Clean Water Act is the same as the secondary maximum contaminant level (MCL) established by EPA in their National Secondary Drinking Water Regulations under the Safe Drinking Water Act. Secondary MCLs are established as guidelines to assist public water systems manage their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at the secondary MCL (EPA, 1992).

EPA has not recommended a manganese criterion for the protection of human health in fresh waters. Manganese is a vital micro-nutrient (EPA, 1976). EPA notes that the average human intake is approximately 10 mg/day (10,000 µg/day) and that while very large doses of ingested manganese can cause some disease and liver damage; these are not known to occur in the United States. Additional information on human intake levels from the World Health Organization is provided in Appendix B.

Protection of Consumers of Marine Mollusks. While EPA's criteria documents (1976, 1986) conclude that "manganese is not considered to be a problem in fresh waters," they do establish a recommended human health criterion for manganese of 100 µg/l for the protection of consumers of marine mollusks. The following information is provided in the 1976 criteria document:

- The average human intake of manganese is approximately 10 mg (10,000 µg) per day.
- Very large doses of ingested manganese can cause some disease and liver damage but these are not known to occur in the United States.

- The ambient [marine] concentration of manganese is about 2 µg/l (Fairbridge, 1966). The material is rapidly assimilated and bioconcentrated into nodules that are deposited on the sea floor. The major problem with manganese may be concentration in the edible portions of mollusks, as bioaccumulation factors as high as 12,000 have been reported (NAS, 1974 in EPA, 1976). In order to protect against a possible health hazard to humans by manganese accumulation in shellfish, a criterion of 100 µg/l is recommended for marine water.

More recent bioconcentration data from EPA's ECOTOX database shows that while marine mollusks have higher bioconcentration factors than other species, the BCFs range from 677 to 2583, with 47 of the 53 BCFs being above 1000 (see Table 5).

EPA's 2002 national criteria recommendations still include the 1976 "organism only" criterion for manganese of 100µg/l as a non-priority pollutant due to potential human health concerns related to consuming oysters and other marine mollusks. Oysters and other marine mollusks occur in "saltwater." In their 2002 criteria document, EPA defines "saltwater" v. "freshwater" for the purpose of applying the aquatic life criteria based on the species that would be present dependent on salinity levels.

Recent Actions in other States

In 2006, the State of Missouri removed its drinking water criterion of 50 µg/l for manganese. Support for EPA approval included the following:

- EPA's recommended criterion for manganese of 50 µg/l is based on aesthetic (e.g., laundry staining) and organoleptic (i.e., taste) effects, and was not developed to protect against toxicological effects.
- EPA reviewed available information regarding potential human health effects from manganese and analyzed this information, in combination with water quality monitoring data from waters in Missouri, in order to estimate potential exposure to manganese. The results of this analysis led EPA to conclude that the current levels of manganese in Missouri's waters pose no long-term risk to human health and that a numeric criterion for manganese is not necessary to ensure protection of Missouri's Drinking Water Supply designated use. EPA concluded that the Missouri Department of Natural Resource's remaining revised numeric metals criteria and narrative criteria protect the designated use.

DEQ Proposed Revisions to Oregon's Manganese Human Health Criteria

Water and fish ingestion criterion. DEQ proposes to withdraw Oregon's manganese criterion for water and fish ingestion. This criterion was not based on health effects. EPA has not recommended a water and fish ingestion criterion for the protection of human health, nor have they recommended an MCL to protect against human health effects of manganese in drinking water. Manganese levels in Oregon surface waters are far below average daily human intake

levels (see Figure 1). There is no reason to believe that discharges of manganese will impact beneficial uses of drinking water or fish consumption for Oregon's fresh waters.

In addition, Oregon does not need a numeric manganese criterion to protect water supply based on aesthetic and organoleptic effects. Table 6 below shows that only one surface water supplier detected manganese in their finish water and the concentration was 0.8 µg/l, far below the levels where aesthetic or taste effects are objectionable (30 – 150 µg/l). In addition, DEQ has a narrative criterion for the protection of taste, odor and aesthetic affects should limits be required to protect a surface water domestic water supply source from particularly high levels of manganese from anthropogenic sources. Finally, EPA has a secondary MCL of 50µg/l in place under the Safe Drinking Water Act to provide guidance to water suppliers for these non-health effects.

Fish consumption only criterion. DEQ proposes to withdraw the 100 µg/l "fish consumption only" criterion as it applies to freshwater, but leave the criterion in place as it applies to saltwater. The 100µg/l criterion was recommended by EPA in 1976, prior to the 1980 publication of their method to develop criteria based on bioconcentration. However, EPA recommended this criterion due to concerns about high bioconcentration rates among marine mollusks (oysters). A fish consumption criterion for freshwaters is not needed because BCFs for manganese in freshwater species are low.

DEQ does not propose to revise the manganese criterion as it applies to the consumption of marine mollusks and did not conduct a review of the scientific literature for that purpose. Rather, DEQ proposes to leave the Oregon's current "fish consumption only criterion" in place for application to saltwater in order to protect for the consumption of marine mollusks, such as oysters. This criterion also remains EPA's recommended criterion. DEQ intends to use the definition of saltwater provided by EPA in their 2002 national criteria recommendations to indicate the presence of marine mollusks. Saltwater is defined based on salinity concentrations and can include estuarine as well as marine waters. Because the criterion is not based on a fish ingestion/ bioconcentration methodology, it will not be revised based on Oregon's revised fish consumption rate.

Additional options considered for the "fish consumption only" criterion were to:

- Retain the 100ug/l criterion with 2004 clarification that it will be applied as a dissolved concentration,
- Revise the 100 µg/l manganese criterion
- Withdraw the criterion, demonstrating that it is not needed to protect the applicable designated use in Oregon.

DEQ's Toxics Standards Review Rulemaking Workgroup, which is a group of stakeholders providing input to DEQ on this rulemaking, supported the recommendations below at their meeting on July 13, 2009.

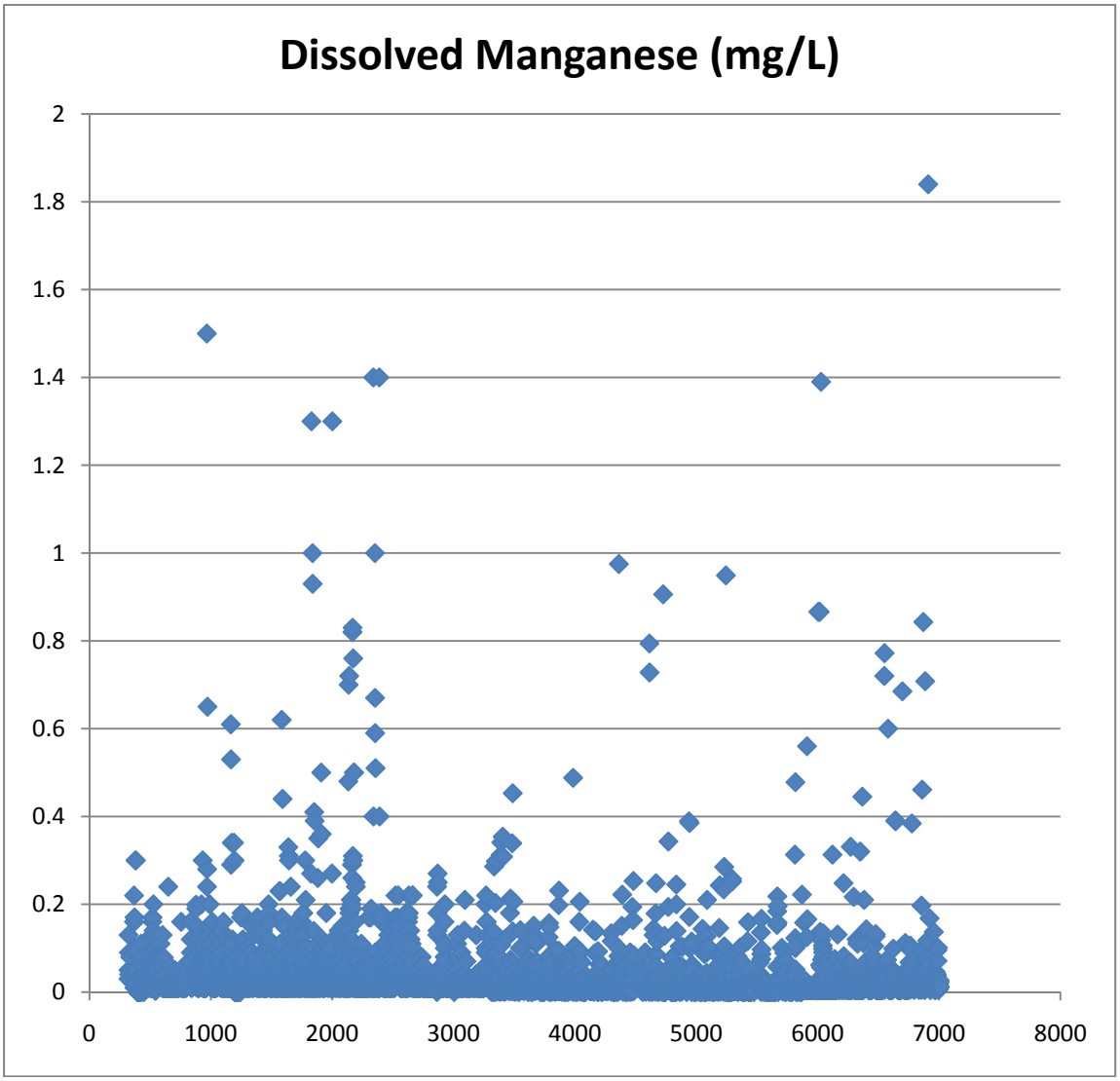

Figure 1. Surface water data for freshwaters of Oregon. From DEQ LASAR data base. Note: 0.2 mg/l = 200 µg/l.

Table 4. Manganese Listings from DEQ's 2004/06 303d Assessment, based on Table 20 Criteria

Watershed (USGS 4th Field Name)	Water Body (Stream/Lake)	River Miles	Samples exceeding
COOS	Isthmus Slough	0 to 10.6	2 of 2
CROSSES SUBBASINS	Willamette River	0 to 24.8	7 of 175
CROSSES SUBBASINS	Willamette River	119.7 to 148.8	2 of 84
CROSSES SUBBASINS	Willamette River	148.8 to 184.7	7 of 313
DONNER UND BLITZEN	Bridge Creek	0 to 3.1	4 of 4
Lower Columbia	Unnamed Creek	0 to 3.2	4 of 5
LOWER OWYHEE	Overstreet Drain	0 to 0	2 of 3
LOWER WILLAMETTE	Arata Creek / Blue Lake	0 to 0.9	7 of 25
LOWER WILLAMETTE	Columbia Slough	0 to 8.5	7 of 8
LOWER WILLAMETTE	Columbia Slough	0 to 9.8	45 of 61
LOWER WILLAMETTE	South Columbia Slough	0 to 3.2	4 of 7
MCKENZIE	Blue River	0 to 15.5	2 of 38
MIDDLE COLUMBIA-HOOD	Lenz Creek	0 to 1.5	15 of 31
MIDDLE COLUMBIA-HOOD	Neal Creek	0 to 6	0 of 13
MOLALLA-PUDDING	Pudding River	0 to 35.4	7 of 72
MOLALLA-PUDDING	Zollner Creek	0 to 7.8	2 of 2
NORTH UMPQUA	Sutherlin Creek	0 to 16	20 of 26
SOUTH UMPQUA	Middle Creek	0 to 12.8	5 of 13
SOUTH UMPQUA	South Fork Middle Creek	0 to 4.4	8 of 12
TUALATIN	Beaverton Creek	0 to 9.8	64 of 68
TUALATIN	Tualatin River	0 to 80.8	151 of275
UMATILLA	Umatilla River	0 to 32.1	11 of 50
UMATILLA	Wildhorse Creek	0 to 33.2	
UMPQUA	Cook Creek	0 to 2.9	
UPPER WILLAMETTE	Calapooia River	0 to 42.8	9 of 39
UPPER WILLAMETTE	Long Tom River	0 to 57.3	2 of 34
UPPER WILLAMETTE	Marys River	0 to 41.1	4 of 39
YAMHILL	North Yamhill River	0 to 32.5	3 of 63
YAMHILL	Salt Creek	0 to 32.8	2 of 2
YAMHILL	Yamhill River	0 to 11.2	3 of 67

Figure 2. Seasonal Distribution of Dissolved Manganese (µg/l)
Beaverton Creek Near Orenco USGS and DEQ Data

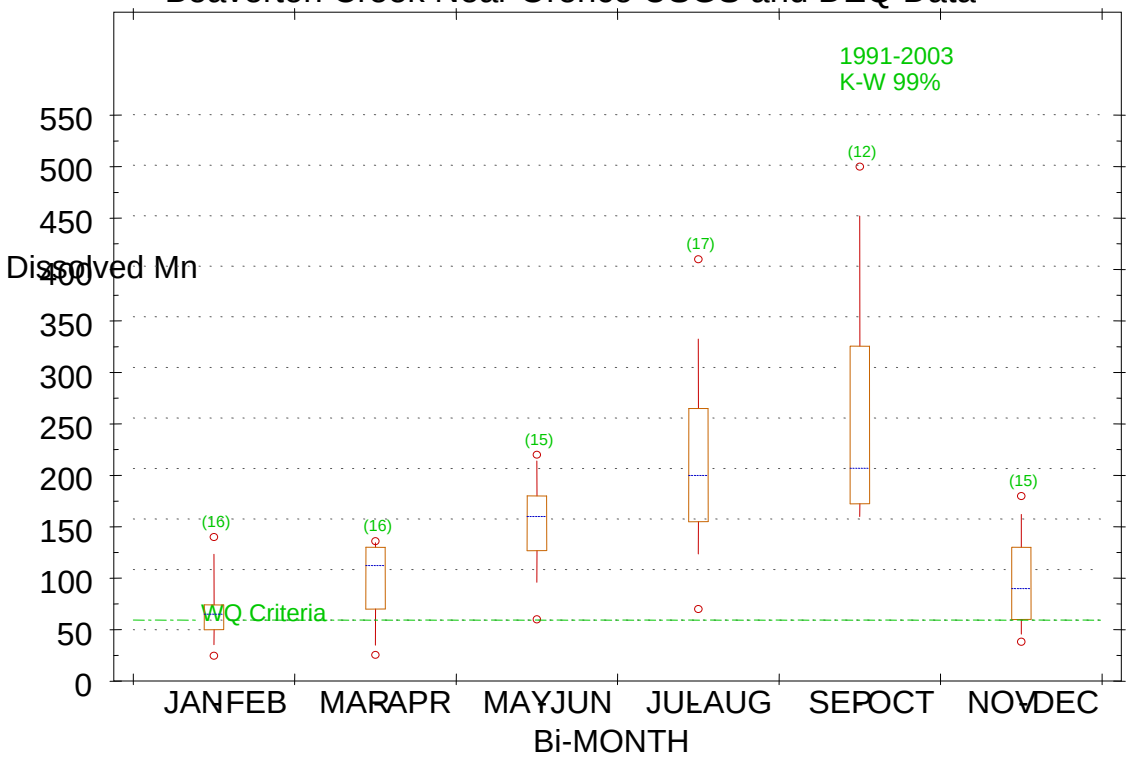

Table 5. Summary of Manganese BCFs for Organisms in Saltwater and Freshwater

Media	Species Group	Number of BCFs	Range of BCF Values		Notes
			Min	Max	
Freshwater	Crustaceans	1	65	65	
Freshwater	Fish	5	0.2	220	
Freshwater	Worms	2	8.5	9	
Saltwater	Crustaceans	14	0	3.18	
Saltwater	Fish	23	10	9090	Only 5 of 23 BCFs were above 1000
Saltwater	Invertebrates	8	3	61	
Saltwater	Mollusks	53	677	2683	47 of 53 BCFs were above 1000
Saltwater	Worms	17	2.2	45	

Values above 1000 considered high bioconcentration potential by EPA R6.
From "ECOTOX" database, EPA. http://cfpub.epa.gov/ecotox/

Table 6. Finish Water Data for Drinking Water Sources, Oregon.

This table contains drinking water source finish data that exceeded detection limits for manganese. Please note that one sample is a surface water source and the other two are groundwater sources.

Finish Water Data for Drinking Water Sources				Manganese µg/l
SW	NPS OREGON CAVES NATL MON	EP FOR LAKE CREEK	24-May-06	0.8
GW	SUNRIVER WATER LLC	~EP FOR WELL 12 (SERVES CROSSWATERS)	13-Sep-06	93
GW	CURRY CO PKS LOBSTER CREEK	EP FOR LOBSTER CREEK	11-Sep-03	58
From: Oregon's Safe Drinking Water Information System (DEQ, 2009)				

Finish water is water that has undergone standard drinking water treatment.

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Appendix A. Supplemental Information on Manganese

World Health Organization, Geneva, 1999. Concise International Chemical Assessment Document 12: Manganese and its Compounds.
http://www.inchem.org/documents/cicads/cicads/cicad12.htm

Manganese (Mn) is a naturally occurring element that is found in rock, soil, water, and food. Thus, all humans are exposed to manganese, and it is a normal component of the human body. Food is usually the most important route of exposure for humans. The Food and Nutrition Board of the US National Research Council establishes Estimated Safe and Adequate Daily Dietary Intake (ESADDI) levels, which generally parallel amounts of the compound usually delivered via the diet, although some individuals consume greater or smaller amounts. The ESADDI levels for manganese are 0.3-0.6 mg/day for infants up to 6 months old, 0.6-1.0 mg/day for infants 6 months to 1 year old, 1.0-1.5 mg/day for children 1-3 years old, 1.0-2.0 mg/day for children 4-10 years old, and 2.0-5.0 mg/day for people over 10 years old (NRC, 1989).

In considering development of a guidance value for oral intake of manganese, it must be noted that there is wide variability in human intake of manganese (from all sources) and that manganese is an essential nutrient for humans and animals. Daily manganese intake from food is estimated to be about 2-9 mg for adults, with an absorbed amount of about 100-450 µg/day based upon 5% gastrointestinal absorption (WHO, 1981). Some studies have reported that neurological effects may be related to ingestion of manganese in non-worker populations. However, these reports provide little information on the levels of ingested manganese that were associated with these effects. Although neurological effects might be a potential concern for people working or living at or near sites where ingestion or inhalation of high levels of manganese can occur (see section 9.2), no firm conclusion on a guidance value level for oral intake of manganese other than estimated daily intake levels is considered possible.

More recently, Kondakis et al. (1989) reported that chronic intake of drinking-water containing elevated levels of manganese (1.8-2.3 mg/litre) led to an increased prevalence of neurological signs in elderly residents (average age 67 years) of two small towns in Greece. The effects were compared with those in similarly aged residents in two other communities where manganese levels were within ambient range (0.004 and 0.0015 mg/litre). The findings suggested that above-average oral exposure to manganese might be of health concern. However, although the comparison populations were reportedly very similar to each other, differences in age, occupational exposures, or general health status could have accounted for the small differences observed. Similarly, Goldsmith et al. (1990) investigated a cluster of Parkinson's disease in southern Israel. The authors suggested that excess levels of aluminum, iron, and manganese in the drinking-water and the use of agricultural chemicals, including maneb and paraquat, in the area were common environmental factors that may have contributed to the observed cluster. However, the observed symptoms could not be conclusively attributed to manganese poisoning alone. By contrast, a recent study by Vieregge et al. (1995) on the neurological impacts of chronic oral intake of manganese in well-water found no significant differences between exposed and control populations in northern Germany. A group of 41 subjects exposed to 0.300-160 mg manganese/litre in well-water was compared with a control group of 71 subjects (matched for age, sex, nutritional habits, and drug intake) exposed to a maximum manganese concentration

in well-water of 0.050 mg/litre. Neurological assessments revealed no significant difference between the two groups. Although the effects reported by Kondakis et al. (1989) and Goldsmith et al. (1990) are consistent with the known toxicological effects of manganese, the findings are inconclusive and are contradicted by the results of Vieregge et al. (1995). As a result, no firm conclusions on manganese-induced neurological effects in humans from chronic oral intake of manganese in drinking-water can be made at this time.

In considering development of a guidance value for oral intake of manganese, it must be noted that there is wide variability in human intake of manganese (from all sources) and that manganese is an essential nutrient for humans and animals. Daily manganese intake from food is estimated to be about 2-9 mg for adults, with an absorbed amount of about 100-450 µg/day based upon 5% gastrointestinal absorption (WHO, 1981). Some studies have reported that neurological effects may be related to ingestion of manganese in non-worker populations. However, these reports provide little information on the levels of ingested manganese that were associated with these effects. Although neurological effects might be a potential concern for people working or living at or near sites where ingestion or inhalation of high levels of manganese can occur (see section 9.2), no firm conclusion on a guidance value level for oral intake of manganese other than estimated daily intake levels is considered possible.

Table A-1. Manganese concentrations in selected foods. [a]

Type of food	Range of mean concentrations (ppm; µg/g or mg/litre)
Nuts and nut products	18.21-46.83
Grains and grain products	0.42-40.70
Legumes	2.24-6.73
Fruits	0.20-10.38
Fruit juices and drinks	0.05-11.47
Vegetables and vegetable products	0.42-6.64
Desserts	0.04-7.98
Infant foods	0.17-4.83
Meat, poultry, fish, and eggs	0.10-3.99
Mixed dishes	0.69-2.98
Condiments, fats, and sweeteners	0.04-1.45
Beverages (including tea)	0.00-2.09
Soups	0.19-0.65
Milk and milk products	0.02-0.49

[a] Adapted from Pennington et al. (1986).

Table A-2: Summary of typical human exposure to manganese.[a]

Parameter	Exposure Medium		
	Water	Air	Food
Typical concentration in medium	4 µg/litre	0.023 µg/m^3	1.28 µg/calorie
Assumed daily intake of medium by 70-kg adult	2 litres	20 m^3	3000 calories
Estimated average daily intake by 70-kg adult	8 µg	0.46 µg[b]	3800 µg
Assumed absorption fraction	0.03[c]	1[c]	0.03[d]
Approximate absorbed dose	0.24 µg	0.46 µg	114 µg

[a] Adapted from US EPA (1984).
[b] Assumes 100% deposition in the lungs.
[c] No data; assumed value.
[d] Davidson et al. (1988)

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Relationship to Federal Requirements

Amendments to Oregon Water Quality Standards for Iron and Manganese

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Answers to the following questions identify how the proposed rulemaking relates to federal requirements and the justification for differing from, or adding to, federal requirements. This statement is required by OAR 340-011-0029(1).

1. Is the proposed rulemaking different from, or in addition to, applicable federal requirements? If so, what are the differences or additions?

The proposed rulemaking is consistent with applicable federal requirements. The federal Clean Water Act requires states to adopt water quality standards to protect beneficial uses of the nation's waters. EPA develops nationally recommended criteria but also allows states to adopt different criteria as long as they are based on sound science and rationale. In developing the proposed revisions to the water quality standards, DEQ used an approach that resulted in criteria that are less stringent than EPA's nationally recommended criteria; however, DEQ concludes that the proposed criteria are scientifically defensible. DEQ must submit the proposed standards to EPA for approval after they are adopted by the EQC. DEQ has worked with EPA through the development of the proposed criteria and expects that EPA will conclude that they meet federal requirements and will approve them.

2. If the proposal differs from, or is in addition to, applicable federal requirements, explain the reasons for the difference or addition (including as appropriate, the public health, environmental, scientific, economic, technological, administrative or other reasons).

The proposed criteria are consistent with federal requirements established by Clean Water Act and implementing federal regulations. DEQ is proposing criteria different from the national criteria recommendations based on environmental and scientific information. Adopting and implementing the proposed criteria is also responsive to a State policy interest in spending public and private resources to achieve environmentally meaningful results. Detailed information is provided in an issue paper available on DEQ's website: *Water Quality Standards Review and Recommendations: Iron and Manganese* (DEQ, 2010).

3. If the proposal differs from, or is in addition to, applicable federal requirements, did DEQ consider alternatives to the difference or addition? If so, describe the alternatives and the reason(s) they were not pursued.

DEQ considered leaving the existing criteria in place, which are the same values as EPA's nationally recommended criteria. However, DEQ found that available data and current information support the conclusion that the iron and manganese criteria for freshwaters are unnecessary to protect human health. In addition, iron and manganese are naturally occurring earth metals and the existing criteria values are lower than natural background levels in some Oregon waters. The reason DEQ is proposing to revise the criteria rather than leaving the existing criteria in place is explained in more detail in the above referenced issue paper (DEQ, 2010).

DEPARTMENT OF ENVIRONMENTAL QUALITY
Chapter 340
Proposed Rulemaking
STATEMENT OF NEED AND FISCAL AND ECONOMIC IMPACT

Amendments to Oregon Water Quality Standards for Iron and Manganese

Title of Proposed Rulemaking	Amending Oregon's Water Quality Standards: Revising Human Health Criteria for Iron and Manganese (OAR 340-041-0033, Table 20).
Statutory Authority or other Legal Authority	ORS 468B.010 and 468B.035, 468.020
Statutes Implemented	ORS 468B.048
Need for the Rule(s)	Oregon's current human health criteria for iron and manganese are not attainable in many Oregon waters due to natural sources and are not needed to protect human health. Clean Water Act requirements for implementing these water quality standards have resulted and will continue to result in DEQ and other entities expending resources to address pollutants that are predominantly natural and are not a priority environmental concern. The proposed rule amendment withdraws the existing human health criteria for iron and manganese as they apply to freshwaters. Upon scientific review, DEQ finds that these criteria are not needed to protect human health. The fish consumption only criterion will remain effective for saltwater, where there is a concern about human exposure through eating oysters. The proposed revisions will result in fewer streams being identified as water quality impaired due to natural levels of iron and manganese and, therefore, in DEQ's ability to target our limited resources and those of regulated parties on more environmentally beneficial activity.
Documents Relied Upon for Rulemaking	The following documents are available at the websites listed or by contacting Debra Sturdevant at sturdevant.debra@de.state.or.us or at 503-229-6691. *Water Quality Standards Review and Recommendations: Iron and Manganese.* Oregon DEQ, Water Quality Standards and Assessment Section, 2010. (http://www.deq.state.or.us/wq/standards/review.htm) *Quality Criteria for Water.* EPA, 1986. (http://www.epa.gov/waterscience/criteria/library/goldbook.pdf) *Water Quality Criteria.* EPA, 1976. (http://www.epa.gov/waterscience/criteria/library/redbook.pdf)
Requests for Other Options	Pursuant to ORS 183.335(2) (b) (G), DEQ requests public comment on whether other options should be considered for achieving the rule's substantive goals while reducing negative economic impact of the rule on business.
Fiscal and Economic Impact, Statement of Cost Compliance	
Overview	The proposed iron and manganese criteria revisions are shown in the table below. Because the proposed criteria are less stringent, the proposed rule amendments will provide an overall fiscal and economic benefit to both regulated parties and DEQ relative to meeting current criteria. Without the proposed revisions, DEQ and permittee resources would need to spend resources attempting to address the

relatively high natural levels of iron and manganese that occur in some Oregon waters.

DEQ does not expect the criteria changes to result in increased health risks or costs to the public from eating fish or drinking water for the reasons described in more detail in the following section.
The withdrawal of the "water and fish ingestion" criteria for iron and manganese is not expected to cause increase costs for water suppliers. Iron and manganese are naturally occurring earth metals generally present at levels below secondary maximum contaminant levels (MCLs) for drinking water and have not historically presented problems for water suppliers. Should a situation arise in the future where a permitted discharge of iron or manganese causes a water supplier to incur treatment costs, DEQ has the authority through existing narrative water quality standards to regulate that discharge. This would be a more efficient manner to address a rare circumstance than the current statewide numeric criteria.

Proposed Human Health Criteria for Iron and Manganese (µg/l)

Pollutant	Water + Fish Ingestion		Fish Consumption Only	
	Current Criteria	Proposed Criteria	Current Criteria	Proposed Criteria
Iron	300	None	None	None
Manganese	50	None	100	100 Saltwater only

Note: Current criteria are from OAR 340-041-0033, Table 20.

Impacts on the General Public

DEQ does not expect that the general public will incur direct fiscal or economic impacts as a result of the revised criteria because the general public is not directly regulated under the Clean Water Act. In addition, the revisions are not expected to significantly affect the human health risks or costs associated with eating fish or drinking water in Oregon. Impacts to municipal sewage treatment and drinking water treatment works are discussed in the section on local governments.

DEQ's proposal to withdraw criteria for iron and manganese does not present a human health concern given the levels of these metals found in Oregon waters. EPA recommended these criteria to protect against potential taste and laundry staining impacts. There are other alternatives for controlling these affects should they be a problem for water suppliers in Oregon that are more targeted and efficient than retaining these statewide numeric criteria.

Impacts to Small Business (50 or fewer employees – ORS183.310(10))

DEQ does not expect small businesses to be negatively impacted by this rule. Most small businesses in Oregon discharge to a publicly owned treatment works (POTW). Because they do not typically discharge directly to a water body, most small businesses are not required to get an NPDES permit. A POTW with iron or manganese limits in their NPDES permit may in turn place requirements on small businesses in order to limit the amount of iron or manganese a business discharges to the public sewer system. However, because the proposed rule withdraws the water quality criteria for these metals or limits their applicability, the amendment will not lead to additional requirements or permit limits for businesses that discharge to POTWs.

Cost of Compliance on Small Business (50 or fewer employees – ORS183.310(10))

a) Estimated number of small businesses subject to the proposed rule

Very few small businesses are directly subject to these water quality criteria because most small businesses do not have direct discharges to waters of the state and do not receive individual NPDES permits from DEQ. Most small businesses discharge to a POTW.

Approximately 2700 permittees, many of whom would be small businesses, receive general NPDES permits from DEQ. The pollution control actions required under these permits will most likely not change as a result of the proposed revisions to the iron and manganese criteria.

		In most cases, the actions address multiple pollutants, not just one of these two. If a permit does contain requirements specific to iron or manganese, those requirements may be able to be removed. Some businesses are subject to requirements from a POTW under their pretreatment program, including approximately 130 small businesses. DEQ does not have data indicating how many of these businesses receive limits for iron or manganese. However, because the proposal will withdraw criteria for iron and manganese, the number of small businesses subject to pretreatment requirements for these pollutants would either remain unchanged or be reduced.
	b) Types of businesses and industries with small businesses subject to the proposed rule	
	c) Projected reporting, recordkeeping and other administrative activities required by small businesses for compliance with the proposed rule, including costs of professional services	The proposed criteria value changes are not likely to affect the reporting, recordkeeping or other administrative activities required of small businesses for compliance with their NPDES discharge or pretreatment requirements. However, they will no longer be required to conduct these activities related to compliance with iron or manganese criteria unless they discharge to saltwater.
	d) The equipment, supplies, labor, and increased administration required by small businesses for compliance with the proposed rule	The proposed criteria value changes are not likely to affect equipment, labor, supplies or other expenses for small businesses related to compliance with water quality standards. If there is any impact, it would be that fewer businesses will be subject to requirements related to meeting water quality standards.
	e) A description of the manner in which DEQ involved small businesses in the development of this rulemaking	DEQ has met with and received input from a stakeholder workgroup that included business representatives, but not specifically small businesses. A representative from Associated Oregon Industries has participated on this workgroup. In addition, DEQ informed a larger Toxics Stakeholder Group of our intention related to these revisions. That group includes the Oregon Forest Industries Council, the Oregon Farm Bureau, a representative of small woodlot owners, Tribal representatives, commercial fishermen and Oregonians for Food and Shelter.
Impacts on Large Business (all businesses that are not "small businesses" under ORS183.310(10))	Large businesses that discharge directly to Oregon's surface waters are directly regulated through DEQ's water quality permitting program. These businesses must test their wastewater to determine what pollutant concentrations it contains. Businesses that have the potential to cause the water body to exceed water quality standards are subject to regulatory effluent limits that specify the maximum concentration of a pollutant that may be in their discharge. Only those businesses with the potential to cause an exceedance of the criterion are required to regularly monitor throughout their permit term. Under the proposed rule, regulatory effluent limits will not be established for iron and manganese unless the business discharges to saltwater. There are 19 major industrial NPDES permittees in Oregon. At this time, no major industrial dischargers and few minor industrial dischargers in Oregon have effluent limits in their NPDES permits for iron or manganese. Many permittees, however, are being required to collect data. As permits are renewed, DEQ expects that additional permittees would have difficulty meeting the current criteria, particularly those located on water bodies that are listed as water quality impaired for these pollutants, such as the Willamette and Columbia Rivers. The proposed criteria changes will reduce restrictions on permittees that could not meet the iron or manganese criteria.	

Impacts on Local Government	Compliance with the proposed criteria will be less costly for municipal dischargers than the current criteria for these two metals. Local water suppliers that wish to manage their water supplies for taste and laundry staining affects may use the secondary MCLs developed for that purpose as guidance.
Impacts on State Agencies other than DEQ	DEQ does not expect that the criteria revisions will have a fiscal or economic impact on other state agencies.
Impacts on DEQ	The proposed criteria revisions will reduce the resources that would be required for DEQ to permit facilities that cannot feasibly meet the current water quality criteria for iron or manganese. The demand on DEQ resources to address toxics is growing. These revisions will help DEQ focus its efforts on other pollutants with greater potential to impact human health. The proposed criteria revisions will also reduce the DEQ resource demands that would otherwise be required to address the 85 water body segments currently listed as impaired for iron or manganese and in need of a TMDL. DEQ expects that most of these listings will be removed when the impaired waters list is updated. Only water body segments that exceed the aquatic life criterion for iron will remain listed, which is expected to be rare. Again, fewer listings and TMDLs for iron and manganese will allow agency resources to address more important water quality problems and pollutants that have more potential for reduction. Due to the agency's limited resources, it is important for DEQ to be able to align its resources with the potential to achieve instream reduction of pollutants that pose significant environmental or human health risk.
Assumptions	DEQ relied on the best available information to propose these amendments and is confident, based on the sources of information, that the data and information are reasonably true and accurate. DEQ concluded that is it in the interest of the public to expend public and private resources on actions that will result in measurable environmental benefits.
Housing Costs	DEQ has determined that this proposed rulemaking will have no effect on the cost of development of a 6,000 square foot parcel and the construction of a 1,200 square foot detached single family dwelling on that parcel.
Administrative Rule Advisory Committee	DEQ assembled a Toxics Water Quality Standards Rulemaking Workgroup to assist us with the development and evaluation of the proposed rule. This group has been meeting since January, 2009 and will continue to work with DEQ on additional rule provisions until fall of this year.

Debra Sturdevant — Prepared by
Debra Sturdevant — Printed name
11/19/10 — Date

Approved by DEQ Budget Office
LUCIANO GARZA — Printed name
11-22-2010 — Date

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Land Use Evaluation Statement

Rulemaking Proposal
For

Amendments to Oregon Water Quality Standards for Iron and Manganese

1. Explain the purpose of the proposed rules.

The purpose of the proposed rule amendment is to revise Oregon's water quality criteria for iron and manganese established to protect human health. DEQ concludes that the existing criteria as they apply to freshwaters are not necessary to protect human health. The revisions proposed by DEQ also recognize the natural occurrence of these earth metals in Oregon waters. Due to natural background levels, the criteria are infeasible to attain in some locations or require the expenditure of public and private resources that will not result in measurable or significant environmental benefit.

2. Do the proposed rules affect existing rules, programs or activities that are considered land use programs in the DEQ State Agency Coordination (SAC) Program?

Yes____ No__X__

a. If yes, identify existing program/rule/activity:

b. If yes, do the existing statewide goal compliance and local plan compatibility procedures adequately cover the proposed rules?

Yes____ No____ (if no, explain):

c. If no, apply the following criteria to the proposed rules.

Staff should refer to Section III, subsection 2 of the SAC document in completing the evaluation form. Statewide Goal 6 - Air, Water and Land Resources is the primary goal that relates to DEQ authorities. However, other

goals may apply such as Goal 5 - Open Spaces, Scenic and Historic Areas, and Natural Resources; Goal 11 - Public Facilities and Services; Goal 16 - Estuarine Resources; and Goal 19 - Ocean Resources. DEQ programs and rules that relate to statewide land use goals are considered land use programs if they are:

1. Specifically referenced in the statewide planning goals; or

2. Reasonably expected to have significant effects on
   a. resources, objectives or areas identified in the statewide planning goals, or
   b. present or future land uses identified in acknowledged comprehensive plans.

In applying criterion 2 above, two guidelines should be applied to assess land use significance:
- The land use responsibilities of a program/rule/action that involved more than one agency, are considered the responsibilities of the agency with primary authority.
- A determination of land use significance must consider the Department's mandate to protect public health and safety and the environment.

In the space below, state if the proposed rules are considered programs affecting land use. State the criteria and reasons for the determination.

DEQ has previous determined, and LCDC certified, that establishing WQ criteria is not a program affecting land use for purposes of ORS 197.180, with one exception that is not relevant here. The proposed rule merely makes adjustments to existing criteria for three pollutants and it does not alter this analysis.

3. If the proposed rules have been determined a land use program under 2. above, but are not subject to existing land use compliance and compatibility procedures, explain the new procedures the Department will use to ensure compliance and compatibility.

Not applicable