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RMRS Rocky Mountain Remediation Services, L L C
protecting the environment

INTEROFFICE MEMORANDUM

DATE October 10, 1995

TO J A Ledford, ER Projects Group, Bldg 080, X8673

FROM K C London, Environmental Projects, Bldg 080, X8585 KL

SUBJECT GROUNDWATER STANDARDS FOR OU 4 ARARs - KCL-005-95

The following information comes from a phone conversation with Bob Fiehweg and David Ward Bob is with RMRS and David is with Safe Sites of Colorado Both have experience with water standards at RFETS

The State standards for groundwater vary depending on the use of that groundwater The previous, February, 1995, proposed OU 4 remedy used a residential scenario for evaluating risk, that would suggest that the drinking water standards would be the appropriate values to use for the aquifer below OU 4 Standards are attached

The recent shift away from a residential scenario at OU 4 for risk assessment suggests that a similar shift should occur for groundwater standards For an open space scenario, the use for the aquifer would be surface water recharge The surface water standards for Walnut Creek would, therefore, need to be protected

The recharge use would allow us to model the groundwater as it contributes to the Walnut Creek drainage, including flow from other Walnut Creek basin sources Based on the standards set for Walnut Creek discharge, the model would back-calculate groundwater standards for the OU 4 contribution The approach creates a larger and more complex modeling effort than we had previously envisioned, but would be likely to establish higher concentration limits for the OU 4 groundwater

David has talked to various people in the State on the groundwater use standards He feels the State groundwater expert agrees with the above interpretation but that the State RCRA/CERCLA people don't understand the logic and dislike both the added complexity and the higher concentration limits David has the impression that the approach would yield many "no further actions"

The site wide groundwater management plan being developed in John Law's group is expected to carry the groundwater use concept forward and obtain regulator agree[illegible] Any modeling you perform and commitments you make would benefit from coordin[illegible] with that effort

For the immediate OU 4 groundwater modeling effort, the drinking water use standards may be adequate for screening We may want to have a discussion with John Law's people to understand the issues more clearly and possible benefit to the OU 4 remedy

ADMIN RECORD

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WATER QUALITY
METALS STANDARDS
(Concentrations in ug/L)

Shaded areas indicate RFETS site specific standards and Statewide standards which are RFETS numeric standards

Metal	Aquatic Life	Agriculture	Drinking Water Supply	Water + Fish	Addit Segment 4/5 Standards
Aluminum	Acute = 750 (d) Chronic = 87 (d)				
Antimony			6 0 (TR) (30 day average)	6 0 (d)	
Arsenic	Acute = 360 (d) Chronic = 150 (d)	100 (TR) (30 day average)	50 (TR) (daily maximum)		
Barium			1,000 (TR) (daily maximum)		
Beryllium		100 (TR) (30 day average)	4 (TR) (30 day average)		
Cadmium	Acute = TVS = 14.8 (d) Chronic = TVS = 1.5 (d)	10 (TR) (30 day average)	5 (TR) (daily maximum)		
Chromium III	Acute = TVS = 2327 (d) Chronic = TVS = 277 (d)	100 (TR) (30 day average)	50 (TR) (daily maximum)		
Chromium VI	Acute = 16 (d) Chronic = 11 (d)	100 (TR) (30 day average)	50 (TR) (daily maximum)		
Copper	Acute = TVS = 24.8 (d) Chronic = TVS = 6 (d)	200 (TR)	1,000 (TR) (30 day average)		23 (TR) Segment 5 Temporary Modification
Iron	Chronic = 1,000 (TR)		300 (d) (30 day average)		16,200 (TR) Segment 5 Temporary Modification
Lead	Acute = TVS = 170.8 (d) Chronic = TVS = 6.5 (d)	100 (TR) (30 day average)	50 (TR) (daily maximum)		23 (TR) Segment 5 Temporary Modification
Manganese	Chronic = 1,000 (d)	200 (TR) (30 day average)	50 (d) (30 day average)		Chronic = 1,000 (TR) 560 (d) Segment 5 Temporary Modification

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Metal	Aquatic Life	Agriculture	Drinking Water Supply	Water + Fish	Addl Segment 405 Standards
Mercury	Acute = 2 4 (d) Chronic = 0 1 (d) Fish = 0.01 (total)		2 0 (TR) (daily maximum)		
Nickel	Acute = TVS = 1,210 (d) Chronic = TVS = 125.4 (d)	200 (TR) (30 day average)	100 (TR) (30 day average)		
Selenium	Acute = 135 (d) Chronic = 17 (d)	20 (TR) (30 day average)	50 (TR) (30 day average)		Chronic = 10 (TR)
Silver	Acute = TVS = 3.5 (d)		100 (TR) (daily maximum)		
Thallium	Chronic = 15 (d)		0 5 (TR) (30 day average)	0 5 (d)	
Uranium	Acute = 3,563 (d) Chronic = 2,226 (d)				
Zinc	Acute = TVS = 159 (d) Chronic = TVS = 144 (d)	2,000 (TR) (30 day average)	5,000 (TR) (30 day average)		350 (TR) Segment 5 Temporary Modification

d = dissolved
TR = Total Recoverable
TVS = Table Value Standard calculated using the average hardness of 143 mg/l
Temporary modifications for Big Dry Creek, Segment 5 only, effective until April 1, 1996

WATER QUALITY
ORGANIC STANDARDS

	PARAMETER ORGANICS	Segment 4/5 Acute Standard ug/l Aquatic Life Std	Segment 5 Chronic Standard ug/l see footnotes	Segment 4 Chronic Standard ug/l see footnotes	footnotes
	ACENAPHTHENE	1,700	520	520	3
	ACENAPHTHYLENE		0 0028	0 0028	4 5
	ACROLEIN	68	21	21	3
	ACRYLONITRILE	7,500	0 058	0 058	4,5
	ALACHLOR		2	2	2
	ALDICARB		10	10	2
	ALDICARB SULFONE		1	1	2
	ALDICARB SULFOXIDE		4	4	2
	ALDRIN	1 5	0 00013	0 00013	4,5
*	ANTHRACNE (PAH)		0 0028	0 0028	5
	ATRAZINE		3	3	2,5
	BENZENE	5,300	1	1	2,4
	BENZIDINE	2,500	0 00012	0 00012	4,5
*	BENZO(a)ANTHRACENE		0 0028	0 0028	5
*	BENZO(a)PYRENE		0 0028	0 0028	5
*	BENZO(b)FLUORANTHENE		0 0028	0 0028	5
*	BENZO(ghi)PERYLENE		0 0028	0 0028	5
*	BENZO(k)FLUORANTHENE		0 0028	0 0028	5
*	BROMODICHLOROMETHANE		0 3	0 3	5
*	BROMOFORM		4	4	5
	BUTYL BENZYL PHTHALATE		3,000	3,000	4
	CARBOFURAN		36	36	2
	CARBON TETRACHLORIDE	35,200	18	0 25	4,6
	CHLORDANE	1 2	0 00058	0 00058	4,5
	CHLOROBENZENE		100	100	2,4
*	CHLOROETHYL ETHER (BIS-2)		0 03	0 03	5
*	CHLOROFORM	28,900	6 0	6 0	5
	CHLOROLSPOPROPYL ETHER (BIS-2)		1,400	1,400	4
	4-CHLORO-3-METHYLPHENOL	30	30	30	3
*	CHLOROMETHYL ETHER (BIS)		0 0000037	0 0000037	5

*=Site specific standard is more restrictive than any statewide standard
1=Statewide agricultural standard
2=Statewide water supply standard
3=Statewide aquatic standard
4=Statewide human health based water + fish standard applicable to aquatic life segments
5=RFETS site specific standard
6=Segment 5 temporary modification is effective until April 1, 1996

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PARAMETER ORGANICS	Segment 4/5 Acute Standard ug/l Aquatic Life Std	Segment 5 Chronic Standard ug/l see footnotes	Segment 4 Chronic Standard ug/l see footnotes	footnotes
CHLORONAPTHALENE 2	2,300	620	620	3
CHLOROPHENOL 2	4,380	2,000	2,000	4
CHLOROPYRIFOS	0 083	0 041	0 041	3
* CHRYSENE		0 0028	0 0028	5
DDD 4'4	0 6	0 00083	0 00083	4
DDE 4'4	1,050	0 001	0 001	4
DDT 4'4	0 55	0 00059	0 00059	4
DALAPON		200	200	2
DEMETON		0 1	0 1	3,5
* DIBENZO(a,h)ANTHRACENE		0 0028	0 0028	5
1,2 DIBROMO-3-CHLOROPROPANE		0 2	0 2	2
* DIBROMOCHLOROMETHANE		6	6	5
DICHLOROBENZENE 1,2		620	620	2,4
DICHLOROBENZENE 1,3		400	400	4
DICHLOROBENZENE 1,4		75	75	4
DICHLOROBENZIDINE		0 039	0 039	4,5
DICHLOROETHANE 1,2	118,000	0 4	0 4	2,4
DICHLOROETHYLENE 1,1		0 057	0 057	4
DICHLOROETHYLENE 1,2-CIS		70	70	2
DICHLOROETHYLENE 1,2-TRANS		100	100	2,4
DICHLOROMETHANE		5	5	2,4
DICHLOROPHENOL 2,4	2,020	21	21	2,4
DICHLOROPHENOXYACETIC ACID (2,4-D)		70	70	2,5
DICHLOROPROPANE 1,2	23,000	0 56	0 56	2,4
DICHLOROPROPYLENE 1,3	6,060	10	10	4
DIELDRIN	1 3	0 00014	0 00014	4,5
DIETHYL PHTHALATE		23,000	23,000	4
DIISOPROPYL METHYL PHOSPHONATE		8	8	2
DIMETHYL PHTHALATE		313,000	313,000	4
DIMETHYLPHENOL 2,4	2,120	2,120	2,120	4
DINITRO-O-CRESOLE		13	13	4
DINITROPHENOL 2,4		14	14	2,4
DINITROTOLUENE 2,4		0 11	0 11	4
DINITROTOLUENE 2,6	33	230	230	3
DINOSEB		7	7	2

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DI(2-ETHYLHEXYL) ADIPATE		400	400	2
DI(2ETHYLHEXYL) PHTHALATE		6	6	2
DIQUAT		20	20	2
DIOXIN (2,3,7,8-TCDD)	0 01	0 000000013	0 000000013	4,5
DIPHENYLHYDRAZINE 1,2	270	0 04	0 04	4
ENDOSULFAN	0 11	0 056	0 056	3,5
ENDOSULFAN SULFATE		110	110	4
ENDOTHALL		100	100	2
ENDRIN	0 09	0 0023	0 0023	5
ENDRIN ALDEHYDE		0 2	0 2	2,4
ETHYLBENZENE	32,000	680	680	2,4
ETHYLHEXYL PHTHALATE (BIS-2)		1 8	1 8	4
ETHYLENE DIBROMIDE		0 05	0 05	2
* FLUORANTHENE (PAH)	3,980	42	42	5
* FLUORENE		0 0028	0 0028	5
GLYPHOSATE		700	700	2
GUTHION		0 01	0 01	3,5
HEPTACHLOR	0 26	0 00021	0 00021	4,5
HEPTACHLOR EPOXIDE	0 26	0 0001	0 0001	4
* HEXACHLOROBENZENE		0 00072	0 00072	5
HEXACHLOROBUTADIENE	90	0 45	0 45	4,5
HEXACHLOROCYCLOHEXANE, ALPHA (BHC)		0 0039	0 0039	4,5
HEXACHLOROCYCLOHEXANE, BETA (BHC)		0 014	0 014	4,5
HEXACHLOROCYCLOHEXANE, GAMMA (BHC)	1 0	0 019	0 019	4,5
HEXACHLOROCYCLOHEXANE, TECHNICAL (BHC)	100	0 012	0 012	4,5
HEXACHLOROETHANE	980	1 9	1 9	4,5
HEXACHLOROROCYCLOPENTADIENE	7	5	5	3
* INDENO(1,2,3-cd)PYRENE		0 0028	0 0028	5
ISOPHORONE		8 4	8 4	4
MALATHION		0 1	0 1	3,5
METHOXYCHLOR		0 03	0 03	3,5
METHYL BROMIDE		48	48	4,5
METHYL CHLORIDE		5 7	5 7	4,5
* METHYLENE CHLORIDE		4 7	4 7	5
MIREX		0 001	0 001	3,5

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*	NAPHTHALENE (PAH)	2,300	0 0028	0 0028	5
	NITROBENZENE	27,000	3 5	3 5	2,4
	NITROSO-DI-n-PROPYLAMINE N		0 005	0 005	4
	NITROSODI-BUTYLAMINE-N		0 0064	0 0064	4,5
	NITROSODIETHYLAMINE-N		0 0008	0 0008	4,5
	NITROSODIMETHYLAMINE-N		0 00069	0 00069	4,5
*	NITROSODIPHENYLAMINE-N		4 9	4 9	5
	NITROSOPYRROLIDINE N		0 016	0 016	4,5
	OXAMYL (VYDATE)		200	200	2
*	PARATHION		0 4	0 4	5
	PCBs	2 0	0 000044	0 000044	4,5
	PENTACHLOROBENZENE		6	6	4
	PENTACHLOROPHENOL	exp[1 005(pH)-4 83]	5 7	5 7	4
	PHENANTHRENE		0 0028	0 0028	4,5
	PHENOL	10200	2560	2560	
	PICLORAM		500	500	2
*	PYRENE		0 0028	0 0028	5
	SIMAZINE		4	4	2,5
	STYRENE		100	100	2
	TETRACHLOROBENZENE 1,2,4,5		2	2	2
	TETRACHLOROETHANE 1,1,2,2		0 17	0 17	4,5
	TETRACHLOROETHYLENE		76	0 8	4,5,6
	TOLUENE	5,280	1,000	1,000	2,4
	TOXAPHENE	18,500	0 0002	0 0002	3,5
	TRICHLOROBENZENE 1,2,4	250	50	50	3
	TRICHLOROETHANE 1,1,1	0 73	200	200	2,4
	TRICHLOROETHANE 1,1,2		0 6	0 6	4,5
	TRICHLOROETHYLENE	45,000	66	2 7	4,6
	TRICHLOROPHENOL 2,4,5		700	700	2,4,5
	TRICHLOROPHENOL 2,4,6		2 0	2 0	2,5
	TRICHLOROPHENOXYPROPIONIC (2,4,5-TP)		50 0	50 0	2,4
	TRIHALOMETHANES (TOTAL)		100 0	100 0	2,4
	VINYL CHLORIDE		2	2	2
	XYLENES (TOTAL)		10,000	10,000	2

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WATER QUALITY
PHYSICAL AND BIOLOGICAL
STANDARDS

Physical and Biological Standards are RFETS site specific standards

PARAMETER	Segment 5	Segment 4
MINIMUM DISSOLVED OXYGEN (mg/l)	5 0	5 0
pH (s u)	6 5-9 0	6 5-9 0
FECAL COLIFORMS PER 100 ML	2000	2000

WATER QUALITY
INORGANIC STANDARDS
(Concentrations in ug/L)

PARAMETER	Segment 5	Segment 4	Footnotes
UNIONIZED AMMONIA March through June	1800	100	5,6
UNIONIZED AMMONIA July through February	700	100	5,6
Note Statewide water supply unionized ammonia standard of 0 5 ug/l applied at water supply intake			
BORON	750	750	5
CHLORIDE	250000	250000	5
CHLORINE (ACUTE)	19	19	5
CHLORINE (CHRONIC)	11	11	5
CYANIDE (FREE)	5	5	5
FLUORIDE	2000	2000	2
NITRATE	10000	10000	5
NITRITE	500	500	5
SULFATE	250000	250000	5
SULFIDE (AS H2S)	2	2	5

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Note Shaded area deleted effective April 10, 1995 This standard was removed from Segment 5 and the portion of Walnut Creek below Pond A-4 to the border of the Site.

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WATER QUALITY
RADIONUCLIDE STANDARDS
(Concentrations in pCi/L)

All radionuclide standards are RFETS site specific standards

Parameter	Woman Creek	Walnut Creek
Gross Alpha	7	11
Gross Beta	5	19
Americium	0 05	0 05
Curium 244	60	60
Neptunium 237	30	30
Plutonium	0 05	0 05
Uranium	5	10
Uranium 233 &234		
Uranium 238		
Cesium 134	80	80
Radium 226 & 228	5	5
Strontium 90	8	8
Thorium 230 & 232	60	60
Tritium	500	500

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