Table 2. Chemical Agent Multi Media/Toxicity Standards Status Table: Existing and proposed criteria as of 3/19/01 POC: V. Hauschild, USACHPPM, 410-436-5213

Media	Standard Name	Population	Exposure Scenario	H/HD/HT (Mustard)	GA (Tabun)	GB (Sarin)	GD/GF	VX	Lewisite	NOTES/Status
WATER	**FDWS** (Field Drinking Water Standards) ug/L	soldier	safe for for up to 7 days:	~~200~~ [a]	~~20~~ [a]	~~20~~ [a]	~~20~~ [a]	~~20~~ [a]	~~200~~ [a]	1986 version is being superceded; new values shown have been endorsed by DoD (see memo ref); Currently revised TBMed577 is a DRAFT dated May 99; final publication date TBD; *Nerve agent standards based on most toxic since field detection can't differentiate-specific standards include tabun-140/46 sarin- 28/9.3; soman -12/4; VX - 15/5.
			Normal/humid climate: 5 L/day	(140) [b]	(12* [b])	(12* [b])	(12* [b])	(12* [b])	(80 [b])	
			Dry climate: 15 L/day	(47 [b])	(4* [b])	(4* [b])	(4* [b])	(4* [b])	(27 [b])	
SOIL (mg/kg) (ppm)	**HBESL-Residential** (Health-Based Environmental Screening Level)	adults and children	daily exposure, lifetime	0.01 [c,d]	2.8 [c,d]	1.3 [c,d]	0.22 [c,d]	0.042 [c,d]	0.3 [c,d]	-EPA Region IX PRG soil risk assessment methods used; -Uses GPLs and chronic toxicity values cited below (RfD, CSF, IUR) -Endorsed by DA (ESOH); May 99
	HBESL-Industrial (Health-Based Environmental Screening Level)	adults	frequent exposures 250 days/ yr. for 30 years	0.3 [c,d]	68 [c,d]	32 [c,d]	5.2 [c,d]	1.1 [c,d]	3.7 [c,d]	
WASTE	**$HWCL_{sol}$ [e] *or* LDR_{sol} [f]** (solid hazardous waste) (mg/kg)	civilian/ DoD worker	possible occasional exposure at HW treatment facility	6.7 [e,f]	680 [e,f]	320 [e,f]	52 [e,f]	10 [e,f]	37 [e,f]	- EPA Reg IX PRG risk risk assessment methods used; - Uses GPLs and chronic toxicity values (RfD, CSF, IUR) -proposed in a Department of Army proposed rule presented to the State of Utah and Oct 2000 CHPPM memo to PMCD -to date no official Utah State response received; -Waste values not represented in any final report policy or guidance document.
	$HWCL_{Liq}$ [e] *or* LDR_{Liq} [f] (liquid hazardous waste) (mg/L)	civilian/ DoD worker	possible occasional exposure at HW treatment facility	0.7 [e,f]	20 [e,f]	8.3 [e,f]	0.3 [e,f]	0.08 [e,f]	3.3 [e,f]	
	NHWCL [e] *or* Solid Waste Exemption Levels [f] (mg/kg or ppm)	civilian/ DoD worker	at a non-HW land disposal facility, possible occasional exposures	0.3 [e,f]	68 [e,f]	32 [e,f]	5.2 [e,f]	1.1 [e,f]	3.7 [e,f]	
Chronic Toxicity Criteria	**RfD** (Reference Dose) (mg/kg/day)	civilian population	chronic (lifetime) ingested dose that will produce adverse health effects	0.000007 g,h,l, j	0.00004 g,h,l, j	0.00002 g,h,l, j	0.000004 g,h,l, j	0.0000006 g,h,l, j	0.0001 g,h,l, j	- NRC/COT (1999) gave general endorsement of values ; outstanding issues (e.g. re: Lewisite) were addressed in Final DA OTSG endorsement letter of final RfDs (dated 16 Feb 2000)
	CSF (Cancer Slope Factor) $(mg/kg/day)^{-1}$	civilian population	represents the potency of the agent by ingestion to cause increase cancer risk.	7.7 [g, c]	Not determined to be a carcinogen					-The NRC/1999 endorsed a less conservative HD Slope Factor of $(1.6\ mg/kg/day)^{-1}$; DA OTSG (Feb 00) has currently endorsed use of the 7.7
	IUR (Inhalation Unit Risk) $(ug/m^3)^{-1}$	civilian population	represents the potency of the agent by inhalation to cause increased cancer risk	4.1×10^{-3} [k]						Table 20 HD HCD, Nov 00

RE:**Table 2. Chemical Agent Multi Media/Toxicity Standards Status Table: Existing and proposed criteria as of 3/19/01 POC: V. Hauschild, USACHPPM, 410-436-5213**

NOTES: ( ) Numbers in parentheses are from draft documents

GREEN Numbers in Green are currently documented in official Army regulation/policy/or through DA Headquarter endorsement

BLUE Numbers have been developed/endorsed by non-DoD federal proponents for Army and non-Army use

RED Numbers are still officially used/endorsed by Army/other approving entity source **but** revisions are proposed/underway

BLACK Numbers black are final technical values but are not officially approved for implementation through a proponent agency

REFERENCES:

[a] TB Med 577, *Sanitary Control and Surveillance of Field Water Supplies*, March 1986.

[b] TB Med 577, *Sanitary Control and Surveillance of Field Water Supplies*, final DRAFT May 1999 (final/official publication date TBD) and Memorandum, DASG-HS-PE, 16 Apr 1997, Subject: Tri-Service Field Water Standards for Nerve Agents.

[c] *Health-Based Environmental Screening Levels for Chemical Warfare Agents*, USACHPPM/ORNL Technical Report, March 99.

[d] Memorandum, Headquarters Department of the Army, Office of the Assistant Secretary for Installations, Logistics, and Environment, SUBJ: Derivation of Health-Based Environmental Screening Levels (HBESLs) for Chemical Warfare Agents, May 28 1999.

[e] Memorandum, Department of the Army – Center for Health Promotion and Preventive Medicine; MCHB-TS-EES; SUBJ: Response to State of Oregon Comments on the Utah Chem,ical Agent Rule (UCAR), 23 October 2000; NOTE: This response includes USACHPPM Information Paper "***Management Criteria for Chemical Warfare Agent (CWA)-Contaminanted Waste and Media***", dated 10 October 00 as well as USACHPPM Technical Paper: "***Chemical Warfare Agent Health-Based Waste Control Limits***", dated September 2000.

[f] U.S. Army –Proposed Utah Chemical Agent Rule (UCAR), May 1999 (Volume 1, Section XI. Development of Health-Based Waste Management Concentration Levels."

[g] Memorandum, MCHB-CG-PPM, Chronic Toxicological Criteria for Chemical Warfare Compounds, 16 February 2000.

[h] Review of the U.S. Army's Health Risk Assessments for Oral Exposure to Six Chemical-Warfare Agents, *National Research Council, National Academy Press, WashDC, 1999*

[i] Opresko et. al, *Chemical Warfare Agents: Estimating Oral Reference Doses, Review of Environmental Contamination and Toxicology*, Vol 156, pp 1-183, 1998

[j] DA 1996, *Interim Chronic Toxicological Criteria for Chemical Warfare Compounds*, Memorandum MCHB-DC-C, 4 June 1996, Office of the Surgeon General.

[k] CHPPM Technical Report: *Evaluation of Airborne Exposure Limits for Sulfur Mustard (HD): Occupational and General Population Exposure Criteria,* Technical Report 47-EM-3767-00**,** November, 2000

ADDITIONAL USEFUL INFORMATION REGARDING CWA BREAKDOWN PRODUCTS:

Munro et al.; *The Sources, Fate, and Toxicity of Chemical Warfare Agent Degradation Products,* Environmental Health Perspectives, Volume 107, Number 12, December 1999 pp933-974.