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TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

OFFICE CORRESPONDENCE

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NASHVILLE ENVIRONMENTAL RECEIVED
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TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION FIELD OFFICE

DATE: December 14, 1993

TO: Field Offices/Solid Waste Management Staff

FROM: Tom Tiesler

SUBJECT: Cleanup Standards for Non-UST Petroleum Releases
Revised from August 26, 1992

This policy replaces a previous one dated August 26, 1992 establishing standards for cleanup of petroleum contaminated soils from non-UST facilities. While the Division of Solid Waste Management is not actively regulating site remediation of this type, we are sometimes called upon to provide guidance on cleanup levels and/or project oversight.

Of special note in any industrial or other non-UST facility, is the possible presence of non-petroleum contaminants. Such contaminants, if present, may determine cleanup levels at a given site.

For petroleum products the following guidelines are established for site cleanup.

SOIL CLEANUP LEVELS
WHERE WATER TABLE AQUIFER IS A DRINKING WATER SOURCE

	BTX	TPH
Coarse Soils (USCS Types) GW, GP, GM, SW, SP or permeability result $>10^{-4}$ cm/sec	10	100
Silty Soils (USCS Types) SM, SC, GC or permeability result between 10^{-4} to 10^{-6} cm/sec	50	250
Fine (clay) Soils (USCS Types) ML, CL, OL, MH, CH, OH or permeability result $<10^{-6}$ cm/sec	100	500

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SOIL CLEANUP LEVELS
WHERE WATER TABLE AQUIFER IS NOT A DRINKING WATER SOURCE

	BTX	TPH
Coarse Soils (USCS Types) GW, GP, GM, SW, SP or permeability result $>10^{-4}$ cm/sec	50	250
Silty Soils (USCS Types) SM, SC, GC or permeability result between 10^{-4} to 10^{-6} cm/sec	250	500
Fine (clay) Soils (USCS Types) ML, CL, OL, MH, CH, OH or permeability result $<10^{-6}$ cm/sec	500	1000

Analytical Methods

The following discussion provides guidance on the type of analytical method to be used to obtain proper results (concentrations) of contamination in soil for BTX and TPH.

For investigations involving petroleum products, the two primary types of analyses performed are Benzene, Toluene, and Xylene (BTX) and Total Petroleum Hydrocarbons (TPH). To prevent variances of methods used for analyses of this type, specific methods shall be used for the analysis of these contaminants.

When analyzing soil samples for Total BTX, the laboratory shall use Test Methods for Evaluating Solid Waste, commonly known as SW-846. The purge and trap procedures for the soil samples in Method 5030 shall be followed. The actual constituent analysis using gas chromatography with a photoionization detector shall follow Method 8020. The level of Total BTX reported as the sum of Benzene, Toluene, Ortho-Xylene, Meta-Xylene, and Para-Xylene found in the sample as well as the concentration of the individual compounds must be reported. The practical quantitation limit for any individual constituent using this method is 0.002 parts per million for low level soil samples. All results shall be reported in parts per million.

Analysis of samples for TPH is more involved. There are three methods that are used depending on the type of hydrocarbon involved.

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1. ~~The~~ For analysis of hydrocarbon mixtures such as gasoline or other low boiling hydrocarbons (70°-180°F), the Gasoline Range Organics Method shall be used.

2. For analysis of high boiling point hydrocarbon mixtures (180°-450°F) such as diesel fuel, kerosene, fuel oil #2, etc., the Diesel Range Organics Method shall be used.

3. For analysis of heavy hydrocarbon mixtures (boiling point of >450°F) such as motor oil, used oil, etc., then either Standard Methods of Analysis Method 503 E or Methods of Analysis of Water and Wastes Method 418.1 must be used.

A review of the type of petroleum stored at the site shall be performed to determine which analytical method or methods shall be used for TPH analysis. Refer to the table below for assistance.

1.	Boiling points between 70°-180°F (e.g. Gasoline)	Gasoline Range Organic Method
2.	Boiling points between 180°-450°F (e.g. Diesel, Kerosene, etc.)	Diesel Range Organics Method
3.	A mixture of products with one product having a boiling point between 70°-180°F and one product having a boiling point between 180°-450°F (Gasoline & Diesel)	Gasoline Range Organics and Diesel Range Organics Method
4.	Hydrocarbon type unknown	Gasoline Range Organics and Diesel Range Organics Method
5.	Boiling points > 450°F (e.g. Used Oil)	Method 503 E or Method 418.1

Most waste oil/motor oil UST sites or spills are separate areas. If waste oil is in the same tank pit or spill site as the gasoline and/or diesel at a site, then an appropriate combination of analytical methods shall be required. If samples must be analyzed using both the Gasoline Range Organics Method (GRO) and the Diesel Range Organics Method (DRO), then the results of each analysis shall be summed (GRO + DRO) and reported as Total Petroleum.

In those situations where the type of hydrocarbon stored is unknown or both gasoline and diesel products were stored, the samples must be analyzed using both the Gasoline Range Organics Method and the Diesel Range Organic Method with the results summed to determine the TPH level.

The Gasoline Range Organics Method has a practical quantitation limit of 5 PPM limit for soil samples. The Diesel Range Organics Methods has a practical quantitation limit of 4 PPM for soil samples.

Ground Water

Ground water monitoring wells must be installed to determine groundwater contamination, unless an exemption is granted based on the responsible party's demonstration that ground water monitoring is not needed.

For petroleum products, the following guidelines are established for ground water cleanup.

GROUND WATER CLEANUP LEVELS

Water Table Aquifer	Benzne Level	Total Petroleum Hydrocarbon Level
Drinking Water Source	0.005 PPM	0.100 PPM
Non-Drinking Water Source	0.070 PPM	1.0 PPM

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

National Primary

Drinking Water Regulations

The Safe Drinking Water Act (SDWA), as amended in 1986, requires EPA to publish Maximum Contaminant Level Goals (MCLGs) for contaminants which, in the judgment of the Administrator, may have any adverse effect on the health of persons and which are known or anticipated to occur in public water systems. MCLGs are to be set at a level which no known or anticipated adverse effects on the health of persons occur and which allow an adequate margin of safety.

At the same time EPA publishes an MCLG, which is a non-enforceable health goal, it must also promulgate a National Primary Drinking Water Regulation (NPDWR) which includes either (1) a Maximum Contaminant Level (MCL), or (2) a required treatment technique. A treatment technique may be set only if it is not economically or technologically feasible to ascertain the level of a contaminant. An MCL must be set as close to the MCLG as feasible. Under the SDWA, "feasible" means feasible with the use of the best technology, treatment techniques, and other means which the Administrator finds are available, after examination for effectiveness under field conditions and not solely under laboratory conditions (taking cost into consideration). NPDWRs also include monitoring, analytical and quality assurance requirements, and specifically, criteria and procedures to assure a supply of drinking water which dependably complies with such MCLs.

DEVELOPMENT OF MCLGs:

MCLGs are set at concentration levels at which no known or anticipated adverse health effects would occur, allowing for an adequate margin of safety. Establishment of a specific MCLG depends on the evidence of carcinogenicity from drinking water exposure or the Agency's noncarcinogenic reference dose (RfD), which is calculated for each specific contaminant.

From the RfD, a drinking water equivalent level (DWEL) is calculated by multiplying the RfD by an assumed adult body weight (generally 70 kg) and then dividing by an average daily water consumption of 2 liters per day. The DWEL assumes the total daily exposure to a substance is from drinking water exposure. The MCLG is determined by multiplying the DWEL by the percentage of the total daily exposure contributed by drinking water, called the relative source contribution (RSC). Generally, EPA assumes that the RSC from drinking water is 20% of the total exposure, unless other exposure data for the chemical are available.

For chemicals suspected as carcinogens, the assessment for nonthreshold toxicants consists of the weight of evidence of carcinogenicity in humans. The objectives of the assessment are (1) to determine the level or strength of evidence that the substance is a human or animal carcinogen and (2) to provide an upperbound estimate of the possible risk of human exposure to the substance in drinking water. A summary of EPA's cancer classification scheme is:

Group A - Known human carcinogen
Group B - Probable human carcinogen
Group C - Possible human carcinogen
Group D - Not classifiable
Group E - No evidence as human carcinogen

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Establishing the MCLG for a chemical is generally accomplished in one of three ways depending on its categorization. Each contaminant is analyzed for evidence of carcinogenicity via ingestion. In most cases, the Agency places Group A and B contaminants into Category I, Group C into Category II, and Group D and E into Category III. However, where there is additional information on cancer risks from drinking water ingestion, additional scrutiny is conducted which may result in placing the contaminant into a different category.

EPA's policy is to set MCLGs for Category I contaminants at zero. The MCLG for Category II contaminants is calculated by using the RfD/DWEL/RSC approach with an added margin of safety (usually 10-fold) to account for cancer effects or is based on a cancer risk range of 10^{-5} to 10^{-6} when non-cancer data are inadequate for deriving a RfD. MCLGs for Category III contaminants are calculated using the RfD/DWEL/RSC approach.

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DEVELOPMENT OF MCLs:

The SDWA directs EPA to set the MCL as close to the MCLG as is feasible. Based on the statutory directive for setting MCLs, EPA derives MCLs based on an evaluation of (1) the availability and performance of various technologies for removing the contaminant, (2) the costs of applying these technologies, and (3) the ability of laboratories to measure accurately and consistently the level of the contaminant with available analytical methods. Because compliance with the MCL is determined by analysis with approved analytical techniques, the ability to analyze consistently and accurately for a contaminant at the MCL is important to enforce a regulatory standard. This factor is critically important in determining the MCL for contaminants for which EPA sets the MCLG at zero, a number which by definition can be neither measured nor attained. Limits of analytical detection require that the MCL be set at some level greater than the MCLG for these contaminants.

EPA also evaluates the health risks that are associated with various contaminant levels in order to ensure that the MCL adequately protects the public health. For drinking water contaminants, EPA sets as a goal a risk range goal of 10^{-4} to 10^{-6} excess individual risk for carcinogens during a lifetime exposure (arsenic is one exception to this risk range). This policy is consistent with other EPA regulatory programs that generally target this range using conservative models that are not likely to underestimate the risk. Usually the MCLs for noncarcinogenic contaminants are set at the MCLG. Since the underlying goal of the SDWA is to protect the public from adverse effects due to drinking water contaminants, EPA seeks to ensure that the health risks associated with MCLs for all contaminants are not significant.

Additional information on this subject matter can be found in Part 141 of the Code of Federal Regulations (CFR) and the January 30, 1991, Federal Register (EPA, National Primary Drinking Water Regulations; Final Rule).

Part 143 of the CFR discusses EPA's National Secondary Drinking Water Regulations (NSDWRs). NSDWRs control contaminants in drinking water that primarily affect the aesthetic qualities relating to the public acceptance of drinking water. At considerably higher concentrations of contaminants, health implications may also exist as well as aesthetic degradation. The regulations are not Federally enforceable but are intended as guidelines for the States.

The NSDWRs represent reasonable goals for drinking water quality. The States may establish higher or lower levels which may be appropriate dependent upon local conditions such as unavailability of alternate source waters or other compelling factors, provided that public health and welfare are not adversely affected.

Provided in the following table is an up-to-date list of all of EPA's MCLs and MCLGs, along with all of EPA's proposed MCLs, MCLGs, and Secondary MCLs. This table will be updated as necessary and the date in the top left hand corner should be checked for time of printing.

A copy of this table will be made available through Region IV's library. If you have any comments or questions about this table please call Glenn Adams at 404/347-3866.

CURRENT and PROPOSED MCLs, MCLGs, and SMCLs

CHEMICAL	MCL (ppm)	MCLG (ppm)	SMCL (ppm)
INORGANICS			
Aluminum (1/91)			0.05-0.2
Antimony (7/92)	0.006	0.006	
Arsenic (NPDWR)	0.050		
Asbestos (1/91)	7 million fibers/liter (>10 um)		
Barium (7/91)	2	2	
Beryllium (7/92)	0.004	0.004	
Cadmium (1/91)	0.005	0.005	
Chloride (NSDWR)			250
Chromium (1/91)	0.1	0.1	
Color (NSDWR)			15 color units
Copper (7/91)	TT	1.3	
Corrosivity (NSDWR)			Noncorrosive
Cyanide (7/92)	0.2	0.2	
Fluoride (4/86)	4.0		2.0
Foaming Agents (NSDWR)			0.5
Iron (NSDWR)			0.3
Lead (6/91)	TT	0	
(6/90)	0.015 (Action Level)		
Manganese (NSDWR)			0.05
Mercury (1/91)	0.002	0.002	
Nickel (7/92)	0.1	0.1	
Nitrite (as N) (1/91)	1	1	
Nitrate (as N) (1/91)	10	10	
Total (as N) (1/91)	10	10	
Odor (NSDWR)			3 threshold odor #
pH (NSDWR)			6.5 - 8.5
Selenium (1/91)	0.05	0.05	
Silver (1/91)			0.1
Sulfate (NSDWR)			250
Sulfate (7/90)	*400/500	*400/500	
Thallium (7/92)	0.002	0.0005	
Total Dissolved Solids (NSDWR)			500
Zinc (NSDWR)			5
ORGANICS			
Acrylamide (1/91)	TT	0	
Alachlor (1/91)	0.002	0	
Aldicarb (5/92)	Deferred		
Aldicarb sulfone (5/92)	Deferred		
Aldicarb sulfoxide (5/92)	Deferred		
Atrazine (1/91)	0.003	0.003	
Benzene (7/87)	0.005	0	
Benzo(a)pyrene (7/92)	0.0002	0	
Carbofuran (1/91)	0.04	0.04	
Carbon Tetrachloride (7/87)	0.005	0	
Chlordane (1/91)	0.002	0	
2,4-D (1/91)	0.07	0.07	

* - Proposed MCL and MCLG

CHEMICAL	MCL (ppm)	MCLG (ppm)	SMCL (ppm)
Dalapon (7/92)	0.2	0.2	
Dibromochloropropane (DBCP) (1/91)	0.0002	0	
o-Dichlorobenzene (1/91,5/89)	0.6	0.6	0.01
p-Dichlorobenzene (7/87)	0.075	0.075	
p-Dichlorobenzene (1/91,5/89)			0.005
1,2-Dichloroethane (7/87)	0.005	0	
cis-1,2-Dichloroethylene (1/91)	0.07	0.07	
trans-1,2-Dichloroethylene (1/91)	0.1	0.1	
1,1-Dichloroethylene (7/87)	0.007	0.007	
Dichloromethane (Methylene chloride) (7/92)	0.005	0	
1,2-Dichloropropane (1/91)	0.005	0	
Di(ethylhexyl)adipate (7/92)	0.4	0.4	
Di(ethylhexyl)phthalate (7/92)	0.006	0	
Diquat (7/92)	0.02	0.02	
Dinoseb (7/92)	0.007	0.007	
Dioxin (2,3,7,8-TCDD) (7/92)	3x10E-8	0	
Endothall (7/92)	0.1	0.1	
Endrin (7/92)	0.002	0.002	
Epichlorohydrin (1/91)	TT	0	
Ethylbenzene (1/91,5/89)	0.7	0.7	0.03
Ethylene dibromide (EDB) (1/91)	0.00005	0	
Glyphosate (7/92)	0.7	0.7	
Heptachlor (1/91)	0.0004	0	
Heptachlor epoxide (1/91)	0.0002	0	
Hexachlorobenzene (7/92)	0.001	0	
Hexachlorocyclopentadiene[HEX] (7/92)	0.05	0.05	0.008
Lindane (1/91)	0.0002	0.0002	
Methoxychlor (1/91)	0.04	0.04	
Monochlorobenzene (1/91)	0.1	0.1	
Oxamyl [Vydate] (7/92)	0.2	0.2	
Pentachlorophenol (7/91, 5/89)	0.001	0	0.03
Picloram (7/92)	0.5	0.5	
Polychlorinated biphenyls(PCBs) (1/91)	0.0005	0	
Simazine (7/92)	0.004	0.004	
Styrene (1/91,5/89)	0.1	0.1	0.01
Tetrachloroethylene (1/91)	0.005	0	
Toluene (1/91,5/89)	1	1	0.04
Toxaphene (1/91)	0.003	0	
2,4,5-TP Silvex (1/91)	0.05	0.05	
1,1,2-Trichloroethane (7/92)	0.005	0.003	
1,2,4-Trichlorobenzene (7/92)	0.07	0.07	
1,1,1-Trichloroethane (7/87)	0.20	0.20	
Trichloroethylene (7/87)	0.005	0	
Trihalomethanes (NPDWR) (Bromoform, Dibromochloromethane, Chloroform, Bromodichloromethane)	0.100		
Vinyl Chloride (7/87)	0.002	0	
Xylenes (1/91,5/89)	10.00	10.00	0.02

* - Proposed MCL and MCLG

CHEMICAL	MCL (ppm)	MCLG (ppm)	SMCL (ppm)
MICROBIALS			
Coliform bacteria (6/89)	< 1/100 ml	0	
Giardia lamblia (6/89)	TT	0	
Heterotrophic bact. (6/89)	TT	0	
Legionella (6/89)	TT	0	
Viruses (6/89)	TT	0	
Turbidity	1 TU (up to 5 TU) (units of turbidity)		
RADIONUCLIDES			
Beta particle and photon radioactivity	4 mrem	0	
Gross Alpha particles	15 pCi/l	0	
Radon-222 (7/91 *)	*300 pCi/l	0	
Radium-226 and Radium-228 (Total)	5 pCi/l	0	
Radium-226 (7/91 *)	* 20 pCi/l	0	
Radium-228 (7/91 *)	* 20 pCi/l	0	
Uranium (7/91 *)	* 20 ug/l or 30 pCi/l	0	

FOOTNOTES

11/85	50 Federal Register (FR), November 13, 1985
4/86	51 FR, April 2, 1986 - Final MCLs and SMCLs
7/87	52 FR, July 8, 1987 - Final MCLs and MCLGs
5/89	54 FR, May 22, 1989 - Proposed SMCLs
6/89	54 FR, June 29, 1989 - Final MCLs and MCLGs
6/90	Action level for lead in drinking water, June 21, 1990, Memorandum from the Office of Emergency and Remedial Response and the Office of Waste Program Enforcement
7/90	55 FR, July 25, 1990 - Proposed MCLs, MCLGs, and SMCLs
1/91	56 FR, January 30, 1991 - Final MCLs, MCLGs, and Proposed SMCLs
6/91	56 FR, June 7, 1991 - MCLGs & NPDWRs for Lead & Copper [Action levels established for lead (0.015 ppm) and copper (1.3 ppm)]
7/91	56 FR, July 1, 1991 - NPDWRs; Final Rule
7/91 *	56 FR, July 18, 1991 - NPDWRs for Radionuclides in Drinking Water
5/92	57 FR, May 27, 1992 - Drinking Water
7/92	57 FR, July 17, 1992 - Final MCLS and MCLGs

MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
NPDWR	National Primary Drinking Water Regulation
NSDWR	National Secondary Drinking Water Regulation
SMCL	Secondary Maximum Contaminant Level
TT	Treatment Technique

* - Proposed MCL and MCLG

TENNESSEE ENVIRONMENTAL QUALITY STANDARDS

WATER

SOIL

Tennessee Department of Environment and Conservation
J.W. Luna, Commissioner

September 16, 1991
Uniform Standards Committee
Bureau of the Environment

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TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DEPARTMENT WIDE
GROUND WATER/DRINKING WATER CLEANUP LEVELS

National Revised Primary
Drinking Water Regulations

Contaminant	MCL		
Alachlor	0.002	mg/L	
Aldicarb	0.003	mg/L	
Aldicarb sulfoxide	0.004	mg/L	
Aldicarb sulfone	0.002	mg/L	
Arsenic	0.05	mg/L	
Asbestos	7 million fibers/liter		
Atrazine	0.003	mg/L	
Barium	2	mg/L	
Benzene	0.005	mg/L	
Cadmium	0.005	mg/L	
Carbofuran	0.04	mg/L	
Carbon tetrachloride	0.005	mg/L	
Chlordane	0.002	mg/L	
Chromium	0.1	mg/L	
2,4 D	0.07	mg/L	
o-Dichlorobenzene	0.6	mg/L	
para-Dichlorobenzene	0.075	mg/L	
1,2-Dichloroethane	0.005	mg/L	
1,1-Dichloroethylene	0.007	mg/L	
cis-1,2-Dichloroethylene	0.07	mg/L	
trans-1,2 Dichloroethylene	0.1	mg/L	
Dibromochloropropane	0.0002	mg/L	
1,2-Dichloropropane	0.005	mg/L	
Ethylbenzene	0.7	mg/L	
Ethylene dibromide	0.00005	mg/L	
Fluoride	4.0	mg/L	
Heptachlor	0.0004	mg/L	
Heptachlor epoxide	0.0002	mg/L	
Lead	0.05	mg/L	(effective until 11/92) now 0.015
Lindane	0.0002	mg/L	
Mercury	0.002	mg/L	
Methoxychlor	0.04	mg/L	
Monochlorobenzene	0.1	mg/L	
Nitrate	10	mg/L	(as N)
Nitrate and Nitrite (total)	10	mg/L	(as N)
Nitrite	1	mg/L	(as N)
Pentachlorophenol	0.001	mg/L	
Polychlorinated biphenyls	0.0005	mg/L	
Silver	0.05	mg/L	(effective until 7/92)
Selenium	0.05	mg/L	
Styrene	0.1	mg/L	
Tetrachloroethylene	0.005	mg/L	
2,4,5-TP	0.05	mg/L	
Toluene	1	mg/L	
Toxaphene	0.003	mg/L	
1,1,1-Trichloroethane	0.2	mg/L	
Trichloroethylene	0.005	mg/L	
Trihalomethanes (total)	0.1	mg/L	
Vinyl chloride	0.002	mg/L	
Xylenes (total)	10	mg/L	

As of 8/22/91

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DEPARTMENT WIDE
SOIL CLEANUP LEVELS IN MG/KG OR PPM

	Residential Soils	Industrial Soils	Required Detection Level
Arsenic	20	200	5
Benzene	0.5	0.5	0.05
Cadmium	2	10	2
Carbon tetrachloride	1	5	0.5
Chlordane	0.5	3	0.08
Chromium	100	500	5
DDT	1	5	0.02
Ethylbenzene	20	20	0.5
Lead	250	500	3
Lindane	0.5	20	0.08
Mercury	1	10	0.1
Methylene chloride	0.5	0.5	0.05
PAHs (carcinogenic)	1	20	0.33
PCBs	1	10	0.08
Pentachlorophenol	10	10	2
Tetrachloroethylene	0.5	0.5	0.05
Toluene	10	40	0.5
TPH	100	250	1
1,1,1 Trichloroethane	1	20	0.5
Trichloroethylene	0.5	0.5	0.05
Vinyl chloride	1	7	1
Xylenes	10	20	0.5

RS/F6041235

STATE OF TENNESSEE
Contaminants with MCLs

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INORGANICS

1005	ARSENIC	0.0500000	MG/L
1010	BARIUM	2.0000000	MG/L
1015	CADMIUM	0.0050000	MG/L
1020	CHROMIUM	0.1000000	MG/L
1024	CYANIDE	0.2000000	MG/L
1025	FLUORIDE	4.0000000	MG/L
1030	LEAD	0.0500000	MG/L
1035	MERCURY	0.0020000	MG/L
1036	NICKEL	0.1000000	MG/L
1038	NITROGEN,NITRITE-TOTAL	10.0000000	MG/L
1040	NITRATE (AS N)	10.0000000	MG/L
1041	NITRITE	1.0000000	MG/L
1045	SELENIUM	0.0500000	MG/L
1074	ANTIMONY TOTAL	0.0060000	MG/L
1075	BERYLIUM TOTAL	0.0040000	MG/L
1085	THALLIUM TOTAL	0.0020000	MG/L
1094	ASBESTOS	7.0000000	MF/L

ORGANICS

2005	ENDRIN	0.0002000	MG/L
2010	LINDANE	0.0002000	MG/L
2015	METHOXYCHLOR	0.0400000	MG/L
2020	TOXAPHENE	0.0030000	MG/L
2031	DALAPON	0.2000000	MG/L
2032	DIQUAT	0.0200000	MG/L
2033	ENDOTHALL	0.1000000	MG/L
2034	GLYPHOSATE	0.7000000	MG/L
2035	ADIPATES	0.4000000	MG/L
2036	VYDATE	0.2000000	MG/L
2037	SIMAZINE	0.0040000	MG/L
2039	PHTHALATES	0.0060000	MG/L
2040	PICLORAM	0.5000000	MG/L
2041	DINOSEB	0.0070000	MG/L
2042	HEXACHLOROCYCLOPENTADIENE	0.0500000	MG/L
2046	CARBOFURAN	0.0400000	MG/L
2050	ATRAZINE	0.0030000	MG/L
2051	ALACHLOR (LASSO)	0.0020000	MG/L
2063	DIOXIN	0.00000008	MG/L
2065	HEPTACHLOR	0.0004000	MG/L
2067	HEPTACHLOR EPOXIDE	0.0002000	MG/L
2105	2,4-D	0.0700000	MG/L
2110	2,4,5-TP SILVEX	0.0500000	MG/L
2274	HEXACHLOROBENZENE	0.0010000	MG/L
2306	BENZO(A)PYRENE	0.0002000	MG/L
2326	PENTACHLOROPHENOL	0.0010000	MG/L
2383	POLYCHLORINATED BIPYHENYLS (PC	0.0005000	MG/L
2931	1,2 DIBROMO-3-CHLOROPROPANE	0.0002000	MG/L
2946	ETHYLENE DIBROMIDE (EDB)	0.0000500	MG/L
2959	CHLORDANE	0.0020000	MG/L

REGULATED VOCs

2378	1,2,4-TRICHLOROBENZENE	0.0700000	MG/L
2380	CIS-1,2-DICHLOROETHYLENE	0.0700000	MG/L
2955	Xylenes (total)	10.0000000	MG/L

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2964	DICHLOROMETHANE	0.0050000	MG/L
2968	O-DICHLOROBENZENE	0.6000000	MG/L
2969	P-DICHLOROBENZENE	0.0750000	MG/L
2976	VINYL CHLORIDE	0.0020000	MG/L
2977	1,1-DICHLOROETHYLENE	0.0070000	MG/L
2979	TRANS-1,2-DICHLOROETHYLENE	0.1000000	MG/L
2980	1,2-DICHLOROETHANE	0.0050000	MG/L
2981	1,1,1-TRICHLOROETHANE	0.2000000	MG/L
2982	CARBON TETRACHLORIDE	0.0050000	MG/L
2983	1,2-DICHLOROPROPANE	0.0050000	MG/L
2984	TRICHLOROETHYLENE	0.0050000	MG/L
2985	1,1,2-TRICHLOROETHANE	0.0050000	MG/L
2987	TETRACHLOROETHYLENE	0.0050000	MG/L
2989	CHLOROBENZENE	0.1000000	MG/L
2990	BENZENE	0.0050000	MG/L
2991	TOLUENE	1.0000000	MG/L
2992	ETHYLBENZENE	0.7000000	MG/L
2996	STYRENE	0.1000000	MG/L

SECONDARIES

1002	ALUMINUM	0.2000000	MG/L
1017	CHLORIDE	250.0000000	MG/L
1022	COPPER	1.0000000	MG/L
1028	IRON	0.3000000	MG/L
1032	MANGANESE	0.0500000	MG/L
1050	SILVER	0.1000000	MG/L
1055	SULFATE	250.0000000	MG/L
1089	MBAS	0.5000000	MG/L
1095	ZINC	5.0000000	MG/L
1905	COLOR	15.0000000	CU
1920	ODOR	3.0000000	TON

STATE OF TENNESSEE

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FAX TRANSMITTAL MEMO

TO: Dora Ann Johnson, EPA
Emergency Response Branch

FAX NUMBER: (404) 347-4464

FROM: Jeff Bagwell,
TN Div. of Water Supply

SUBJECT: MCL Levels

DATE: 1/5/95

NUMBER OF PAGES INCLUDING THIS ONE: 3

IF YOU DO NOT RECEIVE THIS ENTIRE DOCUMENT OR HAVE ANY QUESTIONS, CALL Jeff

TELEPHONE NO. (615) 532-0183

MESSAGE:

Maximum contaminant levels for drinking water.

Table 1. Universal Treatment Standards for Regulated Hazardous Constituents†

Regulated Hazardous Organic Constituent	Wastewater Concentration Total Composition (mg/l)	Nonwastewater Concentration Total Composition (mg/l)
Acenaphthylene	0.059	3.4
Acenaphthene	0.059	3.4
Acetone	0.28	160
Acetonitrile	5.6	1.8
Acetophenone	0.010	9.7
2-Acetylaminofluorene	0.059	140
Acrolein	0.29	Not Regulated
Acrylamide	19	23
Acrylonitrile	0.24	84
Aldrin	0.021	0.066
4-Aminobiphenyl	0.13	NR
Aniline	0.81	14
Anthracene	0.059	3.4
Aramite	0.36	Not Regulated
alpha-BHC	0.00014	0.066
beta-BHC	0.00014	0.066
delta-BHC	0.023	0.066
gamma-BHC	0.0017	0.066
Benz(a)anthracene	0.059	3.4
Benzal chloride	0.055	6.0
✓ Benzene	0.14	10
Benzo(a)pyrene	0.061	3.4
Benzo-(b)fluoranthene *	0.11	6.8
Benzo(k)fluoranthene*	0.11	6.8
Benzo(g,h,i)perylene	0.0055	1.8
Bis(2-chloroethoxy)methane	0.036	7.2
Bis(2-chloroethyl)ether	0.033	6.0
Bis(2-chloroisopropyl)ether	0.055	7.2
Bis(2-ethylhexyl)phthalate	0.28	28
Bromodichloromethane	0.35	15
Bromomethane	0.11	15
4-Bromophenyl phenyl ether	0.055	15
n-Butyl alcohol	5.6	2.6
Butyl benzyl phthalate	0.017	28
2-sec-Butyl-4,6- dinitrophenol	0.066	2.5
Carbon disulfide	3.8	4.8**
Carbon tetrachloride	0.057	6.0
Chlordane	0.0033	0.26
p-Chloroaniline	0.46	16
✓ Chlorobenzene	0.057	6.0
Chlorobenzilate	0.10	Not Regulated
2-Chloro-1,3-butadiene	0.057	0.28
Chlorodibromomethane	0.057	15
Chloroethane	0.27	6.0
✓ Chloroform	0.046	6.0
p-Chloro-m-cresol	0.018	14
2-Chloroethyl vinyl ether	0.062	Not Regulated
Chloromethane (Methyl chloride)	0.19	30
2-Chloronaphthalene	0.055	5.6
2-Chlorophenol	0.044	5.7
3-Chloropropylene	0.036	30
Chrysene	0.059	3.4
Cresol (m- and p-isomers)	0.77	5.6

o-Cresol	0.11	5.6
Cyclohexanone	0.36	0.75**
o,p'-DDD	0.023	0.087
p,p'-DDD	0.023	0.087
o,p'-DDE	0.031	0.087
p,p'-DDE	0.031	0.087
o,p'-DDT	0.0039	0.087
p,p'-DDT	0.0039	0.087
Dibenz(a,e)pyrene	0.061	Not Regulated
Dibenz(a,h)anthracene	0.055	8.2
tris-(2,3-Dibromopropyl) phosphate	0.11	0.10
1,2-Dibromo-3-chloropropane	0.11	15
1,2-Dibromoethane (ethylene ibromide)	0.028	15
Dibromomethane	0.11	15
m-Dichlorobenzene	0.036	6.0
o-Dichlorobenzene	0.088	6.0
p-Dichlorobenzene	0.090	6.0
Dichlorodifluoromethane	0.23	7.2
1,1-Dichloroethane	0.059	6.0
1,2-Dichloroethane	0.21	6.0
1,1-Dichloroethylene	0.025	6.0
trans-1,2-Dichloroethylene	0.054	30
2,4-Dichlorophenol	0.044	14
2,6-Dichlorophenol	0.044	14
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.72	10
1,2-Dichloropropane	0.85	18
cis-1,3-Dichloropropylene	0.036	18
trans-1,3-Dichloropropylene	0.036	18
Dieldrin	0.017	0.13
Diethyl phthalate	0.20	28
p-Dimethylaminoazo-benzene	0.13	Not Regulated
2,4-Dimethyl phenol	0.036	14
Dimethyl phthalate	0.047	28
Di-n-butyl phthalate	0.057	28
1,4-Dinitrobenzene	0.32	2.3
4,6-Dinitrocresol	0.28	160
2,4-Dinitrophenol	0.12	160
2,4-Dinitrotoluene	0.32	140
2,6-Dinitrotoluene	0.55	28
Di-n-octyl phthalate	0.017	28
Di-n-propylnitrosamine	0.40	14
1,4-Dioxane	Not Regulated	170
1,2-Diphenyl hydrazine	0.087	Not Regulated
Diphenylnitrosamine*	0.921	13
Diphenylamine*	0.921	13
Disulfoton	0.017	6.2
Endosulfan I	0.023	0.066
Endosulfan II	0.029	0.13
Endosulfan sulfate	0.029	0.13
Endrin	0.0028	0.13
Endrin aldehyde	0.025	0.13
Ethyl acetate	0.34	33
Ethyl benzene	0.057	10
Ethyl ether	0.12	160
Ethyl methacrylate	0.14	160
Ethylene oxide	0.12	Not Regulated
Famphur	0.017	15

Propanenitrile (Ethyl cyanide)	0.24	360
Pyrene	0.067	8.2
Pyridine	0.014	16
Safrole	0.081	22
Silvex (2,4,5-TP)	0.72	7.9
2,4,5,-T	0.72	7.9
1,2,4,5-Tetrachlorobenzene	0.055	14
Tetrachlorodibenzofurans	0.000063	0.001
Tetrachlorodibenzo-p-dioxins	0.000063	0.001
1,1,1,2-Tetrachloroethane	0.057	6.0
1,1,2,2-Tetrachloroethane	0.057	6.0
✓ Tetrachloroethylene	0.056	6.0
2,3,4,6-Tetrachlorophenol	0.030	7.4
✓ Toluene	0.080	10
Toxaphene	0.0095	2.6
Tribromomethane (Bromoform)	0.63	15
1,2,4-Trichlorobenzene	0.055	19
1,1,1-Trichloroethane	0.054	6.0
1,1,2-Trichloroethane	0.054	6.0
✓ Trichloroethylene	0.054	6.0
Trichloromono fluoromethane	0.020	30
2,4,5-Trichlorophenol	0.18	7.4
2,4,6-Trichlorophenol	0.035	7.4
2,4,5-Trichlorophen-oxyacetic acid	0.72	7.9
1,2,3-Trichloropropane	0.85	30
1,1,2-Trichloro-1,2,2-trifluoroethane	0.057	30
✓ Vinyl chloride	0.27	6.0
✓ Xylenes (total)	0.32	30
Total PCBs	0.1	10

Regulated Hazardous Metal Constituent	Wastewater Concentration Total Composition (mg/l)	Nonwastewater Concentration TCLP (mg/l)
Antimony	1.9	2.1
Arsenic	1.4	5.0
Barium	1.2	7
Beryllium	0.82	0.0
✓ Cadmium	0.69	0.19
✓ Chromium (total)	2.77	0.86
Cyanide (total)	1.2	590***
Cyanide (amenable)	0.86	30***
Fluoride	35	Not Regulated
✓ Lead	0.69	0.37
Mercury--retort residues	N/A	0.20
Mercury--not retort residues	0.15	0.025
Nickel	3.98	5.0
Selenium	0.82	0.16
Silver	0.43	0.30
Sulfide	14	Not Regulated
Thallium	1.4	0.078
Vanadium	4.3	0.23
Zinc****	2.61	5.3

† These universal treatment standards do not apply to characteristic metal wastes D001 to D011.

* This standard represents the sum of the concentrations for each of this pair of constituents.

** Measured in waste extract using TCLP (mg/l).

*** Unit = mg/kg based on TOTAL concentration. As analyzed using SW-846 Method 9010 or 9012; sample size 10 gram; distillation time one hour and fifteen minutes.

**** Zinc is not an "underlying hazardous constituent" in characteristic wastes.

Fluoranthene	0.068	3.4
Fluorene	0.059	3.4
Heptachlor	0.0012	0.066
Heptachlor epoxide	0.016	0.066
Hexachlorobenzene	0.055	10
Hexachlorobutadiene	0.055	5.6
Hexachlorodibenzofurans	0.000063	0.001
Hexachlorodibenzo-p-dioxins	0.000063	0.001
Hexachlorocyclopentadiene	0.057	2.4
Hexachloroethane	0.055	30
Hexachloropropylene	0.035	30
Indeno(1,2,3-c,d)pyrene	0.0055	3.4
Iodomethane	0.19	65
Isobutyl alcohol	5.6	170
Isodrin	0.021	0.066
Isosafrole	0.081	2.6
Kepone	0.0011	0.13
Methacrylonitrile	0.24	84
Methanol	5.6	0.75**
Methapyrilene	0.081	1.5
Methoxychlor	0.25	0.18
3-Methylchloanthrene	0.0055	15
4,4-Methylene bis (2-chloraniline)	0.50	30
✓ Methylene chloride	0.089	30
Methyl ethyl ketone	0.28	36
Methyl isobutyl ketone	0.14	33
Methyl methacrylate	0.14	160
Methyl methansulfonate	0.018	Not Regulated
Methyl parathion	0.014	4.6
✓ Naphthalene	0.059	5.6
2-Naphthylamine	0.52	Not Regulated
p-Nitroaniline	0.028	28
o-Nitroaniline	0.27	14
Nitrobenzene	0.068	14
5-Nitro-o-toluidine	0.32	28
o-Nitrophenol	0.028	13
p-Nitrophenol	0.12	29
N-Nitrosodiethylamine	0.40	28
N-Nitrosodimethylamine	0.40	2.3
N-Nitrosodi-n-butylamine	0.40	17
N-Nitrosomethylethylamine	0.40	2.3
N-Nitrosomorpholine	0.40	2.3
N-Nitrosopiperidine	0.013	35
N-Nitrosopyrrolidine	0.013	35
Parathion	0.014	4.6
Pentachlorobenzene	0.055	10
Pentachlorodibenzofurans	0.000035	0.001
Pentachlorodibenzo-p-dioxins	0.000063	0.001
Pentachloroethane	0.055	6.0
Pentachloronitrobenzene	0.055	4.8
Pentachlorophenol	0.089	7.4
Phenacetin	0.081	16
Phenanthrene	0.059	5.6
✓ Phenol	0.039	6.2
Phorate	0.021	4.6
Phthalic acid	0.055	28
Phthalic anhydride	0.055	28
Pronamide	0.093	1.5