APPENDIX J-1

TNRCC RISK REDUCTION STANDARDS

Updated Examples of Standard No. 2, Appendix II Medium-Specific Concentrations (MSCs)

Background Information:

Section 335.558(d) of the existing Risk Reduction Rules indicates that the Commission will periodically revise the example unadjusted Standard No. 2 MSCs presented in the Appendix II table to reflect newly promulgated standards and to provide MSCs based on current toxicological data. Additionally, §335.556(b) requires consideration of other exposure pathways by which human populations are likely to be exposed (e.g., dermal absorption and vegetable uptake) when setting MSCs.

However, because no specific equations or parameters were provided in the rule, consideration of the dermal absorption pathway has not been addressed in a consistent manner. Therefore, in order to facilitate implementation of Standard No. 2, the MSC values have been updated to reflect current standards (e.g., MCLs), toxicological factors, the soil dermal absorption exposure pathway where appropriate (see Section VII of the memo entitled Implementation of the Existing Risk Reduction Rule for more detail), and to identify contaminants where exposure through vegetable consumption is of particular concern (i.e., cadmium). The updated Standard No. 2 MSCs are provided below for your convenience.

The updated Standard No. 2 Soil MSCs have been calculated using the Risk Reduction Standard No. 2 equations, with the addition of the dermal pathway, updated toxicity factors, and updated chemical/physical properties. In calculating the updated Standard No. 2 Soil MSCs, a risk level of 10^{-6} was used for Class A and B carcingens and a risk level of 10^{-5} was used for Class C carcinogens, and a hazard quotient of 1 was used for all noncarcinogens. In cases where contaminants had both carcinogenic and noncarcinogenic toxicity factors, both types of MSCs (carcinogenic and noncarcinogenic) were calculated and the lowest value (i.e., most conservative) was selected as the updated Standard No. 2 Soil MSC.

The updated Standard No. 2 Groundwater MSCs have been calculated using the MCL (when available) or Risk Reduction Standard No. 2 equations with updated toxicity factors when MCLs were not available. In calculating the updated Standard No. 2 Groundwater MSCs, a risk level of 10^{-6} was used for Class A and B carcingens and a risk level of 10^{-5} was used for Class C carcinogens, and a hazard quotient of 1 was used for all noncarcinogens. In cases where contaminants had both carcinogenic and noncarcinogenic toxicity factors, both types of MSCs (carcinogenic and noncarcinogenic) were calculated and the lowest value (i.e., most conservative) was selected as the updated Standard No. 2 Groundwater MSC.

Abbreviations:

CAS # - Chemical Abstracts Service number
GW-Res - Groundwater MSC for Residential Use
GW-Ind - Groundwater MSC for Industrial Use
GWP-Res - Soil MSC for Resiential Use Based on Groundwater Protection
GWP-Ind - Soil MSC for Industrial Use Based on Groundwater Protection
SAI-Res - Soil MSC for Residential Use Based on Inhalation, Ingestion, and Dermal Contact
SAI-Ind - Soil MSC for Industrial Use Based on Inhalation, Ingestion, and Dermal Contact

Updated Examples of Standard No. 2, Appendix II Medium-Specific Concentrations (MSCs)

(Last update: July 14, 1999)

Contaminant	CAS #	GW-Res (mg/l)	GW-Ind (mg/l)	GWP-Res (mg/kg)	GWP-Ind (mg/kg)	SAI-Res* (mg/kg)	SAI-Ind* (mg/kg)
Acenaphthene	83-32-9	2.2E+00	6.1E+00	2.2E+02	6.1E+02	8.2E+03	5.3E+04
Acenaphthylene	208-96-8	2.2E+00	6.1E+00	2.2E+02	6.1E+02	8.2E+03	5.3E+04
Acetaldehyde	75-07-0	---	---	---	---	5.2E+00	8.8E+00
Acetone	67-64-1	3.7E+00	1.0E+01	3.7E+02	1.0E+03	1.6E+03	2.4E+03
Acetone cyanohydrin	75-86-5	2.9E-02	8.2E-02	2.9E+00	8.2E+00	1.2E+02	8.2E+02
Acetonitrile	75-05-8	---	---	---	---	1.8E+02	2.6E+02
Acetophenone	98-86-2	3.7E+00	1.0E+01	3.7E+02	1.0E+03	2.7E+03	4.3E+03
Acifluorfen, sodium	62476-59-9	4.7E-01	1.3E+00	4.7E+01	1.3E+02	2.0E+03	1.3E+04

Updated Examples of Standard No. 2, Appendix II Medium-Specific Concentrations (MSCs)

(Last update: July 14, 1999)

Contaminant	CAS #	GW-Res (mg/l)	GW-Ind (mg/l)	GWP-Res (mg/kg)	GWP-Ind (mg/kg)	SAI-Res[a] (mg/kg)	SAI-Ind[a] (mg/kg)
Acrolein	107-02-8	7.3E-01	2.0E+00	7.3E+01	2.0E+02	5.5E+03	4.1E+04
Acrylamide	79-06-1	1.9E-05	6.4E-05	1.9E-03	6.4E-03	1.1E-01	6.4E-01
Acrylic acid	79-10-7	1.8E+01	5.1E+01	1.8E+03	5.1E+03	1.4E+05	1.0E+06
Acrylonitrile	107-13-1	1.6E-04	5.3E-04	1.6E-02	5.3E-02	7.9E-02	1.4E-01
Alachlor	15972-60-8	2.0E-03	2.0E-03	2.0E-01	2.0E-01	6.1E+00	3.6E+01
Aldicarb	116-06-3	7.0E-03	7.0E-03	7.0E-01	7.0E-01	1.5E+02	1.0E+03
Aldicarb sulfone	1646-88-4	7.0E-03	7.0E-03	7.0E-01	7.0E-01	1.5E+02	1.0E+03
Aldrin	309-00-2	5.0E-06	1.7E-05	5.0E-04	1.7E-03	2.7E-02	1.4E-01
Allyl alcohol	107-18-6	1.8E-01	5.1E-01	1.8E+01	5.1E+01	1.4E+03	1.0E+04
Allyl chloride	107-05-1	---	---	---	---	1.3E+00	1.8E+00
Aluminum	7429-90-5	3.7E+01	1.0E+02	3.7E+03	1.0E+04	1.5E+05	9.9E+05
Aminopyridine, 4-	504-24-5	7.3E-04	2.0E-03	7.3E-02	2.0E-01	3.1E+00	2.0E+01
Ammonia	7664-41-7	---	---	---	---	1.6E+02	2.3E+02
Aniline	62-53-3	1.5E-02	5.0E-02	1.5E+00	5.0E+00	8.6E+01	5.0E+02
Anthracene	120-12-7	1.1E+01	3.1E+01	1.1E+03	3.1E+03	4.1E+04	2.7E+05
Antimony	7440-36-0	6.0E-03	6.0E-03	6.0E-01	6.0E-01	7.2E+01	4.9E+02
Aramite	140-57-8	3.4E-03	1.1E-02	3.4E-01	1.1E+00	2.0E+01	1.1E+02
Arsenic	7440-38-2	5.0E-02	5.0E-02	5.0E+00	5.0E+00	2.0E+01[b]	2.0E+02[b]
Arsine	7784-42-1	---	---	---	---	---	---
Asbestos	1332-21-4	---	---	---	---	1.5E+03	2.5E+03
Atrazine	1912-24-9	3.0E-03	3.0E-03	3.0E-01	3.0E-01	2.2E+01	1.3E+02
Barium	7440-39-3	2.0E+00	2.0E+00	2.0E+02	2.0E+02	9.1E+03	5.8E+04
Benzene	71-43-2	5.0E-03	5.0E-03	5.0E-01	5.0E-01	9.2E-01	1.6E+00
Benzenethiol	108-98-5	3.7E-04	1.0E-03	3.7E-02	1.0E-01	1.5E+00	3.9E+00
Benzidine	92-87-5	3.7E-07	1.2E-06	3.7E-05	1.2E-04	2.1E-03	1.2E-02
Benz-a-anthracene	56-55-3	2.0E-04	3.9E-04	2.0E-02	3.9E-02	6.3E-01	3.4E+00
Benzo-a-pyrene	50-32-8	2.0E-04	2.0E-04	2.0E-02	2.0E-02	6.3E-02	3.4E-01
Benzo-b-fluoranthene	205-99-2	2.0E-04	3.9E-04	2.0E-02	3.9E-02	6.3E-01	3.4E+00
Benzo-k-fluoranthene	207-08-9	1.2E-03	3.9E-03	1.2E-01	3.9E-01	6.3E+00	3.4E+01
Benzo-g,h,i-perylene	191-24-2	1.1E+00	3.1E+00	1.1E+02	3.1E+02	4.1E+03	2.7E+04
Benzoic acid	65-85-0	1.5E+02	4.1E+02	1.5E+04	4.1E+04	6.2E+05	4.1E+06
Benzotrichloride	98-07-7	6.6E-06	2.2E-05	6.6E-04	2.2E-03	3.8E-02	2.2E-01
Benzyl alcohol	100-51-6	1.1E+01	3.1E+01	1.1E+03	3.1E+03	4.6E+04	3.1E+05
Benzyl chloride	100-44-7	5.0E-04	1.7E-03	5.0E-02	1.7E-01	3.8E+00	3.4E+01
Beryllium	7440-41-7	4.0E-03	4.0E-03	4.0E-01	4.0E-01	4.6E+01	2.7E+02
Biphenyl, 1,1-	92-52-4	1.8E+00	5.1E+00	1.8E+02	5.1E+02	1.9E+02	2.7E+02
Bis (2-chloro-ethyl) ether	111-44-4	7.7E-05	2.6E-04	7.7E-03	2.6E-02	1.5E-01	3.2E-01
Bis (2-chloroisopropyl) ether	108-60-1	1.5E+00	4.1E+00	1.5E+02	4.1E+02	6.2E+03	4.1E+04
Bis (2-chloromethyl) ether	542-88-1	3.9E-07	1.3E-06	3.9E-05	1.3E-04	1.1E-04	1.9E-04
Bis (2-ethyl-hexyl) phthalate	117-81-7	6.0E-03	6.0E-03	6.0E-01	6.0E-01	1.7E+01	6.5E+01
Bromodichloromethane	75-27-4	1.0E-01	1.0E-01	1.0E+01	1.0E+01	1.0E+01	9.2E+01
Bromoform	75-25-2	1.0E-01	1.0E-01	1.0E+01	1.0E+01	3.4E+01	8.5E+01
Bromomethane	74-83-9	5.1E-02	1.4E-01	5.1E+00	1.4E+01	3.5E+00	4.9E+00
Butadiene, 1,3-	106-99-0	---	---	---	---	1.8E-02	3.0E-02

Updated Examples of Standard No. 2, Appendix II Medium-Specific Concentrations (MSCs)

(Last update: July 14, 1999)

Contaminant	CAS #	GW-Res (mg/l)	GW-Ind (mg/l)	GWP-Res (mg/kg)	GWP-Ind (mg/kg)	SAI-Res[a] (mg/kg)	SAI-Ind[a] (mg/kg)
Butanol, n-	71-36-3	3.7E+00	1.0E+01	3.7E+02	1.0E+03	2.7E+04	2.0E+05
Butylate	2008-41-5	1.8E+00	5.1E+00	1.8E+02	5.1E+02	7.7E+03	5.1E+04
Butyl benzyl phthalate	85-68-7	7.3E+00	2.0E+01	7.3E+02	2.0E+03	3.1E+04	2.0E+05
Cacodylic acid	75-60-5	1.1E-01	3.1E-01	1.1E+01	3.1E+01	4.6E+02	3.1E+03
Cadmium	7440-43-9	5.0E-03	5.0E-03	5.0E-01	5.0E-01	1.2E+02[c]	4.1E+02
Captan	133-06-2	2.4E-02	8.2E-02	2.4E+00	8.2E+00	1.4E+02	8.2E+02
Carbaryl	63-25-2	3.7E+00	1.0E+01	3.7E+02	1.0E+03	1.5E+04	1.0E+05
Carbazole	86-74-8	4.3E-03	1.4E-02	4.3E-01	1.4E+00	2.4E+01	1.4E+02
Carbofuran	1563-66-2	4.0E-02	4.0E-02	4.0E+00	4.0E+00	7.7E+02	5.1E+03
Carbon disulfide	75-15-0	3.7E+00	1.0E+01	3.7E+02	1.0E+03	1.0E+03	1.5E+03
Carbon tetrachloride	56-23-5	5.0E-03	5.0E-03	5.0E-01	5.0E-01	3.5E-01	6.3E-01
Carbosulfan	55285-14-8	3.7E-01	1.0E+00	3.7E+01	1.0E+02	1.5E+03	1.0E+04
Chloral	75-87-6	7.3E-02	2.0E-01	7.3E+00	2.0E+01	5.5E+02	4.1E+03
Chlordane	57-74-9	2.0E-03	2.0E-03	2.0E-01	2.0E-01	1.6E+00	1.1E+01
Chlorine	7782-50-5	4.0E+00	4.0E+00	4.0E+02	4.0E+02	2.0E+04	1.4E+05
Chloroaniline, p-	106-47-8	1.5E-01	4.1E-01	1.5E+01	4.1E+01	6.2E+02	4.1E+03
Chlorobenzene	108-90-7	1.0E-01	1.0E-01	1.0E+01	1.0E+01	3.1E+02	4.5E+02
Chlorobenzilate	510-15-6	3.2E-04	1.1E-03	3.2E-02	1.1E-01	1.8E+00	1.1E+01
Chloro-1,3-butadiene, 2-	126-99-8	---	---	---	---	1.0E+01	1.4E+01
Chlorodifluoromethane	75-45-6	---	---	---	---	1.1E+04	1.5E+04
Chloroethane	75-00-3	1.5E+01	4.1E+01	1.5E+03	4.1E+03	1.1E+04	1.7E+04
Chloroform	67-66-3	1.0E-01	1.0E-01	1.0E+01	1.0E+01	3.1E-01	5.1E-01
Chloromethane	74-87-3	6.6E-02	2.2E-01	6.6E+00	2.2E+01	2.3E+00	3.8E+00
Chloronaphthalene, 2-	91-58-7	2.9E+00	8.2E+00	2.9E+02	8.2E+02	1.1E+04	7.1E+04
Chlorophenol, 2-	95-57-8	1.8E-01	5.1E-01	1.8E+01	5.1E+01	1.1E+03	4.0E+03
Chlorotoluene, o-	95-49-8	7.3E-01	2.0E+00	7.3E+01	2.0E+02	3.0E+03	7.7E+03
Chlorpyrifos	2921-88-2	1.1E-01	3.1E-01	1.1E+01	3.1E+01	4.6E+02	3.1E+03
Chromium (III) (total chromium)	16065-83-1/ 7440-47-3	1.0E-01	1.0E-01	1.0E+01	1.0E+01	5.3E+04	2.3E+05
Chromium (VI)	18540-29-9	1.0E-01	1.0E-01	1.0E+01	1.0E+01	2.0E+02	1.2E+03
Chrysene	218-01-9	1.2E-02	3.9E-02	1.2E+00	3.9E+00	6.3E+01	3.4E+02
Cobalt	7440-48-4	2.2E+00	6.1E+00	2.2E+02	6.1E+02	1.3E+04	6.1E+04
Copper	7440-50-8	1.3E+00	1.3E+00	1.3E+02	1.3E+02	1.0E+04	7.4E+04
Cresol, m-	108-39-4	1.8E+00	5.1E+00	1.8E+02	5.1E+02	7.7E+03	5.1E+04
Cresol, o-	95-48-7	1.8E+00	5.1E+00	1.8E+02	5.1E+02	7.7E+03	5.1E+04
Cresol, p-	106-44-5	1.8E-01	5.1E-01	1.8E+01	5.1E+01	7.7E+02	5.1E+03
Crotonaldehyde	123-73-9	4.5E-04	1.5E-03	4.5E-02	1.5E-01	3.4E+00	3.0E+01
Cumene	98-82-8	3.7E+00	1.0E+01	3.7E+02	1.0E+03	5.4E+03	9.0E+03
Cyanide	57-12-5	2.0E-01	2.0E-01	2.0E+01	2.0E+01	5.1E+03	3.7E+04
Cyanogen	460-19-5	1.5E+00	4.1E+00	1.5E+02	4.1E+02	4.3E+00	6.0E+00
Cyclohexanone	108-94-1	1.8E+02	5.1E+02	1.8E+04	5.1E+04	2.1E+03	3.0E+03
Cyclotrimethylenetrinitramine	121-82-4	7.7E-03	2.6E-02	7.7E-01	2.6E+00	3.6E+01	5.4E+01
DDD	72-54-8	3.5E-04	1.2E-03	3.5E-02	1.2E-01	2.4E+00	1.8E+01
DDE	72-55-9	2.5E-04	8.4E-04	2.5E-02	8.4E-02	1.7E+00	1.3E+01

Updated Examples of Standard No. 2, Appendix II Medium-Specific Concentrations (MSCs)

(Last update: July 14, 1999)

Contaminant	CAS #	GW-Res (mg/l)	GW-Ind (mg/l)	GWP-Res (mg/kg)	GWP-Ind (mg/kg)	SAI-Res[a] (mg/kg)	SAI-Ind[a] (mg/kg)
DDT	50-29-3	2.5E-04	8.4E-04	2.5E-02	8.4E-02	1.7E+00	1.2E+01
Di-n-butyl phthalate	84-74-2	3.7E+00	1.0E+01	3.7E+02	1.0E+03	1.5E+04	1.0E+05
Di-n-octyl phthalate	117-84-0	7.3E-01	2.0E+00	7.3E+01	2.0E+02	3.1E+03	2.0E+04
Diallate	2303-16-4	1.4E-03	4.7E-03	1.4E-01	4.7E-01	8.0E+00	4.7E+01
Diazinon	333-41-5	3.3E-02	9.2E-02	3.3E+00	9.2E+00	1.4E+02	9.2E+02
Dibenz-a,h-anthracene	53-70-3	2.0E-04	2.0E-04	2.0E-02	2.0E-02	6.3E-02	3.4E-01
Dibromo-3-chloropropane, 1,2-	96-12-8	2.0E-04	2.0E-04	2.0E-02	2.0E-02	3.5E-01	2.0E+00
Dibromochloromethane	124-48-1	1.0E-01	1.0E-01	1.0E+01	1.0E+01	7.6E+01	6.8E+02
Dicamba	1918-00-9	1.1E+00	3.1E+00	1.1E+02	3.1E+02	4.6E+03	3.1E+04
Dichlorobenzene, 1,2-	95-50-1	6.0E-01	6.0E-01	6.0E+01	6.0E+01	2.6E+03	3.9E+03
Dichlorobenzene, 1,4-	106-46-7	7.5E-02	7.5E-02	7.5E+00	7.5E+00	2.7E+02	2.4E+03
Dichlorobenzidine, 3,3-	91-94-1	1.9E-04	6.4E-04	1.9E-02	6.4E-02	1.1E+00	6.4E+00
Dichloro-2-butene, 1,4-	764-41-0	—	—	—	—	2.3E-02	3.8E-02
Dichlorodifluoromethane	75-71-8	7.3E+00	2.0E+01	7.3E+02	2.0E+03	2.2E+03	3.1E+03
Dichloroethane, 1,1-	75-34-3	3.7E+00	1.0E+01	3.7E+02	1.0E+03	8.9E+02	1.3E+03
Dichloroethane, 1,2-	107-06-2	5.0E-03	5.0E-03	5.0E-01	5.0E-01	2.7E-01	4.7E-01
Dichloroethylene, 1,1-	75-35-4	7.0E-03	7.0E-03	7.0E-01	7.0E-01	6.0E-01	1.1E+00
Dichloroethylene, cis-1,2-	156-59-2	7.0E-02	7.0E-02	7.0E+00	7.0E+00	1.2E+03	2.5E+03
Dichloroethylene, trans-1,2	156-60-5	1.0E-01	1.0E-01	1.0E+01	1.0E+01	1.4E+03	2.4E+03
Dichlorophenol, 2,4-	120-83-2	1.1E-01	3.1E-01	1.1E+01	3.1E+01	4.6E+02	3.1E+03
Dichlorophenoxyacetic acid, 2,4-	94-75-7	7.0E-02	7.0E-02	7.0E+00	7.0E+00	2.0E+03	1.4E+04
Dichloropropane, 1,2-	78-87-5	5.0E-03	5.0E-03	5.0E-01	5.0E-01	9.4E+00	2.5E+01
Dichloropropanol, 2,3-	616-23-9	1.1E-01	3.1E-01	1.1E+01	3.1E+01	4.6E+02	3.1E+03
Dichloropropene, 1,3-	542-75-6	4.7E-04	1.6E-03	4.7E-02	1.6E-01	2.7E-01	4.8E-01
Dichlorvos	62-73-7	2.9E-04	9.9E-04	2.9E-02	9.9E-02	1.7E+00	9.9E+00
Dieldrin	60-57-1	5.3E-06	1.8E-05	5.3E-04	1.8E-03	3.1E-02	1.8E-01
Diethylhexyl adipate	103-23-1	7.1E-01	2.4E+00	7.1E+01	2.4E+02	4.1E+03	2.4E+04
Diethyl phthalate	84-66-2	2.9E+01	8.2E+01	2.9E+03	8.2E+03	1.2E+05	8.2E+05
Diethylstilbestrol	56-53-1	1.8E-08	6.1E-08	1.8E-06	6.1E-06	1.0E-04	6.1E-04
Dimethoate	60-51-5	7.3E-03	2.0E-02	7.3E-01	2.0E+00	3.1E+01	2.0E+02
Dimethoxybenzidine, 3,3'-	119-90-4	6.1E-03	2.0E-02	6.1E-01	2.0E+00	3.5E+01	2.0E+02
Dimethylbenzidine, 3,3'-	119-93-7	9.3E-06	3.1E-05	9.3E-04	3.1E-03	5.3E-02	3.1E-01
Dimethyl phenol, 2,4-	105-67-9	7.3E-01	2.0E+00	7.3E+01	2.0E+02	3.1E+03	2.0E+04
Dinitrobenzene, 1,3-	99-65-0	3.7E-03	1.0E-02	3.7E-01	1.0E+00	1.5E+01	1.0E+02
Dinitrobenzene, 1,4-	100-25-4	1.5E-02	4.1E-02	1.5E+00	4.1E+00	6.2E+01	4.1E+02
Dinitrophenol, 2,4-	51-28-5	7.3E-02	2.0E-01	7.3E+00	2.0E+01	3.1E+02	2.0E+03
Dinitrotoluene, 2,4-	121-14-2	1.3E-04	4.2E-04	1.3E-02	4.2E-02	7.2E-01	4.2E+00
Dinitrotoluene, 2,6-	606-20-2	1.3E-04	4.2E-04	1.3E-02	4.2E-02	7.2E-01	4.2E+00
Dinoseb	88-85-7	7.0E-03	7.0E-03	7.0E-01	7.0E-01	1.5E+02	1.0E+03
Dioxane 1,4-	123-91-1	7.7E-03	2.6E-02	7.7E-01	2.6E+00	5.8E+01	5.2E+02
Diphenylamine	122-39-4	9.1E-01	2.6E+00	9.1E+01	2.6E+02	3.9E+03	2.6E+04
Diphenylhydrazine, 1,2-	122-66-7	1.1E-04	3.6E-04	1.1E-02	3.6E-02	6.1E-01	3.6E+00
Diquat	85-00-7	2.0E-02	2.0E-02	2.0E+00	2.0E+00	3.4E+02	2.2E+03
Disulfoton	298-04-4	1.5E-03	4.1E-03	1.5E-01	4.1E-01	6.2E+00	4.1E+01

Updated Examples of Standard No. 2, Appendix II Medium-Specific Concentrations (MSCs)

(Last update: July 14, 1999)

Contaminant	CAS #	GW-Res (mg/l)	GW-Ind (mg/l)	GWP-Res (mg/kg)	GWP-Ind (mg/kg)	SAI-Res[a] (mg/kg)	SAI-Ind[a] (mg/kg)
Diuron	330-54-1	7.3E-02	2.0E-01	7.3E+00	2.0E+01	3.1E+02	2.0E+03
Endosulfan	115-29-7	2.2E-01	6.1E-01	2.2E+01	6.1E+01	6.2E+01	9.2E+01
Endothall	145-73-3	1.0E-01	1.0E-01	1.0E+01	1.0E+01	3.1E+03	2.0E+04
Endrin	72-20-8	2.0E-03	2.0E-03	2.0E-01	2.0E-01	4.6E+01	3.1E+02
Epichlorohydrin	106-89-8	8.6E-03	2.9E-02	8.6E-01	2.9E+00	7.2E+00	1.0E+01
Ethion	563-12-2	1.8E-02	5.1E-02	1.8E+00	5.1E+00	7.7E+01	5.1E+02
Ethoxy ethanol, 2-	110-80-5	1.5E+01	4.1E+01	1.5E+03	4.1E+03	4.3E+00	6.0E+00
Ethyl acetate	141-78-6	3.3E+01	9.2E+01	3.3E+03	9.2E+03	8.9E+03	1.3E+04
Ethyl acrylate	140-88-5	1.8E-03	6.0E-03	1.8E-01	6.0E-01	1.3E+01	1.2E+02
Ethyl benzene	100-41-4	7.0E-01	7.0E-01	7.0E+01	7.0E+01	4.3E+03	6.9E+03
Ethyl dipropylthiocarbamate, S-	759-94-4	9.1E-01	2.6E+00	9.1E+01	2.6E+02	3.9E+03	2.6E+04
Ethyl ether	60-29-7	7.3E+00	2.0E+01	7.3E+02	2.0E+03	3.8E+03	5.7E+03
Ethyl methacrylate	97-63-2	3.3E+00	9.2E+00	3.3E+02	9.2E+02	5.7E+03	9.9E+03
Ethyl-2-methyl benzene, 1-	611-14-3	1.0E+00	1.0E+00	1.0E+02	1.0E+02	5.5E+03	8.4E+03
Ethyl-4-methyl benzene, 1-	622-96-8	1.0E+00	1.0E+00	1.0E+02	1.0E+02	4.8E+03	7.2E+03
Ethylenediamine	107-15-3	7.3E-01	2.0E+00	7.3E+01	2.0E+02	5.5E+03	4.1E+04
Ethylene dibromide	106-93-4	5.0E-05	5.0E-05	5.0E-03	5.0E-03	7.2E-03	5.5E-02
Ethylene glycol	107-21-1	7.3E+01	2.0E+02	7.3E+03	2.0E+04	3.1E+05	2.0E+06
Ethylene oxide	75-21-8	8.3E-05	2.8E-04	8.3E-03	2.8E-02	7.5E-02	1.4E-01
Ethylene thiourea	96-45-7	7.7E-04	2.6E-03	7.7E-02	2.6E-01	4.4E+00	2.6E+01
Fluoranthene	206-44-0	1.5E+00	4.1E+00	1.5E+02	4.1E+02	5.5E+03	3.6E+04
Fluorene	86-73-7	1.5E+00	4.1E+00	1.5E+02	4.1E+02	5.5E+03	3.6E+04
Fluorine (soluble fluoride)	7782-41-4	4.0E+00	4.0E+00	4.0E+02	4.0E+02	1.5E+04	1.1E+05
Formaldehyde	50-00-0	7.3E+00	2.0E+01	7.3E+02	2.0E+03	5.5E+04	4.1E+05
Formic acid	64-18-6	7.3E+01	2.0E+02	7.3E+03	2.0E+04	5.5E+05	4.1E+06
Furan	110-00-9	3.7E-02	1.0E-01	3.7E+00	1.0E+01	3.9E+01	6.1E+01
Furfural	98-01-1	1.1E-01	3.1E-01	1.1E+01	3.1E+01	8.2E+02	6.1E+03
Glycidylaldehyde	765-34-4	1.5E-02	4.1E-02	1.5E+00	4.1E+00	1.1E+02	8.2E+02
Heptachlor	76-44-8	4.0E-04	4.0E-04	4.0E-02	4.0E-02	9.3E-02	4.1E-01
Heptachlor epoxide	1024-57-3	2.0E-04	2.0E-04	2.0E-02	2.0E-02	5.4E-02	3.1E-01
Hexachlorobenzene	118-74-1	1.0E-03	1.0E-03	1.0E-01	1.0E-01	2.5E-01	1.0E+00
Hexachlorobutadiene	87-68-3	7.3E-03	2.0E-02	7.3E-01	2.0E+00	1.6E+01	3.2E+01
Hexachlorocyclohexane, alpha	319-84-6	1.4E-05	4.5E-05	1.4E-03	4.5E-03	9.0E-02	6.5E-01
Hexachlorocyclohexane, beta	319-85-7	4.7E-04	1.6E-03	4.7E-02	1.6E-01	3.2E+00	2.3E+01
Hexachlorocyclohexane, gamma	58-89-9	2.0E-04	2.0E-04	2.0E-02	2.0E-02	4.4E-01	3.1E+00
Hexachlorocyclohexane, techn	608-73-1	4.7E-05	1.6E-04	4.7E-03	1.6E-02	3.2E-01	2.3E+00
Hexachlorocyclopentadiene	77-47-4	5.0E-02	5.0E-02	5.0E+00	5.0E+00	3.6E+00	5.0E+00
Hexachloroethane	67-72-1	3.7E-02	1.0E-01	3.7E+00	1.0E+01	1.5E+02	7.5E+02
Hexachlorophene	70-30-4	1.1E-02	3.1E-02	1.1E+00	3.1E+00	4.6E+01	3.1E+02
Hexane, n-	110-54-3	2.2E+00	6.1E+00	2.2E+02	6.1E+02	5.7E+01	8.1E+01
Hexazinone	51235-04-2	1.2E+00	3.4E+00	1.2E+02	3.4E+02	5.1E+03	3.4E+04
Hydrazine	302-01-2	2.8E-05	9.5E-05	2.8E-03	9.5E-03	2.1E-01	1.9E+00
Indeno-1,2,3-cd-pyrene	193-39-5	2.0E-04	3.9E-04	2.0E-02	3.9E-02	6.3E-01	3.4E+00
Isobutyl alcohol	78-83-1	1.1E+01	3.1E+01	1.1E+03	3.1E+03	3.0E+03	4.3E+03

Updated Examples of Standard No. 2, Appendix II Medium-Specific Concentrations (MSCs)

(Last update: July 14, 1999)

Contaminant	CAS #	GW-Res (mg/l)	GW-Ind (mg/l)	GWP-Res (mg/kg)	GWP-Ind (mg/kg)	SAI-Res[a] (mg/kg)	SAI-Ind[a] (mg/kg)
Isophorone	78-59-1	9.0E-01	3.0E+00	9.0E+01	3.0E+02	5.2E+03	3.0E+04
Kepone	143-50-0	1.8E-02	5.1E-02	1.8E+00	5.1E+00	7.7E+01	5.1E+02
Lead (inorganic)	7439-92-1	1.5E-02	1.5E-02	1.5E+00	1.5E+00	5.0E+02[d]	1.0E+03[d]
Malathion	121-75-5	7.3E-01	2.0E+00	7.3E+01	2.0E+02	3.1E+03	2.0E+04
Maleic anhydride	108-31-6	3.7E+00	1.0E+01	3.7E+02	1.0E+03	1.5E+04	1.0E+05
Maleic hydrazide	123-33-1	1.8E+01	5.1E+01	1.8E+03	5.1E+03	7.7E+04	5.1E+05
Malononitrile	109-77-3	7.3E-04	2.0E-03	7.3E-02	2.0E-01	3.1E+00	2.0E+01
Manganese	7439-96-5	1.7E+00	1.4E+01	1.7E+02	1.4E+03	1.6E+04	8.1E+04
Mercury	7439-97-6	2.0E-03	2.0E-03	2.0E-01	2.0E-01	6.1E+00	9.6E+00
Methacrylonitrile	126-98-7	3.7E-03	1.0E-02	3.7E-01	1.0E+00	1.1E+01	2.2E+01
Methanol	67-56-1	1.8E+01	5.1E+01	1.8E+03	5.1E+03	1.4E+05	1.0E+06
Methomyl	16752-77-5	9.1E-01	2.6E+00	9.1E+01	2.6E+02	3.9E+03	2.6E+04
Methoxychlor	72-43-5	4.0E-02	4.0E-02	4.0E+00	4.0E+00	7.5E+02	4.4E+03
Methoxyethanol, 2-	109-86-4	---	---	---	---	6.1E+00	8.5E+00
Methyl ethyl ketone	78-93-3	2.2E+01	6.1E+01	2.2E+03	6.1E+03	6.0E+03	8.6E+03
Methyl isobutyl ketone	108-10-1	2.9E+00	8.2E+00	2.9E+02	8.2E+02	2.0E+03	2.9E+03
Methyl mercury	22967-92-6	3.7E-03	1.0E-02	3.7E-01	1.0E+00	2.5E+01	1.9E+02
Methyl methacrylate	80-62-6	5.1E+01	1.4E+02	5.1E+03	1.4E+04	5.8E+03	8.2E+03
Methylnaphthalene, 2-	91-57-6	1.5E+00	4.1E+00	1.5E+02	4.1E+02	5.5E+03	3.6E+04
Methyl parathion	298-00-0	9.1E-03	2.6E-02	9.1E-01	2.6E+00	3.9E+01	2.6E+02
Methylene-bis (2-chloroaniline) 4,4'-	101-14-4	6.6E-04	2.2E-03	6.6E-02	2.2E-01	3.8E+00	2.2E+01
Methylene chloride	75-09-2	5.0E-03	5.0E-03	5.0E-01	5.0E-01	8.7E+00	1.6E+01
Molinate	2212-67-1	7.3E-02	2.0E-01	7.3E+00	2.0E+01	3.1E+02	2.0E+03
Molybdenum	7439-98-7	1.8E-01	5.1E-01	1.8E+01	5.1E+01	1.1E+03	8.1E+03
MTBE	1634-04-4	3.7E-01/ 1.5E-02[e]	1.0E+00/ 1.5E-02[e]	3.7E+01	1.0E+02	1.5E+03	3.7E+03
Naled	300-76-5	7.3E-02	2.0E-01	7.3E+00	2.0E+01	3.1E+02	2.0E+03
Naphthalene	91-20-3	7.3E-01	2.0E+00	7.3E+01	2.0E+02	1.8E+02	2.7E+02
Nickel and compounds	7440-02-0	7.3E-01	2.0E+00	7.3E+01	2.0E+02	1.9E+03	1.2E+04
Nitrate	14797-55-8	1.0E+01	1.0E+01	1.0E+03	1.0E+03	4.1E+05	3.0E+06
Nitrite	14797-65-0	1.0E+00	1.0E+00	1.0E+02	1.0E+02	2.5E+04	1.9E+05
Nitroaniline, 2-	88-74-4	1.1E-02	3.1E-02	1.1E+00	3.1E+00	4.6E+01	3.1E+02
Nitrobenzene	98-95-3	1.8E-02	5.1E-02	1.8E+00	5.1E+00	6.5E+01	2.7E+02
Nitropropane, 2-	79-46-9	---	---	---	---	4.2E-03	7.0E-03
Nitroso-n-ethylurea, n-	759-73-9	6.1E-07	2.0E-06	6.1E-05	2.0E-04	3.5E-03	2.0E-02
Nitroso-methyl-ethyl-amine, n-	10595-95-6	3.9E-06	1.3E-05	3.9E-04	1.3E-03	2.9E-02	2.6E-01
Nitrosodi-n-butylamine, n-	924-16-3	1.6E-05	5.3E-05	1.6E-03	5.3E-03	4.1E-02	1.0E-01
Nitrosodi-n-propylamine, n-	621-64-7	1.2E-05	4.1E-05	1.2E-03	4.1E-03	4.1E-02	1.6E-01
Nitrosodiethanolamine	1116-54-7	3.0E-05	1.0E-04	3.0E-03	1.0E-02	1.7E-01	1.0E+00
Nitrosodiethylamine, n-	55-18-5	5.7E-07	1.9E-06	5.7E-05	1.9E-04	4.3E-03	3.8E-02
Nitrosodimethylamine, n-	62-75-9	1.7E-06	5.6E-06	1.7E-04	5.6E-04	1.3E-02	1.1E-01
Nitrosodiphenylamine	86-30-6	1.7E-02	5.8E-02	1.7E+00	5.8E+00	5.9E+01	2.3E+02
Nitrosopyrrolidine, n-	930-55-2	4.1E-05	1.4E-04	4.1E-03	1.4E-02	2.3E-01	1.4E+00
Nitrotoluene, m-	99-08-1	3.7E-01	1.0E+00	3.7E+01	1.0E+02	4.4E+02	7.9E+02

Updated Examples of Standard No. 2, Appendix II Medium-Specific Concentrations (MSCs)

(Last update: July 14, 1999)

Contaminant	CAS #	GW-Res (mg/l)	GW-Ind (mg/l)	GWP-Res (mg/kg)	GWP-Ind (mg/kg)	SAI-Res[a] (mg/kg)	SAI-Ind[a] (mg/kg)
Nitrotoluene, o-	88-72-2	3.7E-01	1.0E+00	3.7E+01	1.0E+02	4.7E+02	8.6E+02
Nitrotoluene, p-	99-99-0	3.7E-01	1.0E+00	3.7E+01	1.0E+02	4.4E+02	7.9E+02
Octamethylpyrophosphoramide	152-16-9	7.3E-02	2.0E-01	7.3E+00	2.0E+01	3.1E+02	2.0E+03
Oxamyl	23135-22-0	2.0E-01	2.0E-01	2.0E+01	2.0E+01	3.9E+03	2.6E+04
Parathion	56-38-2	2.2E-01	6.1E-01	2.2E+01	6.1E+01	9.3E+02	6.1E+03
Pebulate	1114-71-2	1.8E+00	5.1E+00	1.8E+02	5.1E+02	7.7E+03	5.1E+04
Pentachlorobenzene	608-93-5	2.9E-02	8.2E-02	2.9E+00	8.2E+00	1.2E+02	8.0E+02
Pentachloronitrobenzene	82-68-8	3.3E-03	1.1E-02	3.3E-01	1.1E+00	1.9E+01	1.1E+02
Pentachlorophenol	87-86-5	1.0E-03	1.0E-03	1.0E-01	1.0E-01	3.0E+00	1.4E+01
Perchlorate	NA	2.2E-02[f]	9.2E-02	2.2E+00[f]	9.2E+00	6.6E+01[f]	1.2E+03
Phenanthrene	85-01-8	1.1E+00	3.1E+00	1.1E+02	3.1E+02	4.1E+03	2.7E+04
Phenol	108-95-2	2.2E+01	6.1E+01	2.2E+03	6.1E+03	9.3E+04	6.1E+05
Phenyl mercuric acetate	62-38-4	2.9E-03	8.2E-03	2.9E-01	8.2E-01	1.2E+01	8.2E+01
Phenylene diamine, m-	108-45-2	2.2E-01	6.1E-01	2.2E+01	6.1E+01	9.3E+02	6.1E+03
Phenylene diamine, p-	106-50-3	6.9E+00	1.9E+01	6.9E+02	1.9E+03	2.9E+04	1.9E+05
Phorate	298-02-2	7.3E-03	2.0E-02	7.3E-01	2.0E+00	1.6E+01	3.8E+01
Phosphine	7803-51-2	1.1E-02	3.1E-02	1.1E+00	3.1E+00	5.9E+01	4.1E+02
Phosphorus, white	7723-14-0	7.3E-04	2.0E-03	7.3E-02	2.0E-01	4.0E+00	2.7E+01
Phthalic anhydride	85-44-9	7.3E+01	2.0E+02	7.3E+03	2.0E+04	3.1E+05	2.0E+06
Polybrominated biphenyls	67774-32-7	9.6E-06	3.2E-05	9.6E-04	3.2E-03	5.5E-02	3.2E-01
Polychlorinated biphenyls	1336-36-3	5.0E-04	5.0E-04	5.0E-02	5.0E-02	1.0E+01[g]	1.0E+01[g]
Pronamide	23950-58-5	2.7E+00	7.7E+00	2.7E+02	7.7E+02	1.2E+04	7.7E+04
Propargite	2312-35-8	7.3E-01	2.0E+00	7.3E+01	2.0E+02	3.1E+03	2.0E+04
Propargyl alcohol	107-19-7	7.3E-02	2.0E-01	7.3E+00	2.0E+01	5.5E+02	4.1E+03
Propham	122-42-9	7.3E-01	2.0E+00	7.3E+01	2.0E+02	3.1E+03	2.0E+04
Propylene oxide	75-56-9	3.5E-04	1.2E-03	3.5E-02	1.2E-01	1.2E+00	3.1E+00
Pyrene	129-00-0	1.1E+00	3.1E+00	1.1E+02	3.1E+02	4.1E+03	2.7E+04
Pyridine	110-86-1	3.7E-02	1.0E-01	3.7E+00	1.0E+01	8.2E+00	1.2E+01
Quinoline	91-22-5	7.1E-05	2.4E-04	7.1E-03	2.4E-02	4.1E-01	2.4E+00
Selenium	7782-49-2	5.0E-02	5.0E-02	5.0E+00	5.0E+00	1.3E+03	9.2E+03
Selenourea	630-10-4	1.8E-01	5.1E-01	1.8E+01	5.1E+01	1.4E+03	1.0E+04
Silver	7440-22-4	1.8E-01	5.1E-01	1.8E+01	5.1E+01	4.6E+02	2.8E+03
Sodium diethyldithiocarbamate	148-18-5	3.2E-03	1.1E-02	3.2E-01	1.1E+00	2.4E+01	2.1E+02
Strychnine	57-24-9	1.1E-02	3.1E-02	1.1E+00	3.1E+00	4.6E+01	3.1E+02
Styrene	100-42-5	1.0E-01	1.0E-01	1.0E+01	1.0E+01	1.3E+04	2.3E+04
Tetrachlorobenzene, 1,2,4,5-	95-94-3	1.1E-02	3.1E-02	1.1E+00	3.1E+00	4.6E+01	3.0E+02
Tetrachloroethane, 1,1,1,2-	630-20-6	3.3E-02	1.1E-01	3.3E+00	1.1E+01	5.2E+01	1.0E+02
Tetrachloroethane, 1,1,2,2-	79-34-5	4.3E-03	1.4E-02	4.3E-01	1.4E+00	5.1E+00	9.8E+00
Tetrachloroethylene	127-18-4	5.0E-03	5.0E-03	5.0E-01	5.0E-01	6.0E+00	1.7E+01
Tetrachlorophenol, 2,3,4,6-	58-90-2	1.1E+00	3.1E+00	1.1E+02	3.1E+02	4.6E+03	3.1E+04
Tetraethyl dithiopyrophosphate	3689-24-5	1.8E-02	5.1E-02	1.8E+00	5.1E+00	7.7E+01	5.1E+02
Tetraethyl lead	78-00-2	3.7E-06	1.0E-05	3.7E-04	1.0E-03	1.5E-02	9.7E-02
Thallium and compounds (as thallium chloride)	7791-12-0	2.0E-03	2.0E-03	2.0E-01	2.0E-01	2.0E+01	1.5E+02
Thiofanox	39196-18-4	1.1E-02	3.1E-02	1.1E+00	3.1E+00	4.6E+01	3.1E+02

Updated Examples of Standard No. 2, Appendix II Medium-Specific Concentrations (MSCs)

(Last update: July 14, 1999)

Contaminant	CAS #	GW-Res (mg/l)	GW-Ind (mg/l)	GWP-Res (mg/kg)	GWP-Ind (mg/kg)	SAI-Res[a] (mg/kg)	SAI-Ind[a] (mg/kg)

The SAI-Res (20 mg/kg) and SAI-Ind (200 mg/kg) values for arsenic are based on the cleanup levels established by the Executive irector (interoffice memos entitled "Arsenic Soil Cleanup Standards" from Dan Pearson on May 19, 1995 and "Arsenic Soil leanup Standards for Commercial/Industrial Areas" from Jeff Saitas on September 11, 1998, respectively).

The SAI-Res MSC value for cadmium does NOT account for vegetable ingestion. Please include this pathway when warranted ue to site-specific conditions.

The SAI-Res and SAI-Ind values for lead were calculated using the USEPA Lead Uptake/Biokinetic Model and the USEPA odel for Assessing Risks Associated with Adult Exposures to Lead in Soil, respectively.

The first value for MTBE represents the health-based value; the second value for MTBE is based on odor and taste.

The GW-Res, GWP-Res, and SAI-res values for perchlorate are specifically set to address a childhood exposure scenario, due to he potential for the unique toxicity of perchlorate to children.

The SAI-Res and SAI-Ind value for PCBs (10 mg/kg) is based on the TSCA limit defined in 40 CFR 761.125. An alternate leanup level of 25 mg/kg may be appropriate for certain industrial sites, provided the site meets the requirements for a restricted ccess site (i.e., > 0.1 km from a residential/commercial area limited by man-made barriers) as defined in TSCA 40 CFR 761.123.

APPENDIX J-2

TEXAS-SPECIFIC BACKGROUND CONCENTRATIONS

Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

To: Remediation Division Project Managers

Date: June 28, 2000

Thru: Jacqueline S. Hardee, P.E., Director *(Initialed JSH)*
Remediation Division

From: Chet Clarke, Manager *(Initialed WDC)*
Technical Support Section

Subject: Using non-site specific background assumptions under the 30 TAC 335 Risk Reduction Rules.

As stated in Section VI.3 of the TNRCC Interoffice Memorandum dated July 23, 1998, regarding Implementation of the Existing Risk Reduction Rule, commonly referred to as the "Consistency Document," background concentrations established under the Risk Reduction Rule (30 TAC 335) must be established site-specifically and that Soil Conservation Survey or U.S. Geological Survey reports should not be used to characterize site-specific background for soils. The general policy regarding background as stated in the Consistency Document stands but is now modified to address situations when background cannot be established site-specifically. These situations are limited to sites without appropriate locations being available, due to the extent of contamination from releases or presence of physical barriers, to collect natural background concentration data which are reasonably proximal or within the same environmental media as the affected media of interest. In situations where there are no appropriate locations to collect natural background concentration data, persons may use the following table to determine background concentrations. Otherwise, the person must set background site-specifically. Quantification of anthropogenic background likely will not be influenced by these location constraints and should continue to be based on sample locations beyond the release site.

Texas-Specific Background Concentration	
Metal	Median Background Concentration (mg/kg)
Aluminum	30,000
Antimony	1
Arsenic	5.9
Barium	300
Beryllium	1.5

Boron	30
Total Chromium	30
Cobalt	7
Copper	15
Fluorine	190
Iron	15,000
Lead	15
Manganese	300
Mercury	0.04
Nickel	10
Selenium	0.3
Strontium	100
Tin	0.9
Titanium	2,000
Thallium	9.3
Vanadium	50
Zinc	30

Additional constituents may be added to this table as information becomes available.