Attachment 2
TABLE 1A
Input Parameters for Soil-Water Partition Equation [1]

Parameter	Description	Units	Site-Specific Value	Default Value	Parameter sources and uses
d	Mixing zone thickness	ft	-- [2]	--	Chemical-specific (NDEP, 2010); used to calculate DAF in Equation 4 of leaching guidance. [2]
d_a	Aquifer thickness (ft)	ft	13.5	--	Average saturated alluvial thickness; used to calculate DAF in Equation 4 of leaching guidance. [3]
DAF	Dilution attenuation factor	unitless	-- [4]	--	Chemical- and source-specific calculation; see Attachment 2, Tables 4A and 4B.
I	Infiltration rate	ft/yr	0.1 [5]	0.0067	See Attachment 2 for Site-specific estimate of infiltration rate for industrial land use; used to calculate DAF in Equations 3 and 4 of leaching guidance; default value applies only to undeveloped land. [5]
i	Hydraulic gradient	unitless	0.02	--	Average horizontal gradient in the shallow water-bearing zone; used to calculate DAF in Equations 3 and 4 of leaching guidance. [6]
K	Hydraulic conductivity	ft/yr	47,500	--	Average horizontal hydraulic conductivity in the saturated alluvium; used to calculate DAF in Equations 3 and 4 of leaching guidance. [7]
Kd	Distribution coefficient	L/kg	-- [8]	--	Chemical-specific; used to calculate LBCLs and LSSLs in Equations 1 and 2 of leaching guidance. [8]
Koc	Soil organic carbon-water partition coefficient	L/kg	-- [8]	--	Chemical-specific; used to calculate LBCLs and LSSLs in Equation 2 of leaching guidance. [8]
L	Source length	ft	-- [9]	--	Chemical-specific; used to calculate DAF in Equations 3 and 4 of leaching guidance. [9]
foc	Fraction organic carbon	unitless	--	0.002	Chemical-specific; used to calculate LSSL for organic chemicals in Equation 2 of leaching guidance. [8]
θ	soil porosity [1-(ρb/ρs)]	unitless	0.40	0.43	Site-specific value calculated from dry bulk density and particle density; used to calculate LSSLs; default value used to calculate LBCLs.
θw	Water filled soil porosity	unitless	0.22	0.3	Site-specific mean of geotechnical samples per ASTM D 2216 used to calculate LSSLs; default value used to calculate LBCLS.
θa	Air filled soil porosity	unitless	0.18	0.13	Site-specific value calculated from total porosity - water filled porosity; used to calculate LSSLs; default value used to calculate LBCLs.
H'	Henry's Law constant	unitless	-- [8]	--	Chemical specific; used to calculate LBCLs and LSSLs.
ρb	Dry bulk density	kg/L	1.61	1.5	Site-specific mean of geotechnical samples per ASTM D 2937; used to calculate LSSLs; default value used to calculate LBCLs.
ρs	Soil particle density	kg/L	2.67	--	Site-specific mean of geotechnical samples per ASTM D 854; used to calculate total soil porosity.
RBGC	Risk-based groundwater concentration	mg/L	-- [10]	--	Chemical-specific; used to calculate LBCLs and LSSLs. [10]

Notes:

1 - Leaching-based site-specific levels (LSSLs) are calculated using Equations 1 and 2 of the leaching guidance (NDEP, 2010); see Attachment 2, Tables 5A and 5B .

2 - Aquifer mixing zone depth d = (0.0112L^2)^0.5 + da[1-exp(-LI/Kida)]; see Equation 4 from leaching guidance and Attachment 2, Tables 4A and 4B for chemical and source-specific values. If $d > d_a$, aquifer thickness was used instead of mixing zone thickness, per NDEP guidance (NDEP, 2010).

Attachment 2
TABLE 1A
Input Parameters for Soil-Water Partition Equation [1]

Parameter	Description	Units	Site-Specific Value	Default Value	Parameter sources and uses

3 - Refer to Attachment 2, Table 1B for the calculation of aquifer thickness for the saturated alluvium at northern Site boundary wells, based on the measured groundwater elevations for the shallow water-bearing zone from the Annual Remedial Performance Report for Chromium and Perchlorate (Northgate, 2009).

4 - See Attachment 2, Tables 4A and 4B for calculation of DAFs.

5 - See Attachment 2 for a discussion of the methods used to estimate the infiltration rate.

6 - Average on-Site hydraulic gradient from Annual Remedial Performance Report for Chromium and Perchlorate (Northgate, 2009).

7 - Hydraulic conductivity = average from well M-27 slug test (1,496 gpd/ft2=73,050 ft/yr) + average of six other M-series Qal slug tests (449 gpd/ft2=21,900 ft/yr) (Northgate, 2010).

8 - See Attachment 2, Tables 3A and 3B for references for chemical-specific parameters.

9 - See Attachment 2 for a discussion of the methodology for determining chemical-specific source lengths.

10 - Hierarchy of values used for RBGCs as follows: 1) Primary Federal (USEPA) MCL, 2) NDEP tap water basic comparison levels (NDEP, 2009 BCLs), and 3) Secondary USEPA MCLs (NDEP, 2009). All MCLs from http://www.epa.gov/safewater/consumer/pdf/mcl.pdf.

Attachment 2
TABLE 1B
Thickness of Saturated Alluvium in Northern Boundary Wells

WELL #	Sample Date	Ground Surface Elev (ft MSL)	TOC Elev (ft MSL)	DTW TOC (ft)	Water Elev (ft MSL)	Depth to Qal/UMCf contact (ft)	Thickness of Sat. Qal (ft)
H-48 [1]	5/14/09	NA	1684.29	28.85	1655.44	59.00	30.15
M-44	5/5/09	1695.74	1698.31	20.67	1677.64	20.00	1.90
M-48	5/5/09	1718.43	1720.78	29.05	1691.73	32.00	5.30
M-95	5/4/09	1694.52	1694.09	12.75	1681.34	23.00	9.82
M-96	5/4/09	1693.80	1693.52	12.85	1680.67	20.80	7.67
PC-40	5/13/09	1677.05	1679.23	22.40	1656.83	56.00	35.78
PC-71	5/4/09	1696.11	1698.73	23.98	1674.75	27.50	6.14
PC-72	5/4/09	1696.89	1699.43	27.96	1671.47	34.00	8.58
PC-73	5/4/09	1697.56	1699.50	30.09	1669.41	44.00	15.85
Average Saturated Qal Thickness at N. Boundary Wells (feet):							**13.5**

Notes:

DTW - Depth to groundwater measurements from Annual Performance Monitoring Report--Chromium and Perchlorate, July 2008 - June 2009 (Northgate, 2009)

ft MSL - feet above mean sea level

ft - feet

NA - ground surface elevation not available

Sat. Qal - Saturated alluvium

TOC - top of casing

UMCf - Upper Muddy Creek formation

1 - Thickness of saturated Qal in well H-48 is estimated relative to top of casing, since ground surface elevation is not available.

Attachment 2
TABLE 2A
Leaching-Based Basic Comparison Levels (LBCLs) for Inorganics

Parameter of Interest	Chemical[5]	Kd Distribution coefficient (L/kg)	H' Henry's Law constant (unitless)	RBGC [1] (mg/L)	NDEP Worker BCL (mg/kg)	LBCL (DAF=1) (mg/kg)	LBCL (DAF=20) (mg/kg)	Generic or Adjusted LBCL [2, 3, 4] (DAF=20) (mg/kg)
Metals	**Aluminum**	1.5E+03	**--**	**3.7E+01**	1.0E+05	7.5E+01	1.5E+03	**>100% wt/wt**
	Antimony	4.5E+01	--	6.0E-03	4.5E+02	3.0E-01	6.0E+00	NC
	Arsenic	3.1E+01	--	1.0E-02	1.8E+00	1.0E+00	2.0E+01	NC
	Barium	5.2E+01	--	2.0E+00	1.0E+05	8.2E+01	1.6E+03	NC
	Beryllium	1.0E+05	--	4.0E-03	2.0E+03	3.0E+00	6.0E+01	NC
	Boron	3.0E+00	--	7.3E+00	1.0E+05	2.3E+01	4.7E+02	NC
	Cadmium	4.3E+03	--	5.0E-03	5.5E+02	4.0E-01	8.0E+00	NC
	Chromium (Total)	8.5E+02	--	1.0E-01	4.1E+02	2.0E+00	4.0E+01	NC
	Chromium (VI)	1.4E+01	--	1.0E-01	4.1E+02	2.0E+00	4.0E+01	NC
	Cobalt	4.5E+01	--	**1.1E-02**	3.3E+02	3.3E+01	6.6E+02	**9.9E+00**
	Copper	3.5E+01	--	**1.3E+00**	4.2E+04	3.5E+01	7.0E+02	**9.2E+02**
	Iron	2.5E+01	--	**2.6E+01**	1.0E+05	7.6E+00	1.5E+02	**1.3E+04**
	Lead	9.0E+02	--	1.5E-02	8.0E+02	NE	NE	2.7E+02
	Magnesium	4.5E+00	--	**2.1E+02**	1.0E+05	6.5E+02	1.3E+04	**1.9E+04**
	Manganese	6.5E+01	--	**5.1E-01**	1.4E+04	3.3E+00	6.5E+01	**6.7E+02**
	Mercury	1.0E+01	4.7E-01	2.0E-03	1.8E+02	1.0E-01	2.1E+00	NC
	Molybdenum	2.0E+01	--	1.8E-01	5.7E+03	3.6E+00	7.3E+01	NC
	Nickel	1.9E+03	--	7.3E-01	2.0E+04	7.0E+00	1.4E+02	NC
	Selenium	2.2E+00	--	5.0E-02	5.7E+03	3.0E-01	6.0E+00	NC
	Silver	1.1E+02	--	**1.8E-01**	5.7E+03	2.0E+00	4.0E+01	**3.1E+01**
	Strontium	3.5E+01	--	2.2E+01	1.0E+05	NE	NE	1.5E+04
	Thallium	9.6E+01	--	2.0E-03	8.0E+01	4.0E-01	8.0E+00	NC
	Tin	2.5E+02	--	2.2E+01	1.0E+05	NE	NE	1.1E+05
	Titanium	1.0E+03	--	1.5E+02	1.0E+05	1.5E+05	>100% wt/wt	NC
	Tungsten	1.5E+02	--	2.7E-01	8.5E+03	4.1E+01	8.2E+02	NC
	Uranium	4.5E+02	--	3.0E-02	3.4E+03	1.4E+01	2.7E+02	NC
	Vanadium	1.0E+03	--	1.8E-01	5.7E+03	3.0E+02	6.0E+03	NC
	Zinc	5.3E+02	--	1.1E+01	1.0E+05	6.2E+02	1.2E+04	NC
Perchlorate	Perchlorate	2.8E-07	--	1.8E-02	7.9E+02	NE	NE	7.2E-02

Attachment 2
TABLE 2A
Leaching-Based Basic Comparison Levels (LBCLs) for Inorganics

Notes

1 - Hierarchy of values used for adjusted RBGCs as follows: 1) Primary Federal (USEPA) MCL, 2) NDEP tap water basic comparison levels (NDEP, 2009 BCLs), and 3) Secondary USEPA MCLs (NDEP meeting minutes for February 12 and 17, 2010). All MCLs from http://www.epa.gov/safewater/consumer/pdf/mcl.pdf and are primary MCLs unless otherwise noted.

2 - Leaching-based, basic comparison levels (LBCLs) are calculated as follows: LBCL = RBGC * DAF * (K_d + (Θ_w+Θ_a*H')/ρ_b)

3 - Generic leaching-based basic comparison levels are calculated for chemicals for which NDEP did not establish LBCLs, using literature values for chemical properties and NDEP default values for soil properties (water-filled porosity, θw=0.3; air-filled porosity, θa=0.13; and dry bulk density, ρb=1.5 kg/L).

4 - Adjusted LBCLs are calculated for chemicals in **bold** type using modified hierarchy of values for RBGCs for leaching evaluation, as discussed with NDEP (NDEP meeting minutes for February 12, and 17, 2010).

5 - Chemicals without an RBGC and chemicals with no Site detects are not shown in this table.

SYMBOLS

K_d (L_W/kg_S) = soil-water partition coefficient

θw (L_W/L_T) = water-filled porosity

ρb (kg_S/L_T) = dry bulk density (default value from USEPA, 1996; page 36)

θa (L_A/L_T) = air-filled porosity (default value from USEPA, 1996; page 36)

H' (L_W/L_A) = dimensionless Henry's constant

DAF = dilution-attenuation factor

LBCL = Leaching-based comparison level

RBGC = Risk-based groundwater concentrations; values in **bold** type used to calculate adjusted LBCLs.

NE = Value not established

UNITS

kg = kilograms

mg = milligrams

L_W = liters of water

L_A = liters of air

L_T = liters of total bulk soil (soil air, soil water, and soil)

Attachment 2
TABLE 2B
Leaching-Based Basic Comparison Levels (LBCLs) for Organics

Parameter of Interest	Chemical[5]	Kd Distribution coefficient (L/kg) with foc=0.006 (L/kg)	H' Henry's Law constant (unitless)	RBGC [1] (mg/L)	NDEP Worker BCL (mg/kg)	LBCL (DAF=1) (mg/kg)	LBCL (DAF=20) (mg/kg)	Generic or Adjusted LBCL [2, 3, 4] (DAF=20) (mg/kg)
Organic Acids	Benzenesulfonic acid	--	--	1.8E+01	1.0E+05	NE	NE	**NE**
	Diethyl phosphorodithioic acid	--	1.5E-02	2.9E+00	9.1E+04	NE	NE	**NE**
	Dimethyl phosphorodithioic acid	--	8.6E-03	3.7E+00	1.0E+05	NE	NE	**NE**
	Phthalic acid	--	--	3.7E+01	1.0E+05	NE	NE	NE
Organophosphate Pesticides	Stirphos	--	--	2.8E-03	--	NE	NE	NE
Organochlorine Pesticides	4,4'-DDD	6.0E+03	1.6E-04	2.8E-04	1.1E+01	8.0E-01	1.6E+01	NC
	4,4'-DDE	2.7E+04	8.6E-04	2.0E-04	7.8E+00	3.0E+00	6.0E+01	NC
	4,4'-DDT	1.6E+04	3.3E-04	2.0E-04	7.8E+00	2.0E+00	4.0E+01	NC
	Aldrin	1.5E+04	7.0E-03	4.0E-06	1.1E-01	2.0E-02	4.0E-01	NC
	Alpha-BHC	7.4E+00	4.4E-04	1.1E-05	4.0E-01	3.0E-05	6.0E-04	NC
	Beta-BHC	7.6E+00	3.1E-05	3.7E-05	1.4E+00	1.0E-04	2.0E-03	NC
	Dieldrin	1.3E+02	6.2E-04	4.2E-06	1.2E-01	2.0E-04	4.0E-03	NC
	Endrin	7.4E+01	3.1E-04	2.0E-03	2.1E+02	5.0E-02	1.0E+00	NC
	Gamma-BHC (Lindane)	6.4E+00	5.7E-04	2.0E-04	1.9E+00	5.0E-04	1.0E-02	NC
	Heptachlor Epoxide	5.0E+02	3.9E-04	2.0E-04	2.1E-01	3.0E-02	6.0E-01	NC
	Methoxychlor	5.9E+02	6.5E-04	4.0E-02	3.4E+03	8.0E+00	1.6E+02	NC
SVOCs	1,4-Dioxane	1.0E-01	2.0E+02	6.1E-03	1.7E+02	NE	NE	2.1E+00
	Acenaphthene	2.9E+01	6.4E-03	2.2E+00	6.8E+04	2.9E+01	5.8E+02	NC
	Acenaphthylene	9.0E+00	4.7E-03	1.1E+00	1.5E+02	NE	NE	2.0E+02
	Anthracene	1.4E+02	2.7E-03	1.1E+01	1.0E+05	5.9E+02	1.2E+04	NC
	Benz(a)anthracene	2.4E+03	1.4E-04	9.2E-05	2.3E+00	8.0E-02	1.6E+00	NC
	Benzo(a)pyrene	6.1E+03	4.6E-05	2.0E-04	2.3E-01	4.0E-01	8.0E+00	NC
	Benzo(b)fluoranthene	7.4E+03	4.6E-03	9.2E-05	2.3E+00	2.0E-01	4.0E+00	NC
	Benzo(g,h,i)perylene	--	--	1.1E+00	3.4E+04	NE	NE	NE
	Benzo(k)fluoranthene	7.4E+03	3.4E-05	9.2E-04	2.3E+01	2.0E+00	4.0E+01	NC
	bis(2-Ethylhexyl)phthalate	9.1E+04	4.2E-06	6.0E-03	1.4E+02	1.8E+02	3.6E+03	NC
	Butyl benzyl phthalate	8.3E+01	7.9E-05	7.3E+00	2.4E+02	8.1E+02	1.6E+04	NC
	Chrysene	2.4E+03	3.9E-03	9.2E-03	2.3E+02	8.0E+00	1.6E+02	NC
	Dibenz(a,h)anthracene	2.3E+04	6.0E-07	9.2E-06	2.3E-01	8.0E-02	1.6E+00	NC
	Diethyl phthalate	1.7E+00	1.9E-05	2.9E+01	1.0E+05	NE	NE	1.1E+03
	Dimethyl phthalate	--	--	3.7E+02	1.0E+05	NE	NE	NE
	Di-N-Butyl phthalate	2.0E+02	3.9E-08	3.7E+00	6.8E+04	2.7E+02	5.4E+03	NC
	Fluoranthene	6.4E+02	6.6E-04	1.5E+00	2.4E+04	2.1E+02	4.2E+03	NC
	Fluorene	4.7E+01	3.2E-03	1.5E+00	4.5E+04	2.8E+01	5.6E+02	NC
	Hexachlorobenzene	3.3E+02	5.4E-02	1.0E-03	1.2E+00	1.0E-01	2.0E+00	NC
	Indeno(1,2,3-cd)pyrene	2.1E+04	6.6E-05	9.2E-05	2.3E+00	7.0E-01	1.4E+01	NC
	Naphthalene-SVOC	7.1E+00	2.0E-02	4.3E-03	5.2E+00	4.0E+00	8.0E+01	NC

Attachment 2
TABLE 2B
Leaching-Based Basic Comparison Levels (LBCLs) for Organics

Parameter of Interest	Chemical[5]	Kd Distribution coefficient (L/kg) with foc=0.006 (L/kg)	H' Henry's Law constant (unitless)	RBGC [1] (mg/L)	NDEP Worker BCL (mg/kg)	LBCL (DAF=1) (mg/kg)	LBCL (DAF=20) (mg/kg)	Generic or Adjusted LBCL [2, 3, 4] (DAF=20) (mg/kg)
	Phenanthrene	2.2E+01	9.4E-04	1.1E+00	2.5E+01	NE	NE	4.9E+02
	Pyrene	4.1E+02	4.5E-04	1.1E+00	3.4E+04	2.1E+02	4.2E+03	NC
VOCs	1,1,1-Trichloroethane	8.1E-01	7.1E-01	2.0E-01	1.4E+03	1.0E-01	2.0E+00	NC
	1,1-Dichloroethane	3.2E-01	2.3E-01	1.2E-02	7.3E+00	1.0E+00	2.0E+01	NC
	1,1-Dichloroethene	3.9E-01	1.1E+00	7.0E-03	4.3E+02	3.0E-03	6.0E-02	NC
	1,2,3-Trichloropropane	3.1E-01	1.1E+00	3.4E-05	1.6E+00	NE	NE	4.1E-04
	1,2,4-Trichlorobenzene	1.0E+01	5.8E-02	7.0E-02	2.4E+02	3.0E-01	6.0E+00	NC
	1,2,4-Trimethylbenzene	2.2E+01	2.3E-01	5.1E-02	2.0E+02	NE	NE	2.3E+01
	1,2-Dichlorobenzene	2.3E+00	7.8E-02	6.0E-01	3.7E+02	9.0E-01	1.8E+01	NC
	1,2-Dichloroethane	2.3E-01	4.0E-02	5.0E-03	7.7E-01	1.0E-03	2.0E-02	NC
	1,3,5-Trimethylbenzene	4.9E+00	3.2E-01	5.9E-01	7.0E+01	NE	NE	6.1E+01
	1,3-Dichlorobenzene	2.3E+00	7.8E-02	1.1E-01	3.7E+02	NE	NE	5.4E+00
	1,4-Dichlorobenzene	3.7E+00	1.0E-01	7.5E-02	4.7E+00	1.0E-01	2.0E+00	NC
	2-Butanone	2.7E-02	1.1E-03	2.1E+01	3.4E+04	NE	NE	9.7E+01
	2-Chlorotoluene	9.6E-01	1.4E-01	7.3E-01	5.1E+02	NE	NE	1.7E+01
	4-Methyl-2-pentanone	8.0E-01	5.7E-03	2.9E+00	1.7E+04	NE	NE	5.8E+01
	Acetone	3.5E-03	1.6E-03	3.3E+01	1.0E+05	8.0E-01	1.6E+01	NC
	Benzene	3.7E-01	2.3E-01	5.0E-03	1.4E+00	2.0E-03	4.0E-02	NC
	Bromodichloromethane	6.0E-01	6.6E-02	1.1E-03	5.1E+01	3.0E-02	6.0E-01	NC
	Bromoform	5.2E-01	2.2E-02	8.5E-03	2.4E+02	4.0E-02	8.0E-01	NC
	Carbon tetrachloride	9.1E-01	1.2E+00	5.0E-03	5.3E-01	3.0E-03	6.0E-02	NC
	Chlorobenzene	1.3E+00	1.5E-01	1.0E-01	4.6E+02	7.0E-02	1.4E+00	NC
	Chloroethane	8.8E-02	4.5E-01	2.3E-02	1.1E+03	NE	NE	1.5E-01
	Chloroform	3.2E-01	1.5E-01	1.6E-03	5.2E-01	3.0E-02	6.0E-01	NC
	Chloromethane	2.1E-01	9.8E-01	8.1E-02	2.7E+00	NE	NE	8.0E-01
	cis-1,2-Dichloroethene	2.1E-01	1.7E-01	7.0E-02	1.2E+03	2.0E-02	4.0E-01	NC
	Dibromochloromethane	3.8E-01	3.5E-02	7.0E-04	2.1E+00	2.0E-02	4.0E-01	NC
	Dichlorodifluoromethane	3.5E-01	4.1E+00	5.8E+00	3.1E+02	NE	NE	1.1E+02
	Ethylbenzene	1.2E+00	3.2E-01	7.0E-01	6.7E+00	7.0E-01	1.4E+01	NC
	Hexachlorobutadiene	3.2E+02	3.3E-01	8.6E-04	2.5E+01	1.0E-01	2.0E+00	NC
	Isopropylbenzene	1.3E+00	4.9E+01	3.4E+00	5.4E+02	NE	NE	4.0E+02
	Methylene chloride	6.0E-02	9.0E-02	5.0E-03	2.1E+01	1.0E-03	2.0E-02	NC
	Naphthalene-VOC	7.1E+00	2.0E-02	4.3E-03	5.2E+00	4.0E+00	8.0E+01	NC
	N-Butylbenzene	1.7E+01	5.4E-01	3.7E-01	2.4E+02	NE	NE	1.3E+02
	N-Propylbenzene	1.7E+01	5.4E-01	3.7E-01	2.4E+02	NE	NE	1.3E+02
	o-Xylene	1.4E+00	2.1E-01	4.3E+01	2.8E+02	9.0E+00	1.8E+02	NC
	sec-Butylbenzene	1.3E+01	7.7E-01	3.7E-01	2.2E+02	NE	NE	9.6E+01
	Styrene	5.5E+00	1.1E-01	1.0E-01	1.7E+03	2.0E-01	4.0E+00	NC

Attachment 2
TABLE 2B
Leaching-Based Basic Comparison Levels (LBCLs) for Organics

Parameter of Interest	Chemical[5]	Kd Distribution coefficient (L/kg) with foc=0.006 (L/kg)	H' Henry's Law constant (unitless)	RBGC [1] (mg/L)	NDEP Worker BCL (mg/kg)	LBCL (DAF=1) (mg/kg)	LBCL (DAF=20) (mg/kg)	Generic or Adjusted LBCL [2, 3, 4] (DAF=20) (mg/kg)
	tert-Butylbenzene	1.3E+01	5.2E-01	3.7E-01	3.9E+02	NE	NE	9.6E+01
	Tetrachloroethene	1.6E+00	7.5E-01	5.0E-03	1.7E+00	3.0E-03	6.0E-02	NC
	Toluene	8.4E-01	2.7E-01	1.0E+00	5.2E+02	6.0E-01	1.2E+01	NC
	Trichloroethene	5.7E-01	4.2E-01	5.0E-03	3.4E+00	3.0E-03	6.0E-02	NC
	Trichlorofluoromethane	9.6E-01	4.0E+00	9.9E+00	1.3E+03	NE	NE	3.0E+02
	Vinyl Chloride	1.1E-01	1.1E+00	2.0E-03	8.6E-01	7.0E-04	1.4E-02	NC

Notes

1 - Hierarchy of values used for adjusted RBGCs as follows: 1) Primary Federal (USEPA) MCL, 2) NDEP tap water basic comparison levels (NDEP, 2009 BCLs), and 3) Secondary USEPA MCLs (NDEP meeting minutes for February 12 and 17, 2010).
All MCLs from http://www.epa.gov/safewater/consumer/pdf/mcl.pdf and are primary MCLs unless otherwise noted.

2 - Leaching-based, basic comparison levels (LBCLs) are calculated as follows: $LBCL = RBGC * DAF * (K_d + (\Theta_w + \Theta_a * H')/\rho_b)$

3 - Generic leaching-based basic comparison levels are calculated for chemicals for which NDEP did not establish LBCLs, using literature values for chemical properties and NDEP default values for soil properties (water-filled porosity, θw=0.3; air-filled porosity, θa=0.13; and dry bulk density, ρb=1.5 kg/L).

4 - Adjusted LBCLs are calculated for chemicals in **bold** type using modified hierarchy of values for RBGCs for leaching evaluation, as discussed with NDEP (NDEP meeting minutes for February 12, and 17, 2010).

5 - Chemicals without an RBGC and chemicals with no Site detects are not shown in this table.

SYMBOLS

K_d (L_W/kg_S) = soil-water partition coefficient
θw (L_W/L_T) = water-filled porosity
ρb (kg_S/L_T) = dry bulk density (default value from USEPA, 1996; page 36)
θa (L_A/L_T) = air-filled porosity (default value from USEPA, 1996; page 36)
H' (L_W/L_A) = dimensionless Henry's constant
DAF = dilution-attenuation factor
LBCL = Leaching-based comparison level
RBGC = Risk-based groundwater concentrations; values in **bold** type used to calculate adjusted LBCLs.
NC = Value not calculated because NDEP provides an LBCL.
NE = Value not established

UNITS

kg = kilograms
mg = milligrams
L_W = liters of water
L_A = liters of air
L_T = liters of total bulk soil (soil air, soil water, and soil)

Attachment 2
TABLE 3A
Inorganic Chemical Properties for Soil-Water Partition Equation for Calculating Leaching-Based, Site-Specific Levels (LSSLs)

Parameter of Interest	Chemical	RBGC (mg/L)	RBGC Key	Kd Distribution coefficient (L/kg)	Kd Ref	Ref Soil pH [1]	H' Henry's Law constant	H' Ref
Metals	Aluminum	3.65E+01	N	1.50E+03	Kd a	NA	--	--
	Antimony	6.00E-03	M	4.50E+01	Kd c	NA	--	--
	Arsenic	1.00E-02	M	3.10E+01	Kd d	8	--	--
	Barium	2.00E+00	M	5.20E+01	Kd d	8	--	--
	Beryllium	4.00E-03	M	1.00E+05	Kd d	8	--	--
	Boron	7.30E+00	N	3.00E+00	Kd a	NA	--	--
	Cadmium	5.00E-03	M	4.30E+03	Kd d	8	--	--
	Chromium (Total)	1.00E-01	M	8.50E+02	Kd a	NA	--	--
	Chromium (VI)	1.00E-01	M	1.40E+01	Kd d	8	--	--
	Cobalt	1.10E-02	N	4.50E+01	Kd a	NA	--	--
	Copper	1.30E+00	N	3.50E+01	Kd a	NA	--	--
	Iron	2.56E+01	N	2.50E+01	Kd a	NA	--	--
	Lead	1.50E-02	--	9.00E+02	Kd a	NA	--	--
	Magnesium	2.07E+02	N	4.50E+00	Kd a	NA	--	--
	Manganese	5.11E-01	N	6.50E+01	Kd a	NA	--	--
	Mercury	2.00E-03	M	1.00E+01	Kd a	NA	4.67E-01	2
	Molybdenum	1.80E-01	N	2.00E+01	Kd a	NA	--	--
	Nickel	7.30E-01	N	1.90E+03	Kd d	8	--	--
	Selenium	5.00E-02	M	2.20E+00	Kd d	8	--	--
	Silver	1.83E-01	N	1.10E+02	Kd d	8	--	--
	Strontium	2.19E+01	N	3.50E+01	Kd a	NA	--	--
	Thallium	2.00E-03	M	9.60E+01	Kd d	8	--	--
	Tin	2.19E+01	N	2.50E+02	Kd a	NA	--	--
	Titanium	1.46E+02	--	1.00E+03	Kd a	NA	--	--
	Tungsten	2.74E-01	--	1.50E+02	Kd a	NA	--	--
	Uranium	3.00E-02	M	4.50E+02	Kd a	NA	--	--
	Vanadium	1.83E-01	N	1.00E+03	Kd c	NA	--	--
	Zinc	1.10E+01	N	5.30E+02	Kd d	8	--	--
Perchlorate	Perchlorate	1.80E-02	N	2.80E-07	Kd e	NA	--	--

Notes:
1 - A Site-specific soil pH of 8 was used for chemicals for which published pH-dependent values for Kd are available.
NA = Not available; Kd not dependent on pH or pH dependence has not been established.

RBGC Key:
Chemicals without an RBGC are not shown.
M = USEPA Maximum contaminant level (MCL)
C = LBCL calculated using cancer endpoint (NDEP, 2009)
N = LBCL calculated using noncancer endpoint (NDEP, 2009)

Kd References:
Kd a - Value from Figure 2.31 of Baes et al., 1984
Kd b - Value from Table 46 of USEPA, 1996 (at default pH value of 6.8 [page 40 of USEPA, 1996]).
Kd c - Non-pH dependent value from Exhibit C4, Appendix C, Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, USEPA, 2002 (accessed at http://www.epa.gov/superfund/health/conmedia/soil/pdfs/ssg_main.pdf)
Kd d - Site-specific value (at pH 8.0) from Exhibit C4, Appendix C, Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, USEPA, 2002 (accessed at http://www.epa.gov/superfund/health/conmedia/soil/pdfs/ssg_main.pdf)
Kd e - Value from US EPA, 2005, Superfund Chemical Data Matrix, (accessed at http://www.epa.gov/superfund/sites/npl/hrsres/tools/perchlorate_a.pdf)

H' References:
2 = USEPA Soil Screening Guidance: User's Guide, EPA Document Number: EPA540/R-96/018, July 1996., Attachment C, Table C-1, (accessed at http://www.epa.gov/superfund/health/conmedia/soil/pdfs/attachc.pdf)
-- = No Henry's Law value available for this chemical.

Attachment 2
TABLE 3B
Organic Chemical Properties for Soil-Water Partition Equation for Calculating Leaching-Based, Site-Specific Levels (LSSLs)

Parameter of Interest	Chemical	RBGC (mg/L)	RBGC Key	Koc, Soil-Organic Carbon-Water Distribution coefficient (L/kg)	Koc Ref	Kd Distribution coefficient (L/kg) with f_{oc}=0.002	H' Henry's Law constant	H' Ref
Organic Acids	Benzenesulfonic acid	1.83E+01	N	--	--	--	--	--
	Diethyl phosphorodithioic acid	2.92E+00	N	--	--	--	1.52E-02	1
	Dimethyl phosphorodithioic acid	3.65E+00	N	--	--	--	8.61E-03	1
	Phthalic acid	3.65E+01	N	--	--	--	--	--
Organophosphate Pesticides	Stirphos	2.80E-03	--	--	--	--	--	--
Organochlorine Pesticides	4,4'-DDD	2.80E-04	C	1.00E+06	2	2.00E+03	1.64E-04	2
	4,4'-DDE	1.98E-04	C	4.47E+06	2	8.94E+03	8.61E-04	2
	4,4'-DDT	1.98E-04	C	2.63E+06	2	5.26E+03	3.32E-04	2
	Aldrin	3.95E-06	C	2.45E+06	2	4.90E+03	6.97E-03	2
	Alpha-BHC	1.07E-05	C	1.23E+03	2	2.46E+00	4.35E-04	2
	Beta-BHC	3.74E-05	C	1.26E+03	2	2.52E+00	3.05E-05	2
	Dieldrin	4.20E-06	C	2.14E+04	2	4.28E+01	6.19E-04	2
	Endrin	2.00E-03	M	1.23E+04	2	2.46E+01	3.08E-04	2
	Gamma-BHC (Lindane)	2.00E-04	M	1.07E+03	2	2.14E+00	5.74E-04	2
	Heptachlor Epoxide	2.00E-04	M	8.32E+04	2	1.66E+02	3.90E-04	2
	Methoxychlor	4.00E-02	M	9.77E+04	2	1.95E+02	6.48E-04	2
SVOCs	1,4-Dioxane	6.11E-03	C	1.70E+01	3	3.40E-02	1.97E+02	4
	Acenaphthene	2.19E+00	N	4.90E+03	1	9.80E+00	6.36E-03	1
	Acenaphthylene	1.10E+00	N	1.50E+03	1	3.00E+00	4.67E-03	1
	Anthracene	1.10E+01	N	2.35E+04	1	4.70E+01	2.67E-03	1
	Benz(a)anthracene	9.21E-05	C	3.98E+05	2	7.96E+02	1.37E-04	2
	Benzo(a)pyrene	2.00E-04	M	1.02E+06	2	2.04E+03	4.63E-05	2
	Benzo(b)fluoranthene	9.21E-05	C	1.23E+06	2	2.46E+03	4.55E-03	2
	Benzo(g,h,i)perylene	1.10E+00	N	--	--	--	--	--
	Benzo(k)fluoranthene	9.21E-04	C	1.23E+06	2	2.46E+03	3.40E-05	2
	bis(2-Ethylhexyl)phthalate	6.00E-03	M	1.51E+07	2	3.02E+04	4.18E-06	2
	Butyl benzyl phthalate	7.30E+00	N	1.38E+04	1	2.76E+01	7.94E-05	1
	Chrysene	9.21E-03	C	3.98E+05	1	7.96E+02	3.88E-03	1
	Dibenz(a,h)anthracene	9.21E-06	C	3.80E+06	2	7.60E+03	6.03E-07	2
	Diethyl phthalate	2.92E+01	N	2.88E+02	2	5.76E-01	1.85E-05	2
	Dimethyl phthalate	3.65E+02	N	--	--	--	--	--
	Di-N-Butyl phthalate	3.65E+00	N	3.39E+04	2	6.78E+01	3.85E-08	2
	Fluoranthene	1.46E+00	N	1.07E+05	2	2.14E+02	6.60E-04	2
	Fluorene	1.46E+00	N	7.90E+03	1	1.58E+01	3.16E-03	1
	Hexachlorobenzene	1.00E-03	M	5.50E+04	2	1.10E+02	5.41E-02	2
	Indeno(1,2,3-cd)pyrene	9.21E-05	C	3.47E+06	2	6.94E+03	6.56E-05	2
	Naphthalene-SVOC	4.29E-03	C	1.19E+03	1	2.38E+00	1.98E-02	1
	Phenanthrene	1.10E+00	N	3.70E+03	1	7.40E+00	9.43E-04	1
	Pyrene	1.10E+00	N	6.80E+04	1	1.36E+02	4.51E-04	1
VOCs	1,1,1-Trichloroethane	2.00E-01	M	1.35E+02	1	2.70E-01	7.05E-01	1
	1,1-Dichloroethane	1.18E-02	C	5.30E+01	1	1.06E-01	2.30E-01	1
	1,1-Dichloroethene	7.00E-03	M	6.50E+01	1	1.30E-01	1.07E+00	1
	1,2,3-Trichloropropane	3.36E-05	C	5.10E+01	1	1.02E-01	1.15E+00	1
	1,2,4-Trichlorobenzene	7.00E-02	M	1.66E+03	1	3.32E+00	5.82E-02	1
	1,2,4-Trimethylbenzene	5.11E-02	N	3.72E+03	1	7.44E+00	2.34E-01	1
	1,2-Dichlorobenzene	6.00E-01	M	3.79E+02	1	7.58E-01	7.79E-02	1
	1,2-Dichloroethane	5.00E-03	M	3.80E+01	1	7.60E-02	4.01E-02	1
	1,3,5-Trimethylbenzene	5.92E-01	N	8.19E+02	1	1.64E+00	3.16E-01	1
	1,3-Dichlorobenzene	1.10E-01	N	3.79E+02	1	7.58E-01	7.79E-02	1

Attachment 2
TABLE 3B
Organic Chemical Properties for Soil-Water Partition Equation for Calculating Leaching-Based, Site-Specific Levels (LSSLs)

Parameter of Interest	Chemical	RBGC (mg/L)	RBGC Key	Koc, Soil-Organic Carbon-Water Distribution coefficient (L/kg)	Koc Ref	Kd Distribution coefficient (L/kg) with f_{oc}=0.002	H' Henry's Law constant	H' Ref
	1,4-Dichlorobenzene	7.50E-02	M	6.16E+02	1	1.23E+00	9.96E-02	1
	2-Butanone	2.13E+01	N	4.50E+00	1	9.00E-03	1.12E-03	1
	2-Chlorotoluene	7.30E-01	N	1.60E+02	1	3.20E-01	1.44E-01	1
	4-Methyl-2-pentanone	2.90E+00	N	1.34E+02	1	2.68E-01	5.74E-03	1
	Acetone	3.26E+01	N	5.75E-01	1	1.15E-03	1.59E-03	1
	Benzene	5.00E-03	M	6.20E+01	1	1.24E-01	2.28E-01	1
	Bromodichloromethane	1.08E-03	C	1.00E+02	1	2.00E-01	6.56E-02	1
	Bromoform	8.51E-03	C	8.71E+01	2	1.74E-01	2.19E-02	2
	Carbon tetrachloride	5.00E-03	M	1.52E+02	1	3.04E-01	1.25E+00	1
	Chlorobenzene	1.00E-01	M	2.24E+02	1	4.48E-01	1.52E-01	1
	Chloroethane	2.32E-02	C	1.47E+01	1	2.94E-02	4.51E-01	1
	Chloroform	1.62E-03	C	5.30E+01	1	1.06E-01	1.50E-01	1
	Chloromethane	8.11E-02	C	3.50E+01	1	7.00E-02	9.84E-01	1
	cis-1,2-Dichloroethene	7.00E-02	M	3.55E+01	1	7.10E-02	1.67E-01	1
	Dibromochloromethane	6.97E-04	C	6.31E+01	1	1.26E-01	3.53E-02	1
	Dichlorodifluoromethane	5.84E+00	N	5.80E+01	1	1.16E-01	4.10E+00	1
	Ethylbenzene	7.00E-01	M	2.04E+02	1	4.08E-01	3.23E-01	1
	Hexachlorobutadiene	8.62E-04	C	5.37E+04	2	1.07E+02	3.34E-01	2
	Isopropylbenzene	3.44E+00	N	2.20E+02	1	4.40E-01	4.92E+01	1
	Methylene chloride	5.00E-03	M	1.00E+01	1	2.00E-02	8.98E-02	1
	Naphthalene-VOC	4.29E-03	C	1.19E+03	1	2.38E+00	1.98E-02	1
	N-Butylbenzene	3.65E-01	N	2.83E+03	1	5.66E+00	5.37E-01	1
	N-Propylbenzene	3.65E-01	N	2.83E+03	1	5.66E+00	5.37E-01	1
	o-Xylene	4.26E+01	N	2.41E+02	1	4.82E-01	2.13E-01	1
	sec-Butylbenzene	3.65E-01	N	2.15E+03	1	4.30E+00	7.67E-01	1
	Styrene	1.00E-01	M	9.12E+02	1	1.82E+00	1.13E-01	1
	tert-Butylbenzene	3.65E-01	N	2.15E+03	1	4.30E+00	5.17E-01	1
	Tetrachloroethene	5.00E-03	M	2.65E+02	1	5.30E-01	7.54E-01	1
	Toluene	1.00E+00	M	1.40E+02	1	2.80E-01	2.72E-01	1
	Trichloroethene	5.00E-03	M	9.43E+01	1	1.89E-01	4.22E-01	1
	Trichlorofluoromethane	9.89E+00	N	1.60E+02	1	3.20E-01	3.98E+00	1
	Vinyl Chloride	2.00E-03	M	1.86E+01	1	3.72E-02	1.11E+00	1

Notes:

-- = No Kd, Koc, or Henry's Law value available for this chemical

Kd = Koc x foc; the default value of foc = 0.002 was used to calculate Kd, per NDEP guidance (NDEP, 2010).

RBGC Key Notes:

Chemicals without an RBGC and chemicals without Site detections are not shown in this table.

M = USEPA Maximum contaminant level (MCL)

C = LBCL calculated using cancer endpoint (NDEP, 2009)

N = LBCL calculated using noncancer endpoint (NDEP, 2009)

sat = soil saturation

max = risk-based value is greater than 100,000 mg/kg

References for Koc and H' values:

1 = NDEP November 2009 BCL Spreadsheet (Calculations Tab)
(accessed at http://ndep.nv.gov/bmi/docs/bcl_calculations_nov_2009.xlsx)

2 = USEPA Soil Screening Guidance: User's Guide, EPA Document Number: EPA540/R-96/018, July 1996., Attachment C, Table C-1,

Attachment 2
TABLE 3B
Organic Chemical Properties for Soil-Water Partition Equation for Calculating Leaching-Based, Site-Specific Levels (LSSLs)

Parameter of Interest	Chemical	RBGC (mg/L)	RBGC Key	Koc, Soil-Organic Carbon-Water Distribution coefficient (L/kg)	Koc Ref	Kd Distribution coefficient (L/kg) with f_{oc}=0.002	H' Henry's Law constant	H' Ref

(accessed at http://www.epa.gov/superfund/health/conmedia/soil/pdfs/attachc.pdf)

3 = EC 2002

4 = Park et al. 1987

Attachment 2
TABLE 4A
Calculation of Dilution Attenuation Factors for Inorganics

Parameter of Interest	Chemical [1]	Hydraulic Conductivity K (ft/yr)	Gradient i	Infiltration Rate, I (ft/yr)	Average Aquifer Thickness, da (ft) [2]	Mixing Zone, d (ft) [3]	Source Length, L (ft) [4]	DAF [5]
Metals	Antimony	47,500	0.02	0.1	13.5	36	340	3.8E+02
	Arsenic	47,500	0.02	0.1	13.5	203	1,900	6.8E+01
	Barium	47,500	0.02	0.1	13.5	43	400	3.2E+02
	Boron	47,500	0.02	0.1	13.5	56	530	2.4E+02
	Cadmium	47,500	0.02	0.1	13.5	32	300	4.2E+02
	Chromium (Total)	47,500	0.02	0.1	13.5	221	2,100	6.3E+01
	Chromium (VI)	47,500	0.02	0.1	13.5	22	200	6.3E+02
	Cobalt	47,500	0.02	0.1	13.5	131	1,200	1.0E+02
	Iron	47,500	0.02	0.1	13.5	590	5,600	2.4E+01
	Lead	47,500	0.02	0.1	13.5	42	390	3.3E+02
	Magnesium	47,500	0.02	0.1	13.5	443	4,200	3.2E+01
	Manganese	47,500	0.02	0.1	13.5	192	1,800	7.2E+01
	Mercury	47,500	0.02	0.1	13.5	14	130	9.7E+02
	Molybdenum	47,500	0.02	0.1	13.5	21	200	6.6E+02
	Nickel	47,500	0.02	0.1	13.5	44	420	3.1E+02
	Thallium	47,500	0.02	0.1	13.5	29	280	4.6E+02
Perchlorate	Perchlorate	47,500	0.02	0.1	13.5	445	4,200	3.2E+01

Notes:

1 - DAF is caluculated only for chemicals which had a detect greater than the LBCL (DAF=20).

2 - Average aquifer thickness defined as the mean of the measured values from the wells at the northern Site boundary (see Attachment 2, Table 1B).

3 - Aquifer mixing zone depth d= (0.0112L^2)^0.5 + da[1-exp(-LI/ Kida)] (Equation 4 from BCL guidance).
If d> da, use aquifer thickness instead of mixing zone thickness.

4 - Source lengths measured based on Phase A and B soil samples that exceed LBCLs for DAF= 20, as discussed in Attachment 2.

5 - Dilution attenuation factor DAF= 1 + Kid/ IL (Equation 3 from BCL guidance).

Abbreviations:

DAF: Dilution attenuation factor

RBGC: Risk-based groundwater concentration

Attachment 2
TABLE 4B
Calculation of Dilution Attenuation Factors for Organics

Parameter of Interest	Chemical [1]	Hydraulic Conductivity, K (ft/yr)	Gradient, i	Infiltration Rate, I (ft/yr)	Average Aquifer Thickness, da (ft) [2]	Mixing Zone, d (ft) [3]	Source Length, L (ft) [4]	DAF [5]
Organochlorine Pesticides	4,4'-DDE	47,500	0.02	0.1	13.5	15	150	8.8E+02
	4,4'-DDT	47,500	0.02	0.1	13.5	15	150	8.8E+02
	Aldrin	47,500	0.02	0.1	13.5	23	210	6.0E+02
	Alpha-BHC	47,500	0.02	0.1	13.5	64	610	2.1E+02
	Beta-BHC	47,500	0.02	0.1	13.5	305	2,900	4.6E+01
	Dieldrin	47,500	0.02	0.1	13.5	12	110	1.0E+03
	Gamma-BHC (Lindane)	47,500	0.02	0.1	13.5	72	680	1.9E+02
SVOCs	Benz(a)anthracene	47,500	0.02	0.1	13.5	12	110	1.0E+03
	Benzo(b)fluoranthene	47,500	0.02	0.1	13.5	12	110	1.0E+03
	Hexachlorobenzene	47,500	0.02	0.1	13.5	110	1,000	1.2E+02
VOCs	1,2,3-Trichloropropane	47,500	0.02	0.1	13.5	15	140	9.3E+02
	1,2,4-Trichlorobenzene	47,500	0.02	0.1	13.5	12	120	1.0E+03
	Benzene	47,500	0.02	0.1	13.5	21	200	6.4E+02
	Chloroform	47,500	0.02	0.1	13.5	55	520	2.5E+02
	Methylene chloride	47,500	0.02	0.1	13.5	22	200	6.3E+02

Notes:

1 - DAF is calculated only for chemicals which had a detect greater than the LBCL (DAF=20) and have a RBGC.

2 - Average aquifer thickness defined as the mean of the measured values form the wells at the northern Site boundary (see Attachment 2, Table 1B).

3 - Aquifer mixing zone depth d= (0.0112L^2)^0.5 + da[1-exp(-LI/Kida)] (Equation 4 from BCL guidance). If d> da, use aquifer thickness instead of mizing zone thickness.

4 - Source lengths measured based on Phase A and B soil samples that exceed LBCLs for DAF=20, as discussed in Attachment 2.

5 - Dilution attenuation factor DAF= 1 + KID/ IL (Equation 3 from BCL guidance).

Abbreviations:

DAF: Dilution attenuation factor

RBGC: Risk-based groundwater concentration

Attachment 2
TABLE 5A
Calculation of Leaching-Based Site Specific Levels (LSSLs) for Inorganics

Parameter of Interest	Chemical	Kd Distribution coefficient with foc=0.002 (L/kg)	H' Henry's Law constant (unitless)	RBGC (mg/L)	NDEP Worker BCL (mg/kg)	LBCL (DAF=1)[4] (mg/kg)	LBCL (DAF=20)[4] (mg/kg)	Quaternary Alluvium Average (13.5') Aquifer Thickness	
								DAF	LSSL [1, 2, 3] (mg/kg)
	Antimony	4.5E+01	--	6.0E-03	4.5E+02	3.0E-01	6.0E+00	3.8E+02	1.02E+02
	Arsenic	3.1E+01	--	1.0E-02	1.8E+00	1.0E+00	2.0E+01	6.8E+01	2.12E+01
	Barium	5.2E+01	--	2.0E+00	1.0E+05	8.2E+01	1.6E+03	3.2E+02	3.32E+04
	Boron	3.0E+00	--	7.3E+00	1.0E+05	2.3E+01	4.7E+02	2.4E+02	5.56E+03
	Cadmium	4.3E+03	--	5.0E-03	5.5E+02	4.0E-01	8.0E+00	4.2E+02	9.11E+03
	Chromium (Total)	8.5E+02	--	1.0E-01	4.1E+02	2.0E+00	4.0E+01	6.3E+01	5.32E+03
	Chromium (VI)	1.4E+01	--	1.0E-01	4.1E+02	2.0E+00	4.0E+01	6.3E+02	8.89E+02
	Cobalt	4.5E+01	--	1.1E-02	3.3E+02	4.9E-01	9.9E+00	1.0E+02	5.18E+01
	Iron	2.5E+01	--	2.6E+01	1.0E+05	6.4E+02	1.3E+04	2.4E+01	1.54E+04
	Lead	9.0E+02	--	1.5E-02	8.0E+02	1.4E+01	2.7E+02	3.3E+02	4.42E+03
	Magnesium	4.5E+00	--	2.1E+02	1.0E+05	9.7E+02	1.9E+04	3.2E+01	3.04E+04
	Manganese	6.5E+01	--	5.1E-01	1.4E+04	3.3E+01	6.7E+02	7.2E+01	2.39E+03
	Mercury	1.0E+01	4.7E-01	2.0E-03	1.8E+02	1.0E-01	2.1E+00	9.7E+02	1.97E+01
	Molybdenum	2.0E+01	--	1.8E-01	5.7E+03	3.6E+00	7.3E+01	6.6E+02	2.38E+03
	Nickel	1.9E+03	--	7.3E-01	2.0E+04	7.0E+00	1.4E+02	3.1E+02	4.26E+05
	Thallium	9.6E+01	--	2.0E-03	8.0E+01	4.0E-01	8.0E+00	4.6E+02	8.92E+01
Perchlorate	Perchlorate	2.8E-07	--	1.8E-02	7.9E+02	3.6E-03	7.2E-02	3.2E+01	7.75E-02

Notes:

1 - Leaching-based, site-specific levels (LSSLs) are calculated using dilution attenuation factors (DAFs) calculated in Attachment 2, Table 4A, and the following site-specific soil properties from Attachment 2, Table 1A: water-filled porosity, θw=0.22; air-filled porosity, θa=0.18; and dry bulk density, ρb=1.61 kg/L.

2 - LSSL = RBGC * DAF * (K_d + (Θ_w+Θ_a*H)/ρ_b)

3 - LSSL not calculated for chemicals without a detect above the LBCL (DAF=20) or without an RBGC.

4 - The generic LBCL is used for chemicals without an established LBCL. Where applicable, the adjusted LBCL is used based on the NDEP approved hierarchy for RBGCs is used (See Attachment 2 Table 2A).

Abbreviations:

LSSL = Leaching-based, site-specific levels

RBGC = Risk-based groundwater concentration

DAF = Dilution attenuation factor

NE = Value not established

LBCL = Leaching-based basic comparison levels

f_{oc} = fraction of organic carbon

BCL = Basic comparison level

Attachment 2
TABLE 5B
Calculation of Leaching-Based Site Specific Levels (LSSLs) for Organics

Parameter of Interest	Chemical	Kd Distribution coefficient with foc=0.002 (L/kg)	H' Henry's Law constant (unitless)	RBGC (mg/L)	NDEP Worker BCL (mg/kg)	LBCL (DAF=1)[4] (mg/kg)	LBCL (DAF=20)[4] (mg/kg)	Quaternary Alluvium Average (13.5') Aquifer Thickness	
								DAF	LSSL [1, 2, 3] (mg/kg)
Organochlorine Pesticides	4,4'-DDE	8.9E+03	8.6E-04	2.0E-04	7.8E+00	3.0E+00	6.0E+01	8.8E+02	1.6E+03
	4,4'-DDT	5.3E+03	3.3E-04	2.0E-04	7.8E+00	2.0E+00	4.0E+01	8.8E+02	9.1E+02
	Aldrin	4.9E+03	7.0E-03	4.0E-06	1.1E-01	2.0E-02	4.0E-01	6.0E+02	1.2E+01
	Alpha-BHC	2.5E+00	4.4E-04	1.1E-05	4.0E-01	3.0E-05	6.0E-04	2.1E+02	5.9E-03
	Beta-BHC	2.5E+00	3.1E-05	3.7E-05	1.4E+00	1.0E-04	2.0E-03	4.6E+01	4.5E-03
	Dieldrin	4.3E+01	6.2E-04	4.2E-06	1.2E-01	2.0E-04	4.0E-03	1.0E+03	1.8E-01
	Gamma-BHC (Lindane)	2.1E+00	5.7E-04	2.0E-04	1.9E+00	5.0E-04	1.0E-02	1.9E+02	8.6E-02
SVOCs	Benz(a)anthracene	8.0E+02	1.4E-04	9.2E-05	2.3E+00	8.0E-02	1.6E+00	1.0E+03	7.4E+01
	Benzo(b)fluoranthene	2.5E+03	4.6E-03	9.2E-05	2.3E+00	2.0E-01	4.0E+00	1.0E+03	2.3E+02
	Hexachlorobenzene	1.1E+02	5.4E-02	1.0E-03	1.2E+00	1.0E-01	2.0E+00	1.2E+02	1.4E+01
VOCs	1,2,3-Trichloropropane	1.0E-01	1.1E+00	3.4E-05	1.6E+00	2.0E-05	4.1E-04	9.3E+02	1.1E-02
	1,2,4-Trichlorobenzene	3.3E+00	5.8E-02	7.0E-02	2.4E+02	3.0E-01	6.0E+00	1.0E+03	2.4E+02
	Benzene	1.2E-01	2.3E-01	5.0E-03	1.4E+00	2.0E-03	4.0E-02	6.4E+02	9.2E-01
	Chloroform	1.1E-01	1.5E-01	1.6E-03	5.2E-01	3.0E-02	6.0E-01	2.5E+02	1.0E-01
	Methylene chloride	2.0E-02	9.0E-02	5.0E-03	2.1E+01	1.0E-03	2.0E-02	6.3E+02	5.3E-01

Notes:

1 - Leaching-based, site-specific levels (LSSLs) are calculated using dilution attenuation factors (DAFs) calculated in Attachment 2, Table 4B, and the following site-specific soil properties from Attachment 2, Table 1A: water-filled porosity, θw=0.22; air-filled porosity, θa=0.18; and dry bulk density, ρb=1.61 kg/L.

2 - LSSL = RBGC * DAF * $(K_d + (\Theta_w+\Theta_a*H)/\rho_b)$

3 - LSSL not calculated for chemicals without a detect above the LBCL (DAF=20) or without an RBGC.

4 - Generic LBCLs are used for chemicals without an LBCL (see Attachment 2 Table 2B)

Abbreviations:

LSSL = Leaching-based, site-specific levels

RBGC = Risk-based groundwater concentration

DAF = Dilution attenuation factor

NE = Value not established

LBCL = Leaching-based basic comparison levels

f_{oc} = fraction of organic carbon

BCL = Basic comparison level